



## Appendix A-3: Traffic Operations Technical Memorandum and Interstate Access Modification Request Process Summary

Appendix A-3: Traffic Operations Technical Memorandum and Interstate Access Modification Request Process Summary are companion documents to the Supplemental Final Environmental Impact Statement containing Chapter 3 (Transportation). Metropolitan Council and the United States Department of Transportation - Federal Transit Administration are committed to ensuring that information is available in appropriate alternative formats to meet the requirements of persons who have a disability. If you require an alternative version of this file, please contact [FTAWebAccessibility@dot.gov](mailto:FTAWebAccessibility@dot.gov).

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### Documents include:

- Traffic Operations Technical Memorandum March 2025 (this document contains technical appendices, if you require additional accessibility support please see contact information above)
- Interstate Access Modification Request Process Summary

The following documents were published with the Supplemental Draft Environmental Impact Statement and are available online at [https://metro council.org/Transportation/Projects/Light-Rail-Projects/METRO-Blue-Line-Extension/Publications-And-Resources/Environmental/SDEIS/BLE\\_SDEIS\\_Appendix-A-3-Traffic-and-Aviation-Docume.aspx](https://metro council.org/Transportation/Projects/Light-Rail-Projects/METRO-Blue-Line-Extension/Publications-And-Resources/Environmental/SDEIS/BLE_SDEIS_Appendix-A-3-Traffic-and-Aviation-Docume.aspx):

- Crystal Airport Runway Protection Zone Technical Memorandum
- Crystal Airport Runway Protection Zone Exhibits
- Crystal Airport (MIC) Runway Protection Zone FAA Correspondence
- Crystal Airport MnDOT Safety Zones and Clear Zones Exhibit



# Traffic Operations Technical Report

Supplemental Final Environmental Impact Statement

11/26/2024

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# 1.0 Introduction

The METRO Blue Line Extension project (Project) is proposed to be a 13.5-mile Light Rail Transit (LRT) line with 13 new stations that will operate from downtown Minneapolis through Robbinsdale, Crystal, and Brooklyn Park. The Project will serve as an extension of the METRO Blue Line (Hiawatha Corridor) and will also connect to the METRO Green Line in downtown Minneapolis.

A traffic analysis was previously completed for the 2016 Alignment that included the BNSF Railway Monticello Subdivision. To advance the Project without using railroad right-of-way, a modified route was approved by Hennepin County and the Metropolitan Council in 2022. A preliminary traffic analysis was completed in September 2022 for the Supplemental Draft Environmental Impact Statement (SDEIS).

The traffic analysis presented in this technical report is based on the Project scope as presented to the Metropolitan Council through January 2024 and is being used to inform the Supplemental Final Environmental Impact Statement (SFEIS).

## 1.1 Purpose of Report

This technical report has been prepared in support of the Project SFEIS. The objective of the traffic analysis is to define the scope of the Project improvements and evaluate the potential traffic impacts of the Project, including the following:

- Evaluate the Project's impacts on traffic operations at existing and proposed intersections and at-grade rail crossings along or near the Project Alignment.
- Identify proposed improvements to address operational issues identified in the traffic analysis.

The methodology, assumptions, and results of the analysis are presented in the following sections.

## 1.2 Study Areas

The location of the overall Project Alignment is shown in **Figure 1.1**. The proposed Project guideway will be at-grade for most of its alignment and includes areas with the LRT operating in mixed-use and semi-exclusive street-running operation. The locations of the intersections and at-grade crossings studied as part of the Project traffic analysis are shown in **Figure 1.2-Figure 1.7**. The analysis was broken into six areas, as shown in **Figure 1.1** and described below:

- CSAH 103 (West Broadway)
  - Operations and Maintenance Facility (OMF) to County State Aid Highway (CSAH) 81 (Bottineau Boulevard)/73rd Avenue
  - Project Alignment side-running north of TH 610 and Project Alignment generally center-running along CSAH 103 (West Broadway Avenue)



- CSAH 81 North
  - 73rd Avenue N to TH 100
  - Project Alignment center-running along CSAH 81 (Bottineau Boulevard)
- CSAH 81 South
  - TH 100 to CSAH 153 (Lowry Avenue)
  - Project Alignment generally center-running along CSAH 81 (Bottineau Boulevard)
- CSAH 81 (West Broadway)
  - CSAH 153 (Lowry Avenue) to N James Avenue
  - Project Alignment generally center-running along CSAH 81 (W Broadway Avenue)
- CSAH 81 (West Broadway) / N 21st Avenue
  - N James Avenue to West River Road
  - Project Alignment along N 21st Avenue
- CSAH 152 (N Washington Avenue)/ N 10th Avenue
  - N 21st Avenue to N 7th Street/Target Field Station
  - Project Alignment center-running along CSAH 152 (N Washington Avenue), along N 10th Avenue between CSAH 152 (N Washington Avenue) and N 5th Street, and side-running from N 5th Street to Target Field Station

## 1.3 Data Collection

Multiple data elements were collected for each of the areas analyzed:

- Weekday intersection movement counts including passenger vehicles, heavy vehicles, pedestrians, and bicycles
- Existing turning movement count data from 2021 was utilized where available
- Additional turning movement count data was collected from April 2022 to December 2023
- Freight rail train lengths and crossing times
- Signal timing and coordination plans for existing signalized intersections
- Bus routes, stops, and passenger loading/unloading

This data was used to assemble a comprehensive model of the existing conditions.

Figure 1.1: Project Alignment

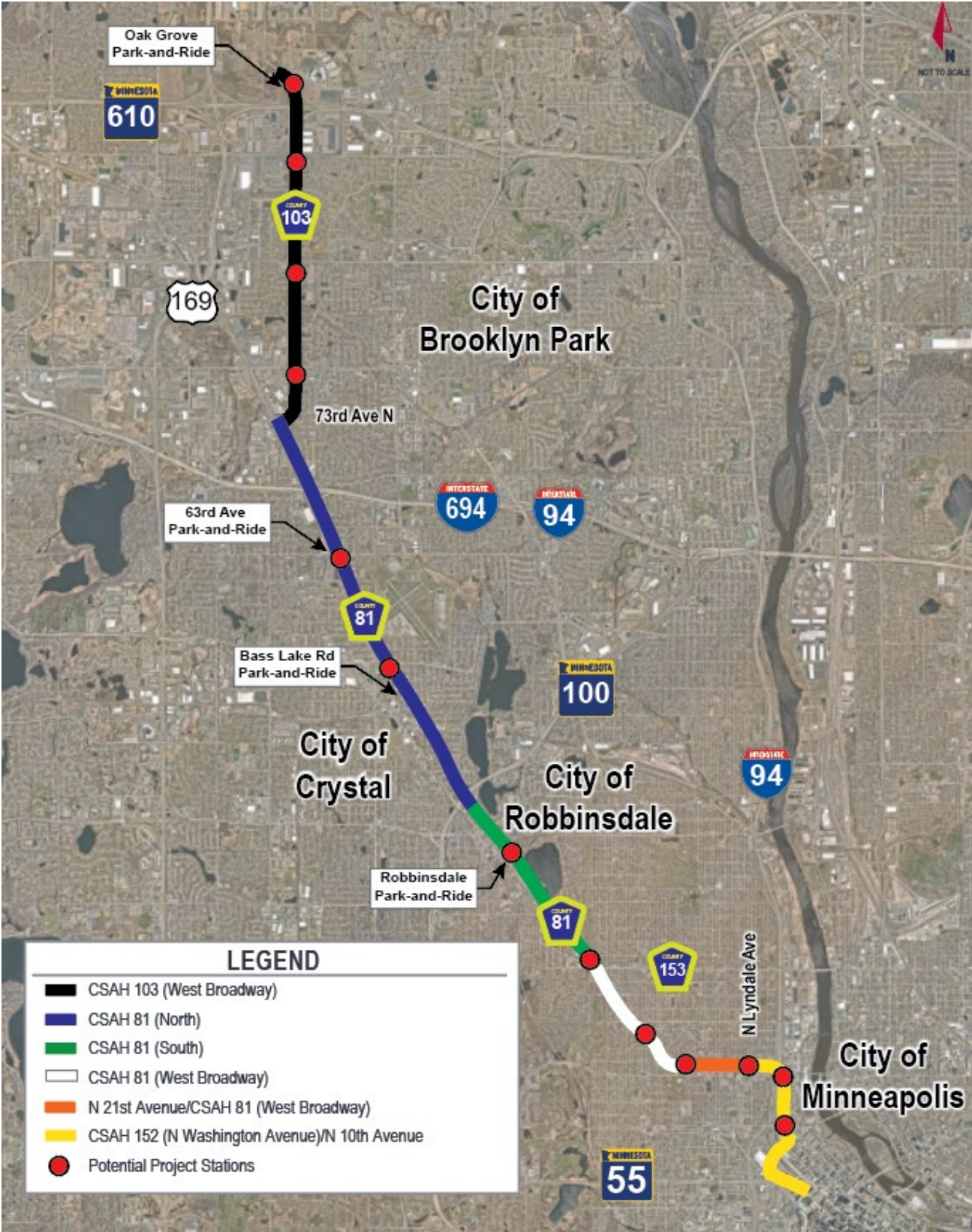




Figure 1.2: Analysis Area/Intersections





Figure 1.3: Analysis Intersections

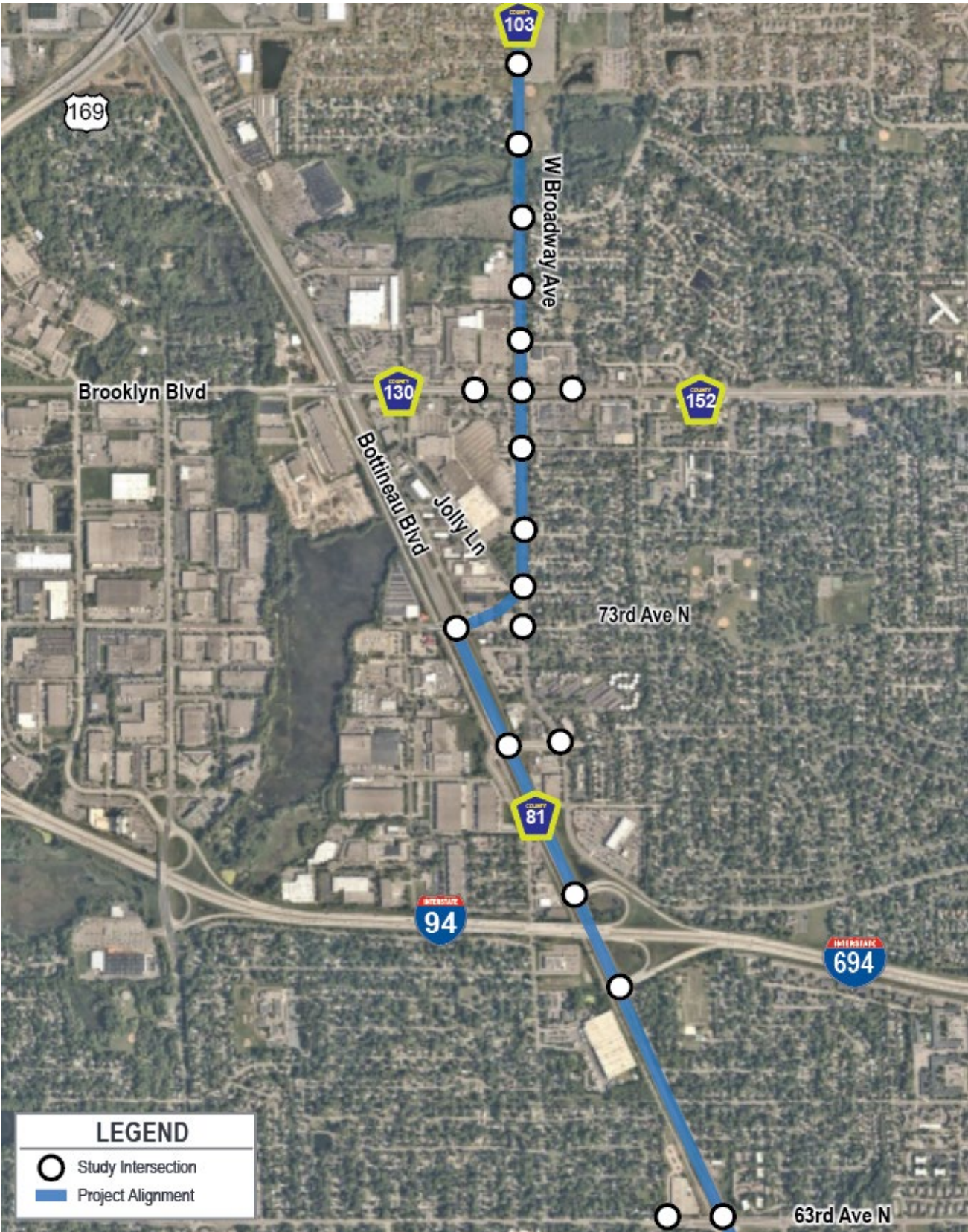




Figure 1.4: Analysis Intersections

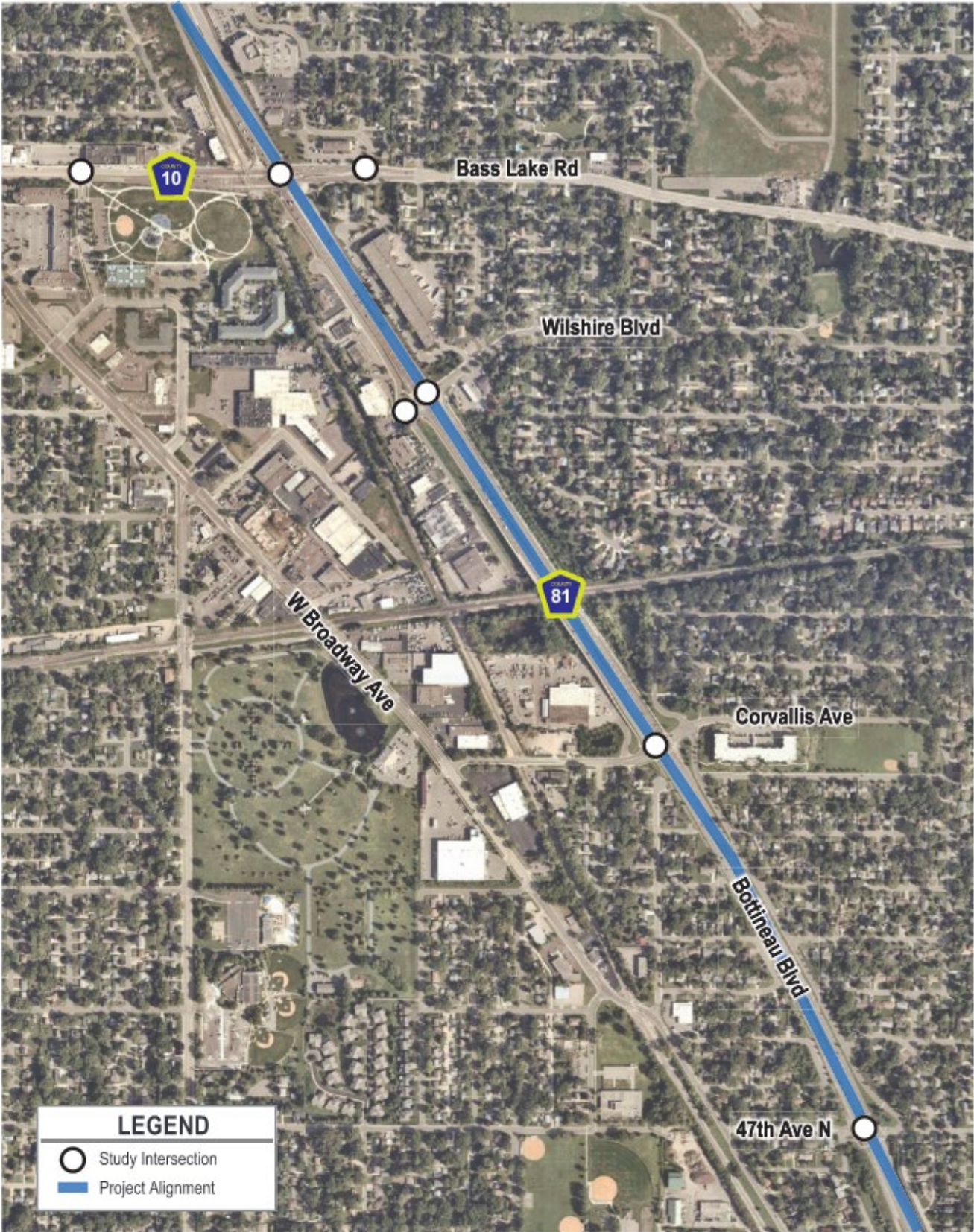


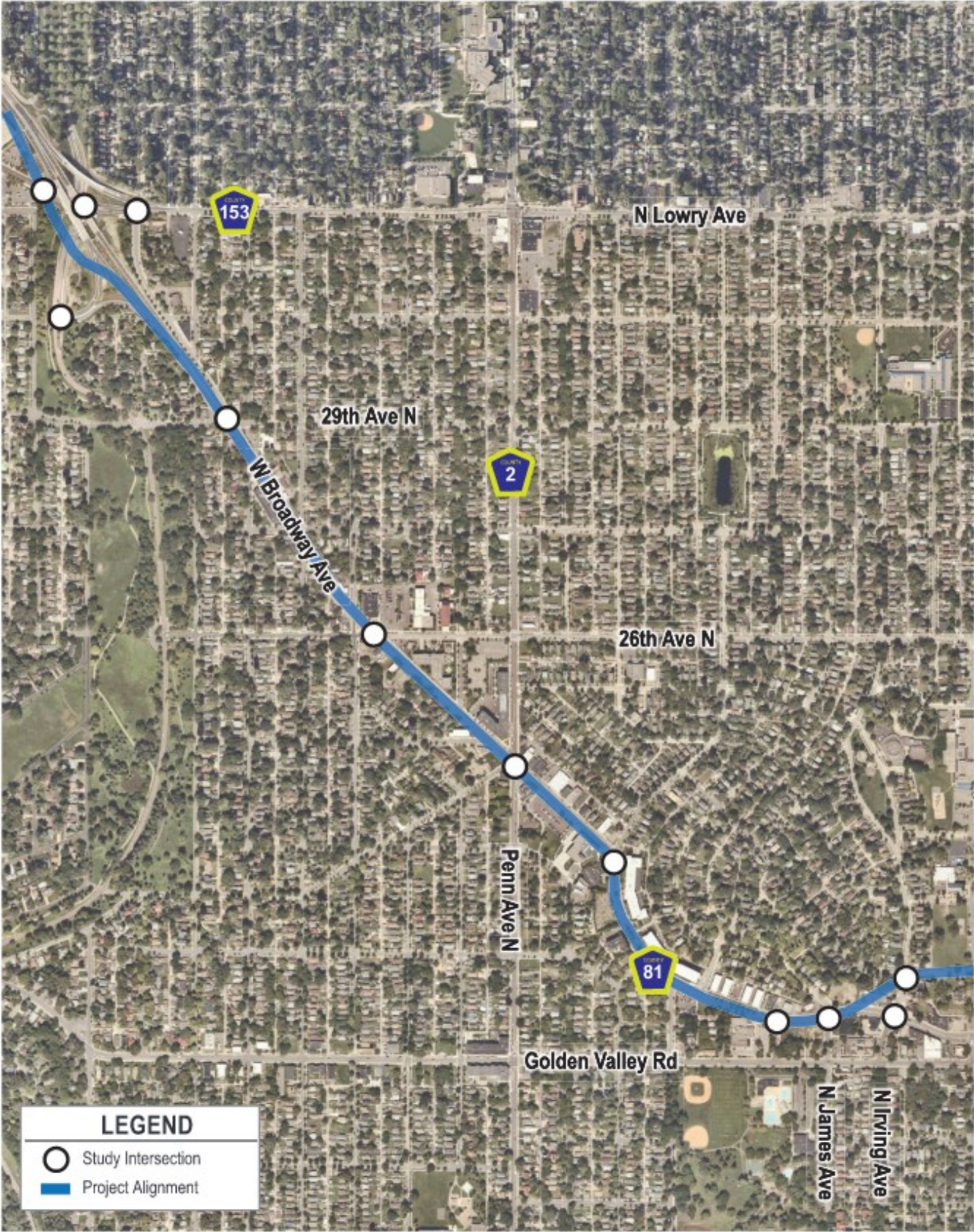


Figure 1.5: Analysis Intersections





Figure 1.6: Analysis Intersections





**LEGEND**

- Study Intersection
- Project Alignment
- \* Build Scenario Only



## 2.0 Methodology

### 2.1 Key Intersections and At-Grade Crossings

To determine the impacts of the Project on the local roadway network, a traffic operations analysis was conducted for signalized and unsignalized intersections within the vicinity of the Project Alignment or for intersections that would be expected to have increased traffic due to the Project stations, such as nearby park-and-ride facilities. The analysis area included signalized intersections with an LRT crossing in the intersection, unsignalized intersections that may have a change in intersection control, and intersections that provide access to an LRT station park-and-ride facility. Additional intersections were analyzed based on their proximity to an LRT crossing or park-and-ride facility and the potential for interaction with the crossing or park-and-ride facility.

### 2.2 Development of Traffic Volumes

The SFEIS future year analysis year assumed to be 2050, 20 years after the Project opening. The development of the 2050 future traffic forecasts was based on the following data sources:

- Historic annual average daily traffic (AADT) volumes in the study area
- 2040 forecast daily traffic volumes as documented in the Hennepin County and city 2040 comprehensive plans
- 2040 socioeconomic data developed by the Metropolitan Council and local communities
- 2050 draft socioeconomic data developed by the Metropolitan Council

The 2050 Twin Cities Activity Based Model (ABM) was not yet available at the time of this analysis. Therefore the 2050 forecasts were based on the published 2040 forecast daily traffic volumes and the projected growth in socioeconomic data between 2040 and 2050. This forecasting process was completed by running the 2050 socioeconomic data through the 2040 ABM without and with the Project (No Build and Build, respectively). Changes to roadway capacity and roadway connections proposed by the Project were included in the Build forecast model and therefore are reflected in the traffic forecasts.

**Table 2.1** highlights projects that were not captured in the 2040 ABM but are expected to be included in the updated 2050 ABM from the Metropolitan Council. These projects have varying levels of anticipated impacts on the 2050 future volumes along the Project Alignment.

- Projects designated as having a “Low” impact to future volumes along the Project Alignment are projects that are regionally significant but are not anticipated to significantly influence future volumes along the Project Alignment.
- Projects designated as having a “Medium” impact to future volumes along the Project Alignment are regionally significant projects that are anticipated to influence the number of regional vehicle trips along the Project Alignment.
- Projects designated as having a “High” impact to future volumes along the Project Alignment are those that have a direct impact to the Project geometry. These projects have already been accounted for in the 2050 forecast volumes for the Project.

**Table 2.1: 2050 Regionally Significant Capacity Improvement Projects**

<b>Regionally Significant Project Name, Location</b>	<b>Transportation Policy Plan (TPP) Scenario</b>	<b>Regionally Significant Project Description</b>	<b>Impact to Forecast Blue Line Extension Project Volumes</b>
MN 65 Grade Separation, Anoka County	Current Revenue Stream (CRS)	Converts MN 65 to a freeway with new interchanges at 99th, 105th, 109th, and 117th Avenues as well as CR 116 (Bunker Lake Boulevard)	Low
I-394 Spot Mobility Improvement, Hennepin County	CRS	Connects 3 lanes west of Louisiana Avenue to 3 lanes east of Louisiana Avenue	Low
Hwy 610/East River Road Interchange Modification, Anoka County	CRS	Constructs the remaining two ramps to convert the existing interchange into a full access interchange	Low
MN 65 Grade Separation, Anoka County	CRS	Conversion to a hybrid freeway with improvements to the TH 10 interchange, new interchange at 93rd Avenue, and construction of an overpass with Right-In/Right-Out access at 85th Avenue	Low
Bass Lake Road Interchange, Hennepin County	CRS	Construction of a new interchange on CSAH 81 at Bass Lake Road as part of the Project	High (Already included in the Project forecasts)
Hwy 252 Freeway Conversion, Hennepin County	CRS	Converts Hwy 252 to a freeway with EZ-Pass Lanes from Hwy 610 to 4th Street and new interchanges at 85th Street, Brookdale Drive, and 66th Street	Medium (Based on Scoping Process documentation, this project is anticipated to reduce regional trips on CSAH 81)
West Broadway (CSAH 103) Avenue Expansion, Hennepin County	CRS	Converts West Broadway Avenue from a 2-lane to 4-lane facility along the Project Alignment	High (Already included in the Project forecasts)

There are not any “High” impact projects anticipated in the 2050 ABM that are not already captured in the Project forecasts. The “Medium” impact projects would be anticipated to reduce traffic volumes along the Project Alignment, therefore the 2050 Project forecasts are conservative.

## 2.3 Traffic Analysis Methodology

Three scenarios were analyzed as part of this traffic analysis:

- Existing conditions – Used to validate and calibrate the simulation models of the study areas
- 2050 No Build conditions – Analysis of future traffic conditions without the Project
- 2050 Build conditions – Analysis of future traffic conditions with the Project (including park-and-rides)

The approach to the traffic operations analysis is derived from the established methodologies documented in the Highway Capacity Manual, 7th Edition (HCM). The HCM contains a series of analysis techniques for evaluating the operations of transportation facilities under specified conditions. The models for the Project analysis have been developed using VISSIM and Synchro/SimTraffic software packages that implement the HCM methodologies. The inputs to the software include lane geometrics, traffic volumes, pedestrian/bicycle volumes, transit stations, freight and LRT alignments, freight and LRT volumes, intersection and grade crossing control devices, and signal phase and timing characteristics.

The outputs of the models are evaluated using the level of service thresholds as defined in the HCM, which are shown in **Table 2.2**. Based on standard practice in the traffic engineering industry, as well as guidance from the American Association of State Highway and Transportation Officials (AASHTO) and conformance with MnDOT practice, level of service D/E is considered to be the threshold of acceptable operations for an overall intersection in an urban or suburban area during peak hours.

The analysis periods included the highest one hour of vehicle traffic volume during the weekday AM peak period (6:00–9:00 AM) and PM peak period (3:00–7:00 PM). The peak hour varied by intersection, but AM peak hours were generally identified as occurring between 7:00 AM and 8:45 AM and PM peak hours were generally identified as occurring between 4:00 PM and 5:45 PM.

**Table 2.2: Intersection Level of Service Definitions**

Level of Service	Signalized Intersection Delay (seconds per vehicle)	Unsignalized Intersection Delay (seconds per vehicle)
A	≤ 10	≤ 10
B	> 10–20	> 10–15
C	> 20–35	> 15–25
D	> 35–55	> 25–35
E	> 55–80	> 35–50
F	> 80	> 50

## 2.4 Design Criteria and Assumptions

All full-access intersections with the LRT guideway, where all vehicular movements are allowed across the guideway, were assumed to be signalized to provide safe movement of LRT, vehicles, pedestrians, and bicycles. Where an intersection along the LRT guideway was assumed to remain unsignalized, the intersections were converted to right-in, right-out only intersections. Except at N Theodore Wirth Parkway / N Lowry Avenue, gates were not assumed to be used at any of the LRT guideway crossings because the LRT operates in the street with traffic signal control and the LRT operating speed through intersections would not exceed 40 miles per hour, consistent with the Manual on Uniform Traffic Control Devices. Automatic gates are proposed for the at-grade LRT crossings on N Lowry Avenue and on N Theodore Wirth Parkway for the safe operation of the LRT because the grade crossings are not at an intersection and the sight lines are limited approaching the grade crossings.

## 2.5 Measures of Effectiveness

The measures of effectiveness used to evaluate the operations results and identify a Project impact in need of improvement were based on intersection delay (level of service) and queuing.

The level of service (LOS) criteria used to identify a Project impact and potential mitigation were as follows:

- Overall intersection LOS E or F in Build conditions, if intersection is LOS D or better in No Build conditions
- Approach or movement LOS E or F in Build conditions, if the movement negatively impacts upstream operations and approach or movement operates at LOS D or better in No Build conditions

The criteria used to identify a queuing issue were as follows:

- 95<sup>th</sup> percentile queue length that exceeds storage length, and one of the following criteria is also met:
  - Average back-of-queue exceeds storage length
  - Movement operates at LOS E or LOS F
  - 95<sup>th</sup> percentile queue blocks upstream full-access intersection(s)
- 95<sup>th</sup> percentile queue length exceeds 500 feet on a stop-controlled approach

For locations where a queuing issue was identified, the need for mitigation was based on a comparison to the No Build conditions, the severity of the issue, the potential safety and operations implications at the study intersection, and the impact the queue had on the larger roadway network. These improvements are listed in **Section 6.1**, along with all improvements that have been identified to be built as part of the Project.

## 3.0 Existing Conditions Analysis

The existing conditions models were developed to validate and calibrate the simulation models of the study areas, which were then used to model the future year conditions. The assumptions, methodology, and results of the existing conditions analysis are presented in the following sections.

### 3.1 Existing Conditions Assumptions

The existing conditions analysis was based on traffic volumes, roadway geometrics, rail crossing treatments, and signal operations as they existed in 2021 through 2023 when the data collection was completed. For the counts conducted in 2021 and 2022, the existing peak hour traffic volumes were developed using modification factors that adjusted for lower traffic volumes experienced during and shortly after COVID-19 pandemic. The geometrics and intersection control for the existing conditions are shown in the intersection layout tables provided in **Appendix B: Intersection Layout Tables**.

The actual calculated peak hours varied for each study area but occurred within the range of 7:00 AM and 8:45 AM for the AM peak hour and 4:00 PM and 5:45 PM for the PM peak hour in all sections, based on the turning movement data collected within the study area.

Information collected along the freight rail corridor as part of the traffic analysis of the 2016 Alignment showed that, at most, one train per day with less than 20 cars is expected on the BNSF Monticello Subdivision. The data collected in 2014 showed that trains typically travel through the freight rail corridor during the AM peak hour, between 7:30 and 8:00 AM. Thus, a freight train event was only included in a scenario in the AM peak hour where the freight rail grade crossing is within 1,000 feet of CSAH 81. The assumed freight event was approximately one minute in duration, which is consistent with the existing freight activity. No freight events were analyzed for the PM peak hour.

### 3.2 Existing Conditions Traffic Modeling Results

The existing operations results are presented for each of the six modeling areas in the following sections. All intersections were modeled in VISSIM.

#### 3.2.1 CSAH 103 (West Broadway)

The results of the AM and PM peak hour analysis showed that all intersections currently operate at overall LOS D or better during the Existing peak hour scenarios with the following exception:

- CSAH 103 (W Broadway Avenue) / CSAH 30 (93rd Avenue N) in the PM peak hour.

The overall intersection results are shown in **Table 3.1**.

The poor LOS at the CSAH 103 (W Broadway Avenue)/CSAH 30 (93rd Avenue N) is due to the eastbound approach which currently operates at LOS F. The eastbound approach has the highest approach volume and the signal operations are limited by the use of protected only signal indications on that approach and do not allow for permissive left turn phasing.

No queueing issues were identified in the Existing conditions under AM peak hour conditions.

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 103 (W Broadway Avenue) / CSAH 30 (93rd Avenue N) – eastbound approach

The queuing issues on eastbound CSAH 30 (93<sup>rd</sup> Avenue N) are directly related to the signal operation and delays noted above.

The full table of existing conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 3.1: CSAH 103 (West Broadway) – Existing Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 103 (W Broadway Ave) / 101 <sup>st</sup> Ave N*	2.0 A	6.7 A
CSAH 103 (W Broadway Ave) / Winnetka Ave N*	0.2 A	0.5 A
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	7.8 A	14.6 B
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	13.0 B	14.2 B
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	9.9 A	10.1 B
CSAH 103 (W Broadway Ave) / 94th Ave N*	1.9 A	2.1 A
CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	36.5 D	69.5 E
CSAH 103 (W Broadway Ave) / 92nd Ave N*	1.9 A	2.7 A
CSAH 103 (W Broadway Ave) / Setzler Pkwy*	2.8 A	1.9 A
CSAH 103 (W Broadway Ave) / 89th Ave N*	2.1 A	2.0 A
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy*	2.2 A	2.9 A
CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	28.3 C	32.5 C
CSAH 103 (W Broadway Ave) / 84th Ave N	5.9 A	6.8 A

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 103 (W Broadway Ave) / College Park Dr*	0.3 A	0.5 A
CSAH 103 (W Broadway Ave) / 82nd Ave N*	0.5 A	0.7 A
CSAH 103 (W Broadway Ave) / Candlewood Dr	4.6 A	4.9 A
CSAH 103 (W Broadway Ave) / 78th Ave N*	0.7 A	1.1 A
CSAH 103 (W Broadway Ave) / Shopping Center Access	1.6 A	9.3 A
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	24.7 C	27.9 C
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	9.6 A	13.8 B
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)*	0.4 A	1.1 A
CSAH 130 (W Broadway Ave) / 76th Ave N	6.4 A	9.3 A
CSAH 130 (W Broadway Ave) / 75th Ave N*	1.2 A	1.8 A
CSAH 130 (W Broadway Ave) / 74th Ave N*	1.2 A	1.6 A
CSAH 130 (W Broadway Ave) / 73rd Ave N	4.8 A	6.4 A

\*Stop-controlled intersection

### 3.2.2 CSAH 81 North

The results of the AM and PM peak hour analysis showed that all intersections currently operate at overall LOS D or better during the Existing peak hour scenarios, including a 20-car freight event in the AM peak hour. The overall intersection results are shown in **Table 3.2**.

Movements for which queuing issues were identified under AM and PM peak hour conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / 47th Avenue N – Eastbound right movement

The queueing issue at the intersection of CSAH 81 (Bottineau Boulevard) / 47th Avenue is due to the existing eastbound no right turn on red (RTOR) operation.

The full table of existing conditions LOS and queueing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 3.2: CSAH 81 North – Existing Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (Bottineau Blvd) / 73 <sup>rd</sup> Ave N	9.9 A	10.3 B	13.5 B
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	20.4 C	18.0 B	18.7 B
CSAH 130 (W Broadway Ave) / 71 <sup>st</sup> Ave N	8.7 A	9.0 A	17.7 B
CSAH 81 (Bottineau Blvd) / I-94/I-694 WB Ramps	9.7 A	11.6 B	10.4 B
CSAH 81 (Bottineau Blvd) / I-94/I-694 EB Ramps	18.8 B	19.6 B	14.1 B
CSAH 81 (Bottineau Blvd) / 63rd Ave N	28.5 C	30.8 C	29.6 C
63rd Ave N / Louisiana Ave N / Park-and-Ride Access*	1.7 A	1.8 A	1.6 A
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Rd)	26.6 C	30.4 C	35.2 D
CSAH 10 (Bass Lake Rd) / Sherburne Ave	9.2 A	8.1 A	10.4 B
CSAH 10 (Bass Lake Rd) / Adair Ave*	1.1 A	0.9 A	1.2 A
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	9.5 A	10.6 B	10.9 B
Wilshire Blvd / Lakeland Ave N*	1.2 A	5.5 A	4.9 A



Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (Bottineau Blvd) / Corvallis Ave	12.6 B	14.0 B	16.3 B
CSAH 81 (Bottineau Blvd) / 47 <sup>th</sup> Ave N	8.4 A	9.2 A	9.3 A
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramp	7.3 A	7.6 A	6.6 A
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramp	12.0 B	11.5 B	6.5 A

\*Stop-controlled intersection

### 3.2.3 CSAH 81 South

The results of the AM and PM peak hour analysis showed that all intersections currently operate at overall LOS D or better during the Existing peak hour scenarios. The overall intersection results are shown in **Table 3.3** below.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / CSAH 9 (42nd Avenue N) – eastbound left movement
- CSAH 81 (Bottineau Boulevard) / 40th Avenue N – northbound right movement. The existing turn lane is only 65 feet and therefore can only accommodate a queue of 2 vehicles.

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / 40th Avenue N – northbound right movement. The existing turn lane is only 65 feet and therefore can only accommodate a queue of about 2 vehicles.
- CSAH 81 (Bottineau Boulevard) / Abbott Avenue N – eastbound left and right movements

These queues are due to higher volumes of vehicle traffic demand in peak hours and the short turn lanes. However, these queues are not considered to be significant operational or safety issues because average queues are contained within the existing storage and the movement operations are LOS D or better.

The full table of existing conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 3.3: CSAH 81 South – Existing Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/ vehicle) and LOS	Overall Intersection Average Delay (seconds/ vehicle) and LOS	Overall Intersection Average Delay (seconds/ vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	0.2 A	0.2 A	0.2 A
CSAH 81 (Bottineau Blvd) / CSAH 9 (42 <sup>nd</sup> Ave N)	26.7 C	26.7 C	32.1 C
CSAH 9 (42 <sup>nd</sup> Ave N) / CSAH 8 (W Broadway Ave)	11.6 B	11.7 B	28.9 C
CSAH 81 (Bottineau Blvd) / 41 <sup>st</sup> Ave N	6.2 A	N/A	9.8 A
CSAH 81 (Bottineau Blvd) / 40 <sup>th</sup> Ave N	7.2 A	N/A	11.6 B
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	0.3 A	N/A	0.2 A
CSAH 81 (Bottineau Blvd) / 36 <sup>th</sup> Ave N	17.4 B	N/A	25.7 C
CSAH 81 (Bottineau Blvd) / 35 <sup>th</sup> Ave N	4.3 A	N/A	8.9 A
CSAH 81 (Bottineau Blvd) / Abbott Ave N	10.4 B	N/A	21.8 C
CSAH 81 (W Broadway Ave) / N Oakdale Ave*	0.9 A	N/A	2.0 A
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy*	7.4 A	N/A	7.6 A
CSAH 153 (N Lowry Ave) / N Washburn Ave*	0.4 A	N/A	0.3 A
CSAH 81 (W Broadway Ave) SB Ramp / Theodore Wirth Pkwy*	0.8 A	N/A	1.4 A

\*Stop-controlled intersection

### 3.2.4 CSAH 81 (West Broadway)

The results of the AM and PM peak hour analysis showed that all intersections currently operate at overall LOS D or better during the Existing peak hour scenarios with the following exception:

- CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) / McNair Ave in the PM peak hour.

The poor LOS is due to the five-leg intersection, which results in inefficient signal operations. The overall intersection results are shown in **Table 3.4** below.

No queuing issues were identified in the Existing conditions under AM peak hour.

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / CSAH 2 (N Penn Avenue) / McNair Avenue – northbound left, eastbound through, and eastbound right movements

These queues are due to higher volumes of vehicle traffic demand in peak hours and some short turn lanes. However, these queues are not considered to be significant operational or safety issues because average queues are contained within the existing storage and the movement operations are LOS D or better.

The full table of existing conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 3.4: CSAH 81 (West Broadway) – Existing Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / 29 <sup>th</sup> Ave N	10.5 B	14.1 B
CSAH 81 (W Broadway Ave) / 26 <sup>th</sup> Ave N	9.9 A	21.4 C
CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) / McNair Ave	34.1 C	55.6 E
CSAH 81 (W Broadway Ave) / Logan Ave N	3.8 A	4.4 A
CSAH 81 (W Broadway Ave) / Knox Ave N	7.4 A	8.5 A

### 3.2.5 CSAH 81 (West Broadway) / N 21st Avenue

The results of the AM and PM peak hour analysis showed that all intersections currently operate at overall LOS D or better during the Existing peak hour scenarios. The overall intersection results are shown in **Table 3.5** below.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / N Girard Avenue – northbound left/through movements
- CSAH 81 (W Broadway Avenue) / N 4<sup>th</sup> Street – eastbound approach
- CSAH 81 (W Broadway Avenue) / I-94 EB Ramps – westbound left movement
- CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) – westbound through and right movements

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / N Irving Avenue – eastbound through/right movements
- CSAH 81 (W Broadway Avenue) / N Girard Avenue – northbound right movement
- CSAH 81 (W Broadway Avenue) / N Fremont Avenue – eastbound approach
- CSAH 81 (W Broadway Avenue) / N Lyndale Avenue – southbound through/right movements
- CSAH 81 (W Broadway Avenue) / N 4<sup>th</sup> Street – eastbound and westbound approaches
- CSAH 81 (W Broadway Avenue) / I-94 EB Ramps – eastbound approach and westbound left movement
- CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) – westbound through and right movements, and northbound approach
- CSAH 81 (W Broadway Avenue) / N 2<sup>nd</sup> Street – eastbound through/right movements

For all of the AM and PM peak hour conditions queuing issues except the two described below, the 95th percentile queue extends to an upstream intersection that is less than 400 feet away. Based on the close intersection spacing, these are not considered to be significant operational issues.

At CSAH 81 (W Broadway Avenue) / I-94 EB Ramps, the westbound left movement serves between 500-700 vehicles in the peak hours and the queues can regularly extend to the upstream intersection (415 feet).

During the PM peak period, the intersection of CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) has vehicle demand of more than 3,800 total vehicles and is nearing the overall intersection capacity, resulting in the northbound queues and movements operating at LOS D and LOS E.

The full table of existing conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 3.5: CSAH 81 (West Broadway) / N 21<sup>st</sup> Avenue – Existing Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / N James Ave*	0.9 A	1.5 A
N Hillside Ave / N 21 <sup>st</sup> Ave / N Irving Ave*	2.4 A	3.1 A
CSAH 81 (W Broadway Ave) / N Irving Ave	6.9 A	8.7 A
N 21 <sup>st</sup> Ave / N Girard Ave*	0.5 A	1.1 A
CSAH 81 (W Broadway Ave) / N Girard Ave	6.7 A	13.5 B
N 21 <sup>st</sup> Ave / N Fremont Ave*	1.5 A	1.9 A

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / N Fremont Ave	19.7 B	21.5 C
N 21 <sup>st</sup> Ave / N Emerson Ave*	2.2 A	2.5 A
CSAH 81 (W Broadway Ave) / N Emerson Ave	9.7 A	12.5 B
CSAH 81 (W Broadway Ave) / N Dupont Ave	9.3 A	8.7 A
N 21 <sup>st</sup> Ave / N Bryant Ave*	4.1 A	3.8 A
N 21 <sup>st</sup> Ave / N Aldrich Ave*	3.4 A	3.4 A
CSAH 81 (W Broadway Ave) / N Aldrich Ave	6.5 A	9.9 A
N 21 <sup>st</sup> Ave / N Lyndale Ave*	2.5 A	6.5 A
CSAH 81 (W Broadway Ave) / N Lyndale Ave	21.2 C	25.0 C
N 21 <sup>st</sup> Ave / N 4 <sup>th</sup> St*	2.5 A	3.6 A
CSAH 81 (W Broadway Ave) / N 4th St	10.7 B	19.6 B
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	25.7 C	24.0 C
CSAH 152 (N Washington Ave) / N 21 <sup>st</sup> Ave*	1.5 A	2.0 A
N 22 <sup>nd</sup> Ave / N 2 <sup>nd</sup> St*	10.0 A	10.2 B
N 21 <sup>st</sup> Ave / N 2 <sup>nd</sup> St*	2.5 A	1.4 A
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	20.0 C	37.4 D
CSAH 81 (W Broadway Ave) / N 2 <sup>nd</sup> St	12.1 B	24.2 C

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / W River Rd	5.8 A	10.9 B

\*Stop-controlled intersection

### 3.2.6 CSAH 152 (N Washington Avenue) / N 10th Avenue

The results of the AM and PM peak hour analysis showed that all intersections currently operate at overall LOS D or better during the Existing peak hour scenarios. The overall intersection results are shown in **Table 3.6** below.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- CSAH 152 (N Washington Avenue) / N Plymouth Avenue – eastbound through, westbound left, and westbound through movements
- N Plymouth Avenue / N 2<sup>nd</sup> Street – eastbound left/through movements
- CSAH 152 (N Washington Avenue) / N 10<sup>th</sup> Avenue – southbound approach
- N 7<sup>th</sup> Street / N Oak Lake Avenue – northbound and southbound approaches
- TH 55 (Olson Memorial Highway) / N 7<sup>th</sup> Street / N 6<sup>th</sup> Avenue – southbound approach
- CSAH 152 (N Washington Avenue) / N 6<sup>th</sup> Avenue – southbound through movement
- CSAH 152 (N Washington Avenue) / N 5<sup>th</sup> Avenue – southbound through/right movements

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 152 (N Washington Avenue) / N Plymouth Avenue – eastbound through, westbound through, northbound through, and northbound right movements
- CSAH 152 (N Washington Avenue) / N 10<sup>th</sup> Avenue – eastbound approach, northbound through, northbound right, southbound through, and southbound right movements
- N 7<sup>th</sup> Street / N Oak Lake Avenue – northbound and southbound approaches
- CSAH 152 (N Washington Avenue) / N 5<sup>th</sup> Avenue – southbound through/right movements

For all of these AM and PM peak conditions queuing issues except the one described below, the 95th percentile queue extends to an upstream intersection that is less than 400 feet away. Based on the close intersection spacing, these are not considered to be significant operational issues.

During the AM peak period, the intersection of TH 55 (Olson Memorial Highway) / N 7<sup>th</sup> Street / N 6<sup>th</sup> Avenue has vehicle demand of more than 2,200 vehicles resulting in longer southbound queues. However, all southbound approach movements operate at LOS D or better so this is not considered a significant operational issue.

The full table of existing conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 3.6: CSAH 152 (N Washington Avenue) / N 10<sup>th</sup> Avenue – Existing Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 152 (N Washington Ave) / N 17 <sup>th</sup> Ave / I-94 WB Ramp	17.0 B	20.9 C
N 17 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	7.9 A	14.3 B
CSAH 152 (N Washington Ave) / N 15 <sup>th</sup> Ave*	1.1 A	1.6 A
N 15 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	1.0 A	1.6 A
N Lyndale Ave / N Plymouth Ave	18.6 B	24.1 C
CSAH 152 (N Washington Ave) / N Plymouth Ave	35.7 D	24.5 C
N Plymouth Ave / N 2 <sup>nd</sup> St	36.6 D	35.0 C
CSAH 152 (N Washington Ave) / N 10 <sup>th</sup> Ave	25.0 C	31.6 C
N 10 <sup>th</sup> Ave / N 2 <sup>nd</sup> St	11.6 B	13.0 B
CSAH 152 (N Washington Ave) / N 8 <sup>th</sup> Ave	3.6 A	5.9 A
N 10 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	4.1 A	6.6 A
N 10 <sup>th</sup> Ave / N 4 <sup>th</sup> St*	1.4 A	2.6 A
N 10 <sup>th</sup> Ave / N 5 <sup>th</sup> St*	3.0 A	4.4 A
N 8 <sup>th</sup> Ave / N 5 <sup>th</sup> St*	2.7 A	3.7 A
N 8 <sup>th</sup> Ave / N Oak Lake Ave*	1.9 A	2.0 A
N 7 <sup>th</sup> St / W Lyndale Ave	17.5 B	17.1 B



Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
N 7 <sup>th</sup> St / E Lyndale Ave	14.5 B	15.5 B
N 7 <sup>th</sup> St / N Oak Lake Ave	20.7 C	23.7 C
TH 55 (Olson Memorial Hwy) / N 7 <sup>th</sup> St / N 6 <sup>th</sup> Ave	28.3 C	26.8 C
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	18.4 B	18.9 B
N 6 <sup>th</sup> Ave / N 5 <sup>th</sup> St	13.2 B	17.2 B
N 6 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	2.1 A	3.5 A
CSAH 152 (N Washington Ave) / N 6 <sup>th</sup> Ave	8.8 A	12.6 B
N 5 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	2.3 A	4.0 A
CSAH 152 (N Washington Ave) / N 5 <sup>th</sup> Ave	12.9 B	16.0 B
N 5 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	9.7 A	11.8 B

\*Stop-controlled intersection

### 3.3 Existing Conditions Traffic Modeling Summary

All intersections operate at overall LOS D or better in the AM and PM peak hour existing conditions, except

- CSAH 103 (W Broadway Avenue) / CSAH 30 (93<sup>rd</sup> Avenue N) which operates at LOS E in the PM peak hour. The poor LOS at the CSAH 103 (W Broadway Avenue) / CSAH 30 (93<sup>rd</sup> Avenue N) is due to the eastbound approach which currently operates at an LOS F. The eastbound approach has the highest approach volume, and the signal operations are limited due to the protected only signal phasing.
- CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) / McNair Ave which operates at LOS E in the PM peak hour due to the five-leg intersection which results in inefficient signal operations.

A number of queuing issues were identified in the existing conditions during peak hours, primarily due to existing signal operations, high peak hour vehicle volumes, short turn lanes, or short intersection spacing. None of the queuing issues identified are considered to be significant operational or safety issues.



## 4.0 No Build Analysis

The No Build modeling was conducted to identify the expected traffic operations for the forecast horizon year (2050). The assumptions, methodology, and results of the No Build conditions analysis are presented in the following sections.

### 4.1 No Build Conditions Assumptions

Forecast horizon year 2050 forecast peak hour volumes were based on the forecast No Build traffic volumes developed within the study area, as described in Section 2.2. The turning movement volumes for 2050 No Build AM and PM peak conditions are provided in **Appendix A: Peak Hour Traffic Volumes**.

The No Build analysis was based on the future year No Build traffic volumes, existing roadway geometrics and rail crossing treatments, existing signal operations, and programmed improvement projects. Geometric improvements assumed in the No Build analysis are shown in the intersection layouts provided in **Appendix B: Intersection Layout Tables**. The programmed improvement projects in the No Build conditions include:

- Oakdale Avenue N reconstruction currently programmed by the City of Robbinsdale.
- Intersection improvements at CSAH 81 (W Broadway Avenue) / N Lyndale Avenue by Hennepin County.
- 7th Street reconstruction from a four-lane to a three-lane roadway from N 10<sup>th</sup> Street to East Lyndale Avenue programmed by the City of Minneapolis.

No improvements are programmed at any of the existing rail crossings. Signal timing was assumed to be optimized in the 2050 No Build analysis. The CSAH 103 (West Broadway Avenue), CSAH 81 (Bottineau Boulevard/W Broadway Avenue), and CSAH 152 (N Washington Avenue) corridors were all assumed to operate with coordinated and interconnected signals. All modeling was completed in VISSIM.

The geometrics and intersection control for the No Build conditions are shown in the intersection layout tables provided in **Appendix B: Intersection Layout Tables**.

### 4.2 No Build Conditions Traffic Modeling Results

The same six modeling areas created for the Existing conditions modeling were used for the No Build analysis. The No Build operations results are presented by modeling area in the following sections.

#### 4.2.1 CSAH 103 (West Broadway)

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the No Build peak hour scenarios with the following exceptions:

- CSAH 103 (West Broadway Avenue) / 101st Avenue N in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / Winnetka Avenue N in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / 94th Avenue N in the 2050 AM peak
- CSAH 103 (West Broadway Avenue) / CSAH 30 (93rd Avenue N) in the 2050 AM and PM peak

- CSAH 103 (West Broadway Avenue) / 92nd Avenue N in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / Setzler Parkway in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / 89th Avenue N in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / Maplebrook Parkway in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / CSAH 109 (85th Avenue N) in the 2050 PM peak

The overall intersection results are shown in **Table 4.1** below.

Movements for which queuing issues were identified under AM peak conditions were as follows:

- CSAH 103 (West Broadway Avenue) / Winnetka Avenue – eastbound left and right movements
- CSAH 103 (West Broadway Avenue) / 94th Avenue N – southbound through movement and all westbound movements
- CSAH 103 (West Broadway Avenue) / CSAH 30 (93rd Avenue N) – northbound through and right movements, southbound through movement, and westbound left movement
- CSAH 103 (West Broadway Avenue) / 92nd Avenue N – all northbound movements
- CSAH 103 (West Broadway Avenue) / Setzler Parkway – northbound through movement
- CSAH 103 (West Broadway Avenue) / 89th Avenue – northbound left and through movements
- CSAH 103 (West Broadway Avenue) / Maplebrook Parkway – northbound left and right movements
- CSAH 103 (West Broadway Avenue) / 85th Avenue N – northbound left movement

Movements for which queuing issues were identified under PM peak conditions were as follows:

- CSAH 103 (West Broadway Avenue) / 101st Avenue – eastbound left and right movements
- CSAH 103 (West Broadway Avenue) / Winnetka Avenue – eastbound left and right movements
- CSAH 103 (West Broadway Avenue) / CSAH 30 (93<sup>rd</sup> Avenue N) – northbound through and right movements and westbound left movement
- CSAH 103 (West Broadway Avenue) / 92nd Avenue N – all northbound movements
- CSAH 103 (West Broadway Avenue) / Setzler Parkway – northbound through movement
- CSAH 103 (West Broadway Avenue) / 89th Avenue – northbound left and through movements and eastbound left and right movements
- CSAH 103 (West Broadway Avenue) / Maplebrook Parkway – all northbound movements and all westbound movements
- CSAH 103 (West Broadway Avenue) / CSAH 109 (85th Avenue N) – northbound left and through movements, eastbound left and through movements, and westbound left and right movements
- CSAH 103 (West Broadway Avenue) / 84th Avenue N – northbound through and right movements
- CSAH 103 (West Broadway Avenue) / Shopping Center Access – all eastbound movements
- CSAH 103 (West Broadway Avenue) / CSAH 130 (Brooklyn Boulevard) – eastbound left movement

The poor operations (delay and queuing) north of TH 610 in the 2050 No Build scenarios are due to the size and density of development planned to occur in this area by 2050. Currently this area is mostly undeveloped land, however the City of Brooklyn Park has identified this area as a regionally significant development location. The remaining poor operations (delay and queuing) are due to CSAH 103 (West Broadway Avenue) being over capacity as a two-lane facility. The major intersections including 93rd Avenue and 85th Avenue are the key bottlenecks in the north/south directions which spill back to adjacent intersections.

The full table of 2050 No Build conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 4.1: CSAH 103 (West Broadway) – 2050 No Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 103 (W Broadway Ave) / 101 <sup>st</sup> Ave N*	5.4 A	54.8 F
CSAH 103 (W Broadway Ave) / Winnetka Ave N*	32.8 D	52.8 F
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	7.9 A	15.4 B
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	16.7 B	18.8 B
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	26.2 C	18.8 B
CSAH 103 (W Broadway Ave) / 94th Ave N*	83.7 F	1.9 A
CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	>100 F	>100 F
CSAH 103 (W Broadway Ave) / 92nd Ave N*	49.8 E	70.9 F
CSAH 103 (W Broadway Ave) / Setzler Pkwy*	77.3 F	>100 F
CSAH 103 (W Broadway Ave) / 89th Ave N*	68.6 F	>100 F
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	38.4 E	>100 F
CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	36.1 D	>100 F
CSAH 103 (W Broadway Ave) / 84th Ave N*	0.4 A	10.6 B
CSAH 103 (W Broadway Ave) / College Park Dr	0.3 A	3.1 A

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 103 (W Broadway Ave) / 82nd Ave N*	0.5 A	1.8 A
CSAH 103 (W Broadway Ave) / Candlewood Dr	5.4 A	8.5 A
CSAH 103 (W Broadway Ave) / 78th Ave N*	1.2 A	1.5 A
CSAH 103 (W Broadway Ave) / Shopping Center Access	2.3 A	12.3 B
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	24.1 C	32.1 C
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	14.5 B	26.0 C
CSAH 152 (Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)*	0.6 A	1.4 A
CSAH 130 (W Broadway Ave) / 76th Ave N	8.9 A	27.0 C
CSAH 130 (W Broadway Ave) / 75th Ave N*	1.4 A	4.5 A
CSAH 130 (W Broadway Ave) / 74th Ave N*	0.5 A	1.0 A
CSAH 130 (W Broadway Ave) / 73rd Ave N	6.0 A	8.3 A

\*Stop-controlled intersection

#### 4.2.2 CSAH 81 North

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the No Build peak hour scenarios.

The overall intersection results are shown in **Table 4.2** below.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / 47th Avenue – eastbound right movement

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / CSAH 10 (Bass Lake Road) – eastbound left movement
- CSAH 81 (Bottineau Boulevard) / 63rd Avenue N – northbound through movement
- CSAH 81 (Bottineau Boulevard) / 47th Avenue – eastbound right movement

The queueing issue at the intersection of CSAH 81 (Bottineau Boulevard) / 47th Avenue is due to the eastbound no right turn on red (RTOR) operation which was also noted in existing conditions.

The queueing issue identified at the intersection of CSAH 81 (Bottineau Boulevard) / CSAH 10 (Bass Lake Road) is due to the heavy volume of eastbound left-turn traffic in the PM peak hour and the closely-spaced full access intersection at Elmhurst Avenue. This is not considered a significant operational or safety issue.

The full table of 2050 No Build conditions LOS and queueing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 4.2: CSAH 81 North – 2050 No Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (Bottineau Blvd) / 73 <sup>rd</sup> Ave N	13.9 B	14.1 B	17.7 B
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	21.2 C	21.0 C	33.8 C
CSAH 130 (W Broadway Ave) / 71 <sup>st</sup> Ave N	10.6 B	10.8 B	20.8 C
CSAH 81 (Bottineau Blvd) / I-94 WB Ramps	12.2 B	12.1 B	14.5 B
CSAH 81 (Bottineau Blvd) / I-94 EB Ramps	18.0 B	18.7 B	14.7 B
CSAH 81 (Bottineau Blvd) / 63rd Ave N	29.1 C	29.6 C	51.9 D
63rd Ave N / Louisiana Ave N / Park-and-Ride Access*	2.3 A	2.4 A	2.8 A
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Rd)	29.4 C	30.6 C	42.1 D

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 10 (Bass Lake Rd) / Sherburne Ave	8.8 A	9.0 A	12.2 B
CSAH 10 (Bass Lake Rd) / Adair Ave*	1.0 A	0.9 A	1.1 A
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	11.3 B	11.1 B	12.7 B
Wilshire Blvd / Lakeland Ave N*	2.6 A	2.6 A	5.8 A
CSAH 81 (Bottineau Blvd) / Corvallis Ave	15.7 B	16.3 B	17.0 B
CSAH 81 (Bottineau Blvd) / 47 <sup>th</sup> Ave N	14.7 B	15.3 B	10.3 B
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramp	5.3 A	5.3 A	6.5 A
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramp	12.4 B	12.6 B	7.1 A

\*Stop-controlled intersection

### 4.2.3 CSAH 81 South

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the No Build peak hour scenarios.

The overall intersection results are shown in **Table 4.3** below.

There were no movements for which queuing issues were identified under AM peak hour.

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / CSAH 9 (42nd Avenue N) – eastbound left, southbound left, and westbound right movements
- CSAH 81 (Bottineau Boulevard) / 41st Avenue N – northbound left movement



- CSAH 81 (Bottineau Boulevard) / 40th Avenue N – eastbound left, westbound left and right, northbound left, and southbound left and right movements
- CSAH 81 (Bottineau Boulevard) / 36th Avenue N – eastbound left movement
- CSAH 81 (Bottineau Boulevard) / Abbott Avenue N – eastbound left and right movements

These queues are due to higher volumes of vehicle traffic demand in peak hours. However, these queues are not anticipated to cause significant operational or safety issues because average queues can be contained within the existing storage and operations are LOS D or better.

The full table of 2050 No Build conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 4.3: CSAH 81 South – 2050 No Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	0.2 A	0.2 A	0.3 A
CSAH 81 (Bottineau Blvd) / CSAH 9 (42 <sup>nd</sup> Ave N)	26.8 C	26.8 C	34.6 C
CSAH 9 (42 <sup>nd</sup> Ave N) / CSAH 8 (W Broadway Ave)	12.1 B	12.0 B	33.3 C
CSAH 81 (Bottineau Blvd) / 41 <sup>st</sup> Ave N	6.1 A	N/A	9.8 A
CSAH 81 (Bottineau Blvd) / 40 <sup>th</sup> Ave N	6.9 A	N/A	11.6 B
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	0.3 A	N/A	0.3 A
CSAH 81 (Bottineau Blvd) / 36 <sup>th</sup> Ave N	17.7 B	N/A	26.8 C
CSAH 81 (Bottineau Blvd) / 35 <sup>th</sup> Ave N	4.4 A	N/A	9.7 A

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (Bottineau Blvd) / Abbott Ave N	10.7 B	N/A	23.5 C
CSAH 81 (W Broadway Ave) / N Oakdale Ave*	1.4 A	N/A	2.5 A
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy*	8.7 A	N/A	9.3 A
CSAH 153 (N Lowry Ave) / N Washburn Ave*	0.4 A	N/A	0.4 A
CSAH 81 (W Broadway Ave) SB Ramp / N Theodore Wirth Pkwy*	1.3 A	N/A	2.1 A

\*Stop-controlled intersection

#### 4.2.4 CSAH 81 (West Broadway)

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the No Build peak hour scenarios with the following exception:

- CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) / McNair Ave in the PM peak hour

This is similar to the existing conditions. The overall intersection results are shown in **Table 4.4** below.

There were no movements for which queuing issues were identified under AM peak hour conditions.

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / CSAH 2 (Penn Avenue N) / McNair Avenue – northbound left and southbound left movements

The queues are due to higher volumes of vehicle traffic demand in peak hours and some short turn lanes, which are similar to existing conditions.

**Table 4.4: CSAH 81 (West Broadway) – 2050 No Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / 29 <sup>th</sup> Ave N	12.1 B	14.1 B
CSAH 81 (W Broadway Ave) / 26 <sup>th</sup> Ave N	16.0 B	21.2 C
CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) / McNair Ave	33.5 C	60.8 E
CSAH 81 (W Broadway Ave) / Logan Ave N	4.2 A	5.1 A
CSAH 81 (W Broadway Ave) / Knox Ave N	7.1 A	9.1 A

#### 4.2.5 CSAH 81 (West Broadway) / N 21st Avenue

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the No Build peak hour scenarios.

The overall intersection results are shown in **Table 4.5** below.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / N Girard Avenue – northbound approach
- 
- CSAH 81 (W Broadway Avenue) / N 4th Street – eastbound approach
- CSAH 81 (W Broadway Avenue) / I-94 EB Ramp – westbound left movement

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / N Irving Avenue – eastbound through/right movements
- CSAH 81 (W Broadway Avenue) / N Girard Avenue – eastbound through/right movements and northbound approach
- CSAH 81 (W Broadway Avenue) / N Fremont Avenue – eastbound approach
- CSAH 81 (W Broadway Avenue) / N Lyndale Avenue – eastbound through and right movements, northbound through/right movements, and southbound approach
- CSAH 81 (W Broadway Avenue) / N 4th Street – eastbound and westbound approaches
- CSAH 81 (W Broadway Avenue) / I-94 EB Ramps – eastbound approach and westbound left movement
- CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) – westbound through and right movements, and northbound approach

- CSAH 81 (W Broadway Avenue) / N 2<sup>nd</sup> Street – westbound through and right movements

Many of the AM and PM queuing issues were present under existing conditions and became worse in the No Build conditions due to the slight increase in traffic volumes along CSAH 81 (W Broadway). Several movements at the intersection of CSAH 81 (W Broadway Avenue) / N Lyndale Avenue are only slightly below the threshold for being defined as a queuing issue in existing conditions. The combination of the increase in traffic along CSAH 81 (W Broadway Avenue) and minor changes in traffic operations and approach geometry pushes these over the threshold for being defined as a queuing issue. On the northbound approach, the removal of the additional width that is currently used by vehicles turning right would result in a more significant increase in queuing and delay compared to existing conditions.

High westbound volumes of about 1,000 vehicles per hour on CSAH 81 (W Broadway Avenue) in the PM peak are anticipated to result in queues extending from CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) through CSAH 81 (W Broadway Avenue) / N 2<sup>nd</sup> Street.

The full table of 2050 No Build conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 4.5: CSAH 81 (West Broadway) / N 21<sup>st</sup> Avenue – 2050 No Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / N James Ave*	0.9 A	1.8 A
N Hillside Ave / N 21 <sup>st</sup> Ave / N Irving Ave*	2.3 A	3.2 A
CSAH 81 (W Broadway Ave) / N Irving Ave	6.7 A	9.9 A
N 21 <sup>st</sup> Ave / N Girard Ave*	0.7 A	1.6 A
CSAH 81 (W Broadway Ave) / N Girard Ave	6.9 A	16.3 B
N 21 <sup>st</sup> Ave / N Fremont Ave*	1.9 A	2.1 A
CSAH 81 (W Broadway Ave) / N Fremont Ave	20.2 C	19.2 B
N 21 <sup>st</sup> Ave / N Emerson Ave*	2.6 A	3.2 A
CSAH 81 (W Broadway Ave) / N Emerson Ave	10.7 B	11.5 B

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / N Dupont Ave	8.3 A	9.9 A
N 21 <sup>st</sup> Ave / N Bryant Ave*	4.9 A	4.5 A
N 21 <sup>st</sup> Ave / N Aldrich Ave*	3.7 A	3.9 A
CSAH 81 (W Broadway Ave) / N Aldrich Ave	7.2 A	15.0 B
N 21 <sup>st</sup> Ave / N Lyndale Ave*	3.2 A	6.4 A
CSAH 81 (W Broadway Ave) / N Lyndale Ave	23.6 C	31.5 C
N 21 <sup>st</sup> Ave / N 4 <sup>th</sup> St*	2.2 A	5.5 A
CSAH 81 (W Broadway Ave) / N 4th St	9.8 A	22.4 C
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	29.1 C	26.2 C
CSAH 152 (N Washington Ave) / N 21 <sup>st</sup> Ave*	1.5 A	2.1 A
N 22 <sup>nd</sup> Ave / N 2 <sup>nd</sup> St*	11.0 B	11.6 B
N 21 <sup>st</sup> Ave / N 2 <sup>nd</sup> St*	2.8 A	1.6 A
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	21.8 C	46.1 D
CSAH 81 (W Broadway Ave) / N 2 <sup>nd</sup> St	12.2 B	31.6 C
CSAH 81 (W Broadway Ave) / W River Rd	5.5 A	14.7 B

\*Stop-controlled intersection

#### 4.2.6 CSAH 152 (N Washington Avenue) / N 10th Avenue

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the No Build peak hour scenarios with the following exceptions:

- N Lyndale Avenue / N Plymouth Avenue in the 2050 PM peak
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue in the 2050 AM peak and 2050 PM peak
- N Plymouth Avenue / N 2nd Street in the 2050 AM peak and 2050 PM peak
- N 7th Street / W Lyndale Avenue in the 2050 AM peak
- N 7th Street / E Lyndale Avenue in the 2050 AM peak
- N 7th Street / N Oak Lake Avenue in the 2050 AM peak
- TH 55 (Olson Memorial Highway) / N 7th Street / N 6th Avenue in the 2050 PM peak

The overall intersection results are shown in **Table 4.6** below. Protected-permissive phasing was assumed to be implemented in the 2050 PM peak at the westbound approach of N Lyndale Avenue / N Plymouth Avenue and the southbound approach of N 7th Street / N Oak Lake Avenue. Without this improvement, gridlock would be anticipated to occur in the network resulting in almost all intersections operating at LOS E/F.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- N Lyndale Avenue / N Plymouth Avenue – eastbound through, eastbound right, and westbound left movements
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue – eastbound and southbound approaches, westbound left and through movements
- N Plymouth Avenue / N 2nd Street – eastbound left, eastbound through, westbound left, and westbound through movements
- CSAH 152 (N Washington Avenue) / N 10th Avenue – northbound left and through movements, and southbound approach
- N 7th Street / W Lyndale Avenue – eastbound through and right movements
- N 7th Street / E Lyndale Avenue – eastbound through movement
- N 7th Street / Oak Lake Avenue N – eastbound, northbound, and southbound approaches
- TH 55 (Olson Memorial Highway) / N 7<sup>th</sup> Street / N 6<sup>th</sup> Avenue – eastbound through, eastbound right, and westbound left movements, and southbound approach
- TH 55 (Olson Memorial Highway) / N Oak Lake Avenue / Border Avenue – eastbound left, eastbound through, and westbound right movements
- CSAH 152 (N Washington Avenue) / N 6<sup>th</sup> Avenue – southbound through movement
- CSAH 152 (N Washington Avenue) / N 5<sup>th</sup> Avenue – southbound through and right movements

Movements for which queuing issues were identified under PM peak conditions were as follows:

- CSAH 152 (N Washington Avenue) / N 17<sup>th</sup> Avenue / I-94 WB Ramp – northbound through, northbound right, and westbound left movements
- N Lyndale Avenue / N Plymouth Avenue – eastbound through, eastbound right, southbound through, and southbound right movements
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue – northbound through, northbound right, eastbound left, eastbound through, and westbound through movements
- N Plymouth Avenue / N 2<sup>nd</sup> Street – northbound left, northbound through, eastbound left, eastbound through, westbound left, and westbound through movements
- CSAH 152 (N Washington Avenue) / N 10<sup>th</sup> Avenue – eastbound and northbound approaches, and southbound through and right movements
- N 7<sup>th</sup> Street / E Lyndale Avenue – eastbound through movement

- N 7<sup>th</sup> Street / Oak Lake Avenue N – eastbound left and westbound through/right movements, and northbound and southbound approaches
- TH 55 (Olson Memorial Highway) / N 7<sup>th</sup> Street / N 6<sup>th</sup> Avenue – northbound through, northbound right, eastbound right, southbound through, southbound right, and westbound right movements
- CSAH 152 (N Washington Avenue) / N 6<sup>th</sup> Avenue – southbound through movement
- CSAH 152 (N Washington Avenue) / N 5<sup>th</sup> Avenue – southbound through and right movements

All three of the study intersections along N Plymouth Avenue are currently operating at LOS C or LOS D in existing conditions. Traffic volumes along N Plymouth Avenue (between N Lyndale Avenue and N 2<sup>nd</sup> Street) are anticipated to increase by 25-35% by 2050 which is anticipated to result in some of these intersections operating at LOS E or LOS F during both peak hours.

The intersections of N 7<sup>th</sup> Street / W Lyndale Avenue, N 7<sup>th</sup> Street / E Lyndale Avenue, and N 7<sup>th</sup> Street / N Oak Lake Avenue are projected to operate overall at LOS E or F during the AM peak hour. The intersection of TH 55 (Olson Memorial Highway) / N 7<sup>th</sup> Street / N 6<sup>th</sup> Avenue is anticipated to operate at LOS E in the PM peak. The capacity on N 7<sup>th</sup> Street was reduced to three lanes based on the programmed project planned by the City of Minneapolis, which resulted in the increased delays and queuing.

The other queuing issues identified in the 2050 No Build conditions were also present under existing conditions and were similar or worse in 2050 due to traffic volume growth.

The full table of 2050 No Build conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 4.6: CSAH 152 (N Washington Avenue) / N 10<sup>th</sup> Avenue – 2050 No Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 152 (N Washington Ave) / N 17 <sup>th</sup> Ave / I-94 WB Ramp	17.9 B	37.6 D
N 17 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	9.2 A	26.5 C
CSAH 152 (N Washington Ave) / N 15 <sup>th</sup> Ave*	1.2 A	1.7 A
N 15 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	0.9 A	1.7 A
N Lyndale Ave / N Plymouth Ave	26.2 C	57.7 E
CSAH 152 (N Washington Ave) / N Plymouth Ave	75.2 E	60.4 E

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
N Plymouth Ave / N 2 <sup>nd</sup> St	>100 F	74.3 E
CSAH 152 (N Washington Ave) / N 10 <sup>th</sup> Ave	25.5 C	35.3 D
N 10 <sup>th</sup> Ave / N 2 <sup>nd</sup> St	13.9 B	13.2 B
CSAH 152 (N Washington Ave) / N 8 <sup>th</sup> Ave*	3.5 A	5.6 A
N 10 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	4.4 A	10.8 B
N 10 <sup>th</sup> Ave / N 4 <sup>th</sup> St*	1.6 A	4.7 A
N 10 <sup>th</sup> Ave / N 5 <sup>th</sup> St*	3.0 A	7.3 A
N 8 <sup>th</sup> Ave / N 5 <sup>th</sup> St*	2.3 A	3.6 A
N 8 <sup>th</sup> Ave / N Oak Lake Ave*	5.1 A	9.2 A
N 7 <sup>th</sup> St / W Lyndale Ave	>100 F	19.2 B
N 7 <sup>th</sup> St / E Lyndale Ave	72.4 E	26.8 C
N 7 <sup>th</sup> St / N Oak Lake Ave	58.3 E	45.4 D
TH 55 (Olson Memorial Hwy) / N 7 <sup>th</sup> St / N 6 <sup>th</sup> Ave	34.4 C	69.5 E
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	29.8 C	22.4 C
N 6 <sup>th</sup> Ave / N 5 <sup>th</sup> St	13.1 B	18.3 B
N 6 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	3.1 A	4.2 A



Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 152 (N Washington Ave) / N 6 <sup>th</sup> Ave	8.6 A	13.5 B
N 5 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	2.3 A	4.2 A
CSAH 152 (N Washington Ave) / N 5 <sup>th</sup> Ave	13.5 B	17.2 B
N 5 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	9.8 A	12.0 B

\*Stop-controlled intersection

### 4.3 No Build Conditions Traffic Modeling Summary

All intersections would be expected to operate at overall LOS D or better in the 2050 No Build AM and PM peak conditions, with the following exceptions:

- CSAH 103 (West Broadway Avenue) / 101st Avenue N in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / Winnetka Avenue N in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / 94th Avenue N in the 2050 AM peak
- CSAH 103 (West Broadway Avenue) / CSAH 30 (93rd Avenue N) in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / 92nd Avenue N in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / Setzler Parkway in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / 89th Avenue N in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / Maplebrook Parkway in the 2050 AM and PM peak
- CSAH 103 (West Broadway Avenue) / CSAH 109 (85th Avenue N) in the 2050 PM peak
- CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) / McNair Ave in the 2050 PM peak
- N Lyndale Avenue / N Plymouth Avenue in the 2050 PM peak
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue in the 2050 AM peak and 2050 PM peak
- N Plymouth Avenue / N 2<sup>nd</sup> Street in the 2050 AM peak and 2050 PM peak
- N 7<sup>th</sup> Street / W Lyndale Avenue in the 2050 AM peak
- N 7<sup>th</sup> Street / E Lyndale Avenue in the 2050 AM peak
- N 7<sup>th</sup> Street / N Oak Lake Avenue in the 2050 AM peak
- TH 55 (Olson Memorial Highway) / N 7<sup>th</sup> Street / N 6<sup>th</sup> Avenue in the 2050 PM peak

The poor operations (delay and queuing) on CSAH 103 (West Broadway Avenue) north of TH 610 are due to the size and density of development planned to occur in this area by 2050. The remaining poor operations (delay and queuing) on CSAH 103 (West Broadway Avenue) are due to the existing two-lane section being over capacity and north/south queues spilling back from the 93rd Avenue N and 85th Avenue N intersections.

All three of the study intersections along N Plymouth Avenue were already operating at LOS C or LOS D in existing conditions. Traffic volumes along N Plymouth Avenue (between N Lyndale Avenue and N 2<sup>nd</sup> Street) are anticipated to increase by 25-35% by 2050 which is anticipated to result in some of these intersections operating at LOS E or LOS F during both peak hours.

The poor operations (delay and queuing) on 7<sup>th</sup> Street N are primarily due to the reduction in capacity as part of the 7<sup>th</sup> Street Reconstruction project planned by the City of Minneapolis.

## 5.0 Build Analysis

The Build modeling was conducted to identify the expected traffic operations for the forecast horizon year (2050), with the Project constructed and LRT operating. The assumptions, methodology, and results of the Build conditions analysis are presented in the following sections.

### 5.1 Build Conditions Assumptions

Traffic volumes for the Build conditions were developed following a similar process as the No Build conditions. At and near LRT stations, additional pedestrian volumes were incorporated into the modeling to account for increased activity near the stations. The pedestrian volume increase varied depending on how close the intersection was to an LRT station. Near park-and-ride facilities, additional vehicle traffic was added to the roadway network to account for traffic generated at these facilities. The modeled AM and PM peak hour Build turning movement volumes for the 2050 conditions are provided in **Appendix A: Peak Hour Traffic Volumes**.

The location and size of park-and-ride facilities included in the traffic modeling are summarized in **Table 5.1**. The number of spaces included in the traffic analysis was the maximum number of spaces that could be built to capture the worst case in terms of traffic impacts.

**Table 5.1: Park-and-Ride Facility – Analysis Summary**

Location	Number of Park-and-Ride Spaces Analyzed
Oak Grove Station	850
63 <sup>rd</sup> Avenue Station	725
Bass Lake Road Station	170
Robbinsdale Station	500

The control of each LRT crossing was identified based on the Project Alignment and geometric design. **Table 5.2** below displays the existing and proposed control of the freight and LRT crossings along the Project Alignment.

**Table 5.2: 2050 Build Conditions Rail Crossing Treatments**

Crossing Location	Existing Freight Crossing Control	Proposed LRT and/or Freight Crossing Control
CSAH 103 (W Broadway Ave)/Oak Grove Pkwy	N/A – no freight crossings	LRT controlled by traffic signal (non-revenue track)

<b>CSAH 103 (W Broadway Ave)/99<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/94<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/CSAH 30 (93<sup>rd</sup> Ave N)</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/Setzler Pkwy</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/Maplebrook Pkwy</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/CSAH 109 (85<sup>th</sup> Ave N)</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/College Park Dr</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/Candlewood Dr</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/CSAH 130 (Brooklyn Blvd)/ CSAH 152</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/76<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 103 (W Broadway Ave)/75<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/73<sup>rd</sup> Ave N</b>	Flashers; preemption of CSAH 81 (Bottineau Blvd)/73 <sup>rd</sup> Ave N traffic signal	Freight – flashers and automatic gates; preemption of CSAH 81 (Bottineau Blvd)/73 <sup>rd</sup> Ave N traffic signal LRT – grade separated over CSAH 81 (Bottineau Blvd)
<b>CSAH 81 (Bottineau Blvd)/CSAH 8 (W Broadway Ave)/ 71<sup>st</sup> Ave N</b>	Flashers and automatic gates; preemption of CSAH 81 (Bottineau Blvd)/CSAH 8 (W Broadway Ave)/ 71 <sup>st</sup> Ave N traffic signal	Freight – flashers and automatic gates; preemption of CSAH 81 (Bottineau Blvd)/CSAH 8 (W Broadway Ave)/ 71 <sup>st</sup> Ave N traffic signal LRT – Controlled by traffic signal with transit signal priority

<b>CSAH 81 (Bottineau Blvd)/I-694/I-94</b>	Grade separated under I-94/I-694	Freight – Grade separated under I-94/I-694  LRT – Controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/63<sup>rd</sup> Ave N</b>	Flashers and automatic gates; preemption of CSAH 81 (Bottineau Blvd)/63 <sup>rd</sup> Ave N traffic signal	Freight – Flashers and automatic gates; preemption of CSAH 81 (Bottineau Blvd)/63 <sup>rd</sup> Ave N traffic signal  LRT – Controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/CSAH 10 (Bass Lake Rd)</b>	Flashers and automatic gates; preemption of CSAH 81 (Bottineau Blvd)/CSAH 10 (Bass Lake Rd) traffic signal	Freight – Flashers and automatic gates; preemption of CSAH 81 (Bottineau Blvd)/CSAH 10 (Bass Lake Rd) traffic signal  LRT – Controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/Wilshire Blvd</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/Corvallis Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/47<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/TH 100</b>	Grade separated over TH 100	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/Lakeland Ave N (North)</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/CSAH 9 (42<sup>nd</sup> Ave N)</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/41<sup>st</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/40<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/Lakeland Ave N (South)</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority

<b>CSAH 81 (Bottineau Blvd)/36<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/35<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (Bottineau Blvd)/Abbott Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy</b>	N/A – no freight crossings	Flashers and automatic gates; preemption of CSAH 81 (W Broadway Ave) / N Lowry Ave traffic signal
<b>CSAH 81 (W Broadway Ave)/29<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (W Broadway Ave)/26<sup>th</sup> Ave N</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (W Broadway Ave)/CSAH 2 (Penn Ave N)</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (W Broadway Ave)/N James Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N Hillside Ave/N 21<sup>st</sup> Ave/N Irving Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 21<sup>st</sup> Ave/N Girard Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 21<sup>st</sup> Ave/N Fremont Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 21<sup>st</sup> Ave/N Emerson Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 21<sup>st</sup> Ave/N Bryant Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 21<sup>st</sup> Ave/N Aldrich Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 21<sup>st</sup> Ave/N Lyndale Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 21<sup>st</sup> Ave/N 4<sup>th</sup> St</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority

<b>N 21<sup>st</sup> Ave/I-94 EB Ramps</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 152 (N Washington Ave)/N 21<sup>st</sup> Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 81 (W Broadway Ave)/CSAH 152 (N Washington Ave)</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 152 (N Washington Ave)/N 17<sup>th</sup> Ave/I-94 WB Ramp</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 152 (N Washington Ave)/N 15<sup>th</sup> Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 152 (N Washington Ave)/N Plymouth Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>CSAH 152 (N Washington Ave)/N 10<sup>th</sup> Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 10<sup>th</sup> Ave/N 3<sup>rd</sup> St</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 10<sup>th</sup> Ave/N 4<sup>th</sup> St</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 10<sup>th</sup> Ave/N 5<sup>th</sup> St</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>N 8<sup>th</sup> Ave/N Oak Lake Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority
<b>TH 55 (Olson Memorial Hwy)/N 7<sup>th</sup> St/N 6<sup>th</sup> Ave</b>	N/A – no freight crossings	LRT controlled by traffic signal with transit signal priority

Several improvements were identified as part of the Project scope in order to provide control of the LRT at intersections and to provide adequate infrastructure to accommodate buses, pedestrians, and park-and-ride traffic near stations. These Project elements were incorporated into the Build conditions modeling and are shown in **Appendix B: Intersection Layout Tables**. The significant Project infrastructure improvements and changes are listed below:

- Reconstruct 101<sup>st</sup> Avenue N and Oak Grove Parkway to accommodate the needs of the Project OMF site.
- Reconstruct CSAH 103 (West Broadway Avenue) from TH 610 to north of Oak Grove Parkway to accommodate the desired location of the Project Alignment, station location, and park-and-ride parking structure.

- Install a new traffic signal at CSAH 103 (West Broadway Avenue) / 99<sup>th</sup> Avenue N to provide a second access point to the park-and-ride facility.
- Install a new traffic signal at CSAH 103 (West Broadway Avenue) / 94<sup>th</sup> Avenue N to allow LRT to transition from side-running to center-running.
- Reconstruct CSAH 103 (West Broadway Avenue) from a two-lane to a four-lane roadway from 78<sup>th</sup> Avenue N to CSAH 30 (93<sup>rd</sup> Avenue N) in Brooklyn Park.
- Install a new traffic signal at CSAH 103 (West Broadway Avenue) / Setzler Parkway to provide safe crossings of the LRT.
- Remove the traffic signal and modify the CSAH 103 (W Broadway Avenue) / Shopping Center Access north of CSAH 130/152 (Brooklyn Boulevard) intersection to right-in/right-out access.
- Install a new traffic signal at CSAH 130 (W Broadway Avenue) / 75<sup>th</sup> Avenue N to allow LRT to transition in/out of the CSAH 130 (W Broadway Avenue) median.
- Reduce the number of through lanes on CSAH 81 (Bottineau Boulevard) from 6 lanes to 4 lanes between 73<sup>rd</sup> Avenue N and a point north of 47<sup>th</sup> Avenue N.
- Install a new traffic signal at 63<sup>rd</sup> Avenue N / Louisiana Avenue to provide for pedestrian crossings of 63<sup>rd</sup> Avenue N and facilitate traffic exiting the park-and-ride facility.
- Install new traffic signals at CSAH 81 (Bottineau Boulevard) / Lakeland Avenue N (North) and at CSAH 81 (Bottineau Boulevard) / Lakeland Avenue N (South) to provide safe vehicle crossings of the LRT.
- Install traffic signal at CSAH 153 (N Lowry Avenue) / Theodore Wirth Parkway to facilitate traffic movements near the at-grade LRT crossing.
- Realign Theodore Wirth Parkway, install a new traffic signal at CSAH 153 (Lowry Avenue) / Theodore Wirth Parkway, and construct a new directional ramp from southbound CSAH 81 (Bottineau Boulevard) to CSAH 153 (Lowry Avenue N).
- Reduce the number of through lanes on CSAH 81 (W Broadway Avenue) from 4 lanes to 2 lanes between 29<sup>th</sup> Avenue and Lyndale Avenue.
- Close McNair Avenue at CSAH 81 (W Broadway Avenue).
- Reconstruct CSAH 81 (W Broadway Avenue) / Knox Avenue N to be a right-in-right-out intersection only.
- Install a new traffic signal at CSAH 81 (W Broadway Avenue)/ N James Avenue to allow the LRT to transition from CSAH 81 (W Broadway Avenue) to N 21<sup>st</sup> Avenue.
- Remove vehicle traffic on N 21<sup>st</sup> Avenue from N Hillside Avenue / N Irving Avenue to N 4<sup>th</sup> Street to create a transit and pedestrian/bicycle mall.
- Install new traffic signals along N 21<sup>st</sup> Avenue at the intersections of N Hillside Avenue / N Irving Avenue, N Girard Avenue, N Fremont Avenue, N Emerson Avenue, N Bryant Avenue, N Aldrich Avenue, N Lyndale Avenue, and N 4<sup>th</sup> Street to maintain neighborhood access and provide safe LRT crossings for vehicles, pedestrians, and bicyclists.
- Construct a new intersection and install a new traffic signal at N 21<sup>st</sup> Avenue/ I-94 EB Ramps.
- Install a new traffic signal at CSAH 152 (N Washington Avenue) / N 21<sup>st</sup> Avenue to allow LRT to transition to/from N 21<sup>st</sup> Avenue and CSAH 152 (N Washington Avenue).
- Reduce the number of through lanes on CSAH 152 (Washington Avenue) from 4 lanes to 2 lanes between N 21<sup>st</sup> Avenue and N 10<sup>th</sup> Avenue.
- Install a new traffic signal at CSAH 152 (N Washington Avenue) / N 15<sup>th</sup> Avenue to provide safe crossings of the LRT.



- Remove vehicle traffic on N 10<sup>th</sup> Avenue from CSAH 152 (N Washington Avenue) to N 5<sup>th</sup> Street to create a transit and pedestrian/bicycle mall.
- Install a new traffic signal at CSAH 152 (N Washington Avenue) / N 8<sup>th</sup> Avenue.
- Install new traffic signals along N 10<sup>th</sup> Avenue at N 3<sup>rd</sup> Street, N 4<sup>th</sup> Street, N 5<sup>th</sup> Street, and Oak Lake Avenue / N 8<sup>th</sup> Avenue to maintain neighborhood access.
- Construct new roadway connection on N 9<sup>th</sup> Avenue between N 5<sup>th</sup> Street and N 4<sup>th</sup> Street to maintain neighborhood access.

Construct new roadway connection of N 8<sup>th</sup> Avenue between N 5<sup>th</sup> Street and N 3<sup>rd</sup> Street to provide a through route from N Washington Avenue to N Oak Lake Avenue. In addition to the new intersections mentioned above that will be constructed as part of the Project, several other new intersections were assumed in the analysis north of TH 610 for 2050 Build conditions.

Signal timing was assumed to be optimized in the 2050 Build conditions analysis. The CSAH 103 (West Broadway Avenue), CSAH 81 (Bottineau Boulevard), CSAH 81 (W Broadway Avenue), and CSAH 152 (N Washington Avenue) corridors were all assumed to operate with coordinated and interconnected signals. All modeling was completed in VISSIM, except the Oak Gove Parkway / Xylon Avenue intersection which was analyzed in Synchro/SimTraffic.

The geometrics and intersection control for the Build conditions are shown in the intersection layout tables provided in **Appendix B: Intersection Layout Tables**.

## 5.2 Build Conditions Traffic Modeling Results

The same modeling areas created for the Existing and No Build conditions modeling were used for the Build analysis. The Build operations results are presented by modeling area in the following sections.

### 5.2.1 CSAH 103 (West Broadway)

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the Build peak hour scenarios with the following exceptions:

- CSAH 103 (West Broadway Avenue) / CSAH 30 (93<sup>rd</sup> Avenue N) in the 2050 AM and PM peaks
- CSAH 103 (West Broadway Avenue) / CSAH 109 (85<sup>th</sup> Avenue) in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / College Park Drive in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / 82<sup>nd</sup> Avenue in the 2050 PM peak
- CSAH 130 (Brooklyn Boulevard) / Shopping Center Access (west of CSAH 103) in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / CSAH 130 (Brooklyn Boulevard) / CSAH 152 in the 2050 PM peak

The overall intersection results are shown in **Table 5.3** below.

Movements for which queuing issues were identified under AM peak conditions were as follows:

- CSAH 103 (West Broadway Avenue) / 94<sup>th</sup> Avenue – eastbound left movement
- CSAH 103 (West Broadway Avenue) / CSAH 30 (93<sup>rd</sup> Avenue N) – westbound left movement

Movements for which queuing issues were identified under PM peak conditions were as follows:

- CSAH 103 (West Broadway Avenue) / 94<sup>th</sup> Avenue – eastbound left movement
- CSAH 103 (West Broadway Avenue) / CSAH 30 (93<sup>rd</sup> Avenue N) – southbound left, eastbound and westbound approaches
- CSAH 103 (West Broadway Avenue) / CSAH 109 (85<sup>th</sup> Avenue N) – northbound and eastbound approaches, southbound left and westbound left movements
- CSAH 130 (Brooklyn Boulevard) / Shopping Center Access (west of CSAH 103) – southbound left and eastbound through movements
- CSAH 103 (West Broadway Avenue) / CSAH 130 (Brooklyn Boulevard) – eastbound left and westbound through movements
- CSAH 130 (West Broadway Avenue) / 76<sup>th</sup> Avenue – eastbound left and westbound left movements

A future traffic signal is expected to be needed at the Oak Grove Parkway / Xylon Avenue intersection to accommodate future traffic volumes. The traffic signal is recommended to be constructed (by others) as development traffic warrants. The signal is not needed for the Project or for LRT operations, and therefore is not proposed to be constructed as part of the Project.

The expansion of CSAH 103 (West Broadway Avenue) addressed the operational issues under No Build conditions with the exception of the CSAH 30 (93<sup>rd</sup> Avenue N), CSAH 109 (85<sup>th</sup> Avenue), and CSAH 130 (Brooklyn Boulevard) intersections. The poor operations (delay and queueing) along CSAH 103 (West Broadway Avenue) at the intersections of CSAH 30 (93<sup>rd</sup> Avenue) and CSAH 109 (85<sup>th</sup> Avenue) are due to the high demand at these intersections. Additionally, the removal of the channelized right-turns at CSAH 109 (85<sup>th</sup> Avenue) are safety improvements but are expected to increase vehicle delays. Queueing from these intersections extends beyond adjacent signals in both the northbound/southbound and eastbound/westbound directions. There are no proposed mitigations at these intersections, but Hennepin County may consider dual left-turn lanes for eastbound and westbound in the future and the Project design allows for the second left-turn lane to be added in the median.

The poor operations at the intersection of CSAH 103 (West Broadway Avenue) and CSAH 130 (Brooklyn Boulevard) are due to the increased eastbound left-turn demand due to access management changes at adjacent intersections. Queueing for this movement extends beyond the adjacent signal to the west.

The full table of 2050 Build conditions LOS and queueing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 5.3: CSAH 103 (West Broadway) – 2050 Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
Oak Grove Pkwy / Xylon Ave	21.0 C	24.3 C
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	23.5 C	25.8 C

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 103 (W Broadway Ave) / 99 <sup>th</sup> Ave N	23.1 C	52.9 D
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	17.9 B	21.8 C
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	15.7 B	21.3 C
CSAH 103 (W Broadway Ave) / 94 <sup>th</sup> Ave N	32.3 C	20.3 C
CSAH 103 (W Broadway Ave) / CSAH 30 (93 <sup>rd</sup> Ave N)	83.1 F	>100 F
CSAH 103 (W Broadway Ave) / 92 <sup>nd</sup> Ave N*	2.6 A	4.1 A
CSAH 103 (W Broadway Ave) / Setzler Pkwy	13.3 B	10.3 B
CSAH 103 (W Broadway Ave) / 89 <sup>th</sup> Ave N*	1.2 A	0.7 A
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	5.3 A	9.0 A
CSAH 103 (W Broadway Ave) / CSAH 109 (85 <sup>th</sup> Ave N)	51.0 D	>100 F
CSAH 103 (W Broadway Ave) / 84 <sup>th</sup> Ave N*	0.6 A	28.0 D
CSAH 103 (W Broadway Ave) / College Park Dr	8.5 A	65.8 E
CSAH 103 (W Broadway Ave) / 82 <sup>nd</sup> Ave N*	0.5 A	48.8 E
CSAH 103 (W Broadway Ave) / Candlewood Dr	5.7 A	40.5 D
CSAH 103 (W Broadway Ave) / 78 <sup>th</sup> Ave N*	0.5 A	24.7 C
CSAH 103 (W Broadway Ave) / Shopping Center Access*	0.6 A	17.5 C

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	35.7 D	68.2 E
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	17.6 B	81.3 F
CSAH 152 (Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)*	0.7 A	14.8 B
CSAH 130 (W Broadway Ave) / 76 <sup>th</sup> Ave N	16.0 B	43.2 D
CSAH 130 (W Broadway Ave) / 75 <sup>th</sup> Ave N	16.1 B	22.2 C
CSAH 130 (W Broadway Ave) / 74 <sup>th</sup> Ave N*	2.0 A	5.0 A
CSAH 130 (W Broadway Ave) / 73 <sup>rd</sup> Ave N	11.4 B	16.1 B

\*Stop-controlled intersection

### 5.2.2 CSAH 81 North

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the Build peak hour scenarios with the following exceptions:

- CSAH 81 (Bottineau Boulevard) / 63<sup>rd</sup> Avenue in the 2050 AM and PM peaks
- Wilshire Boulevard / Lakeland Avenue in the 2050 PM peak

The overall intersection results are shown in **Table 5.4** below.

Movements for which queuing issues were identified under AM peak conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / 63<sup>rd</sup> Avenue – westbound right movement
- CSAH 10 (Bass Lake Road) / Adair Avenue – westbound right movement
- CSAH 81 (Bottineau Boulevard) / 47<sup>th</sup> Avenue – all eastbound movements

Movements for which queuing issues were identified under PM peak conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / 71<sup>st</sup> Avenue – eastbound left movement
- CSAH 81 (Bottineau Boulevard) / 63<sup>rd</sup> Avenue – northbound through, southbound left, eastbound left, and westbound right movements
- CSAH 10 (Bass Lake Road) / Adair Avenue – westbound right movement
- CSAH 81 (Bottineau Boulevard) / Wilshire Boulevard – eastbound left movement

- CSAH 81 (Bottineau Boulevard) / 47<sup>th</sup> Avenue – all eastbound movements

The poor operations at the intersection of CSAH 81 (Bottineau Boulevard) / 63<sup>rd</sup> Avenue are primarily due to the reduction in capacity of the northbound through, southbound through, and southbound left movements. The intersection is expected to operate over capacity during the 2050 AM and PM peak hours. These changes are proposed to improve pedestrian safety at the intersection and therefore mitigations are not proposed to increase vehicle capacity.

The poor operations at the intersection of Wilshire Boulevard / Lakeland Avenue are primarily due to the close spacing to CSAH 81 (Bottineau Boulevard) and traffic exiting the park-and-ride during the PM peak. The intersection capacity and spacing are constrained by the proximity of the freight rail, therefore mitigation is not proposed.

The full table of 2050 Build conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 5.4: CSAH 81 North – 2050 Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (Bottineau Blvd) / 73 <sup>rd</sup> Ave N	16.7 B	17.7 B	18.3 B
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71 <sup>st</sup> Ave N	32.9 C	32.4 C	50.9 D
CSAH 130 (W Broadway Ave) / 71 <sup>st</sup> Ave N	11.9 B	11.9 B	26.2 C
CSAH 81 (Bottineau Blvd) / I-694 / I-94 WB Ramps	11.1 B	11.1 B	29.3 C
CSAH 81 (Bottineau Blvd) / I-694 / I-94 EB Ramps	24.4 C	24.5 C	33.1 C
CSAH 81 (Bottineau Blvd) / 63 <sup>rd</sup> Ave N	59.9 E	57.9 E	90.2 F
63 <sup>rd</sup> Ave N / Louisiana Ave N / Park-and-Ride Access*	8.3 A	8.3 A	20.8 C
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Rd)	13.5 B	13.9 B	20.3 C

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 10 (Bass Lake Rd) / Sherburne Ave	9.5 A	9.6 A	12.4 B
CSAH 10 (Bass Lake Rd) / Adair Ave*	7.0 A	7.1 A	5.9 A
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	15.1 B	14.8 B	34.9 C
Wilshire Blvd / Lakeland Ave N*	6.7 A	6.7 A	61.9 E
CSAH 81 (Bottineau Blvd) / Corvallis Ave	42.7 D	40.4 D	19.8 B
CSAH 81 (Bottineau Blvd) / 47 <sup>th</sup> Ave N	13.0 B	13.2 B	14.9 B
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramp	4.7 A	4.7 A	10.8 B
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramp	12.0 B	12.1 B	11.6 B

\*Side street stop-controlled intersection

### 5.2.3 CSAH 81 South

The results of the AM and PM peak hour analysis showed that all intersections are anticipated to operate at overall LOS D or better during the Build peak hour scenarios.

The overall intersection results are shown in **Table 5.5** below.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / 40<sup>th</sup> Avenue N – northbound right movement

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (Bottineau Boulevard) / CSAH 9 (42<sup>nd</sup> Avenue N) – eastbound left movement
- CSAH 81 (Bottineau Boulevard) / 40<sup>th</sup> Avenue N – northbound left and right movements
- CSAH 81 (Bottineau Boulevard) / Abbott Avenue N – eastbound left and right movements

These queues are due to higher volumes of traffic demand in peak hours. The queuing issues are similar to the 2050 No Build conditions.

The full table of 2050 Build conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.

**Table 5.5: CSAH 81 South – 2050 Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	0.4 A	0.8 A	12.0 B
CSAH 81 (Bottineau Blvd) / CSAH 9 (42 <sup>nd</sup> Ave N)	35.3 D	35.4 D	52.2 D
CSAH 9 (42 <sup>nd</sup> Ave N) / CSAH 8 (W Broadway Ave)	12.7 B	12.7 B	20.5 C
CSAH 81 (Bottineau Blvd) / 41 <sup>st</sup> Ave N	13.5 B	N/A	20.5 C
CSAH 81 (Bottineau Blvd) / 40 <sup>th</sup> Ave N	13.3 B	N/A	46.2 D
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	0.4 A	N/A	1.3 A
CSAH 81 (Bottineau Blvd) / 36 <sup>th</sup> Ave N	28.9 C	N/A	34.8 C
CSAH 81 (Bottineau Blvd) / 35 <sup>th</sup> Ave N	5.0 A	N/A	13.0 B
CSAH 81 (Bottineau Blvd) / Abbott Ave N	15.2 B	N/A	18.3 B
CSAH 81 (W Broadway Ave) / N Oakdale Ave*	1.3 A	N/A	3.4 A
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	19.0 B	N/A	30.8 C
CSAH 153 (N Lowry Ave) / N Washburn Ave*	1.3 A	N/A	1.0 A

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour No Freight Event	AM Peak Hour Freight Event	PM Peak Hour
CSAH 81 (W Broadway Ave) SB Ramp / N Theodore Wirth Pkwy*	5.4 A	N/A	5.2 A

\*Side street stop-controlled intersection

#### 5.2.4 CSAH 81 (West Broadway)

The results of the AM and PM peak hour analysis showed that all intersections are expected to operate at overall LOS D or better during the Build peak hour scenarios with the following exception:

- CSAH 81 (W Broadway Avenue) / CSAH 2 (N Penn Avenue) in the PM peak hour.

The overall intersection results are shown in **Table 5.6** below.

There were no movements for which queuing issues were identified under AM peak hour conditions.

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / N 26<sup>th</sup> Avenue – southbound left movement
- CSAH 81 (W Broadway Avenue) / CSAH 2 (N Penn Avenue) – northbound approach, southbound through and right movements

The queues are due to high volumes of traffic demand in peak hours and the protected left-turn phasing planned on CSAH 81 (W Broadway Avenue). The southbound left turn lanes on CSAH 81 (W Broadway Avenue) at N 29<sup>th</sup> Avenue, N 26<sup>th</sup> Avenue, and CSAH 2 (N Penn Avenue) were extended to be as long as possible without significant right-of-way impacts.

The intersection of CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) is significantly reconfigured in the Build scenario, and with LRT will continue to operate with similar LOS as the Existing and No-Build scenarios.

The full table of 2050 Build conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**.



**Table 5.6: CSAH 81 (West Broadway) – 2050 Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / 29 <sup>th</sup> Ave N	18.4 B	33.7 C
CSAH 81 (W Broadway Ave) / 26 <sup>th</sup> Ave N	33.6 C	39.6 D
CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N)	38.3 D	65.8 E
CSAH 81 (W Broadway Ave) / Logan Ave N	13.7 B	5.9 A
CSAH 81 (W Broadway Ave) / Knox Ave N	1.8 A	2.0 A

### 5.2.5 CSAH 81 (West Broadway) / N 21<sup>st</sup> Avenue

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the Build peak hour scenarios with the following exception:

- CSAH 81 (W Broadway Avenue) / N 2nd Street in the 2050 PM peak

The overall intersection results are shown in **Table 5.7** below.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / N Girard Avenue – northbound approach
- CSAH 81 (W Broadway Avenue) / N Fremont Avenue – eastbound through/right and westbound through movements
- CSAH 81 (W Broadway Avenue) / N Emerson Avenue – eastbound through movement
- CSAH 81 (W Broadway Avenue) / N Dupont Avenue – eastbound through/right movements
- CSAH 81 (W Broadway Avenue) / N Aldrich Avenue – eastbound through/right and westbound through/right movements
- CSAH 81 (W Broadway Avenue) / N Lyndale Avenue – eastbound through and right movements and southbound approach
- CSAH 81 (W Broadway Avenue) / N 4<sup>th</sup> Street – eastbound and westbound approaches
- CSAH 81 (W Broadway Avenue) / I-94 EB Ramps – eastbound approach and westbound left movement
- CSAH 152 (N Washington Avenue) / N 21<sup>st</sup> Avenue – northbound through movement and eastbound and southbound approaches

- CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) – southbound left and right movements, and westbound through and right movements

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 81 (W Broadway Avenue) / N James Avenue – westbound through/right movements
- CSAH 81 (W Broadway Avenue) / N Girard Avenue – northbound right movement
- CSAH 81 (W Broadway Avenue) / N Fremont Avenue – eastbound through/right and westbound through movements, and southbound approach
- CSAH 81 (W Broadway Avenue) / N Emerson Avenue – eastbound through and westbound through/right movements
- CSAH 81 (W Broadway Avenue) / N Dupont Avenue – eastbound through/right and westbound through/right movements, and southbound approach
- CSAH 81 (W Broadway Avenue) / N Aldrich Avenue – eastbound through/right and westbound through/right movements
- N 21<sup>st</sup> Avenue / N Lyndale Avenue – southbound through movement
- CSAH 81 (W Broadway Avenue) / N Lyndale Avenue – eastbound through and right movements and northbound and southbound approaches
- CSAH 81 (W Broadway Avenue) / N 4<sup>th</sup> Street – eastbound and westbound approaches
- N 21<sup>st</sup> Avenue / I-94 EB Ramps – westbound approach
- CSAH 81 (W Broadway Avenue) / I-94 EB Ramps – westbound left movement and eastbound and southbound approaches
- CSAH 152 (N Washington Avenue) / N 21<sup>st</sup> Avenue – northbound through and right movements and eastbound and southbound approaches
- CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) – eastbound left, northbound right, and westbound through and right movements, and southbound approach
- CSAH 81 (W Broadway Avenue) / N 2<sup>nd</sup> Street – eastbound through/right and westbound through/right movements, and northbound and southbound approaches
- CSAH 81 (W Broadway Avenue) / W River Road – westbound left movement

At CSAH 81 (W Broadway Avenue) / N 2<sup>nd</sup> Street, the overall intersection operates at LOS E in the PM peak conditions which is due to the short intersection spacing and queues from the CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) intersection. The westbound queue in the 2050 PM peak is anticipated to impact the intersection of CSAH 81 (W Broadway Avenue) / W River Road.

The full table of 2050 Build conditions LOS and queuing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**. Project mitigations for this segment are discussed in section 6.

**Table 5.7: CSAH 81 (West Broadway) / N 21<sup>st</sup> Avenue – 2050 Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / N James Ave	11.7 B	17.4 B
N 21 <sup>st</sup> Ave / N Irving Ave	6.1 A	9.7 A
CSAH 81 (W Broadway Ave) / N Irving Ave	10.8 B	11.5 B
N 21 <sup>st</sup> Ave / N Girard Ave	0.9 A	1.9 A
CSAH 81 (W Broadway Ave) / N Girard Ave	9.7 A	12.1 B
N 21 <sup>st</sup> Ave / N Fremont Ave	3.0 A	4.4 A
CSAH 81 (W Broadway Ave) / N Fremont Ave	24.3 C	21.8 C
N 21 <sup>st</sup> Ave / N Emerson Ave	1.4 A	3.3 A
CSAH 81 (W Broadway Ave) / N Emerson Ave	16.8 B	20.1 C
CSAH 81 (W Broadway Ave) / N Dupont Ave	16.9 B	10.5 B
N 21 <sup>st</sup> Ave / N Bryant Ave	1.5 A	2.9 A
N 21 <sup>st</sup> Ave / N Aldrich Ave	1.3 A	3.7 A
CSAH 81 (W Broadway Ave) / N Aldrich Ave	20.8 C	21.2 C
N 21 <sup>st</sup> Ave / N Lyndale Ave	10.9 B	22.6 C
CSAH 81 (W Broadway Ave) / N Lyndale Ave	31.9 C	38.3 D

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
N 21 <sup>st</sup> Ave / N 4 <sup>th</sup> St	7.9 A	11.5 B
CSAH 81 (W Broadway Ave) / N 4 <sup>th</sup> St	15.4 B	24.8 C
N 21 <sup>st</sup> Ave / I-94 EB Ramps	37.6 D	39.0 D
CSAH 81 (W Broadway Ave) / I-94 Ramps	21.2 C	29.3 C
CSAH 152 (N Washington Ave) / N 21 <sup>st</sup> Ave	27.3 C	37.8 D
N 22 <sup>nd</sup> Ave / N 2 <sup>nd</sup> St*	2.9 A	8.0 A
N 21 <sup>st</sup> Ave / N 2 <sup>nd</sup> St*	5.1 A	18.7 B
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	35.6 D	46.6 D
CSAH 81 (W Broadway Ave) / N 2 <sup>nd</sup> St	19.5 B	56.4 E
CSAH 81 (W Broadway Ave) / W River Rd	8.6 A	36.3 D

\*Stop-controlled intersection

Many of the intersections in this area of the Project Alignment are very closely spaced due to the grid network present in the area.

The northbound and southbound left turn queues at CSAH 81 (W Broadway Avenue) / N Lyndale Avenue are due to queuing on CSAH 81 (W Broadway Avenue).

The intersection of CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) is anticipated to operate at or over capacity in 2050 Build conditions resulting in queuing issues on all intersection approaches. The short spacing between CSAH 81 (W Broadway Avenue) and N 21<sup>st</sup> Avenue, as well as protected-only left turn phasing on CSAH 152 (N Washington Avenue) is expected to result in southbound queuing that has upstream impacts at multiple intersections.

### 5.2.6 CSAH 152 (N Washington Avenue) / N 10<sup>th</sup> Avenue

The results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the Build peak hour scenarios with the following exceptions:

- CSAH 152 (N Washington Avenue) / N 17<sup>th</sup> Avenue / I-94 WB Ramp in the 2050 PM peak
- N 17<sup>th</sup> Avenue / N 2<sup>nd</sup> Street in the 2050 PM peak
- N Lyndale Avenue / N Plymouth Avenue in the 2050 PM peak
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue in the 2050 AM peak and 2050 PM peak
- N Plymouth Avenue / N 2<sup>nd</sup> Street in the 2050 AM peak and 2050 PM peak
- N 8<sup>th</sup> Avenue / N Oak Lake Avenue in the 2050 PM peak
- N 7<sup>th</sup> Street / W Lyndale Avenue in the 2050 AM peak
- N 7<sup>th</sup> Street / E Lyndale Avenue in the 2050 AM peak
- TH 55 (Olson Memorial Highway) / N 7<sup>th</sup> Street / N 6<sup>th</sup> Avenue in the 2050 AM peak and 2050 PM peak
- TH 55 (Olson Memorial Highway) / N Oak Lake Avenue / Border Avenue in the 2050 AM peak

The overall intersection results are shown in **Table 5.8** below.

Movements for which queuing issues were identified under AM peak hour conditions were as follows:

- N Lyndale Avenue / N Plymouth Avenue – eastbound right and westbound left movements and southbound approach
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue – eastbound through, eastbound right, southbound left, westbound left and westbound through movements
- N Plymouth Avenue / N 2<sup>nd</sup> Street – eastbound left/through, westbound left and westbound through movements
- CSAH 152 (N Washington Avenue) / N 8<sup>th</sup> Avenue – southbound approach
- N 8<sup>th</sup> Avenue / N Oak Lake Avenue – northbound approach
- N 7<sup>th</sup> Street / W Lyndale Avenue – eastbound through and right movements
- N 7<sup>th</sup> Street / E Lyndale Avenue – eastbound through movement
- N 7<sup>th</sup> Street / Oak Lake Avenue N – northbound left/through movements and eastbound and southbound approaches
- TH 55 (Olson Memorial Highway) / N 7<sup>th</sup> Street / N 6<sup>th</sup> Avenue – northbound left, eastbound through, eastbound right, and westbound left movements and southbound approach
- TH 55 (Olson Memorial Highway) / N Oak Lake Avenue / Border Avenue – eastbound left, eastbound through, southbound left, and southbound through movements
- CSAH 152 (N Washington Avenue) / N 6<sup>th</sup> Avenue – eastbound right and southbound through movements
- CSAH 152 (N Washington Avenue) / N 5<sup>th</sup> Avenue – southbound through/right movements

Movements for which queuing issues were identified under PM peak hour conditions were as follows:

- CSAH 152 (N Washington Avenue) / N 17<sup>th</sup> Avenue / I-94 WB Ramp – northbound right, southbound left, westbound left, and westbound right movements
- N 2<sup>nd</sup> Street / N 17<sup>th</sup> Avenue – northbound, eastbound and southbound approaches

- N Lyndale Avenue / N Plymouth Avenue – eastbound through, eastbound right, and westbound left movements, and northbound and southbound approaches
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue – northbound left and westbound through movements, and eastbound approach
- N Plymouth Avenue / N 2nd Street – eastbound left/through movements and northbound, southbound, and westbound approaches
- CSAH 152 (N Washington Avenue) / N 8th Avenue – southbound and westbound approaches
- N 8th Avenue / N Oak Lake Avenue – northbound and westbound approaches
- N 7th Street / Oak Lake Avenue N – westbound through/right movements and northbound and southbound approaches
- TH 55 (Olson Memorial Highway) / N 7th Street / N 6th Avenue – eastbound through, eastbound right, and westbound left movements, and northbound and southbound approaches
- TH 55 (Olson Memorial Highway) / N Oak Lake Avenue / Border Avenue – eastbound left, eastbound through, westbound through, westbound right, southbound left, and southbound through movements
- N 6<sup>th</sup> Avenue / N 5<sup>th</sup> Street – eastbound left and through movements
- CSAH 152 (N Washington Avenue) / N 6th Avenue –southbound through movement and eastbound approach
- CSAH 152 (N Washington Avenue) / N 5th Avenue –northbound through/right and southbound through/right movements and westbound approach

Many of the LOS and queueing issues in the 2050 Build conditions were also present in the Existing and/or No Build conditions, or the 95th percentile queue extends to an upstream intersection that is less than 400 feet away. Three areas where the LOS and queueing issues are directly related to the Build conditions are discussed in the following paragraphs.

In the PM peak, the increased traffic forecast on 2<sup>nd</sup> Street N and the existing side street stop control on N 17<sup>th</sup> Avenue result in insufficient gaps for traffic on N 17<sup>th</sup> Avenue. The queues on N 17<sup>th</sup> Avenue would extend from 2<sup>nd</sup> Street N to CSAH 152 (N Washington Avenue)

The 2050 PM peak hour forecasts would result in N Plymouth Avenue operating over capacity based on the existing geometry and signal phasing. While traffic volumes are not anticipated to significantly increase along N Plymouth Avenue compared to 2050 No Build conditions, the reduction in capacity on CSAH 152 (N Washington Avenue) reduces the amount of available green time on N Plymouth Avenue. The modeling showed delays and queues at all the intersections on N Plymouth Avenue.

In the AM peak, traffic operations along N 7th Street are not anticipated to significantly change compared to 2050 No Build conditions. At the TH 55 (Olson Memorial Highway) / N 7th Street / N 6th Avenue intersection, which is a key entry point to downtown, the LRT signal phasing causes the intersection delays to increase. The assumed 2050 geometry and signal operations have been optimized as much as possible, therefore no additional mitigations are being considered at this location.

The full table of 2050 Build conditions LOS and queueing analysis results can be found in **Appendix C: Traffic Analysis Detailed Results**. Project mitigations are discussed in the following section.

**Table 5.8: CSAH 152 (N Washington Ave) / N 10th Ave - 2050 Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 152 (N Washington Ave) / N 17 <sup>th</sup> Ave / I-94 WB Ramp	32.2 C	>100 F
N 17 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	13.4 B	>100 F
CSAH 152 (N Washington Ave) / N 15 <sup>th</sup> Ave	28.8 C	15.3 B
N 15 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	1.7 A	30.2 C
N Lyndale Ave / N Plymouth Ave	45.0 D	>100 F
CSAH 152 (N Washington Ave) / N Plymouth Ave	82.8 F	>100 F
N Plymouth Ave / N 2 <sup>nd</sup> St	65.9 E	>100 F
CSAH 152 (N Washington Ave) / N 10 <sup>th</sup> Ave	18.1 B	18.4 B
N 10 <sup>th</sup> Ave / N 2 <sup>nd</sup> St	12.3 B	16.9 B
CSAH 152 (N Washington Ave) / N 8 <sup>th</sup> Ave	28.9 C	26.2 C
N 10 <sup>th</sup> Ave / N 3 <sup>rd</sup> St	10.9 B	10.0 A
N 10 <sup>th</sup> Ave / N 4 <sup>th</sup> St	Not Analyzed	
N 10 <sup>th</sup> Ave / N 5 <sup>th</sup> St	8.5 A	8.7 A
N 8 <sup>th</sup> Ave / N 5 <sup>th</sup> St*	4.4 A	25.4 C
N 9 <sup>th</sup> Ave / N 5 <sup>th</sup> St*	1.9 A	10.3 B
N 8 <sup>th</sup> Ave / N Oak Lake Ave	28.6 C	77.1 E

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
N 7 <sup>th</sup> St / W Lyndale Ave	>100 F	17.0 B
N 7 <sup>th</sup> St / E Lyndale Ave	57.5 E	23.2 C
N 7 <sup>th</sup> St / N Oak Lake Ave	48.8 D	36.8 D
TH 55 (Olson Memorial Hwy) / N 7 <sup>th</sup> St / N 6 <sup>th</sup> Ave	56.1 E	72.8 E
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	>100 F	40.4 D
N 6 <sup>th</sup> Ave / N 5 <sup>th</sup> St	12.0 B	20.6 C
N 6 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	4.3 A	12.8 B
CSAH 152 (N Washington Ave) / N 6 <sup>th</sup> Ave	14.9 B	20.3 C
N 5 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	3.2 A	3.7 A
CSAH 152 (N Washington Ave) / N 5 <sup>th</sup> Ave	14.4 B	32.1 C
N 5 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	10.7 B	20.1 C

\*Stop-controlled intersection

### 5.3 Build Conditions Traffic Modeling Summary

The results of the 2050 Build AM and PM peak conditions analysis showed that all intersections would be expected to operate at overall LOS D or better during the Build peak hour scenarios with the following exceptions:

- CSAH 103 (West Broadway Avenue) / CSAH 30 (93rd Avenue N) in the 2050 AM and PM peaks
- CSAH 103 (West Broadway Avenue) / CSAH 109 (85th Avenue N) in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / College Park Drive in the 2050 PM peak
- CSAH 103 (West Broadway Avenue) / 82nd Avenue in the 2050 PM peak
- CSAH 130 (Brooklyn Boulevard) / Shopping Center Access (west of CSAH 103) in the 2050 PM peak



- CSAH 103 (West Broadway Avenue) / CSAH 130 (Brooklyn Boulevard) / CSAH 152 in the 2050 PM peak
- CSAH 81 (Bottineau Boulevard) / 63rd Avenue in the 2050 AM and PM peaks
- Wilshire Boulevard / Lakeland Avenue in the 2050 PM peak
- CSAH 81 (W Broadway Avenue) / CSAH 2 (N Penn Avenue) in the PM peak
- CSAH 81 (W Broadway Avenue) / N 2nd Street in the 2050 PM peak
- CSAH 152 (N Washington Avenue) / N 17th Avenue / I-94 WB Ramp in the 2050 PM peak
- N 17th Avenue / N 2nd Street in the 2050 PM peak
- N Lyndale Avenue / N Plymouth Avenue in the 2050 PM peak
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue in the 2050 AM peak and 2050 PM peak
- N Plymouth Avenue / N 2nd Street in the 2050 AM peak and 2050 PM peak
- N 8th Avenue / N Oak Lake Avenue in the 2050 PM peak
- N 7th Street / W Lyndale Avenue in the 2050 AM peak
- N 7th Street / E Lyndale Avenue in the 2050 AM peak
- TH 55 (Olson Memorial Highway) / N 7th Street / N 6th Avenue in the 2050 AM peak and 2050 PM peak
- TH 55 (Olson Memorial Highway) / N Oak Lake Avenue / Border Avenue in the 2050 AM peak

A future traffic signal is expected to be needed at the Oak Grove Parkway / Xylon Avenue intersection to accommodate future traffic volumes independent of the Project. The traffic signal is recommended to be constructed (by others) when warranted by development traffic. Therefore, the signal is not proposed to be constructed as part of the Project.

The expansion of CSAH 103 (West Broadway Avenue) addressed the operational issues under No Build conditions with the exception of the CSAH 30 (93<sup>rd</sup> Avenue N), CSAH 109 (85<sup>th</sup> Avenue) and CSAH 130 (Brooklyn Boulevard) intersections. The poor operations (delay and queueing) along CSAH 103 (West Broadway Avenue) at the intersections of CSAH 30 (93rd Avenue) and CSAH 109 (85th Avenue) are due to the high demand at these intersections. Additionally, the removal of the channelized right-turns at CSAH 109 (85th Avenue) are safety improvements but are expected to increase vehicle delays. Queuing from these intersections extends beyond adjacent signals in both the northbound/southbound and eastbound/westbound directions. There are no proposed mitigations at these intersections, but Hennepin County may consider dual left turn lanes for eastbound and westbound in the future and the Project design allows for the second left-turn lane to be added in the median.

The poor operations at the intersection of CSAH 103 (West Broadway Avenue) / CSAH 130 (Brooklyn Boulevard) are due to the increased eastbound left turn demand due to access management changes at adjacent intersections. Queuing for this movement extends beyond the adjacent signal to the west.

The poor operations at the intersection of CSAH 81 (Bottineau Boulevard) / 63rd Avenue are primarily due to the reduction in capacity of the northbound through, southbound through, and southbound left movements. The intersection is expected to operate over capacity during the 2050 AM and PM peak hours. These changes are proposed to improve pedestrian safety at the intersection and therefore mitigations are not proposed to increase vehicle capacity.

The poor operations at the intersection of Wilshire Boulevard / Lakeland Avenue are primarily due to the close spacing to CSAH 81 (Bottineau Boulevard) and traffic exiting the park-and-ride during the PM peak.

The intersection capacity and spacing are constrained by the proximity of the freight rail, therefore mitigation is not proposed.

The intersection of CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) is significantly reconfigured in the Build scenario, and with LRT will continue to operate with similar LOS as the Existing and No-Build scenarios.

At CSAH 81 (W Broadway Avenue) / N 2nd Street, the overall intersection operates at LOS E in the PM peak conditions which is due to the short intersection spacing and queues from the CSAH 81 (W Broadway Avenue) / CSAH 152 (N Washington Avenue) intersection. The westbound queue in the 2050 PM peak is anticipated to impact the intersection of CSAH 81 (W Broadway Avenue) / W River Road.

In the PM peak, the increased traffic forecast on 2<sup>nd</sup> Street N and the existing side street stop control on N 17<sup>th</sup> Avenue result in insufficient gaps for traffic on N 17<sup>th</sup> Avenue. The queues on N 17<sup>th</sup> Avenue would extend from 2<sup>nd</sup> Street N to CSAH 152 (N Washington Avenue).

The 2050 PM peak hour forecasts would result in N Plymouth Avenue operating over capacity based on the existing geometry and signal phasing. While traffic volumes are not anticipated to significantly increase along N Plymouth Avenue compared to 2050 No Build conditions, the reduction in capacity on CSAH 152 (N Washington Avenue) reduces the amount of available green time on N Plymouth Avenue. The modeling showed delays and queues at all the intersections on N Plymouth Avenue.

In the AM peak, traffic operations along N 7th Street are not anticipated to significantly change compared to 2050 No Build conditions. At the TH 55 (Olson Memorial Highway) / N 7th Street / N 6th Avenue intersection, which is a key entry point to downtown, the LRT signal phasing causes the intersection delays to increase. The assumed 2050 geometry and signal operations have been optimized as much as possible, therefore no additional mitigations are being considered at this location.

## 6.0 Mitigated Build Analysis

Where the 2050 Build analysis showed a traffic impact due to the Project, traffic improvements have been identified to mitigate the impacts. The following sections present the proposed mitigation measures and the resulting traffic operations. All intersections were modeled in VISSIM. Only the segments and intersections with proposed mitigations are presented in this section.

### 6.1 Traffic Mitigation

Proposed traffic mitigations for the Project are summarized in **Table 6.1**.

**Table 6.1: 2050 Build Traffic Mitigations**

Intersection	Recommended Mitigation Measures	Rationale
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	Provide 100-ft westbound right turn lane	Reduces westbound queues on CSAH 81 (W Broadway Ave)
CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	Modify I-94 off-ramp lane configuration to L / L / TR Implement protected-permissive left phase for westbound left turn	Improves intersection LOS from LOS F to LOS D and eliminates queuing issues for all movements
N 17th Ave / N 2nd St	Install all-way stop control	Eliminates queuing issues on N 17 <sup>th</sup> Ave
N Lyndale Ave / N Plymouth Ave	Provide 150-ft northbound right turn lane Implement protected-permissive left-turn phasing	Reduces intersection delay to similar level as experienced in 2050 No Build
N Plymouth Ave / N 2nd St	Provide 100-ft southbound left turn lane Provide 50-ft eastbound left turn lane Provide 100-ft westbound left turn lane	Reduces intersection delay to similar level as experienced in 2050 No Build

## 6.2 Mitigated Build Conditions Traffic Modeling Results

### 6.2.1 CSAH 81 (West Broadway) / N 21st Avenue

After incorporating the improvements and mitigations described above, the results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the Mitigated Build peak hour scenarios.

The overall intersection results are shown in **Table 6.2** below.

**Table 6.2: CSAH 81 (West Broadway) / N 21st Avenue – 2050 Mitigated Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 81 (W Broadway Ave) / N James Ave	11.3 B	16.7 B
N 21 <sup>st</sup> Ave / N Irving Ave	5.9 A	10.3 B
CSAH 81 (W Broadway Ave) / N Irving Ave	10.6 B	10.9 B
N 21 <sup>st</sup> Ave / N Girard Ave	0.8 A	2.0 A
CSAH 81 (W Broadway Ave) / N Girard Ave	9.9 A	11.8 B
N 21 <sup>st</sup> Ave / N Fremont Ave	3.1 A	4.8 A
CSAH 81 (W Broadway Ave) / N Fremont Ave	24.7 C	22.1 C
N 21 <sup>st</sup> Ave / N Emerson Ave	1.4 A	3.0 A
CSAH 81 (W Broadway Ave) / N Emerson Ave	16.9 B	19.8 B
CSAH 81 (W Broadway Ave) / N Dupont Ave	17.3 B	10.9 B
N 21 <sup>st</sup> Ave / N Bryant Ave	1.5 A	2.3 A

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
N 21 <sup>st</sup> Ave / N Aldrich Ave	1.2 A	3.8 A
CSAH 81 (W Broadway Ave) / N Aldrich Ave	21.2 C	21.3 C
N 21 <sup>st</sup> Ave / N Lyndale Ave	11.0 B	15.0 B
CSAH 81 (W Broadway Ave) / N Lyndale Ave	31.9 C	35.8 D
N 21 <sup>st</sup> Ave / N 4 <sup>th</sup> St	7.5 A	13.6 B
CSAH 81 (W Broadway Ave) / N 4 <sup>th</sup> Street	16.2 B	26.5 C
N 21 <sup>st</sup> Ave / I-94 EB Ramps	35.2 D	37.1 D
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	20.8 C	29.4 C
CSAH 152 (N Washington Ave) / N 21 <sup>st</sup> Ave	27.7 C	35.2 D
N 22 <sup>nd</sup> Ave / N 2 <sup>nd</sup> St*	2.9 A	7.3 A
N 21 <sup>st</sup> Ave / N 2 <sup>nd</sup> St*	5.3 A	4.9 A
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	33.9 C	47.2 D
CSAH 81 (W Broadway Ave) / N 2 <sup>nd</sup> St	18.5 B	31.0 C
CSAH 81 (W Broadway Ave) / W River Rd	8.5 A	20.3 C

\*Stop-controlled intersection

Even after the implementation of the Project mitigations, several queuing issues are still anticipated to exist. **Table 6.3** and **Table 6.4** and below summarizes these remaining queuing issues for the AM and PM peak periods respectively and why additional mitigations were not developed to address them.

**Table 6.3: CSAH 81 (West Broadway) / N 21st Avenue: Remaining Queuing Issues after Mitigation (AM Peak)**

Intersection	Movement(s)	Rationale for Not Proposing Additional Mitigation
CSAH 81 (W Broadway Ave) / N Lyndale Ave	Eastbound right	Average back of queue exceeds storage length but storage is only 100 feet
CSAH 152 (N Washington Ave) / N 21st Ave	Southbound left	Movement serves less than 100 vehicles and is less than 6 seconds from the LOS D/E threshold. Protected-permissive left-turn phasing already assumed to be implemented and turn lane length has been maximized within available space
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	Southbound left	Not anticipated to have a significant impact on the upstream CSAH 152 (N Washington Ave)/N 21st Ave intersection. All movements at that intersection (except southbound left) operate at LOS D or better.
CSAH 81 (W Broadway Ave) / I-94 Ramps	Eastbound right	Average back of queue exceeds storage length but storage is only 70 feet

**Table 6.4: CSAH 81 (West Broadway) / N 21st Avenue: Remaining Queuing Issues after Mitigation (PM Peak)**

Intersection	Movement(s)	Rationale for Not Proposing Additional Mitigation
N 21st Ave / N Lyndale Ave	Southbound through	Movement operates at LOS B
CSAH 81 (W Broadway Ave) / N Lyndale Ave	Eastbound right	Average back of queue exceeds storage length but storage is only 100 feet and right-turn on red is not allowed
CSAH 81 (W Broadway Ave) / N Lyndale Ave	Northbound approach	Queuing issue occurs in 2050 No Build for through and right movements
CSAH 81 (W Broadway Ave) / I-94 Ramps	Eastbound right	Average back of queue exceeds storage length but storage is only 70 feet
CSAH 152 (N Washington Ave) / N 21 <sup>st</sup> Ave	Eastbound approach	Eastbound approach queues not anticipated to impact upstream intersection at N 21st Ave/I-94 Ramps
CSAH 152 (N Washington Ave) / N 21 <sup>st</sup> Ave	Northbound approach	Average back of queue exceeds storage but approach operates at LOS D or better and queues are not anticipated to impact upstream intersections.

Intersection	Movement(s)	Rationale for Not Proposing Additional Mitigation
CSAH 152 (N Washington Ave) / N 21 <sup>st</sup> Ave	Southbound left	Movement less than 3 seconds from LOS D/E threshold. Protected-permissive left-turn phasing already assumed to be implemented and turn lane length has been maximized within available space
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	Eastbound left and right, southbound left, and westbound right	Intersection design accommodates future LRT station while minimizing ROW impacts
CSAH 81 (W Broadway Ave) / N 2nd St	Westbound through and right	To mitigate queuing issues at N 2 <sup>nd</sup> Street, additional capacity needed at CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave) intersection, which is limited by ROW (as described above)
CSAH 81 (W Broadway Ave) / N 4th St	Eastbound approach	Average back of queue exceeds storage length but storage length is only 125 feet and queues not anticipated to cause any upstream intersections to operate at LOS E or F

### 6.2.2 CSAH 152 (N Washington Avenue) / N 10th Avenue

After incorporating the improvements and mitigations described above, the results of the 2050 AM and PM peak hour analysis showed that all intersections would be expected to operate at overall LOS D or better during the Mitigated Build peak hour scenarios with the following exceptions:

- N Lyndale Avenue / N Plymouth Avenue in the 2050 PM peak
- CSAH 152 (N Washington Avenue) / N Plymouth Avenue in the 2050 AM peak and 2050 PM peak
- N Plymouth Avenue / N 2nd Street in the 2050 PM peak
- N 8th Avenue / N Oak Lake Avenue in the 2050 AM peak
- N 7th Street / W Lyndale Avenue in the 2050 AM peak
- N 7th Street / N Oak Lake Avenue in the 2050 AM peak
- TH 55 (Olson Memorial Highway) / N 7th Street / N 6th Avenue in the 2050 PM peak

With the exception of the N 8<sup>th</sup> Avenue/ N Oak Lake Avenue intersection, all these intersections operated at LOS E or LOS F in the 2050 No Build conditions. The overall intersection results are shown in **Table 6.5** below.

**Table 6.5: CSAH 152 (N Washington Ave) / N 10th Ave - 2050 Mitigated Build Conditions Results**

Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
CSAH 152 (N Washington Ave) / N 17 <sup>th</sup> Ave / I-94 WB Ramp	32.6 C	46.8 D
N 17 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	14.1 B	21.2 C
CSAH 152 (N Washington Ave) / N 15 <sup>th</sup> Ave	29.8 C	13.7 B
N 15 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	1.6 A	4.3 A
N Lyndale Ave / N Plymouth Ave	29.2 C	59.3 E
CSAH 152 (N Washington Ave) / N Plymouth Ave	60.3 E	74.2 E
N Plymouth Ave / N 2 <sup>nd</sup> St	50.0 D	64.7 E
CSAH 152 (N Washington Ave) / N 10 <sup>th</sup> Ave	16.5 B	19.0 B
N 10 <sup>th</sup> Ave / N 2 <sup>nd</sup> St	11.8 B	14.5 B
CSAH 152 (N Washington Ave) / N 8 <sup>th</sup> Ave	27.2 C	27.7 C
N 10 <sup>th</sup> Ave / N 3 <sup>rd</sup> St	10.9 B	9.3 A
N 10 <sup>th</sup> Ave / N 4 <sup>th</sup> St	Not Analyzed	
N 10 <sup>th</sup> Ave / N 5 <sup>th</sup> St	8.4 A	7.2 A
N 8 <sup>th</sup> Ave / N 5 <sup>th</sup> St*	5.1 A	8.4 A
N 9 <sup>th</sup> Ave / N 5 <sup>th</sup> St*	1.8 A	1.6 A



Intersection	Overall Intersection Average Delay (seconds/vehicle) and LOS	Overall Intersection Average Delay (seconds/vehicle) and LOS
	AM Peak Hour	PM Peak Hour
N 8 <sup>th</sup> Ave / N Oak Lake Ave	79.0 E	46.6 D
N 7 <sup>th</sup> St / W Lyndale Ave	>100 F	18.4 B
N 7 <sup>th</sup> St / E Lyndale Ave	53.1 D	23.0 C
N 7 <sup>th</sup> St / N Oak Lake Ave	57.0 E	42.8 D
TH 55 (Olson Memorial Hwy) / N 7 <sup>th</sup> St / N 6 <sup>th</sup> Ave	54.0 D	71.9 E
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	32.1 C	42.9 D
N 6 <sup>th</sup> Ave / N 5 <sup>th</sup> St	12.1 B	20.5 C
N 6 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	4.6 A	10.7 B
CSAH 152 (N Washington Ave) / N 6 <sup>th</sup> Ave	13.7 B	20.5 C
N 5 <sup>th</sup> Ave / N 3 <sup>rd</sup> St*	3.2 A	4.0 A
CSAH 152 (N Washington Ave) / N 5 <sup>th</sup> Ave	15.9 B	34.7 C
N 5 <sup>th</sup> Ave / N 2 <sup>nd</sup> St*	10.8 B	20.5 C

\*Stop-controlled intersection

Even after the implementation of the Project mitigations, several queuing issues are still anticipated to exist. **Table 6.6** and **Table 6.7** below summarizes these remaining queuing issues for the AM and PM peak periods respectively and why additional mitigations were not developed to address them.

**Table 6.6: CSAH 152 (N Washington Ave) / N 10th Ave: Remaining Queuing Issues after Mitigation (AM Peak)**

Intersection	Movement(s)	Rationale for Not Proposing Additional Mitigation
CSAH 152 (N Washington Ave) / N Plymouth Ave	Southbound left and right	Overall intersection delay expected to decrease compared to 2050 No Build conditions and queuing is not expected to impact the upstream intersection which is expected to operate at LOS C
CSAH 152 (N Washington Ave) / N Plymouth Ave	Westbound left	Expected to operate at LOS F with queuing issue in 2050 No Build. 2050 Mitigated Build delay within 2 seconds of LOS D/LOS E threshold
CSAH 152 (N Washington Ave) / N Plymouth Ave	Eastbound right	Average back of queue exceeds storage length but storage is only 90 feet
N Plymouth Ave / N 2nd St	Westbound left and through	Movement and overall intersection delays are expected to improve compared to 2050 No Build
N 7th St / W Lyndale Ave	Eastbound through and right	Movements expected to operate at LOS F (100+ sec of delay) in 2050 No Build
N 7th St / E Lyndale Ave	Eastbound through	Movement expected to operate at LOS F (100+ sec of delay) in 2050 No Build
N 7th St / N Oak Lake Ave	Eastbound through and right, northbound left and through, and southbound left and through	Overall intersection is expected to operate at LOS E under 2050 No Build and intersection delay is similar in 2050 Mitigated Build
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	Southbound approach	Queuing is similar in 2050 No Build
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	Eastbound through	Movement expected to operate at LOS D in 2050 Build

**Table 6.7: CSAH 152 (N Washington Ave) / N 10th Ave: Remaining Queuing Issues after Mitigation (PM Peak)**

<b>Intersection</b>	<b>Movement(s)</b>	<b>Rationale for Not Proposing Additional Mitigation</b>
N Lyndale Ave / N Plymouth Ave	Northbound right	Movement anticipated to operate with similar delay and queue as in 2050 No Build
N Lyndale Ave / N Plymouth Ave	Southbound left and through	Movement already anticipated to operate at LOS E in 2050 No Build. 2050 Mitigated Build delay for southbound through movement is within 1 second of LOS D/ LOS E threshold
CSAH 152 (N Washington Ave) / N Plymouth Ave	Eastbound approach and southbound left	Eastbound approach delay expected to improve compared to 2050 No Build
N Plymouth Ave / N 2nd St	Westbound approach, northbound left and through, and southbound left	Movement delays expected to improve compared to 2050 No Build
CSAH 152 (N Washington Ave) / N 8th Ave	Northbound approach	All movements expected to operate at LOS D or better and queuing issues don't result in any LOS or queuing issues at upstream intersection of CSAH 152 (N Washington Ave) / N 6th Ave
N 7th St / N Oak Lake Ave	Eastbound left and westbound through and right	Queuing issue expected in 2050 No Build and movement delays expected to be similar or better in 2050 Mitigated Build compared to 2050 No Build
N 7th St / N Oak Lake Ave	Northbound approach	Average back of queue exceeds storage length but storage is only 100 feet
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	Eastbound through	Queue not anticipated to significantly impact upstream intersection of TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	Westbound left and northbound left and through	Movements anticipated to operate with similar or less delay compared to 2050 No Build

Intersection	Movement(s)	Rationale for Not Proposing Additional Mitigation
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	Southbound approach	Queuing issue already anticipated for through and right movements under 2050 No Build and similar delay/LOS expected. Southbound left queue not anticipated to impact upstream intersection.
CSAH 152 (N Washington Ave) / N 5th Ave	Northbound through and right	Movements expected to operate at LOS D
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	Eastbound through	Eastbound through movement expected to operate within 5 sec of LOS D/E threshold
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	Southbound left	Movement expected to operate at LOS D in 2050 No Build and queue not anticipated to cause any upstream intersection movements to operate at LOS E or F

# Appendix A: Peak Hour Traffic Volumes

## Existing Conditions: AM Peak Hour Traffic Volumes

Intersection	ID	Eastbound				Westbound				Northbound				Southbound				Northeastbound			
		Left	Thru	Right	Right 2	Left 2	Left	Thru	Right	Left 2	Left	Thru	Right	Left	Thru	Thru 2	Right	Left 2	Left	Thru	Right
Brooklyn Park																					
Oak Grove Pkwy / Xylon Ave	1	Does not exist in Existing conditions																			
CSAH 103 (W Broadway Ave) / 101st Ave N	2	70	-	40	-	-	-	-	-	-	35	180	-	-	315	-	205	-	-	-	-
CSAH 103 (W Broadway Ave) / Winnetika Ave N	3	5	-	5	-	-	-	-	-	-	5	210	-	-	355	-	5	-	-	-	-
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	4	-	-	-	-	-	30	-	45	-	-	170	130	55	300	-	-	-	-	-	-
CSAH 103 (W Broadway Ave) / 99th Ave N	5	Does not exist in Existing conditions																			
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	6	-	-	-	-	-	480	-	115	-	-	180	70	25	305	-	-	-	-	-	-
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	7	-	-	-	-	-	175	-	105	-	-	150	205	140	645	-	-	-	-	-	-
CSAH 103 (W Broadway Ave) / 94th Ave N	8	35	10	35	-	-	15	10	30	-	45	285	15	45	660	-	115	-	-	-	-
CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	9	105	225	55	-	-	60	260	30	-	65	210	40	25	415	-	285	-	-	-	-
CSAH 103 (W Broadway Ave) / 92nd Ave N	10	15	5	10	-	-	5	5	10	-	20	290	5	10	430	-	95	-	-	-	-
CSAH 103 (W Broadway Ave) / Settler Pkwy	11	55	5	45	-	-	45	5	40	-	55	215	15	20	350	-	75	-	-	-	-
CSAH 103 (W Broadway Ave) / 89th Ave N	12	15	-	5	-	-	-	-	-	-	20	270	-	-	355	-	90	-	-	-	-
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	13	25	5	5	-	-	25	5	15	-	5	250	5	10	340	-	15	-	-	-	-
CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	14	60	340	90	-	-	130	555	60	-	75	145	70	45	215	-	110	-	-	-	-
CSAH 103 (W Broadway Ave) / 84th Ave N	15	10	5	5	-	-	5	5	10	-	5	270	20	50	375	-	10	-	-	-	-
CSAH 103 (W Broadway Ave) / College Park Dr	16	5	-	15	-	-	-	-	-	-	5	290	-	-	375	-	5	-	-	-	-
CSAH 103 (W Broadway Ave) / 82nd Ave N	17	10	-	15	-	-	-	-	-	-	10	285	-	-	390	-	5	-	-	-	-
CSAH 103 (W Broadway Ave) / Candlewood Dr	18	-	-	-	-	-	65	-	25	-	-	275	25	15	390	-	-	-	-	-	-
CSAH 103 (W Broadway Ave) / 78th Ave N	19	5	5	5	-	-	10	5	30	-	5	265	5	10	440	-	5	-	-	-	-
CSAH 103 (W Broadway Ave) / Shopping Center Access	20	5	5	5	-	-	5	5	5	-	10	265	5	5	440	-	10	-	-	-	-
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	21	50	200	25	-	-	70	270	55	-	35	175	55	55	250	-	145	-	-	-	-
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	22	5	235	35	-	-	25	425	5	-	25	5	35	5	5	-	5	-	-	-	-
CSAH 130 (W Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	23	5	305	5	-	-	5	385	5	-	5	5	5	5	5	-	5	-	-	-	-
CSAH 130 (W Broadway Ave) / 76th Ave N	24	15	5	5	-	-	25	20	30	-	20	220	20	25	265	-	50	-	-	-	-
CSAH 130 (W Broadway Ave) / 75th Ave N	25	5	5	15	-	-	30	5	10	-	20	245	10	15	285	-	5	-	-	-	-
CSAH 130 (W Broadway Ave) / 74th Ave N	26	5	5	75	-	-	5	5	5	-	45	270	5	5	315	-	10	-	-	-	-
CSAH 130 (W Broadway Ave) / 73rd Ave N	27	15	15	10	-	-	15	35	5	-	10	300	25	15	360	-	20	-	-	-	-
CSAH 81 (Bottineau Blvd) / 73rd Ave N	28	30	5	35	-	-	20	15	30	-	45	810	10	30	1340	-	65	-	-	-	-
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	29	65	60	30	-	-	315	120	50	-	70	755	250	55	1240	-	100	-	-	-	-
CSAH 130 (W Broadway Ave) / 71st Ave N	30	240	15	110	-	-	5	20	5	-	165	90	5	5	85	-	305	-	-	-	-
CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps	31	-	-	-	-	-	120	-	435	-	-	635	415	135	1450	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps	32	-	-	-	-	-	360	-	120	-	-	935	220	380	1190	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / 63rd Ave N	33	115	120	75	-	-	200	185	265	-	75	770	175	150	1285	-	115	-	-	-	-
63rd Ave N / Louisiana Ave N / Park and Ride Access	34	5	230	5	-	-	95	270	5	-	5	5	80	5	5	-	5	-	-	-	-
Crystal																					
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Road)	35	145	180	380	-	-	70	255	70	-	250	800	45	60	1320	-	185	-	-	-	-
CSAH 10 (Bass Lake Road) / Sherburne Ave	36	5	640	10	-	-	70	610	5	-	5	5	65	5	5	-	5	-	-	-	-
CSAH 10 (Bass Lake Road) / Adair Ave N	37	40	235	10	-	-	5	350	5	-	5	5	5	5	5	-	35	-	-	-	-
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	38	10	5	15	-	-	135	10	70	-	25	1015	110	55	1690	-	20	-	-	-	-
Wilshire Blvd / Lakeland Ave N	39	-	-	-	-	-	45	-	10	-	5	5	20	5	5	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / Corvallis Ave N	40	40	5	130	-	-	35	20	35	-	100	1080	5	10	1780	-	50	-	-	-	-
CSAH 81 (Bottineau Blvd) / 47th Ave N	41	10	5	75	-	-	55	5	5	-	40	1170	15	5	1935	-	5	-	-	-	-
Robbinsdale																					
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	42	-	-	-	-	-	235	-	200	-	-	1020	-	-	860	-	1210	-	-	-	-
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	43	15	195	5	-	-	-	-	505	-	-	500	220	170	925	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	44	-	-	-	-	-	0	-	5	-	-	650	0	5	750	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	45	60	190	150	-	-	50	215	80	-	145	520	30	50	650	-	50	-	-	-	-
CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	46	35	340	65	-	-	25	350	35	-	80	50	25	35	60	-	40	-	-	-	-
CSAH 81 (Bottineau Blvd) / 41st Ave N	47	45	10	10	-	-	5	10	10	-	40	645	5	10	795	-	50	-	-	-	-
CSAH 81 (Bottineau Blvd) / 40th Ave N	48	50	30	10	-	-	40	50	90	-	5	550	20	40	735	-	35	-	-	-	-
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	49	-	-	-	-	-	0	-	0	-	-	575	0	0	785	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / 36th Ave N	50	65	70	135	-	-	55	185	75	-	85	430	25	20	685	-	80	-	-	-	-
CSAH 81 (Bottineau Blvd) / 35th Ave N	51	45	0	70	-	-	0	0	0	-	55	485	0	0	740	-	135	-	-	-	-
CSAH 81 (Bottineau Blvd) / Abbott Ave N	52	170	0	100	-	-	0	0	0	-	70	380	0	0	510	-	300	-	-	-	-
CSAH 81 (W Broadway Ave) / N Oakdale Ave	53	10	105	0	-	-	0	135	45	-	0	0	0	20	0	-	5	-	-	-	-
Minneapolis																					
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	54	10	70	45	-	-	150	100	15	-	50	50	180	35	145	-	25	-	-	-	-
CSAH 153 (N Lowry Ave) / N Washburn Ave	55	-	285	-	-	-	-	250	-	-	15	-	0	-	-	-	-	-	-	-	-
CSAH 81 (W Broadway Ave) SB Ramps / Theodore Wirth Pkwy	56	-	-	-	-	-	5	-	120	-	-	155	0	50	290	-	-	-	-	-	-
CSAH 81 (W Broadway Ave) / N 29th Ave	57	50	10	45	-	-	10	20	10	-	0	295	10	30	435	-	20	-	-	-	-
CSAH 81 (W Broadway Ave) / N 26th Ave	58	15	45	10	-	-	5	60	30	-	5	245	10	50	460	-	0	-	-	-	-
CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McNair Ave	59	10	400	65	0	20	10	200	25	0	60	115	10	50	140	5	5	0	5	5	0
CSAH 81 (W Broadway Ave) / N Logan Ave	60	5	460	0	-	-	0	225	5	-	0	0	0	25	0	-	25	-	-	-	-
CSAH 81 (W Broadway Ave) / N Knox Ave	61	5	435	10	-	-	25	220	0	-	5	5	20	0	5	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N James Ave	62	5	450	0	-	-	0	220	15	-	20	5	15	15	0	-	15	-	-	-	-
N Hillside Ave / N 21st Ave / N Irving Ave	63	10	5	20	-	-	5	5	0	-	20	30	5	5	30	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N Irving Ave	64	20	435	25	-	-	5	205	25	-	10	10	10	30	5	-	20	-	-	-	-
N 21st Ave / N Girard Ave	65	5	0	10	-	-	0	0	0	-	5	150	0	0	20	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N Girard Ave	66	30	430	15	-	-	65	205	85	-	20	40	85	10	10	-	10	-	-	-	-
N 21st Ave / N Fremont Ave	67	0	0	0	-	-	30	0	0	-	0	0	0	20	225	-	0	-	-	-	-
CSAH 81 (W Broadway Ave) / N Fremont Ave	68	0	465	60	-	-	15	325	0	-	0	0	0	50	175	-	30	-	-	-	-
N 21st Ave / N Emerson Ave	69	5	15	0	-	-	0	20	15	-	10	175	15	0	0	-	0	-	-	-	-
CSAH 81 (W Broadway Ave) / N Emerson Ave	70	40	475	0	-	-	0	260	50	-	80	110	15	0	0	-	0	-	-	-	-
CSAH 81 (W Broadway Ave) / N Dupont Ave	71	20	455	15	-	-	10	260	15	-	15	5	10	20	10	-	35				



## Existing Conditions: AM Peak Hour Traffic Volumes

Intersection	ID	Eastbound				Westbound				Northbound				Southbound				Northeastbound			
		Left	Thru	Right	Right 2	Left 2	Left	Thru	Right	Left 2	Left	Thru	Right	Left	Thru	Thru 2	Right	Left 2	Left	Thru	Right
CSAH 81 (W Broadway Ave) / N Aldrich Ave	74	5	560	20	-	-	35	330	25	-	10	5	40	20	5	-	5	-	-	-	-
N 21st Ave / N Lyndale Ave	75	10	10	15	-	-	10	5	10	-	10	150	10	40	270	-	20	-	-	-	-
CSAH 81 (W Broadway Ave) / N Lyndale Ave	76	30	525	65	-	-	95	340	40	-	25	100	55	125	145	-	25	-	-	-	-
N 21st Ave / N 4th St	77	5	5	35	-	-	15	5	0	-	15	35	15	0	65	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N 4th St	78	10	590	20	-	-	20	405	50	-	15	5	50	100	5	-	10	-	-	-	-
N 21st Ave / I-94 EB Ramps	79	Does not exist in Existing conditions																			
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	80	0	380	360	-	-	540	305	0	-	0	0	0	600	5	-	170	-	-	-	-
CSAH 152 (N Washington Ave) / N 21st Ave	81	0	0	0	-	-	5	0	10	-	0	900	15	5	400	-	0	-	-	-	-
N 22nd Ave / N 2nd St	82	20	35	5	-	-	10	25	25	-	35	170	10	40	140	-	40	-	-	-	-
N 21st Ave / N 2nd St	83	5	10	5	-	-	5	5	5	-	5	205	5	5	145	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	84	125	555	300	-	-	75	515	190	-	155	450	315	30	200	-	175	-	-	-	-
CSAH 81 (W Broadway Ave) / N 2nd St	85	25	750	40	-	-	20	575	35	-	20	80	45	25	85	-	55	-	-	-	-
CSAH 81 (W Broadway Ave) / W River Rd	86	20	730	70	-	-	25	575	30	-	40	15	40	15	20	-	15	-	-	-	-
CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	87	520	135	140	-	-	95	0	20	-	0	335	55	40	465	-	0	-	-	-	-
N 17th Ave / N 2nd St	88	105	105	10	-	-	5	15	5	-	5	65	0	25	60	-	15	-	-	-	-
CSAH 152 (N Washington Ave) / N 15th Ave	89	0	5	5	-	-	15	0	5	-	5	235	10	5	495	-	5	-	-	-	-
N 15th Ave / N 2nd St	90	10	0	10	-	-	0	0	0	-	0	60	0	0	55	-	20	-	-	-	-
N Lyndale Ave / N Plymouth Ave	91	35	210	45	-	-	155	150	25	-	30	140	140	45	220	-	30	-	-	-	-
CSAH 152 (N Washington Ave) / N Plymouth Ave	92	60	365	145	-	-	75	310	55	-	45	160	35	75	500	-	80	-	-	-	-
N Plymouth Ave / N 2nd St	93	20	330	45	-	-	140	350	10	-	35	35	85	15	80	-	20	-	-	-	-
CSAH 152 (N Washington Ave) / N 10th Ave	94	40	105	40	-	-	30	155	10	-	55	205	70	90	490	-	145	-	-	-	-
N 10th Ave / N 2nd St	95	85	0	65	-	-	0	0	0	-	65	70	0	0	125	-	140	-	-	-	-
CSAH 152 (N Washington Ave) / N 8th Ave	96	10	0	15	-	-	15	0	5	-	15	330	5	5	450	-	110	-	-	-	-
N 10th Ave / N 3rd St	97	35	250	20	-	-	10	330	50	-	35	5	10	10	0	-	10	-	-	-	-
N 10th Ave / N 4th St	98	0	195	15	-	-	15	300	0	-	40	0	20	0	0	-	0	-	-	-	-
N 10th Ave / N 5th St	99	15	170	15	-	-	30	250	60	-	5	15	10	30	20	-	25	-	-	-	-
N 8th Ave / N 5th St	100	10	0	60	-	-	0	0	0	-	15	40	0	0	55	-	20	-	-	-	-
N 9th Ave / N 5th St	101	Does not exist in Existing conditions																			
N 8th Ave / N Oak Lake Ave	102	5	0	15	-	-	25	5	5	-	30	285	65	5	280	-	5	-	-	-	-
N 7th St / W Lyndale Ave	103	0	240	195	-	-	15	290	0	-	0	0	0	725	715	-	190	-	-	-	-
N 7th St / E Lyndale Ave	104	100	865	0	-	-	0	105	145	-	200	525	30	0	0	-	0	-	-	-	-
N 7th St / N Oak Lake Ave	105	85	745	65	-	-	5	205	55	-	15	240	5	100	190	-	30	-	-	-	-
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	106	0	360	375	-	-	65	155	30	-	75	235	40	65	845	-	10	-	-	-	-
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	107	230	675	85	-	-	20	205	15	-	35	65	50	10	70	-	150	-	-	-	-
N 6th Ave / N 5th St	108	15	170	90	-	-	10	250	25	-	20	15	10	20	20	-	40	-	-	-	-
N 6th Ave / N 3rd St	109	5	110	25	-	-	10	75	5	-	15	5	10	0	0	-	5	-	-	-	-
CSAH 152 (N Washington Ave) / N 6th Ave	110	15	0	125	-	-	5	0	5	-	75	325	15	5	420	-	25	-	-	-	-
N 5th Ave / N 3rd St	111	5	75	5	-	-	35	105	20	-	5	5	5	30	5	-	15	-	-	-	-
CSAH 152 (N Washington Ave) / N 5th Ave	112	10	30	45	-	-	20	30	35	-	120	370	30	25	485	-	40	-	-	-	-
N 5th Ave / N 2nd St	113	35	0	55	-	-	0	0	0	-	75	90	0	0	190	-	40	-	-	-	-

## Existing Conditions: PM Peak Hour Traffic Volumes

Intersection	ID	Eastbound				Westbound				Northbound				Southbound				Northeastbound			
		Left	Thru	Right	Right 2	Left 2	Left	Thru	Right	Left 2	Left	Thru	Right	Left	Thru	Thru 2	Right	Left 2	Left	Thru	Right
Brooklyn Park																					
Oak Grove Pkwy / Xylon Ave	1	Does not exist in Existing conditions																			
CSAH 103 (W Broadway Ave) / 101st Ave N	2	185	-	95	-	-	-	-	-	-	55	440	-	-	290	-	120	-	-	-	-
CSAH 103 (W Broadway Ave) / Winnetka Ave N	3	5	-	10	-	-	-	-	-	-	5	495	-	-	385	-	5	-	-	-	-
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	4	-	-	-	-	-	105	-	120	-	-	380	215	120	265	-	-	-	-	-	-
CSAH 103 (W Broadway Ave) / 99th Ave N	5	Does not exist in Existing conditions																			
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	6	-	-	-	-	-	230	-	160	-	-	435	120	70	300	-	-	-	-	-	-
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	7	-	-	-	-	-	160	-	175	-	-	375	360	140	390	-	-	-	-	-	-
CSAH 103 (W Broadway Ave) / 94th Ave N	8	95	5	70	-	-	20	5	40	-	45	600	5	10	490	-	50	-	-	-	-
CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	9	235	515	50	-	-	55	170	60	-	30	355	110	130	315	-	135	-	-	-	-
CSAH 103 (W Broadway Ave) / 92nd Ave N	10	30	5	35	-	-	5	5	5	-	15	460	10	15	390	-	15	-	-	-	-
CSAH 103 (W Broadway Ave) / Setzler Pkwy	11	30	5	20	-	-	35	5	25	-	20	430	65	40	365	-	20	-	-	-	-
CSAH 103 (W Broadway Ave) / 89th Ave N	12	45	-	25	-	-	-	-	-	-	10	465	-	-	400	-	25	-	-	-	-
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	13	15	10	10	-	-	25	5	10	-	10	445	35	10	385	-	25	-	-	-	-
CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	14	135	1225	140	-	-	175	585	45	-	120	310	360	90	255	-	75	-	-	-	-
CSAH 103 (W Broadway Ave) / 84th Ave N	15	10	5	5	-	-	50	5	90	-	5	690	40	45	515	-	10	-	-	-	-
CSAH 103 (W Broadway Ave) / College Park Dr	16	5	-	20	-	-	-	-	-	-	45	740	-	-	555	-	20	-	-	-	-
CSAH 103 (W Broadway Ave) / 82nd Ave N	17	10	-	20	-	-	-	-	-	-	30	775	-	-	565	-	10	-	-	-	-
CSAH 103 (W Broadway Ave) / Candlewood Dr	18	-	-	-	-	-	65	-	30	-	-	780	110	30	560	-	-	-	-	-	-
CSAH 103 (W Broadway Ave) / 78th Ave N	19	15	5	15	-	-	5	5	40	-	15	835	15	20	595	-	10	-	-	-	-
CSAH 103 (W Broadway Ave) / Shopping Center Access	20	95	5	65	-	-	30	5	40	-	65	735	45	25	510	-	80	-	-	-	-
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	21	260	530	60	-	-	155	415	115	-	90	465	165	115	320	-	170	-	-	-	-
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	22	60	685	95	-	-	90	540	50	-	65	20	115	50	15	-	50	-	-	-	-
CSAH 130 (W Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	23	35	765	10	-	-	5	645	35	-	10	5	5	25	5	-	30	-	-	-	-
CSAH 130 (W Broadway Ave) / 76th Ave N	24	110	25	60	-	-	45	45	55	-	50	555	60	80	325	-	135	-	-	-	-
CSAH 130 (W Broadway Ave) / 75th Ave N	25	10	10	90	-	-	25	10	15	-	85	640	45	15	405	-	10	-	-	-	-
CSAH 130 (W Broadway Ave) / 74th Ave N	26	5	5	160	-	-	5	5	10	-	80	755	20	5	505	-	10	-	-	-	-
CSAH 130 (W Broadway Ave) / 73rd Ave N	27	60	30	15	-	-	15	50	30	-	10	765	25	40	580	-	50	-	-	-	-
CSAH 81 (Bottineau Blvd) / 73rd Ave N	28	85	40	70	-	-	45	30	30	-	40	1495	40	30	1185	-	50	-	-	-	-
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	29	125	215	60	-	-	345	130	85	-	45	1365	585	55	1145	-	100	-	-	-	-
CSAH 130 (W Broadway Ave) / 71st Ave N	30	595	30	225	-	-	5	15	5	-	175	200	5	15	225	-	370	-	-	-	-
CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps	31	-	-	-	-	-	175	-	580	-	-	1415	445	110	1440	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps	32	-	-	-	-	-	395	-	195	-	-	1665	200	390	1225	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / 63rd Ave N	33	140	240	70	-	-	235	220	260	-	80	1470	355	255	1250	-	115	-	-	-	-
63rd Ave N / Louisiana Ave N / Park and Ride Access	34	5	345	10	-	-	80	335	5	-	5	5	105	5	5	-	5	-	-	-	-
Crystal																					
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Road)	35	330	485	360	-	-	80	340	80	-	520	1490	150	145	1155	-	260	-	-	-	-
CSAH 10 (Bass Lake Road) / Sherburne Ave	36	5	1040	25	-	-	95	1015	10	-	15	5	120	10	5	-	10	-	-	-	-
CSAH 10 (Bass Lake Road) / Adair Ave N	37	45	720	5	-	-	5	420	15	-	10	5	5	15	5	-	70	-	-	-	-
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	38	15	10	35	-	-	95	5	70	-	25	2070	175	55	1515	-	20	-	-	-	-
Wilshire Blvd / Lakeland Ave N	39	-	-	-	-	-	10	-	40	-	-	5	25	25	5	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / Corvallis Ave N	40	75	20	160	-	-	20	20	25	-	135	2170	30	55	1530	-	55	-	-	-	-
CSAH 81 (Bottineau Blvd) / 47th Ave N	41	15	10	50	-	-	40	5	5	-	70	2315	50	5	1695	-	15	-	-	-	-
Robbinsdale																					
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	42	-	-	-	-	-	220	-	330	-	-	2105	-	-	935	-	850	-	-	-	-
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	43	50	125	5	-	-	-	-	1300	-	-	755	190	80	1075	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	44	-	-	-	-	-	0	-	5	-	-	1000	5	10	1080	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	45	85	190	175	-	-	65	215	130	-	215	785	100	150	615	-	80	-	-	-	-
CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	46	60	580	175	-	-	40	375	90	-	135	90	60	75	85	-	60	-	-	-	-
CSAH 81 (Bottineau Blvd) / 41st Ave N	47	105	10	35	-	-	25	10	45	-	75	950	15	35	745	-	80	-	-	-	-
CSAH 81 (Bottineau Blvd) / 40th Ave N	48	60	30	25	-	-	70	50	85	-	20	895	50	95	670	-	60	-	-	-	-
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	49	-	-	-	-	-	0	-	5	-	-	965	5	5	765	-	-	-	-	-	-
CSAH 81 (Bottineau Blvd) / 36th Ave N	50	130	70	165	-	-	40	185	85	-	135	750	60	60	585	-	120	-	-	-	-
CSAH 81 (Bottineau Blvd) / 35th Ave N	51	135	0	135	-	-	0	0	0	-	95	810	0	0	695	-	100	-	-	-	-
CSAH 81 (Bottineau Blvd) / Abbott Ave N	52	340	0	145	-	-	0	0	0	-	40	570	0	0	670	-	160	-	-	-	-
CSAH 81 (W Broadway Ave) / N Oakdale Ave	53	5	160	-	-	-	-	145	5	-	-	-	-	80	-	-	5	-	-	-	-
Minneapolis																					
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	54	30	130	80	-	-	95	75	45	-	60	185	410	35	100	-	15	-	-	-	-
CSAH 153 (N Lowry Ave) / N Washburn Ave	55	-	575	-	-	-	-	200	-	-	15	-	0	-	-	-	-	-	-	-	-
CSAH 81 (W Broadway Ave) SB Ramps / Theodore Wirth Pkwy	56	-	-	-	-	-	50	-	125	-	-	530	5	30	240	-	-	-	-	-	-
CSAH 81 (W Broadway Ave) / N 29th Ave	57	40	35	40	-	-	10	10	20	-	0	530	15	85	525	-	35	-	-	-	-
CSAH 81 (W Broadway Ave) / N 26th Ave	58	15	95	15	-	-	5	70	75	-	15	455	10	100	470	-	0	-	-	-	-
CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McNair Ave	59	25	375	95	0	25	15	345	90	0	145	305	40	100	240	10	10	5	15	15	0
CSAH 81 (W Broadway Ave) / N Logan Ave	60	30	500	0	-	-	0	450	30	-	-	0	0	25	0	-	20	-	-	-	-
CSAH 81 (W Broadway Ave) / N Knox Ave	61	10	525	15	-	-	25	470	5	-	5	0	15	20	0	-	15	-	-	-	-
CSAH 81 (W Broadway Ave) / N James Ave	62	15	550	0	-	-	0	475	25	-	15	5	15	25	0	-	15	-	-	-	-
N Hillside Ave / N 21st Ave / N Irving Ave	63	5	15	25	-	-	5	10	0	-	20	30	5	0	30	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N Irving Ave	64	25	540	25	-	-	10	460	15	-	15	15	5	20	15	-	25	-	-	-	-
N 21st Ave / N Girard Ave	65	5	0	15	-	-	0	0	0	-	10	40	0	0	45	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N Girard Ave	66	15	525	25	-	-	120	450	10	-	15	25	150	15	25	-	20	-	-	-	-
N 21st Ave / N Fremont Ave	67	0	0	0	-	-	30	0	0	-	0	0	0	55	275	-	0	-	-	-	-
CSAH 81 (W Broadway Ave) / N Fremont Ave	68	0	625	65	-	-	30	530	0	-	0	0	0	105	150	-	50	-	-	-	-
N 21st Ave / N Emerson Ave	69	10	45	0	-	-	0	15	25	-	15	250	30	0	0	-	0	-	-	-	-
CSAH 81 (W Broadway Ave) / N Emerson Ave	70	60	670	0	-	-	0	450	80	-	110	155	55	0</							

## Existing Conditions: PM Peak Hour Traffic Volumes

Intersection	ID	Eastbound				Westbound				Northbound				Southbound				Northeastbound			
		Left	Thru	Right	Right 2	Left 2	Left	Thru	Right	Left 2	Left	Thru	Right	Left	Thru	Thru 2	Right	Left 2	Left	Thru	Right
CSAH 81 (W Broadway Ave) / N Dupont Ave	71	30	685	10	-	-	15	465	35	-	15	5	20	25	20	-	50	-	-	-	-
N 21st Ave / N Bryant Ave	72	5	35	20	-	-	20	25	5	-	20	30	25	5	40	-	5	-	-	-	-
N 21st Ave / N Aldrich Ave	73	5	40	20	-	-	10	35	10	-	10	30	10	15	50	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N Aldrich Ave	74	10	720	40	-	-	55	505	10	-	45	30	65	35	30	-	15	-	-	-	-
N 21st Ave / N Lyndale Ave	75	15	20	30	-	-	25	15	15	-	20	275	30	25	320	-	20	-	-	-	-
CSAH 81 (W Broadway Ave) / N Lyndale Ave	76	80	665	75	-	-	90	475	80	-	50	165	85	150	180	-	45	-	-	-	-
N 21st Ave / N 4th St	77	5	5	60	-	-	40	5	5	-	30	55	20	5	65	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N 4th St	78	25	810	55	-	-	30	615	70	-	35	10	35	130	10	-	25	-	-	-	-
N 21st Ave / I-94 EB Ramps	79	Does not exist in Existing conditions																			
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	80	0	500	475	-	-	895	555	0	-	0	0	0	615	10	-	175	-	-	-	-
CSAH 152 (N Washington Ave) / N 21st Ave	81	0	0	0	-	-	10	0	20	-	0	1200	15	10	395	-	0	-	-	-	-
N 22nd Ave / N 2nd St	82	10	10	15	-	-	15	110	85	-	70	135	5	25	130	-	45	-	-	-	-
N 21st Ave / N 2nd St	83	10	0	15	-	-	0	0	0	-	20	200	0	0	150	-	10	-	-	-	-
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	84	200	535	205	-	-	75	705	255	-	320	650	490	10	170	-	225	-	-	-	-
CSAH 81 (W Broadway Ave) / N 2nd St	85	25	800	25	-	-	10	895	80	-	20	75	65	60	55	-	65	-	-	-	-
CSAH 81 (W Broadway Ave) / W River Rd	86	25	820	80	-	-	40	885	55	-	75	85	80	30	15	-	25	-	-	-	-
CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	87	670	200	125	-	-	105	0	75	-	0	730	105	60	335	-	0	-	-	-	-
N 17th Ave / N 2nd St	88	130	180	5	-	-	5	80	30	-	10	95	10	15	65	-	90	-	-	-	-
CSAH 152 (N Washington Ave) / N 15th Ave	89	5	10	5	-	-	30	10	5	-	5	540	10	5	350	-	5	-	-	-	-
N 15th Ave / N 2nd St	90	20	0	5	-	-	0	0	0	-	10	95	0	0	40	-	35	-	-	-	-
N Lyndale Ave / N Plymouth Ave	91	45	255	60	-	-	260	240	50	-	30	245	185	45	275	-	45	-	-	-	-
CSAH 152 (N Washington Ave) / N Plymouth Ave	92	85	450	80	-	-	45	515	60	-	135	380	70	80	345	-	60	-	-	-	-
N Plymouth Ave / N 2nd St	93	10	500	45	-	-	110	470	15	-	50	75	230	20	70	-	25	-	-	-	-
CSAH 152 (N Washington Ave) / N 10th Ave	94	70	175	35	-	-	80	250	55	-	95	450	40	15	360	-	115	-	-	-	-
N 2nd St / N 10th Ave	95	205	0	90	-	-	0	0	0	-	80	150	0	0	115	-	110	-	-	-	-
CSAH 152 (N Washington Ave) / N 8th Ave	96	0	0	5	-	-	5	5	0	-	10	645	10	15	325	-	15	-	-	-	-
N 10th Ave / N 3rd St	97	10	395	25	-	-	15	430	10	-	40	5	25	15	5	-	35	-	-	-	-
N 10th Ave / N 4th St	98	0	210	30	-	-	30	540	0	-	40	0	30	0	0	-	0	-	-	-	-
N 10th Ave / N 5th St	99	20	190	15	-	-	35	470	90	-	10	30	35	20	15	-	35	-	-	-	-
N 8th Ave / N 5th St	100	20	0	25	-	-	0	0	0	-	25	95	0	0	50	-	15	-	-	-	-
N 9th Ave / N 5th St	101	Does not exist in Existing conditions																			
N 8th Ave / N Oak Lake Ave	102	5	0	0	-	-	30	0	10	-	30	370	40	5	450	-	5	-	-	-	-
N 7th St / W Lyndale Ave	103	0	210	205	-	-	35	450	0	-	0	0	0	330	675	-	135	-	-	-	-
N 7th St / E Lyndale Ave	104	150	390	0	-	-	0	255	430	-	230	1055	20	0	0	-	0	-	-	-	-
N 7th St / N Oak Lake Ave	105	50	325	35	-	-	10	615	105	-	15	285	10	150	275	-	55	-	-	-	-
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	106	0	290	260	-	-	55	295	65	-	140	665	95	45	465	-	25	-	-	-	-
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	107	255	520	25	-	-	20	425	15	-	55	85	20	10	30	-	255	-	-	-	-
N 6th Ave / N 5th St	108	25	180	60	-	-	5	175	25	-	85	10	5	25	20	-	30	-	-	-	-
N 6th Ave / N 3rd St	109	15	170	15	-	-	10	120	15	-	20	5	15	10	10	-	30	-	-	-	-
CSAH 152 (N Washington Ave) / N 6th Ave	110	50	10	180	-	-	10	5	5	-	120	520	15	5	365	-	30	-	-	-	-
N 5th Ave / N 3rd St	111	5	155	5	-	-	15	100	30	-	10	15	35	30	10	-	15	-	-	-	-
CSAH 152 (N Washington Ave) / N 5th Ave	112	30	70	155	-	-	20	20	55	-	65	570	40	60	470	-	25	-	-	-	-
N 5th Ave / N 2nd St	113	60	0	145	-	-	0	0	0	-	60	170	0	0	170	-	35	-	-	-	-

2050 No Build Conditions: AM Peak Hour Traffic Volumes

Intersection	ID	Eastbound				Westbound				Northbound				Southbound				Northeastbound			
		Left	Thru	Right	Right 2	Left 2	Thru	Right	Right 2	Left 2	Thru	Right	Right 2	Left	Thru	Thru 2	Right	Left 2	Left	Thru	Right
Brooklyn Park																					
Oak Grove Pkwy / Xylon Ave	1	Does not exist in 2050 No Build																			
CSAH 103 (W Broadway Ave) / 101st Ave N	2	50	-	50	-	-	-	-	-	-	285	470	-	-	350	-	240	-	-	-	-
CSAH 103 (W Broadway Ave) / Winnetka Ave N	3	235	-	170	-	-	-	-	-	-	25	520	-	-	300	-	100	-	-	-	-
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	4	-	-	-	-	-	-	45	-	25	-	520	125	40	435	-	-	-	-	-	
CSAH 103 (W Broadway Ave) / 99th Ave N	5	Does not exist in 2050 No Build																			
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	6	-	-	-	-	-	775	-	245	-	-	400	140	45	430	-	-	-	-	-	
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	7	-	-	-	-	-	265	-	235	-	-	305	370	310	895	-	-	-	-	-	
CSAH 103 (W Broadway Ave) / 94th Ave N	8	25	5	40	-	-	95	25	140	-	60	510	10	20	1030	-	115	-	-	-	
CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	9	70	580	90	-	-	240	445	55	-	155	450	320	90	835	-	240	-	-	-	
CSAH 103 (W Broadway Ave) / 92nd Ave N	10	-	-	25	-	-	-	-	90	-	-	835	15	-	1010	-	185	-	-	-	
CSAH 103 (W Broadway Ave) / Settler Pkwy	11	115	5	45	-	-	30	5	60	-	45	640	10	80	870	-	85	-	-	-	
CSAH 103 (W Broadway Ave) / 89th Ave N	12	-	-	25	-	-	-	-	-	-	-	695	-	-	855	-	110	-	-	-	
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	13	35	5	5	-	-	5	5	60	-	-	585	5	60	800	-	15	-	-	-	
CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	14	190	365	85	-	-	285	580	150	-	170	250	165	85	335	-	390	-	-	-	
CSAH 103 (W Broadway Ave) / 84th Ave N	15	-	-	5	-	-	-	-	10	-	-	575	15	-	700	-	10	-	-	-	
CSAH 103 (W Broadway Ave) / College Park Dr	16	15	-	5	-	-	5	-	-	-	10	570	-	70	630	-	5	-	-	-	
CSAH 103 (W Broadway Ave) / 82nd Ave N	17	-	-	10	-	-	-	-	-	-	-	580	-	-	635	-	5	-	-	-	
CSAH 103 (W Broadway Ave) / Candlewood Dr	18	-	-	-	-	-	55	-	55	-	30	520	30	35	610	-	-	-	-	-	
CSAH 103 (W Broadway Ave) / 78th Ave N	19	-	-	10	-	-	-	-	90	-	-	485	20	-	680	-	10	-	-	-	
CSAH 103 (W Broadway Ave) / Shopping Center Access	20	10	5	15	-	-	5	5	-	-	15	480	5	20	660	-	10	-	-	-	
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	21	105	290	40	-	-	85	260	90	-	40	305	65	95	365	-	215	-	-	-	
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	22	5	325	50	-	-	35	475	5	-	80	5	105	5	10	-	5	-	-	-	
CSAH 130 (W Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	23	5	440	5	-	-	5	425	5	-	5	-	5	5	-	-	5	-	-	-	
CSAH 130 (W Broadway Ave) / 76th Ave N	24	45	30	20	-	-	40	30	45	-	35	320	55	60	360	-	70	-	-	-	
CSAH 130 (W Broadway Ave) / 75th Ave N	25	5	5	40	-	-	45	10	20	-	25	385	25	30	385	-	5	-	-	-	
CSAH 130 (W Broadway Ave) / 74th Ave N	26	-	5	15	-	-	15	5	5	-	5	430	15	5	460	-	5	-	-	-	
CSAH 130 (W Broadway Ave) / 73rd Ave N	27	30	25	20	-	-	25	55	15	-	5	400	25	25	410	-	55	-	-	-	
CSAH 81 (Bottineau Blvd) / 73rd Ave N	28	40	10	90	-	-	50	35	30	-	120	970	20	50	1860	-	95	-	-	-	
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	29	110	105	50	-	-	375	185	75	-	100	920	290	95	1700	-	205	-	-	-	
CSAH 130 (W Broadway Ave) / 71st Ave N	30	300	30	160	-	-	5	30	10	-	250	125	-	10	85	-	355	-	-	-	
CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps	31	-	-	-	-	-	135	-	560	-	-	755	400	200	1920	-	-	-	-	-	
CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps	32	-	-	-	-	-	400	-	125	-	-	1030	230	520	1535	-	-	-	-	-	
CSAH 81 (Bottineau Blvd) / 63rd Ave N	33	120	170	110	-	-	310	270	310	-	90	830	200	200	1595	-	135	-	-	-	
63rd Ave N / Louisiana Ave N / Park and Ride Access	34	-	305	20	-	-	130	365	-	-	10	-	95	5	-	-	5	-	-	-	
Crystal																					
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Road)	35	150	190	405	-	-	65	285	65	-	275	900	45	80	1675	-	265	-	-	-	
CSAH 10 (Bass Lake Road) / Sherburne Ave	36	5	665	10	-	-	95	725	5	-	5	80	5	5	5	-	45	-	-	-	
CSAH 10 (Bass Lake Road) / Adair Ave N	37	25	275	10	-	-	5	370	5	-	5	5	5	5	5	-	45	-	-	-	
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	38	10	5	15	-	-	140	10	75	-	30	1135	95	60	2050	-	35	-	-	-	
Wilshire Blvd / Lakeland Ave N	39	-	-	-	-	-	65	-	10	-	-	5	20	10	-	-	-	-	-	-	
CSAH 81 (Bottineau Blvd) / Corvallis Ave N	40	45	5	145	-	-	30	25	30	-	135	1180	5	10	2105	-	90	-	-	-	
CSAH 81 (Bottineau Blvd) / 47th Ave N	41	10	5	90	-	-	60	5	5	-	55	1305	15	5	2265	-	10	-	-	-	
Robbinsdale																					
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	42	-	-	-	-	-	110	-	80	-	-	1295	-	-	1055	-	1355	-	-	-	
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	43	25	160	-	-	-	-	-	470	-	-	800	135	170	1000	-	-	-	-	-	
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	44	0	0	0	-	-	0	0	0	-	0	715	0	0	855	-	0	-	-	-	
CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	45	60	175	140	-	-	65	225	80	-	165	570	40	60	735	-	55	-	-	-	
CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	46	35	330	75	-	-	35	380	35	-	95	55	35	40	75	-	45	-	-	-	
CSAH 81 (Bottineau Blvd) / 41st Ave N	47	50	10	15	-	-	0	10	10	-	45	725	5	10	880	-	55	-	-	-	
CSAH 81 (Bottineau Blvd) / 40th Ave N	48	55	30	10	-	-	50	45	105	-	5	610	20	45	810	-	40	-	-	-	
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	49	0	0	0	-	-	0	0	0	-	0	640	0	0	870	-	0	-	-	-	
CSAH 81 (Bottineau Blvd) / 36th Ave N	50	70	60	145	-	-	60	185	90	-	95	480	25	25	750	-	90	-	-	-	
CSAH 81 (Bottineau Blvd) / 35th Ave N	51	55	0	80	-	-	0	0	0	-	65	550	0	0	810	-	145	-	-	-	
CSAH 81 (Bottineau Blvd) / Abbott Ave N	52	195	0	115	-	-	0	0	0	-	65	415	0	0	565	-	325	-	-	-	
CSAH 81 (W Broadway Ave) / N Oakdale Ave	53	10	120	0	-	-	0	155	50	-	0	0	0	25	0	-	5	-	-	-	
Minneapolis																					
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	54	25	145	55	-	-	175	115	20	-	45	30	130	40	160	-	30	-	-	-	
CSAH 153 (N Lowry Ave) / N Washburn Ave	55	0	310	0	-	-	0	295	0	-	20	0	5	0	0	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / SB Ramps / Theodore Wirth Pkwy	56	0	0	0	-	-	50	0	15	-	0	185	5	60	330	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N 29th Ave	57	55	10	50	-	-	15	20	10	-	0	290	10	35	515	-	25	-	-	-	
CSAH 81 (W Broadway Ave) / N 26th Ave	58	20	45	10	-	-	5	60	35	-	0	245	10	55	520	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McNair Ave	59	15	445	70	0	10	20	180	30	0	70	110	10	50	145	-	5	0	5	0	
CSAH 81 (W Broadway Ave) / N Logan Ave	60	5	505	0	-	-	0	210	5	-	0	0	0	30	0	-	25	-	-	-	
CSAH 81 (W Broadway Ave) / N Knox Ave	61	5	465	10	-	-	25	230	0	-	0	5	25	0	5	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N James Ave	62	5	485	0	-	-	0	235	15	-	20	5	15	15	0	-	15	-	-	-	
N Hillside Ave / N 21st Ave / N Irving Ave	63	10	5	20	-	-	5	5	0	-	20	30	5	15	30	-	5	-	-	-	
CSAH 81 (W Broadway Ave) / N Irving Ave	64	20	470	25	-	-	5	220	25	-	10	10	10	30	5	-	20	-	-	-	
N 21st Ave / N Girard Ave	65	10	0	15	-	-	0	0	0	-	5	155	0	0	25	-	5	-	-	-	
CSAH 81 (W Broadway Ave) / N Girard Ave	66	30	465	15	-	-	75	210	90	-	20	40	90	10	10	-	20	-	-	-	
N 21st Ave / N Fremont Ave	67	0	0	0	-	-	45	0	0	-	0	0	0	25	250	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N Fremont Ave	68	0	480	75	-	-	15	340	0	-	0	0	0	55	205	-	35	-	-	-	
N 21st Ave / N Emerson Ave	69	15	10	0	-	-	0	30	15	-	15	190	35	0	0	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N Emerson Ave	70	50	495	0	-	-	0	275	50	-	80	140	15	0	0	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N Dupont Ave	71	25	470	15	-	-	10	270	15	-	15	5	10	20	10	-	40	-	-	-	
N 21st Ave / N Bryant Ave	72	5	30	10	-	-	20	15	5	-	15	10	15	20	25	-	5	-	-	-	
N 21st Ave / N Aldrich Ave	73	15	35	15	-	-	15	30	5	-	5	50	5	5	15	-	5	-	-	-	

2050 No Build Conditions: AM Peak Hour Traffic Volumes

Intersection	ID	Eastbound				Westbound				Northbound				Southbound				Northeastbound			
		Left	Thru	Right	Right 2	Left 2	Left	Thru	Right	Left 2	Left	Thru	Right	Left	Thru	Thru 2	Right	Left 2	Left	Thru	Right
CSAH 81 (W Broadway Ave) / N Aldrich Ave	74	10	385	20	-	-	35	345	30	-	10	20	40	20	20	-	5	-	-	-	-
N 21st Ave / N Lyndale Ave	75	15	10	20	-	-	10	20	10	-	10	170	10	45	285	-	20	-	-	-	-
CSAH 81 (W Broadway Ave) / N Lyndale Ave	76	35	545	65	-	-	95	360	40	-	25	115	60	135	155	-	25	-	-	-	-
N 21st Ave / N 4th St	77	5	5	45	-	-	10	5	0	-	15	45	15	0	60	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N 4th St	78	15	615	20	-	-	20	420	55	-	15	5	50	100	5	-	10	-	-	-	-
N 21st Ave / I-94 EB Ramps	79	Does not exist in 2050 No Build																			
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	80	0	390	375	-	-	555	315	0	-	0	0	0	650	25	-	180	-	-	-	-
CSAH 152 (N Washington Ave) / N 21st Ave	81	0	0	0	-	-	5	0	10	-	0	975	15	5	435	-	0	-	-	-	-
N 22nd Ave / N 2nd St	82	25	35	5	-	-	15	30	30	-	45	205	15	50	170	-	50	-	-	-	-
N 21st Ave / N 2nd St	83	5	15	0	-	-	15	5	10	-	5	250	5	5	180	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	84	130	600	310	-	-	75	520	190	-	160	510	325	30	220	-	190	-	-	-	-
CSAH 81 (W Broadway Ave) / N 2nd St	85	50	780	40	-	-	20	580	55	-	20	80	45	30	105	-	70	-	-	-	-
CSAH 81 (W Broadway Ave) / W River Rd	86	20	765	70	-	-	25	600	30	-	40	10	40	15	20	-	15	-	-	-	-
CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	87	615	160	165	-	-	105	0	20	-	0	330	60	40	480	-	0	-	-	-	-
N 17th Ave / N 2nd St	88	110	130	10	-	-	5	25	5	-	5	70	10	30	75	-	15	-	-	-	-
CSAH 152 (N Washington Ave) / N 15th Ave	89	0	5	5	-	-	15	0	5	-	5	235	10	5	540	-	5	-	-	-	-
N 15th Ave / N 2nd St	90	15	0	5	-	-	0	0	0	-	0	65	0	0	70	-	20	-	-	-	-
N Lyndale Ave / N Plymouth Ave	91	50	380	60	-	-	200	200	40	-	30	135	210	50	245	-	30	-	-	-	-
CSAH 152 (N Washington Ave) / N Plymouth Ave	92	90	530	220	-	-	110	450	40	-	75	150	40	75	455	-	120	-	-	-	-
N Plymouth Ave / N 2nd St	93	25	430	65	-	-	240	535	10	-	35	35	95	10	90	-	20	-	-	-	-
CSAH 152 (N Washington Ave) / N 10th Ave	94	45	120	45	-	-	30	160	5	-	65	230	80	105	540	-	165	-	-	-	-
N 2nd St / N 10th Ave	95	90	0	80	-	-	0	0	0	-	70	75	0	0	245	-	150	-	-	-	-
CSAH 152 (N Washington Ave) / N 8th Ave	96	10	0	15	-	-	15	0	5	-	15	360	5	5	510	-	100	-	-	-	-
N 10th Ave / N 3rd St	97	50	295	40	-	-	10	380	35	-	35	5	10	10	0	-	10	-	-	-	-
N 10th Ave / N 4th St	98	0	255	20	-	-	20	345	0	-	45	0	20	0	0	-	0	-	-	-	-
N 10th Ave / N 5th St	99	20	230	20	-	-	45	265	80	-	5	15	10	35	20	-	25	-	-	-	-
N 8th Ave / N 5th St	100	5	0	65	-	-	0	0	0	-	10	35	0	0	65	-	20	-	-	-	-
N 9th Ave / N 5th St	101	Does not exist in 2050 No Build																			
N 8th Ave / N Oak Lake Ave	102	5	0	15	-	-	20	5	5	-	35	355	65	5	295	-	5	-	-	-	-
N 7th St / W Lyndale Ave	103	0	245	200	-	-	15	315	0	-	0	0	0	800	795	-	180	-	-	-	-
N 7th St / E Lyndale Ave	104	105	940	0	-	-	0	115	160	-	215	570	30	0	0	-	0	-	-	-	-
N 7th St / N Oak Lake Ave	105	95	800	75	-	-	5	225	70	-	15	290	5	105	190	-	35	-	-	-	-
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	106	0	385	420	-	-	65	160	30	-	85	270	50	40	930	-	10	-	-	-	-
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	107	255	705	85	-	-	20	220	15	-	65	115	90	10	80	-	150	-	-	-	-
N 6th Ave / N 5th St	108	15	175	90	-	-	10	255	15	-	20	15	10	15	35	-	45	-	-	-	-
N 6th Ave / N 3rd St	109	5	125	35	-	-	15	65	10	-	20	5	15	0	0	-	5	-	-	-	-
CSAH 152 (N Washington Ave) / N 6th Ave	110	20	0	140	-	-	5	0	5	-	80	355	15	5	510	-	25	-	-	-	-
N 5th Ave / N 3rd St	111	5	90	5	-	-	40	120	25	-	5	10	5	35	5	-	20	-	-	-	-
CSAH 152 (N Washington Ave) / N 5th Ave	112	10	30	50	-	-	20	30	45	-	125	395	40	25	580	-	40	-	-	-	-
N 5th Ave / N 2nd St	113	40	0	60	-	-	0	0	0	-	90	90	0	0	190	-	40	-	-	-	-



## 2050 No Build Conditions: PM Peak Hour Traffic Volumes

Intersection	ID	Eastbound				Westbound				Northbound				Southbound				Northeastbound			
		Left	Thru	Right	Right 2	Left 2	Left	Thru	Right	Left 2	Left	Thru	Right	Left	Thru	Thru 2	Right	Left 2	Left	Thru	Right
Brooklyn Park																					
Oak Grove Pkwy / Xylon Ave	1	Does not exist in 2050 No Build																			
CSAH 103 (W Broadway Ave) / 101st Ave N	2	170	-	280	-	-	-	-	-	-	215	700	-	-	275	-	300	-	-	-	-
CSAH 103 (W Broadway Ave) / Winnetka Ave N	3	150	-	225	-	-	-	-	-	-	200	765	-	-	430	-	125	-	-	-	-
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	4	-	-	-	-	-	70	-	85	-	-	880	285	100	555	-	-	-	-	-	
CSAH 103 (W Broadway Ave) / 99th Ave N	5	Does not exist in 2050 No Build																			
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	6	-	-	-	-	-	365	-	230	-	-	930	175	110	520	-	-	-	-	-	
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	7	-	-	-	-	-	325	-	465	-	-	640	380	385	500	-	-	-	-	-	
CSAH 103 (W Broadway Ave) / 94th Ave N	8	75	5	80	-	-	10	5	15	-	30	930	25	40	750	-	35	-	-	-	
CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	9	280	1090	95	-	-	355	320	90	-	115	615	370	-	585	-	75	-	-	-	
CSAH 103 (W Broadway Ave) / 92nd Ave N	10	-	-	45	-	-	-	-	5	-	-	1100	110	30	1020	-	95	-	-	-	
CSAH 103 (W Broadway Ave) / Setzler Pkwy	11	40	5	10	-	-	40	5	80	-	30	1050	30	115	890	-	55	-	-	-	
CSAH 103 (W Broadway Ave) / 89th Ave N	12	-	-	80	-	-	-	-	-	-	-	1110	-	-	915	-	40	-	-	-	
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	13	30	5	5	-	-	30	5	75	-	5	955	20	105	845	-	40	-	-	-	
CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	14	440	1120	480	-	-	370	590	115	-	295	425	790	220	185	-	475	-	-	-	
CSAH 103 (W Broadway Ave) / 84th Ave N	15	-	-	15	-	-	-	-	100	-	-	1410	20	-	1025	-	10	-	-	-	
CSAH 103 (W Broadway Ave) / College Park Dr	16	5	-	10	-	-	50	-	-	-	40	1405	-	65	970	-	10	-	-	-	
CSAH 103 (W Broadway Ave) / 82nd Ave N	17	-	-	25	-	-	-	-	-	-	-	1445	-	-	1025	-	20	-	-	-	
CSAH 103 (W Broadway Ave) / Candlewood Dr	18	-	-	-	-	-	55	-	95	-	25	1340	85	75	975	-	-	-	-	-	
CSAH 103 (W Broadway Ave) / 78th Ave N	19	-	-	45	-	-	-	-	85	-	-	1365	25	40	975	-	40	-	-	-	
CSAH 103 (W Broadway Ave) / Shopping Center Access	20	140	10	75	-	-	40	5	70	-	70	1150	60	75	830	-	120	-	-	-	
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	21	460	590	95	-	-	205	580	215	-	125	605	175	160	500	-	285	-	-	-	
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	22	75	925	235	-	-	180	740	60	-	95	25	155	60	35	-	60	-	-	-	
CSAH 130 (W Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	23	35	870	20	-	-	10	915	25	-	30	-	10	25	-	-	55	-	-	-	
CSAH 130 (W Broadway Ave) / 76th Ave N	24	140	55	100	-	-	130	175	140	-	110	630	110	120	430	-	255	-	-	-	
CSAH 130 (W Broadway Ave) / 75th Ave N	25	10	15	115	-	-	65	45	30	-	180	805	75	35	585	-	25	-	-	-	
CSAH 130 (W Broadway Ave) / 74th Ave N	26	-	-	10	-	-	40	-	10	-	15	1055	45	5	765	-	-	-	-	-	
CSAH 130 (W Broadway Ave) / 73rd Ave N	27	135	40	20	-	-	10	55	55	-	10	930	15	50	625	-	140	-	-	-	
CSAH 81 (Bottineau Blvd) / 73rd Ave N	28	145	90	185	-	-	100	75	30	-	175	2235	75	25	1430	-	80	-	-	-	
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	29	235	335	75	-	-	320	190	150	-	65	2095	680	105	1440	-	175	-	-	-	
CSAH 130 (W Broadway Ave) / 71st Ave N	30	700	50	375	-	-	-	25	5	-	260	245	5	20	255	-	380	-	-	-	
CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps	31	-	-	-	-	-	165	-	835	-	-	2005	445	160	1675	-	-	-	-	-	
CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps	32	-	-	-	-	-	370	-	230	-	-	2215	230	465	1375	-	-	-	-	-	
CSAH 81 (Bottineau Blvd) / 63rd Ave N	33	180	360	85	-	-	335	285	330	-	95	1940	540	290	1330	-	130	-	-	-	
63rd Ave N / Louisiana Ave N / Park and Ride Access	34	5	470	40	-	-	65	445	5	-	20	5	155	-	-	-	-	-	-	-	
Crystal																					
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Road)	35	445	540	400	-	-	90	355	115	-	530	2010	155	165	1320	-	265	-	-	-	
CSAH 10 (Bass Lake Road) / Sherburne Ave	36	10	1195	30	-	-	115	1025	10	-	15	5	180	10	5	-	10	-	-	-	
CSAH 10 (Bass Lake Road) / Adair Ave N	37	50	800	10	-	-	5	485	15	-	10	5	5	10	5	-	50	-	-	-	
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	38	25	10	40	-	-	75	5	65	-	20	2605	180	60	1720	-	30	-	-	-	
Wilshire Blvd / Lakeland Ave N	39	-	-	-	-	-	15	-	40	-	-	5	30	45	5	-	-	-	-	-	
CSAH 81 (Bottineau Blvd) / Corvallis Ave N	40	110	20	210	-	-	15	15	20	-	120	2670	25	60	1710	-	60	-	-	-	
CSAH 81 (Bottineau Blvd) / 47th Ave N	41	25	10	65	-	-	35	5	5	-	60	2785	50	5	1910	-	20	-	-	-	
Robbinsdale																					
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	42	-	-	-	-	-	90	-	325	-	-	2570	-	-	1090	-	920	-	-	-	
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	43	60	130	5	-	-	-	-	1585	-	-	920	205	80	1100	-	-	-	-	-	
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	44	0	0	0	-	-	0	0	0	-	0	1085	0	0	970	-	0	-	-	-	
CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	45	95	205	200	-	-	80	235	140	-	340	840	115	170	700	-	85	-	-	-	
CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	46	70	585	195	-	-	45	410	95	-	160	100	70	80	95	-	60	-	-	-	
CSAH 81 (Bottineau Blvd) / 41st Ave N	47	120	10	65	-	-	30	10	50	-	85	1040	20	35	855	-	95	-	-	-	
CSAH 81 (Bottineau Blvd) / 40th Ave N	48	70	30	25	-	-	80	50	95	-	20	965	60	110	775	-	70	-	-	-	
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	49	0	0	0	-	-	0	0	0	-	0	1060	0	0	885	-	0	-	-	-	
CSAH 81 (Bottineau Blvd) / 36th Ave N	50	140	50	195	-	-	45	190	100	-	140	825	70	65	685	-	140	-	-	-	
CSAH 81 (Bottineau Blvd) / 35th Ave N	51	155	0	150	-	-	0	0	0	-	110	875	0	0	800	-	120	-	-	-	
CSAH 81 (Bottineau Blvd) / Abbott Ave N	52	395	0	170	-	-	0	0	0	-	40	590	0	0	775	-	180	-	-	-	
CSAH 81 (W Broadway Ave) / N Oakdale Ave	53	5	185	0	-	-	0	160	5	-	0	0	0	100	0	-	5	-	-	-	
Minneapolis																					
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	54	75	255	95	-	-	115	90	50	-	45	150	340	35	110	-	15	-	-	-	
CSAH 153 (N Lowry Ave) / N Washburn Ave	55	0	625	0	-	-	0	240	0	-	15	0	0	0	0	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / SB Ramps / Theodore Wirth Pkwy	56	0	0	0	-	-	35	0	75	-	0	465	5	30	290	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N 29th Ave	57	40	35	40	-	-	15	10	20	-	0	565	15	95	590	-	40	-	-	-	
CSAH 81 (W Broadway Ave) / N 26th Ave	58	15	100	15	-	-	5	70	80	-	20	480	10	115	520	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McNair Ave	59	25	410	105	0	15	30	340	85	0	155	315	45	106	240	-	10	5	20	15	
CSAH 81 (W Broadway Ave) / N Logan Ave	60	40	535	0	-	-	0	450	30	-	0	0	0	20	5	-	20	-	-	-	
CSAH 81 (W Broadway Ave) / N Knox Ave	61	10	555	15	-	-	30	505	5	-	5	0	20	20	5	-	20	-	-	-	
CSAH 81 (W Broadway Ave) / N James Ave	62	15	590	0	-	-	0	510	25	-	15	5	15	25	0	-	15	-	-	-	
N Hillside Ave / N 21st Ave / N Irving Ave	63	5	15	25	-	-	5	10	0	-	20	30	5	20	30	-	5	-	-	-	
CSAH 81 (W Broadway Ave) / N Irving Ave	64	25	580	25	-	-	10	485	15	-	15	15	15	20	15	-	25	-	-	-	
N 21st Ave / N Girard Ave	65	20	0	20	-	-	0	0	0	-	10	40	0	0	60	-	5	-	-	-	
CSAH 81 (W Broadway Ave) / N Girard Ave	66	15	565	35	-	-	125	485	10	-	15	25	160	15	45	-	20	-	-	-	
N 21st Ave / N Fremont Ave	67	0	0	0	-	-	45	0	0	-	0	0	0	75	295	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N Fremont Ave	68	0	660	80	-	-	30	550	0	-	0	0	0	110	160	-	70	-	-	-	
N 21st Ave / N Emerson Ave	69	25	50	0	-	-	0	30	25	-	15	260	35	0	0	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N Emerson Ave	70	60	710	0	-	-	0	470	85	-	110	165	55	0	0	-	0	-	-	-	
CSAH 81 (W Broadway Ave) / N Dupont Ave	71	30	710	25	-	-	15	480	35	-	15	5	20	25	20	-	60	-	-	-	
N 21st Ave / N Bryant Ave	72	5	40	25	-	-	25	40	5	-	25	35	25	30	45	-	5	-	-	-	
N 21st Ave / N Aldrich Ave	73	25	45	25	-	-															



2050 No Build Conditions: PM Peak Hour Traffic Volumes

Intersection	ID	Eastbound				Westbound				Northbound				Southbound				Northeastbound			
		Left	Thru	Right	Right 2	Left 2	Left	Thru	Right	Left 2	Left	Thru	Right	Left	Thru	Thru 2	Right	Left 2	Left	Thru	Right
CSAH 81 (W Broadway Ave) / N Aldrich Ave	74	10	730	50	-	-	55	525	10	-	45	55	65	35	50	-	20	-	-	-	-
N 21st Ave / N Lyndale Ave	75	45	25	35	-	-	30	20	10	-	20	290	30	25	340	-	40	-	-	-	-
CSAH 81 (W Broadway Ave) / N Lyndale Ave	76	80	695	75	-	-	90	485	80	-	55	180	95	160	195	-	50	-	-	-	-
N 21st Ave / N 4th St	77	0	5	75	-	-	50	10	5	-	30	60	0	5	75	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / N 4th St	78	25	845	70	-	-	95	635	55	-	35	10	35	140	35	-	25	-	-	-	-
N 21st Ave / I-94 EB Ramps	79	Does not exist in 2050 No Build																			
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	80	0	535	485	-	-	715	580	0	-	0	0	0	475	5	-	205	-	-	-	-
CSAH 152 (N Washington Ave) / N 21st Ave	81	0	0	0	-	-	10	0	20	-	0	1300	35	10	440	-	0	-	-	-	-
N 22nd Ave / N 2nd St	82	10	15	10	-	-	20	145	115	-	90	165	5	30	155	-	5	-	-	-	-
N 21st Ave / N 2nd St	83	15	10	20	-	-	0	0	0	-	25	245	0	0	180	-	5	-	-	-	-
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	84	205	550	255	-	-	75	710	255	-	330	735	505	10	185	-	255	-	-	-	-
CSAH 81 (W Broadway Ave) / N 2nd St	85	25	800	50	-	-	10	920	130	-	20	75	65	75	60	-	80	-	-	-	-
CSAH 81 (W Broadway Ave) / W River Rd	86	25	830	85	-	-	40	940	55	-	70	85	80	30	15	-	50	-	-	-	-
CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	87	800	235	150	-	-	110	0	80	-	0	720	105	90	345	-	0	-	-	-	-
N 17th Ave / N 2nd St	88	140	230	5	-	-	5	75	25	-	15	95	10	10	70	-	100	-	-	-	-
CSAH 152 (N Washington Ave) / N 15th Ave	89	5	10	5	-	-	30	10	5	-	5	535	10	5	345	-	20	-	-	-	-
N 15th Ave / N 2nd St	90	20	0	5	-	-	0	0	0	-	10	100	0	0	45	-	35	-	-	-	-
N Lyndale Ave / N Plymouth Ave	91	60	490	40	-	-	335	285	75	-	30	240	185	50	265	-	50	-	-	-	-
CSAH 152 (N Washington Ave) / N Plymouth Ave	92	90	645	125	-	-	65	745	45	-	150	415	80	80	340	-	60	-	-	-	-
N Plymouth Ave / N 2nd St	93	15	680	40	-	-	185	705	25	-	50	80	245	20	75	-	25	-	-	-	-
CSAH 152 (N Washington Ave) / N 10th Ave	94	80	200	40	-	-	85	265	45	-	105	510	45	15	405	-	130	-	-	-	-
N 2nd St / N 10th Ave	95	220	0	95	-	-	0	0	0	-	85	155	0	0	185	-	115	-	-	-	-
CSAH 152 (N Washington Ave) / N 8th Ave	96	0	0	5	-	-	5	5	0	-	10	660	10	15	500	-	15	-	-	-	-
N 10th Ave / N 3rd St	97	15	480	40	-	-	15	470	10	-	40	5	20	15	5	-	35	-	-	-	-
N 10th Ave / N 4th St	98	0	265	45	-	-	40	585	0	-	45	0	35	0	0	-	0	-	-	-	-
N 10th Ave / N 5th St	99	35	260	20	-	-	50	485	125	-	10	25	35	20	15	-	40	-	-	-	-
N 8th Ave / N 5th St	100	15	0	35	-	-	0	0	0	-	20	105	0	0	60	-	5	-	-	-	-
N 9th Ave / N 5th St	101	Does not exist in 2050 No Build																			
N 8th Ave / N Oak Lake Ave	102	5	0	15	-	-	20	0	5	-	35	465	45	5	480	-	5	-	-	-	-
N 7th St / W Lyndale Ave	103	0	225	210	-	-	35	490	0	-	0	0	0	400	760	-	165	-	-	-	-
N 7th St / E Lyndale Ave	104	210	415	0	-	-	0	280	485	-	245	1140	30	0	0	-	0	-	-	-	-
N 7th St / N Oak Lake Ave	105	55	355	35	-	-	10	690	115	-	15	375	10	165	290	-	60	-	-	-	-
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	106	0	310	280	-	-	60	300	65	-	160	750	110	35	520	-	25	-	-	-	-
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	107	270	545	25	-	-	20	450	15	-	100	190	35	10	35	-	270	-	-	-	-
N 6th Ave / N 5th St	108	25	185	55	-	-	5	180	20	-	95	10	5	20	50	-	25	-	-	-	-
N 6th Ave / N 3rd St	109	20	230	20	-	-	15	115	20	-	25	5	20	10	10	-	30	-	-	-	-
CSAH 152 (N Washington Ave) / N 6th Ave	110	75	15	215	-	-	15	5	5	-	135	600	15	5	400	-	105	-	-	-	-
N 5th Ave / N 3rd St	111	5	190	5	-	-	15	115	35	-	10	20	50	35	10	-	20	-	-	-	-
CSAH 152 (N Washington Ave) / N 5th Ave	112	30	75	170	-	-	20	35	60	-	70	660	50	65	540	-	25	-	-	-	-
N 5th Ave / N 2nd St	113	65	0	160	-	-	0	0	0	-	80	170	0	0	170	-	35	-	-	-	-

# 2050 Build Conditions: AM Peak Hour Traffic Volumes

Intersection	ID	Eastbound			Westbound			Northbound			Southbound			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Brooklyn Park														
Oak Grove Pkwy / Xylon Ave	1	205	525	465	105	235	80	265	55	70	55	30	195	
CSAH 103 (W Broadway Ave) / 101st Ave N	2	Does not exist in 2050 Build												
CSAH 103 (W Broadway Ave) / Winnetka Ave N	3	Does not exist in 2050 Build												
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	4	55	5	50	40	60	20	340	450	120	35	415	360	
CSAH 103 (W Broadway Ave) / 99th Ave N	5	40	125	75	25	155	-	245	865	55	10	345	150	
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	6	-	-	-	760	-	460	-	705	135	55	385	-	
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	7	-	-	-	300	-	420	-	420	340	255	890	-	
CSAH 103 (W Broadway Ave) / 94th Ave N	8	30	5	40	90	25	155	55	575	10	20	1050	120	
CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	9	110	590	145	525	520	80	130	455	300	70	980	135	
CSAH 103 (W Broadway Ave) / 92nd Ave N	10	-	-	10	-	-	100	-	785	-	-	1455	190	
CSAH 103 (W Broadway Ave) / Setzler Pkwy	11	130	5	45	40	5	70	25	585	10	50	1320	95	
CSAH 103 (W Broadway Ave) / 89th Ave N	12	-	-	10	-	-	-	-	615	-	-	1310	90	
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	13	40	5	5	5	5	65	5	510	5	95	1190	35	
CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	14	215	340	90	225	625	140	220	160	135	135	515	545	
CSAH 103 (W Broadway Ave) / 84th Ave N	15	-	-	5	-	-	10	5	505	-	-	820	10	
CSAH 103 (W Broadway Ave) / College Park Dr	16	20	-	10	5	-	-	10	485	15	70	750	5	
CSAH 103 (W Broadway Ave) / 82nd Ave N	17	-	-	5	-	-	-	-	505	-	-	755	5	
CSAH 103 (W Broadway Ave) / Candlewood Dr	18	5	-	5	50	-	50	15	455	35	35	670	55	
CSAH 103 (W Broadway Ave) / 78th Ave N	19	-	-	5	-	-	55	-	450	10	-	715	5	
CSAH 103 (W Broadway Ave) / Shopping Center Access	20	-	-	15	-	-	-	-	460	5	-	715	10	
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	21	120	305	35	90	280	80	50	265	60	145	350	235	
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	22	5	330	50	35	510	20	80	5	110	20	10	5	
CSAH 130 (W Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	23	15	490	5	5	435	5	5	-	5	10	-	15	
CSAH 130 (W Broadway Ave) / 76th Ave N	24	40	30	20	40	30	40	30	300	50	60	345	70	
CSAH 130 (W Broadway Ave) / 75th Ave N	25	5	5	40	50	10	20	25	355	25	30	375	5	
CSAH 130 (W Broadway Ave) / 74th Ave N	26	-	-	-	10	-	5	-	400	15	10	455	-	
CSAH 130 (W Broadway Ave) / 73rd Ave N	27	35	25	25	30	50	20	5	360	20	20	405	40	
CSAH 81 (Bottineau Blvd) / 73rd Ave N	28	45	10	75	35	30	30	110	945	20	60	1800	110	
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	29	110	100	50	365	175	75	100	885	265	95	1625	190	
CSAH 130 (W Broadway Ave) / 71st Ave N	30	270	25	165	5	30	10	240	105	-	10	95	355	
CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps	31	-	-	-	135	-	555	-	695	410	195	1840	-	
CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps	32	-	-	-	420	-	125	-	980	220	540	1430	-	
CSAH 81 (Bottineau Blvd) / 63rd Ave N	33	145	185	105	280	350	310	100	740	180	195	1360	300	
63rd Ave N / Louisiana Ave N / Park and Ride Access	34	110	310	20	125	385	235	10	-	90	35	-	20	
Crystal														
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Road)	35	155	190	505	85	295	70	245	795	40	65	1470	210	
CSAH 10 (Bass Lake Road) / Sherburne Ave	36	5	760	10	95	650	5	5	5	85	5	5	5	
CSAH 10 (Bass Lake Road) / Adair Ave N	37	30	250	10	5	405	5	5	5	5	5	5	40	
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	38	15	5	15	140	10	70	30	990	95	60	1890	105	
Wilshire Blvd / Lakeland Ave N	39	-	-	-	60	-	85	-	-	20	15	-	-	
CSAH 81 (Bottineau Blvd) / Corvallis Ave N	40	45	5	150	30	25	30	135	1040	5	10	1950	85	
CSAH 81 (Bottineau Blvd) / 47th Ave N	41	10	5	85	60	5	5	50	1160	15	5	2120	10	
Robbinsdale														
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	42	-	-	-	115	-	80	-	1145	-	-	985	1280	
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	43	15	145	-	-	-	450	-	680	165	160	940	-	
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	44	0	0	0	0	0	0	0	790	0	10	915	0	
CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	45	115	185	160	30	225	160	145	515	35	100	720	90	
CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	46	35	395	75	25	400	40	95	55	35	40	75	45	
CSAH 81 (Bottineau Blvd) / 41st Ave N	47	20	5	5	0	5	5	20	680	0	5	870	55	
CSAH 81 (Bottineau Blvd) / 40th Ave N	48	45	25	10	40	40	95	5	585	20	35	800	40	
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	49	0	0	0	0	0	0	0	675	0	0	855	0	
CSAH 81 (Bottineau Blvd) / 36th Ave N	50	70	60	145	60	185	90	100	515	30	25	745	90	
CSAH 81 (Bottineau Blvd) / 35th Ave N	51	50	0	80	0	0	0	65	585	0	0	800	145	

# 2050 Build Conditions: AM Peak Hour Traffic Volumes

Intersection	ID	Eastbound			Westbound			Northbound			Southbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
CSAH 81 (Bottineau Blvd) / Abbott Ave N	52	195	0	115	0	0	0	70	455	0	0	555	320
CSAH 81 (W Broadway Ave) / N Oakdale Ave	53	10	120	0	0	155	50	0	0	0	25	0	5
Minneapolis													
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	54	30	160	105	180	120	20	40	25	115	40	155	30
CSAH 153 (N Lowry Ave) / N Washburn Ave	55	0	315	0	0	295	0	20	0	0	0	0	0
CSAH 81 (W Broadway Ave) SB Ramps / Theodore Wirth Pkwy	56	0	0	0	0	0	0	0	180	0	60	380	0
CSAH 81 (W Broadway Ave) / N 29th Ave	57	55	10	45	10	20	10	0	340	10	35	455	85
CSAH 81 (W Broadway Ave) / N 26th Ave	58	55	45	10	5	55	105	0	255	10	55	400	0
CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McNair Ave	59	15	300	65	20	210	30	65	115	10	50	130	15
CSAH 81 (W Broadway Ave) / N Logan Ave	60	0	485	0	0	240	10	0	0	0	0	0	25
CSAH 81 (W Broadway Ave) / N Knox Ave	61	0	495	10	0	260	0	0	0	25	0	0	5
CSAH 81 (W Broadway Ave) / N James Ave	62	5	340	0	0	120	15	30	5	15	15	0	15
N Hillside Ave / N 21st Ave / N Irving Ave	63	25	0	10	0	0	0	20	45	0	0	45	25
CSAH 81 (W Broadway Ave) / N Irving Ave	64	25	320	25	30	105	25	10	15	10	25	10	20
N 21st Ave / N Girard Ave	65	0	0	0	0	0	0	0	155	0	0	30	0
CSAH 81 (W Broadway Ave) / N Girard Ave	66	10	340	5	75	145	110	10	35	100	15	10	5
N 21st Ave / N Fremont Ave	67	0	0	0	0	0	0	0	0	0	0	290	0
CSAH 81 (W Broadway Ave) / N Fremont Ave	68	0	430	25	15	300	0	0	0	0	80	180	30
N 21st Ave / N Emerson Ave	69	0	0	0	0	0	0	0	235	0	0	0	0
CSAH 81 (W Broadway Ave) / N Emerson Ave	70	65	445	0	0	250	55	65	115	10	0	0	0
CSAH 81 (W Broadway Ave) / N Dupont Ave	71	20	425	10	10	240	20	20	5	10	25	10	45
N 21st Ave / N Bryant Ave	72	0	0	0	0	0	0	0	30	0	0	50	0
N 21st Ave / N Aldrich Ave	73	0	0	0	0	0	0	0	45	0	0	30	0
CSAH 81 (W Broadway Ave) / N Aldrich Ave	74	5	540	20	30	320	30	10	5	35	20	5	5
N 21st Ave / N Lyndale Ave	75	0	0	0	0	0	0	0	175	0	0	330	0
CSAH 81 (W Broadway Ave) / N Lyndale Ave	76	25	495	75	100	325	30	30	120	60	130	175	25
N 21st Ave / N 4th St	77	0	0	0	15	0	145	0	25	15	205	70	0
CSAH 81 (W Broadway Ave) / N 4th St	78	5	585	15	25	405	30	10	5	55	75	5	5
N 21st Ave / I-94 EB Ramps	79	0	150	70	80	140	0	0	0	0	100	645	20
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	80	0	260	455	460	300	0	0	0	0	490	145	160
CSAH 152 (N Washington Ave) / N 21st Ave	81	35	40	175	10	65	15	95	785	0	75	330	60
N 22nd Ave / N 2nd St	82	15	20	0	5	15	50	15	215	25	75	165	55
N 21st Ave / N 2nd St	83	30	30	55	5	5	0	80	225	5	0	165	5
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	84	110	500	140	65	490	255	100	345	260	155	190	170
CSAH 81 (W Broadway Ave) / N 2nd St	85	20	725	85	35	585	45	35	115	70	30	135	120
CSAH 81 (W Broadway Ave) / W River Rd	86	25	705	95	60	565	30	85	15	95	15	20	15
CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	87	455	200	110	95	0	20	0	195	60	125	270	0
N 17th Ave / N 2nd St	88	200	100	10	5	10	5	5	95	10	35	110	30
CSAH 152 (N Washington Ave) / N 15th Ave	89	0	15	5	15	0	5	5	160	20	130	340	5
N 15th Ave / N 2nd St	90	20	0	20	0	0	0	0	90	0	0	105	20
N Lyndale Ave / N Plymouth Ave	91	35	315	20	210	210	70	10	115	205	115	170	35
CSAH 152 (N Washington Ave) / N Plymouth Ave	92	85	485	250	50	390	25	80	85	15	40	285	125
N Plymouth Ave / N 2nd St	93	20	485	45	260	390	100	20	20	130	115	5	25
CSAH 152 (N Washington Ave) / N 10th Ave	94	0	0	0	120	0	5	0	175	95	50	545	0
N 2nd St / N 10th Ave	95	45	0	45	0	0	0	50	125	0	0	210	100
CSAH 152 (N Washington Ave) / N 8th Ave	96	75	5	100	20	5	10	100	270	10	10	445	230
N 10th Ave / N 3rd St	97	0	0	0	0	0	0	0	240	0	0	95	0
N 10th Ave / N 4th St	98	0	0	0	0	0	0	0	0	0	0	0	0
N 10th Ave / N 5th St	99	15	0	20	0	0	0	10	20	0	0	55	10
N 8th Ave / N 5th St	100	10	185	100	10	65	10	70	10	15	5	50	15
N 9th Ave / N 5th St	101	0	0	0	20	0	15	0	15	10	5	70	0
N 8th Ave / N Oak Lake Ave	102	10	30	75	110	15	25	25	30	245	20	10	15
N 7th St / W Lyndale Ave	103	0	435	210	25	330	0	0	0	0	755	730	165
N 7th St / E Lyndale Ave	104	130	1060	0	0	110	145	245	575	35	0	0	0

# 2050 Build Conditions: AM Peak Hour Traffic Volumes

Intersection	ID	Eastbound			Westbound			Northbound			Southbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
N 7th St / N Oak Lake Ave	105	100	895	100	0	160	15	30	185	0	25	105	65
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	106	0	385	570	65	170	15	140	200	50	105	855	25
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	107	190	790	70	60	250	25	20	100	120	45	140	115
N 6th Ave / N 5th St	108	15	245	90	5	250	25	20	15	10	50	50	50
N 6th Ave / N 3rd St	109	70	255	40	25	105	15	15	5	20	10	5	15
CSAH 152 (N Washington Ave) / N 6th Ave	110	40	115	140	5	0	10	100	320	15	10	415	85
N 5th Ave / N 3rd St	111	10	110	10	30	150	15	10	5	5	20	5	20
CSAH 152 (N Washington Ave) / N 5th Ave	112	5	65	25	70	30	60	80	370	95	35	515	10
N 5th Ave / N 2nd St	113	120	0	80	0	0	0	90	95	0	0	200	95

# 2050 Build Conditions: PM Peak Hour Traffic Volumes

Intersection	ID	Eastbound			Westbound			Northbound			Southbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Brooklyn Park													
Oak Grove Pkwy / Xylon Ave	1	160	475	370	175	425	135	355	70	95	70	40	260
CSAH 103 (W Broadway Ave) / 101st Ave N	2	Does not exist in 2050 Build											
CSAH 103 (W Broadway Ave) / Winnetka Ave N	3	Does not exist in 2050 Build											
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	4	295	35	320	75	85	80	265	560	290	50	345	305
CSAH 103 (W Broadway Ave) / 99th Ave N	5	110	175	245	60	180	60	100	945	20	5	705	35
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	6	-	-	-	390	-	255	-	805	455	480	535	-
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	7	-	-	-	355	-	515	-	745	385	415	510	-
CSAH 103 (W Broadway Ave) / 94th Ave N	8	80	5	85	10	5	15	25	1030	25	40	785	35
CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	9	250	995	110	460	335	85	165	750	555	190	615	75
CSAH 103 (W Broadway Ave) / 92nd Ave N	10	-	-	45	-	-	5	-	1465	115	-	1170	20
CSAH 103 (W Broadway Ave) / Setzler Pkwy	11	50	5	10	40	5	105	15	1430	35	100	1045	65
CSAH 103 (W Broadway Ave) / 89th Ave N	12	-	-	30	-	-	-	-	1475	-	-	1075	25
CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	13	50	5	5	30	5	145	5	1275	20	75	975	50
CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	14	560	1285	590	275	555	135	380	610	560	260	180	565
CSAH 103 (W Broadway Ave) / 84th Ave N	15	-	-	5	-	-	95	-	1455	-	-	1040	10
CSAH 103 (W Broadway Ave) / College Park Dr	16	30	-	10	50	5	-	40	1425	20	45	985	10
CSAH 103 (W Broadway Ave) / 82nd Ave N	17	-	-	15	-	-	-	-	1485	-	-	1040	5
CSAH 103 (W Broadway Ave) / Candlewood Dr	18	30	5	5	55	5	105	5	1350	75	60	990	5
CSAH 103 (W Broadway Ave) / 78th Ave N	19	-	-	20	-	-	75	-	1355	25	-	1030	20
CSAH 103 (W Broadway Ave) / Shopping Center Access	20	-	-	85	-	-	70	-	1310	60	-	930	120
CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	21	605	625	85	225	640	205	135	565	160	260	465	285
CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	22	100	935	230	195	750	120	90	30	155	225	35	60
CSAH 130 (W Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	23	90	935	20	10	945	30	30	-	10	35	-	95
CSAH 130 (W Broadway Ave) / 76th Ave N	24	130	55	100	130	175	115	105	620	105	120	400	255
CSAH 130 (W Broadway Ave) / 75th Ave N	25	10	15	130	65	45	30	170	785	75	35	570	25
CSAH 130 (W Broadway Ave) / 74th Ave N	26	-	-	-	45	-	15	-	1015	30	5	760	-
CSAH 130 (W Broadway Ave) / 73rd Ave N	27	155	40	20	10	60	70	10	820	15	40	660	110
CSAH 81 (Bottineau Blvd) / 73rd Ave N	28	165	105	185	85	65	25	130	2160	80	30	1365	85
CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	29	230	310	70	295	205	135	75	2005	615	100	1355	185
CSAH 130 (W Broadway Ave) / 71st Ave N	30	620	50	365	-	25	5	225	215	5	20	280	385
CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps	31	-	-	-	165	-	860	-	1835	490	145	1575	-
CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps	32	-	-	-	355	-	245	-	2085	240	480	1260	-
CSAH 81 (Bottineau Blvd) / 63rd Ave N	33	355	460	100	325	275	360	70	1610	440	280	1175	160
63rd Ave N / Louisiana Ave N / Park and Ride Access	34	5	520	45	60	400	45	15	5	160	225	-	100
Crystal													
CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Road)	35	405	545	425	100	365	115	510	1600	145	145	1220	225
CSAH 10 (Bass Lake Road) / Sherburne Ave	36	10	1190	35	120	970	10	15	5	175	10	5	10
CSAH 10 (Bass Lake Road) / Adair Ave N	37	50	775	10	5	520	15	10	5	5	10	5	50
CSAH 81 (Bottineau Blvd) / Wilshire Blvd	38	90	10	40	75	5	60	20	2110	165	60	1645	40
Wilshire Blvd / Lakeland Ave N	39	-	-	-	10	-	50	-	5	30	105	5	-
CSAH 81 (Bottineau Blvd) / Corvallis Ave N	40	100	20	200	15	15	20	110	2175	25	55	1645	60
CSAH 81 (Bottineau Blvd) / 47th Ave N	41	20	10	65	35	5	5	55	2285	45	5	1835	15
Robbinsdale													
CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	42	-	-	-	70	-	305	-	2080	-	-	1055	880
CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	43	30	145	5	-	-	1380	-	665	325	85	1045	-
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	44	0	0	0	0	0	5	0	889	0	0	859	0
CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	45	80	180	175	65	195	125	195	675	90	155	610	75
CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	46	65	520	175	35	345	85	140	90	60	80	85	60
CSAH 81 (Bottineau Blvd) / 41st Ave N	47	70	5	35	15	10	30	55	865	15	20	745	75
CSAH 81 (Bottineau Blvd) / 40th Ave N	48	50	20	25	60	40	75	15	810	50	80	650	55
CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	49	0	0	0	0	0	0	0	962	0	0	738	0
CSAH 81 (Bottineau Blvd) / 36th Ave N	50	125	60	180	40	165	90	140	785	70	55	580	115
CSAH 81 (Bottineau Blvd) / 35th Ave N	51	135	0	135	0	0	0	105	860	0	0	695	105



2050 Build Conditions: PM Peak Hour Traffic Volumes

Intersection	ID	Eastbound			Westbound			Northbound			Southbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
CSAH 81 (Bottineau Blvd) / Abbott Ave N	52	350	0	155	0	0	0	45	635	0	0	680	160
CSAH 81 (W Broadway Ave) / N Oakdale Ave	53	5	185	0	0	150	5	0	0	0	95	0	5
Minneapolis													
CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	54	65	225	135	115	90	55	40	135	285	35	115	15
CSAH 153 (N Lowry Ave) / N Washburn Ave	55	0	545	0	0	240	0	15	0	0	0	0	0
CSAH 81 (W Broadway Ave) SB Ramps / Theodore Wirth Pkwy	56	0	0	0	0	0	0	0	455	5	35	330	0
CSAH 81 (W Broadway Ave) / N 29th Ave	57	40	35	35	15	10	20	0	625	15	120	535	65
CSAH 81 (W Broadway Ave) / N 26th Ave	58	40	100	15	5	75	105	20	490	10	165	370	50
CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McNair Ave	59	25	240	125	70	295	105	185	325	50	125	260	35
CSAH 81 (W Broadway Ave) / N Logan Ave	60	0	420	0	0	405	40	0	0	0	0	0	75
CSAH 81 (W Broadway Ave) / N Knox Ave	61	0	410	10	0	400	5	0	0	40	0	0	45
CSAH 81 (W Broadway Ave) / N James Ave	62	30	385	0	0	345	30	30	5	15	40	0	20
N Hillside Ave / N 21st Ave / N Irving Ave	63	20	0	35	0	0	0	20	40	0	0	30	20
CSAH 81 (W Broadway Ave) / N Irving Ave	64	25	390	25	30	335	10	15	25	10	20	20	25
N 21st Ave / N Girard Ave	65	0	0	0	0	0	0	0	70	0	0	80	0
CSAH 81 (W Broadway Ave) / N Girard Ave	66	5	400	15	120	360	40	0	25	180	55	10	15
N 21st Ave / N Fremont Ave	67	0	0	0	0	0	0	0	0	0	0	390	0
CSAH 81 (W Broadway Ave) / N Fremont Ave	68	0	550	85	25	475	0	0	0	0	195	150	45
N 21st Ave / N Emerson Ave	69	0	0	0	0	0	0	0	355	0	0	0	0
CSAH 81 (W Broadway Ave) / N Emerson Ave	70	70	675	0	0	415	95	85	190	45	0	0	0
CSAH 81 (W Broadway Ave) / N Dupont Ave	71	35	675	10	15	440	40	15	5	20	30	20	55
N 21st Ave / N Bryant Ave	72	0	0	0	0	0	0	0	50	0	0	85	0
N 21st Ave / N Aldrich Ave	73	0	0	0	0	0	0	0	55	0	0	95	0
CSAH 81 (W Broadway Ave) / N Aldrich Ave	74	10	700	35	50	430	15	40	30	55	40	40	15
N 21st Ave / N Lyndale Ave	75	0	0	0	0	0	0	0	350	0	0	410	0
CSAH 81 (W Broadway Ave) / N Lyndale Ave	76	75	640	80	100	390	80	60	195	100	150	215	45
N 21st Ave / N 4th St	77	0	0	0	30	0	255	0	65	15	165	95	0
CSAH 81 (W Broadway Ave) / N 4th St	78	15	810	65	60	500	60	30	5	40	100	5	20
N 21st Ave / I-94 EB Ramps	79	0	125	55	85	230	0	0	0	0	115	545	55
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	80	0	365	585	570	435	0	0	0	0	380	120	185
CSAH 152 (N Washington Ave) / N 21st Ave	81	150	20	70	30	85	30	105	1105	45	110	320	125
N 22nd Ave / N 2nd St	82	15	0	10	15	105	140	50	220	25	40	155	55
N 21st Ave / N 2nd St	83	65	15	95	0	0	0	125	230	0	0	155	25
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	84	160	505	80	65	650	435	130	500	465	80	120	225
CSAH 81 (W Broadway Ave) / N 2nd St	85	25	755	80	15	910	160	35	115	90	115	95	80
CSAH 81 (W Broadway Ave) / W River Rd	86	40	740	180	95	855	60	200	90	220	30	15	30
CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	87	605	265	95	135	0	110	0	455	90	130	135	0
N 17th Ave / N 2nd St	88	255	135	5	5	75	35	15	180	10	15	115	155
CSAH 152 (N Washington Ave) / N 15th Ave	89	5	15	5	100	15	5	5	375	15	165	190	10
N 15th Ave / N 2nd St	90	30	0	20	0	0	0	15	175	0	0	75	50
N Lyndale Ave / N Plymouth Ave	91	40	405	20	335	310	125	10	200	270	175	235	40
CSAH 152 (N Washington Ave) / N Plymouth Ave	92	135	650	135	25	715	25	155	200	40	40	195	70
N Plymouth Ave / N 2nd St	93	10	725	40	150	710	150	50	30	255	225	45	30
CSAH 152 (N Washington Ave) / N 10th Ave	94	0	0	0	155	0	5	0	390	70	85	365	0
N 2nd St / N 10th Ave	95	120	0	75	0	0	0	60	215	0	0	155	80
CSAH 152 (N Washington Ave) / N 8th Ave	96	75	5	100	15	15	20	90	510	25	30	265	200
N 10th Ave / N 3rd St	97	0	0	0	0	0	0	0	175	0	0	85	0
N 10th Ave / N 4th St	98	0	0	0	0	0	0	0	0	0	0	0	0
N 10th Ave / N 5th St	99	10	0	10	0	0	0	10	35	0	0	60	70
N 8th Ave / N 5th St	100	15	130	15	15	130	5	65	55	10	15	65	80
N 9th Ave / N 5th St	101	0	0	0	20	0	15	0	30	10	5	65	0
N 8th Ave / N Oak Lake Ave	102	5	10	5	250	15	10	35	65	135	15	70	5
N 7th St / W Lyndale Ave	103	0	275	235	65	635	0	0	0	0	410	690	110
N 7th St / E Lyndale Ave	104	200	485	0	0	380	515	320	1165	20	0	0	0

# 2050 Build Conditions: PM Peak Hour Traffic Volumes

Intersection	ID	Eastbound			Westbound			Northbound			Southbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
N 7th St / N Oak Lake Ave	105	55	395	55	20	750	30	85	150	35	75	190	60
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	106	0	375	425	60	370	65	275	735	105	110	375	20
TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	107	105	665	10	50	535	80	25	150	65	70	65	245
N 6th Ave / N 5th St	108	25	340	60	5	180	25	155	10	25	25	20	35
N 6th Ave / N 3rd St	109	110	365	30	30	135	20	20	5	10	10	5	30
CSAH 152 (N Washington Ave) / N 6th Ave	110	115	10	185	10	10	5	160	450	10	5	430	70
N 5th Ave / N 3rd St	111	10	210	10	15	145	25	20	15	30	20	10	25
CSAH 152 (N Washington Ave) / N 5th Ave	112	5	180	95	80	90	85	40	530	150	90	530	5
N 5th Ave / N 2nd St	113	235	0	200	0	0	0	85	180	0	0	180	165



# Appendix B: Intersection Layout Tables

# Intersection Layout Table

1

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
1	Oak Grove Pkwy / Xylon Ave	N/A	N/A		
2	CSAH 103 (W Broadway Ave) / 101 <sup>st</sup> Ave N			N/A	
3	CSAH 103 (W Broadway Ave) / Winnetka Ave N			N/A	
4	CSAH 103 (W Broadway Ave) / Oak Grove Pkwy				
5	CSAH 103 (W Broadway Ave) / 99th Ave N	N/A	N/A		

Legend					
Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

NOT TO SCALE

# Intersection Layout Table

2

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
6	CSAH 103 (W Broadway Ave) / TH 610 WB Ramps				
7	CSAH 103 (W Broadway Ave) / TH 610 EB Ramps				
8	CSAH 103 (W Broadway Ave) / 94 <sup>th</sup> Ave N				*NTOR when LRT approaching
9	CSAH 103 (W Broadway Ave) / CSAH 30 (93 <sup>rd</sup> Ave N)				
10	CSAH 103 (W Broadway Ave) / 92 <sup>nd</sup> Ave N				Intersection converted to right-in right-out in 2050 Build conditions

## Legend



Traffic Signal		No Turn on Red		NTOR	Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail			Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT			Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn			FYA	Flashing Yellow Arrow Left-Turn Phase

# Intersection Layout Table

3

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
11	CSAH 103 (W Broadway Ave) / Setzler Pkwy				
12	CSAH 103 (W Broadway Ave) / 89 <sup>th</sup> Ave N				Intersection converted to right-in right-out in 2050 Build conditions
13	CSAH 103 (W Broadway Ave) / Maplebrook Pkwy				
14	CSAH 103 (W Broadway Ave) / CSAH 109 (85 <sup>th</sup> Ave N)				
15	CSAH 103 (W Broadway Ave) / 84 <sup>th</sup> Ave N				Intersection converted to right-in right-out in 2050 Build conditions

## Legend

	Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
	Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
	Lane Use		LRT		Prot	Protected Left-Turn Phase
	Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

NOT TO SCALE

# Intersection Layout Table

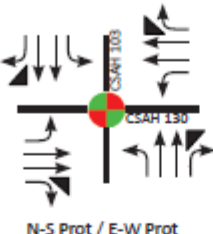
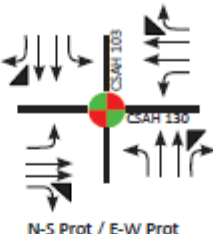
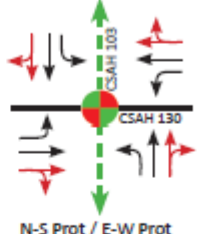
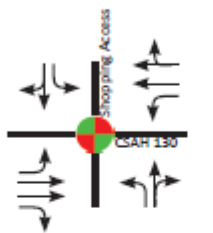
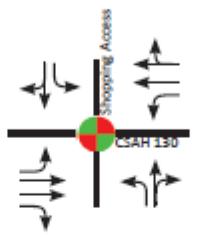
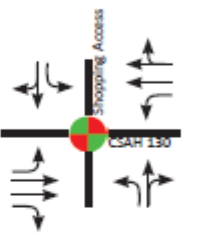
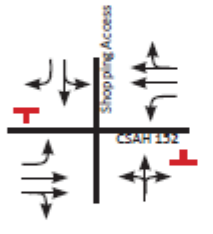
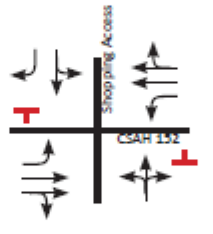
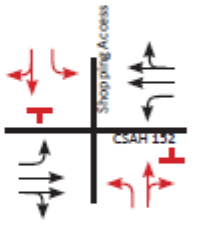
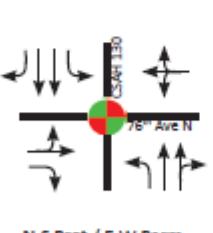
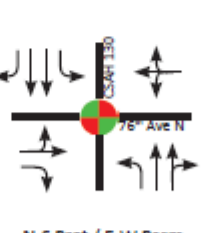
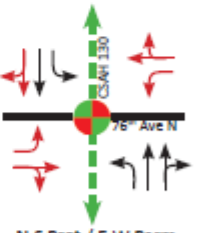
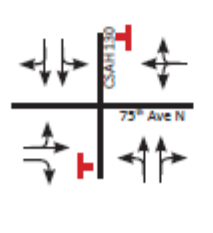
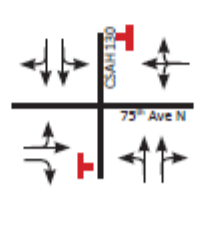
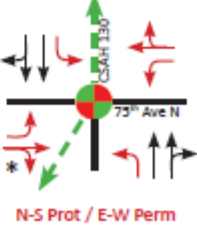
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#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
16	CSAH 103 (W Broadway Ave) / College Park Dr				
17	CSAH 103 (W Broadway Ave) / 82nd Ave N				Intersection converted to right-in right-out in 2050 Build conditions
18	CSAH 103 (W Broadway Ave) / Candlewood Dr				
19	CSAH 103 (W Broadway Ave) / 78th Ave N				Intersection converted to right-in right-out in 2050 Build conditions
20	CSAH 103 (W Broadway Ave) / Shopping Center Access				Intersection converted to right-in right-out in 2050 Build conditions

<b>Legend</b>  NOT TO SCALE	Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
	Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
	Lane Use		LRT		Prot	Protected Left-Turn Phase
	Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

# Intersection Layout Table

5

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
21	CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd)/CSAH 152	 N-S Prot / E-W Prot	 N-S Prot / E-W Prot	 N-S Prot / E-W Prot	
22	CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	 N-S FYA / E-W FYA	 N-S FYA / E-W FYA	 N-S Perm / E-W Prot	
23	CSAH 152 (Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	 N-S FYA / E-W FYA	 N-S FYA / E-W FYA	 N-S Perm / E-W Prot	
24	CSAH 130 (W Broadway Ave) / 76 <sup>th</sup> Ave N	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	
25	CSAH 130 (W Broadway Ave) / 75 <sup>th</sup> Ave N	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	*NTOR when LRT approaching in 2050 Build conditions

## Legend

	Traffic Signal		No Turn on Red		Perm		Permissive Left-Turn Phase
	Stop Control		Freight Rail		Prot+Perm		Protected/Permissive Left-Turn Phase
	Lane Use		LRT		Prot		Protected Left-Turn Phase
	Lane Use Change		Channelized Right-Turn		FYA		Flashing Yellow Arrow Left-Turn Phase

NOT TO SCALE

# Intersection Layout Table

6

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
26	CSAH 130 (W Broadway Ave) / 74 <sup>th</sup> Ave N				West approach (Jolly Lane) removed and cul-de-sac constructed for Jolly Lane in 2050 Build conditions.
27	CSAH 130 (W Broadway Ave) / 73 <sup>rd</sup> Ave N				
28	CSAH 81 (Bottineau Blvd) / 73 <sup>rd</sup> Ave N				LRT grade-separated over CSAH 81
29	CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71 <sup>st</sup> Ave N				
30	CSAH 130 (W Broadway Ave) / 71 <sup>st</sup> Ave N				

## Legend



Traffic Signal		No Turn on Red	<b>NTOR</b>	Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase



# Intersection Layout Table

7

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
31	CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps				
32	CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps				
33	CSAH 81 (Bottineau Blvd) / 63rd Ave N				
34	63rd Ave N / Louisiana Ave N / Park and Ride Access				
35	CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Rd)				In 2050 Build conditions, NB/SB CSAH 81 is grade separated from CSAH 10.

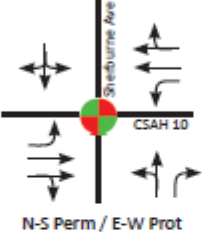
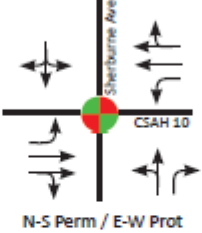
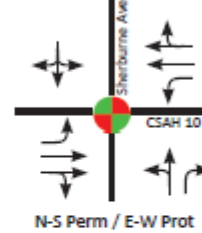
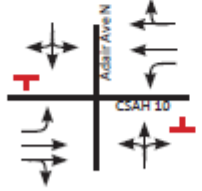
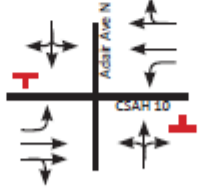
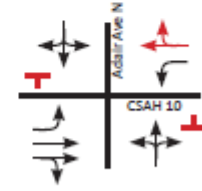
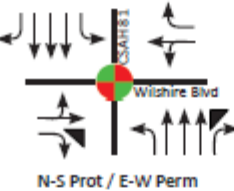
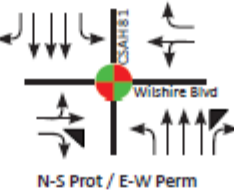
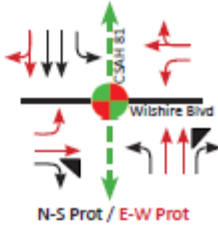

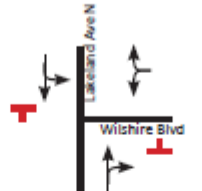

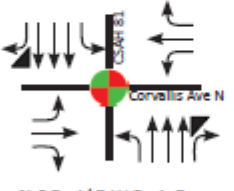
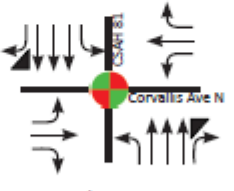
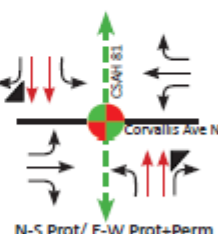
## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase









# Intersection Layout Table

8

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
36	Sherburne Ave / CSAH 10 (Bass Lake Rd)	 N-S Perm / E-W Prot	 N-S Perm / E-W Prot	 N-S Perm / E-W Prot	
37	CSAH 10 (Bass Lake Rd) / Adair Ave N	 T	 T	 T	
38	CSAH 81 (Bottineau Blvd) / Wilshire Blvd	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	 N-S Prot / E-W Prot	
39	Wilshire Blvd / Lakeland Ave N	 T	 T	 T	
40	CSAH 81 (Bottineau Blvd) / Corvallis Ave N	 N-S Prot / E-W Prot+Perm	 N-S Prot / E-W Prot+Perm	 N-S Prot / E-W Prot+Perm	

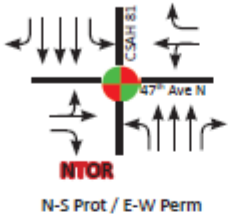
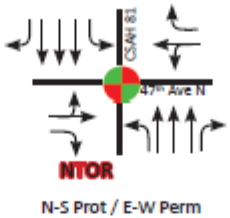
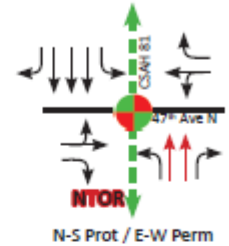
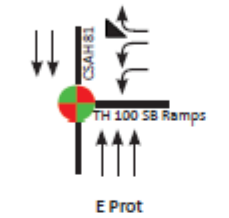
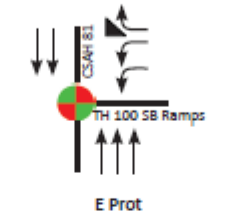
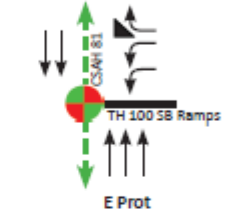
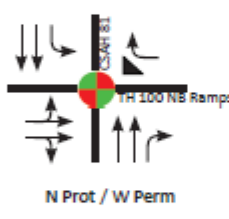
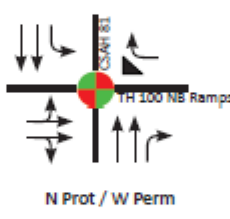
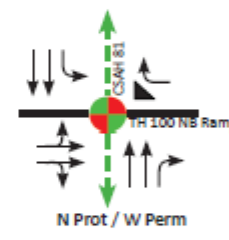
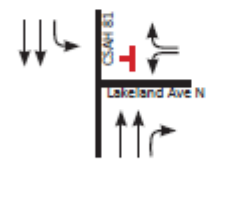
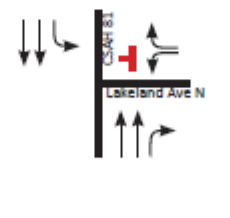
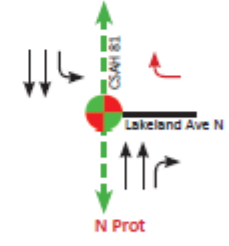
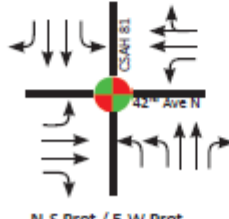
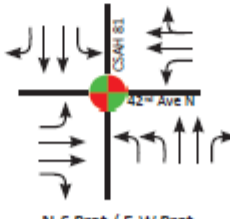
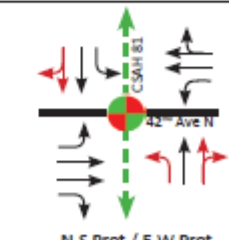
## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase








# Intersection Layout Table

9

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
41	CSAH 81 (Bottineau Blvd) / 47 <sup>th</sup> Ave N	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	
42	CSAH 81 (Bottineau Blvd) / TH 100 Southbound Ramps	 E Prot	 E Prot	 E Prot	
43	CSAH 81 (Bottineau Blvd) / TH 100 Northbound Ramps	 N Prot / W Perm	 N Prot / W Perm	 N Prot / W Perm	
44	CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	 N Prot	 N Prot	 N Prot	Intersection converted to 3/4 access in 2050 Build conditions, with side-street left turns disallowed.
45	CSAH 81 (Bottineau Blvd) / CSAH 9 (42 <sup>nd</sup> Ave N)	 N-S Prot / E-W Prot	 N-S Prot / E-W Prot	 N-S Prot / E-W Prot	

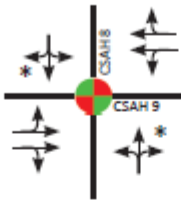
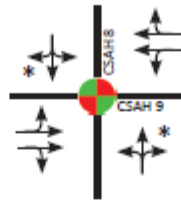
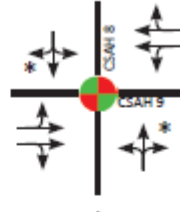
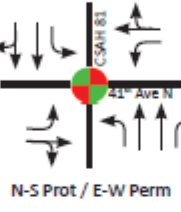
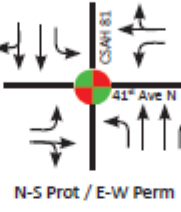
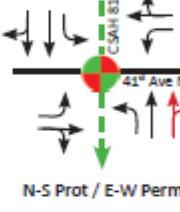

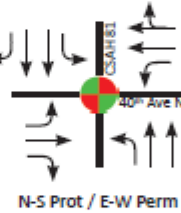

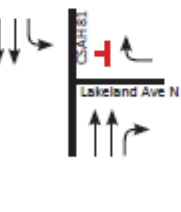

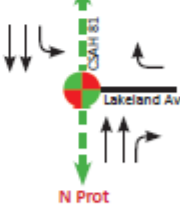



## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase









# Intersection Layout Table

10

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
46	CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	*De facto right turn lane assumed due to larger approach width (bus stop/ bicycle lane)
47	CSAH 81 (Bottineau Blvd) / 41 <sup>st</sup> Ave N	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	
48	CSAH 81 (Bottineau Blvd) / 40 <sup>th</sup> Ave N	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	 N-S Prot / E-W Perm	
49	CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	 N-S Prot	 N-S Prot	 N-S Prot	
50	CSAH 81 (Bottineau Blvd) / 36 <sup>th</sup> Ave N	 N-S Prot / E-W Prot	 N-S Prot / E-W Prot	 N-S Prot / E-W Prot	

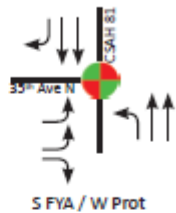

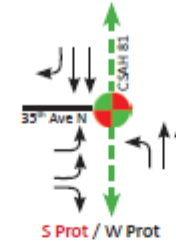
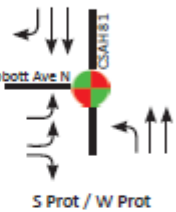


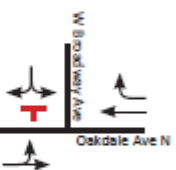

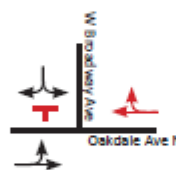
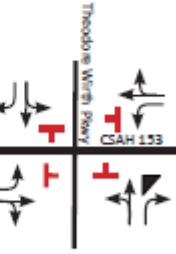
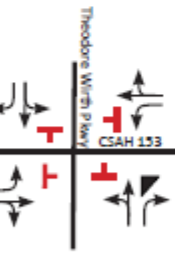
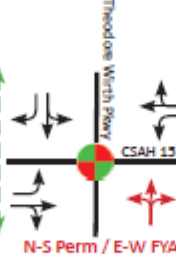
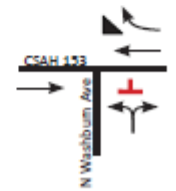
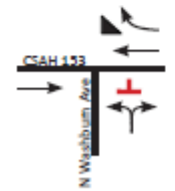
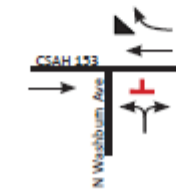
## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase









# Intersection Layout Table

11

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
51	CSAH 81 (Bottineau Blvd) / 35 <sup>th</sup> Ave N				
52	CSAH 81 (Bottineau Blvd) / Abbott Ave N				
53	CSAH 81 (W Broadway Ave) / N Oakdale Ave				
54	CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy				
55	CSAH 153 (N Lowry Ave) / N Washburn Ave				

## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

# Intersection Layout Table

12

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
56	Theodore Wirth Pkwy / CSAH 81 (W Broadway Ave) SB Ramp				Off-Ramp closed in 2050 Build conditions, with the on ramp remaining open.
57	CSAH 81 (W Broadway Ave) / N 29th Ave				*South of intersection, on-street parking is permitted in outside lane in NB direction during AM peak hour and in SB direction during PM peak hour
58	CSAH 81 (W Broadway Ave) / N 26th Ave				*South of intersection, on-street parking is permitted in outside lane in NB direction during AM peak hour and in SB direction during PM peak hour
59	CSAH 81 (W Broadway Ave) / CSAH 2 (Penn Ave N) / McNair Ave				*On-street parking permitted in outside lane in WB direction during AM peak hour and in EB direction during PM peak hour. McNair Avenue connection removed in 2050 Build conditions
60	CSAH 81 (W Broadway Ave) / N Logan Ave				*On-street parking permitted in outside lane in WB direction during AM peak hour and in EB direction during PM peak hour

## Legend

	Traffic Signal		No Turn on Red		Perm		Permissive Left-Turn Phase
	Stop Control		Freight Rail		Prot+Perm		Protected/Permissive Left-Turn Phase
	Lane Use		LRT		Prot		Protected Left-Turn Phase
	Lane Use Change		Channelized Right-Turn		FYA		Flashing Yellow Arrow Left-Turn Phase

NOT TO SCALE



# Intersection Layout Table

13

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
61	CSAH 81 (W Broadway Ave) / N Knox Ave				*On-street parking permitted in outside lane in WB direction during AM peak hour and in EB direction during PM peak hour
62	CSAH 81 (W Broadway Ave) / N James Ave				*On-street parking permitted in outside lane in WB direction during AM peak hour and in EB direction during PM peak hour
63	N Hillside Ave / N 21st Ave / N Irving Ave				N 21st Avenue (east of N Irving Avenue) closed in 2050 Build conditions
64	CSAH 81 (W Broadway Ave) / N Irving Ave				*On-street parking permitted in outside lane in WB direction during AM peak hour and in EB direction during PM peak hour
65	N 21st Ave / N Girard Ave				N 21st Avenue closed in 2050 Build conditions

## Legend

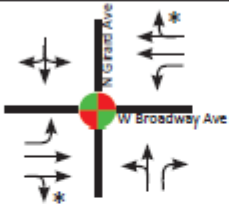
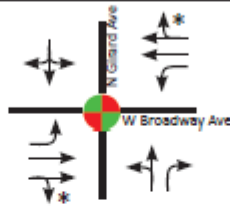
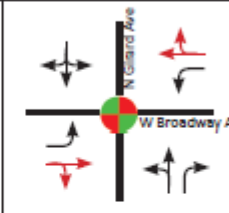
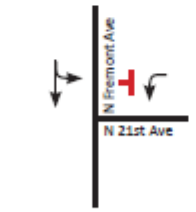

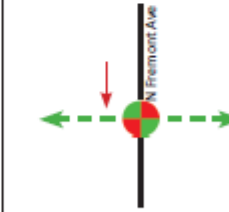
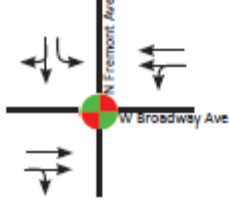




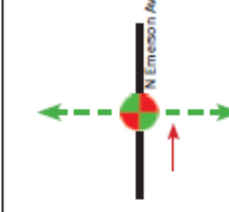
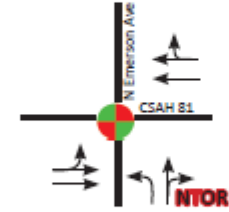




Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase











# Intersection Layout Table

14

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
66	CSAH 81 (W Broadway Ave) Ave / N Girard Ave	 N-S-W Perm / E Prot + Perm	 N-S-W Perm / E Prot + Perm	 N-S-W Perm / E Prot + Perm	*On-street parking permitted in outside lane in WB direction during AM peak hour and in EB direction during PM peak hour
67	N 21st Ave / N Fremont Ave	 N 21st Ave	 N 21st Ave	 N 21st Ave	21st Avenue closed in 2050 Build conditions
68	CSAH 81 (W Broadway Ave) / N Fremont Ave	 N Perm / E Perm	 N Perm / E Perm	 N Perm / E Perm	
69	N 21st Ave / N Emerson Ave	 N 21st Ave	 N 21st Ave	 N 21st Ave	21st Avenue closed in 2050 Build conditions
70	CSAH 81 (W Broadway Ave) / N Emerson Ave	 S Perm / W Perm	 S Perm / W Perm	 S Perm / W Perm	

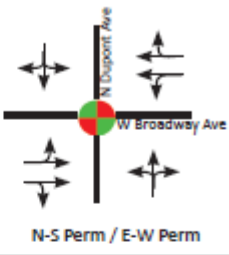
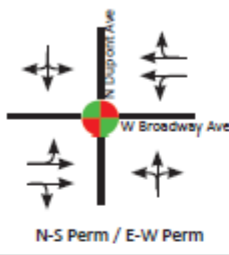
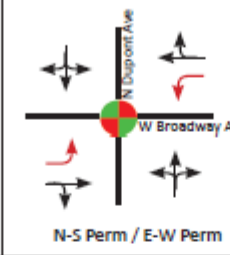
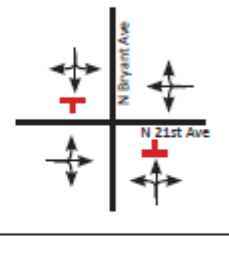
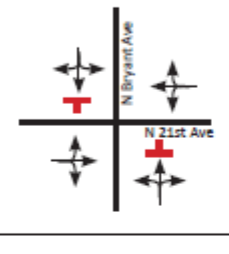
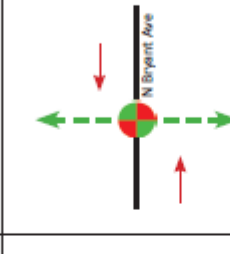
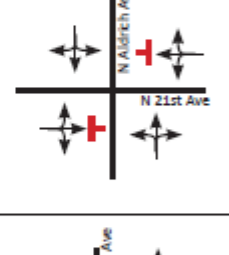
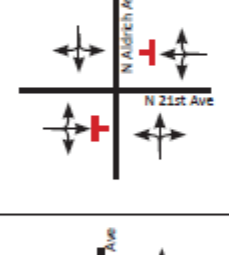
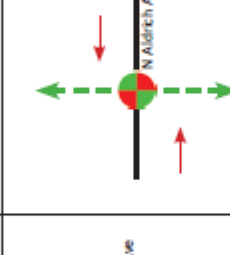
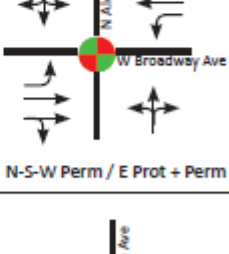
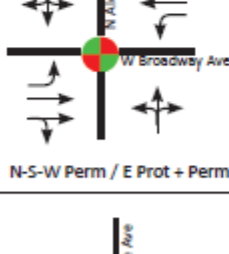
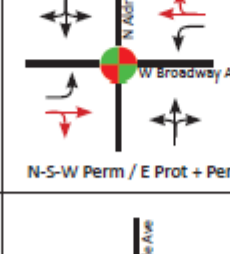


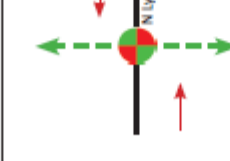
## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase








# Intersection Layout Table

15

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
71	CSAH 81 (W Broadway Ave) / N Dupont Ave	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	
72	N 21st Ave / N Bryant Ave	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	21st Avenue closed in 2050 Build conditions
73	N 21st Ave / N Aldrich Ave	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	21st Avenue closed in 2050 Build conditions
74	CSAH 81 (W Broadway Ave) Ave / N Aldrich Ave	 N-S-W Perm / E Prot + Perm	 N-S-W Perm / E Prot + Perm	 N-S-W Perm / E Prot + Perm	
75	N 21st Ave / N Lyndale Ave	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	21st Avenue closed in 2050 Build conditions

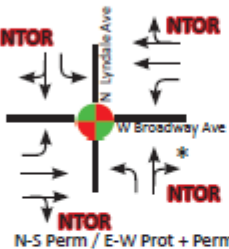
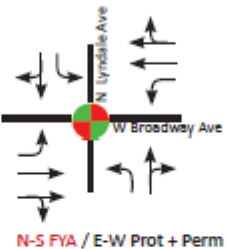
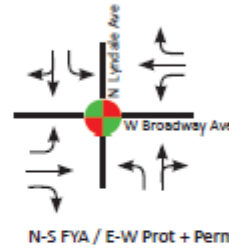
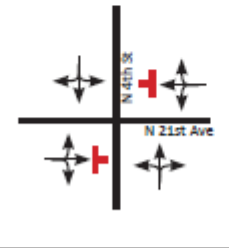
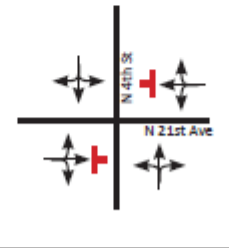
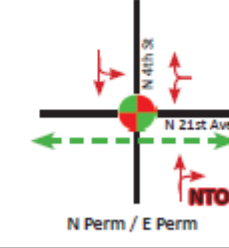
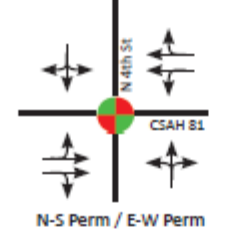
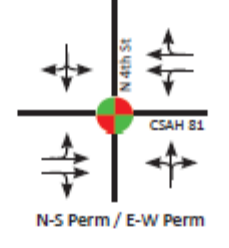
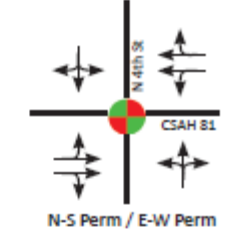
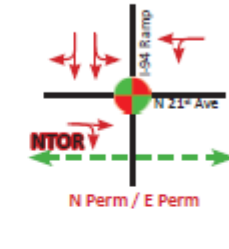
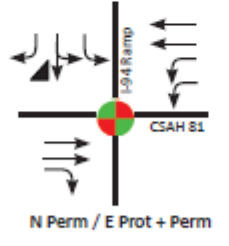
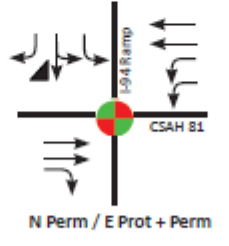
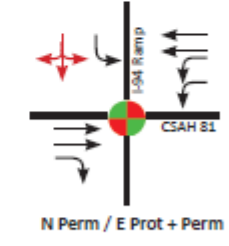
## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

# Intersection Layout Table

16

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
76	CSAH 81 (W Broadway Ave) / N Lyndale Ave	 N-S Perm / E-W Prot + Perm	 N-S FYA / E-W Prot + Perm	 N-S FYA / E-W Prot + Perm	*De facto right turn lane assumed due to larger approach width (bus stop/ bicycle lane)
77	N 21st Ave / N 4th St	 N 4th St	 N 4th St	 N Perm / E Perm	21st Avenue closed west of 4th Street in 2050 Build conditions
78	CSAH 81 (W Broadway Ave) / N 4th St N	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	
79	N 21st Ave / I-94 EB Ramps	N/A	N/A	 N Perm / E Perm	Intersection exists only in 2050 Build conditions
80	CSAH 81 (W Broadway Ave) / I-94 Ramp	 N Perm / E Prot + Perm	 N Perm / E Prot + Perm	 N Perm / E Prot + Perm	


## Legend










Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

## 17

Legend



Traffic Signal		No Turn on Red	<b>NVOR</b>	Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

# Intersection Layout Table

18

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
86	CSAH 81 (W Broadway Ave) / W River Rd				
87	CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp				*Near side bus stop on north-bound CSAH 152 provides approach width for de facto right turn lane in Existing and 2050 No Build conditions
88	N 17th Ave / N 2nd St				
89	CSAH 152 (N Washington Ave) / N 15th Ave				
90	N 15th Ave / N 2nd St				

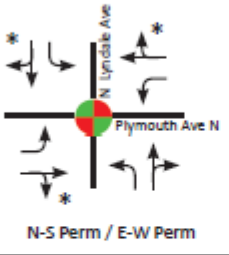
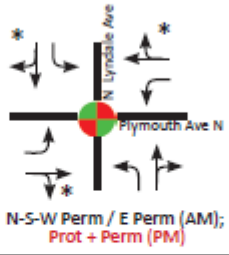
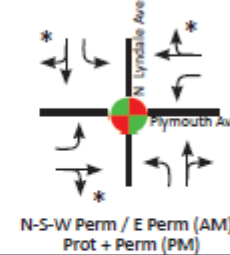
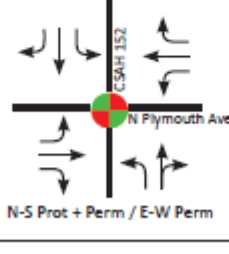
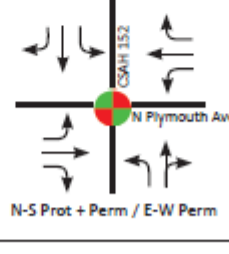
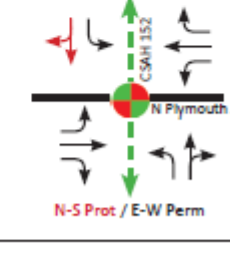
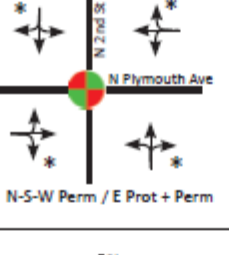
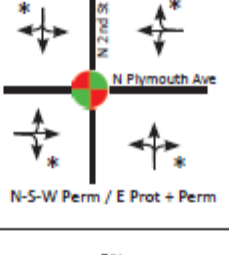
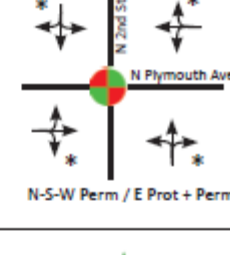
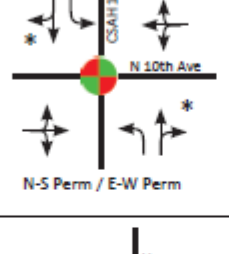
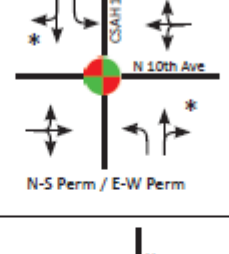
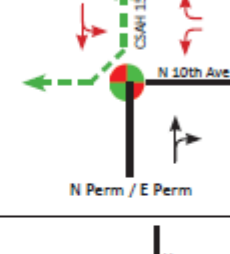
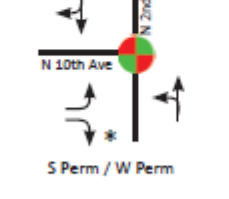
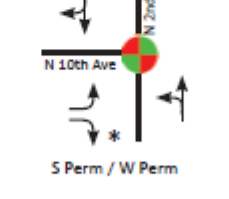
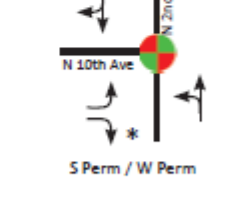
## Legend

	Traffic Signal		No Turn on Red		Permissive Left-Turn Phase
	Stop Control		Freight Rail		Protected/Permissive Left-Turn Phase
	Lane Use		LRT		Protected Left-Turn Phase
	Lane Use Change		Channelized Right-Turn		Flashing Yellow Arrow Left-Turn Phase

NOT TO SCALE









# Intersection Layout Table

19

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
91	N Lyndale Ave / Plymouth Ave N				* De facto right turn lane assumed due to larger approach width (bus stop/ bicycle lane)
92	CSAH 152 (N Washington Ave) / N Plymouth Ave				
93	N Plymouth Ave / N 2nd St				* De facto right turn lane assumed due to larger approach width (bus stop/ bicycle lane)
94	CSAH 152 (N Washington Ave) / N 10th Ave				* Near side bus stop provides for de facto right turn lane N 10th Ave closed west of CSAH 152 in 2050 Build conditions.
95	N 2nd St / N 10th Ave				* De facto right turn lane assumed due to larger approach width (bus stop/ bicycle lane)

## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

# Intersection Layout Table

20

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
96	CSAH 152 (N Washington Ave) / N 8th Ave				
97	N 10th Ave / N 3rd St				N 10th Avenue closed in 2050 Build conditions between N 5th Street and CSAH 152.
98	N 10th Ave / N 4th St				N 10th Avenue closed in 2050 Build conditions between N 5th Street and CSAH 152.
99	N 10th Ave / N 5th St				N 10th Avenue closed east of N 5th Street in 2050 Build conditions
100	N 8th Ave / N 5th St				N 8th Avenue connection completed in 2050 Build conditions between N 5th Street and CSAH 152

## Legend


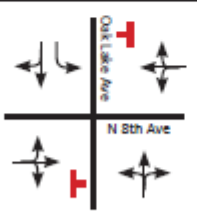
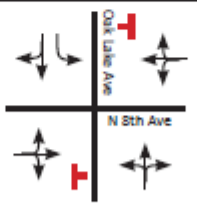
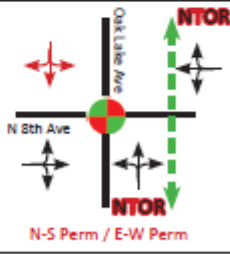
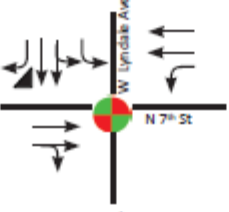
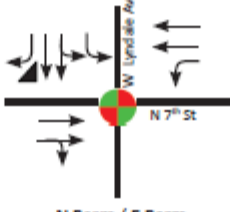
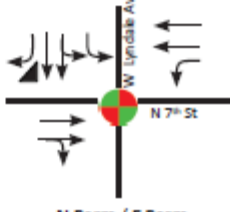
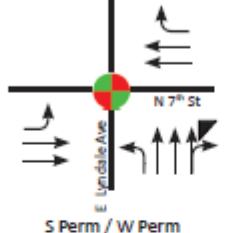
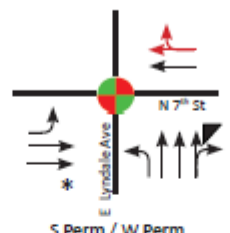
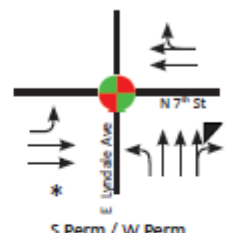
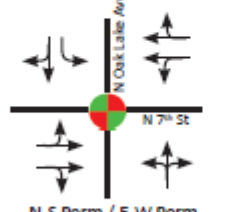
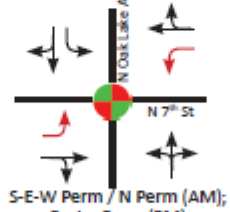
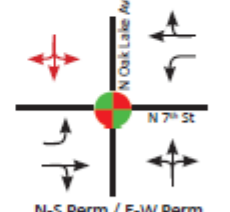


Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase











# Intersection Layout Table

21

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
101	N 9th Ave / N 5th St	N/A	N/A		N 9th Avenue constructed in 2050 Build conditions to provide access to 4th Street N.
102	N 8th Ave / N Oak Lake Ave			 N-S Perm / E-W Perm	
103	N 7th St / W Lyndale Ave				
104	N 7th St / E Lyndale Ave				*Eastbound through lanes reduced from two to one lane downstream of intersection
105	N 7th St / N Oak Lake Ave				

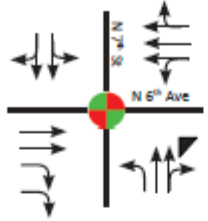


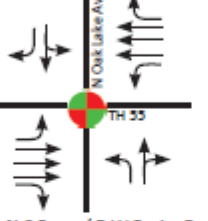
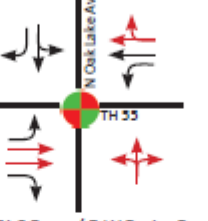
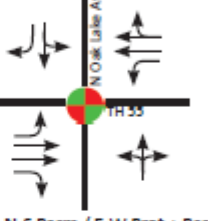
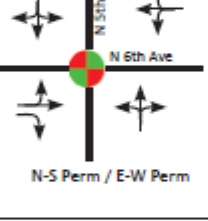
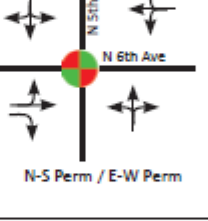
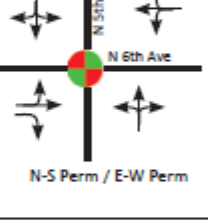
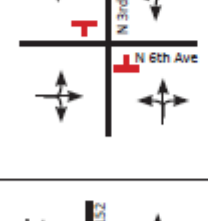
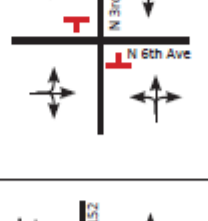
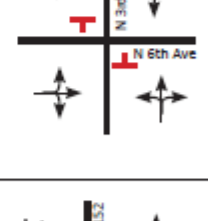
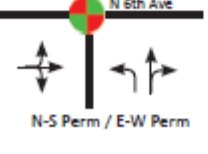
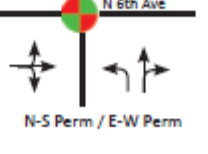
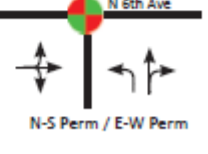
## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase








# Intersection Layout Table

22

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
106	TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	 N Perm / S Prot + Perm / E Perm	 N Perm / S Prot + Perm / E Perm	 N Prot / S Prot + Perm / E Perm	
107	TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	 N-S Perm / E-W Prot + Perm	 N-S Perm / E-W Prot + Perm	 N-S Perm / E-W Prot + Perm	
108	N 6th Ave / N 5th St	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	
109	N 6th Ave / N 3rd St	 N 3rd St / N 6th Ave	 N 3rd St / N 6th Ave	 N 3rd St / N 6th Ave	
110	CSAH 152 (N Washington Ave) / N 6th Ave	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	 N-S Perm / E-W Perm	* De facto right turn lane assumed due to larger approach width (bus stop/bicycle lane)

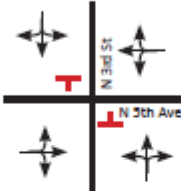
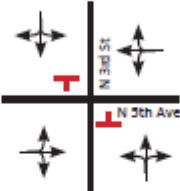
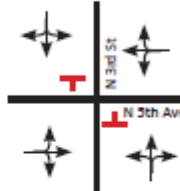
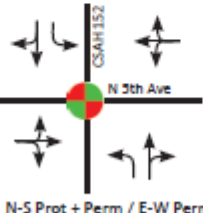
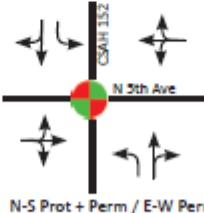
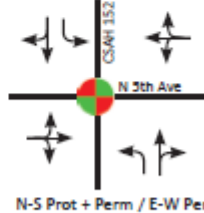



## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase





# Intersection Layout Table

23

#	Intersection	Existing Conditions	No Build Conditions	Build Conditions	Notes
111	N 5th Ave / N 3rd St				
112	N 5th Ave / CSAH 152 (N Washington Ave)	 N-S Prot + Perm / E-W Perm	 N-S Prot + Perm / E-W Perm	 N-S Prot + Perm / E-W Perm	
113	N 5th Ave / N 2nd St				

## Legend



Traffic Signal		No Turn on Red		Perm	Permissive Left-Turn Phase
Stop Control		Freight Rail		Prot+Perm	Protected/Permissive Left-Turn Phase
Lane Use		LRT		Prot	Protected Left-Turn Phase
Lane Use Change		Channelized Right-Turn		FYA	Flashing Yellow Arrow Left-Turn Phase

# Appendix C: Traffic Analysis Detailed Results

# AM Level of Service and Intersection Delay

	Scenario		2023				2050				Build		Build + Freight Event		Mitigated Build	
			Existing Condition		Existing + Freight Event		No Build		No Build + Freight Event							
#	Intersection	Appr	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)
1	Oak Grove Pkwy / Xylon Ave	NB EB SB WB	Does not exist in Existing Conditions		Does not exist in Existing Conditions		Does not exist in 2050 No Build		Does not exist in 2050 No Build		B C A C	C	21.0	Not Applicable		Not Applicable
2	CSAH 103 (W Broadway Ave) / 101st Ave N	NB EB SB WB	A A - -	A 2.0	Not Applicable		A B A -	A 5.4	Not Applicable		Does not exist in 2050 Build		Does not exist in 2050 Build			
3	CSAH 103 (W Broadway Ave) / Winnetka Ave N	NB EB SB WB	A A - -	A 0.2			A F A -	D 32.8			Does not exist in 2050 Build		Does not exist in 2050 Build			
4	CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	NB EB SB WB	A - A C	A 7.8			A - A C	A 7.9			C C B D	C 23.5				
5	CSAH 103 (W Broadway Ave) / 99th Ave N	NB EB SB WB	Does not exist in Existing Conditions				Does not exist in Existing Conditions				Does not exist in 2050 No Build		Does not exist in 2050 No Build		B E B D	
6	CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	NB EB SB WB	B - B A	B 13.0	Not Applicable		C - C B	B 16.7	Not Applicable		C - C B	B 17.9				
7	CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	NB EB SB WB	A - A B	A 9.9			B - C C	C 26.2			B - B B	B 15.7				
8	CSAH 103 (W Broadway Ave) / 94th Ave N	NB EB SB WB	A A A A	A 1.9			D E F F	F 83.7			B E C F	C 32.3				
9	CSAH 103 (W Broadway Ave) / CSAH 130 (93rd Ave N)	NB EB SB WB	D D C C	D 36.5			F F F F	F >100			D F F D	F 83.1				
10	CSAH 103 (W Broadway Ave) / 92nd Ave N	NB EB SB WB	A A A A	A 1.9			F D A E	E 49.8			A A A A	A 2.6				
11	CSAH 103 (W Broadway Ave) / Setzler Pkwy	NB EB SB WB	A A A A	A 2.8			F F A F	F 77.3			B D A B	B 13.3				
12	CSAH 103 (W Broadway Ave) / 89th Ave N	NB EB SB WB	A A A -	A 2.1			F F A -	F 68.6			A A A -	A 1.2				
13	CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	NB EB SB WB	A A A A	A 2.2			F E B C	E 38.4			A A A B	A 5.3				
14	CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	NB EB SB WB	C C C C	C 28.3			D D C D	D 36.1			D D E D	D 51.0				
15	CSAH 103 (W Broadway Ave) / 84th Ave N	NB EB SB WB	A D A B	A 5.9			A A A A	A 0.4			A A A A	A 0.6				
16	CSAH 103 (W Broadway Ave) / College Park Dr	NB EB SB WB	A A A -	A 0.3			A A A -	A 0.3			A E A -	A 8.5				
17	CSAH 103 (W Broadway Ave) / 82nd Ave N	NB EB SB WB	A A A -	A 0.5			A A A -	A 0.5			A A A -	A 0.5				
18	CSAH 103 (W Broadway Ave) / Candlewood Dr	NB EB SB WB	A - A B	A 4.6			A - A B	A 5.4			A D A C	A 5.7				
19	CSAH 103 (W Broadway Ave) / 78th Ave N	NB EB SB WB	A A A A	A 0.7			A A A A	A 1.2			A A A A	A 0.5				
20	CSAH 103 (W Broadway Ave) / Shopping Center Access	NB EB SB WB	A B A C	A 1.6			A B A C	A 2.3			A A A A	A 0.6				
21	CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	NB EB SB WB	C C B C	C 24.7			C C B C	C 24.1			C D D D	D 35.7				
22	CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	NB EB SB WB	C A D A	A 9.6			C B D A	B 14.5			C B D B	B 17.6				

# AM Level of Service and Intersection Delay

Scenario		2023										2030								
		Existing Condition			Existing + Freight Event			No Build		No Build + Freight Event		Build		Build + Freight Event		Mitigated Build				
#	Intersection	Appr	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)				
23	CSAH 130 (W Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	NB EB SB WB	A A A A	0.4	Not Applicable		A A A A	A A A A	0.6	Not Applicable		A A A A	A A A A	0.7	Not Applicable					
24	CSAH 130 (W Broadway Ave) / 76th Ave N	NB EB SB WB	A C A B	6.4			A C A B	A A A A	8.9			B D A D	B B B B	16.0						
25	CSAH 130 (W Broadway Ave) / 75th Ave N	NB EB SB WB	A A A A	1.2			A A A A	A A A A	1.4			B B B D	B B B B	16.1						
26	CSAH 130 (W Broadway Ave) / 74th Ave N	NB EB SB WB	A A A A	1.2			A A A A	A A A A	0.5			A - A A	A A A A	2.0						
27	CSAH 130 (W Broadway Ave) / 73rd Ave N	NB EB SB WB	A C A C	4.8			A C A C	A A A A	6.0			A D A D	B B B B	11.4						
28	CSAH 81 (Bottineau Blvd) / 73rd Ave N	NB EB SB WB	A C B C	9.9	A C B D	B B B B	10.3	A C B D	B B B B	13.9	A C B D	B B B B	14.1	A D B D	B B B B	16.7	A D C D	B B B B	17.7	
29	CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	NB EB SB WB	B D B D	C C C C	20.4	B D B D	B B B B	18.0	B D B D	C C C C	21.2	B D B D	C C C C	21.0	E E E E	C C C C	32.9	E E E E	C C C C	32.4
30	CSAH 130 (W Broadway Ave) / 71st Ave N	NB EB SB WB	A B A B	A A A A	8.7	B B A B	A A A A	9.0	B B A B	B B A B	10.6	B B A B	B B A B	10.8	B B A B	B B A B	11.9	B B A B	B B A B	11.9
31	CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps	NB EB SB WB	A - A B	A A A A	9.7	- A A B	B B B B	11.6	- A A B	B B B B	12.2	- A A B	B B B B	12.1	A - B C	B B B B	11.1	A - B C	B B B B	11.1
32	CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps	NB EB SB WB	B - B D	B B B B	18.8	- B D	B B B B	19.6	- B D	B B B B	18.0	- B D	B B B B	18.7	- C D	C C C D	24.4	- C D	C C C D	24.5
33	CSAH 81 (Bottineau Blvd) / 63rd Ave N	NB EB SB WB	C C C C	C C C C	28.5	C C C D	C C C D	30.8	C C C D	C C C D	29.1	C C C D	C C C D	29.6	E E E E	E E E E	59.9	E E E E	E E E E	57.9
34	63rd Ave N / Louisiana Ave N / Park and Ride Access	NB EB SB WB	A A C A	A A A A	1.7	A A C A	A A A A	1.8	A A B A	A A A A	2.3	A A B A	A A A A	2.4	A A D A	A A A A	8.3	A A D A	A A A A	8.3
35	CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Road)	NB EB SB WB	C C C D	C C C D	26.6	C C C D	C C C D	30.4	C C C D	C C C D	29.4	C C C D	C C C D	30.6	A C A D	B B B B	13.5	A C A D	B B B B	13.9
36	CSAH 10 (Bass Lake Road) / Sherburne Ave	NB EB SB WB	A A D B	A A A A	9.2	A A A A	A A A A	8.1	A A C A	A A A A	8.8	A A C B	A A A B	9.0	A A D B	A A D B	9.5	A A D B	A A D B	9.6
37	CSAH 10 (Bass Lake Road) / Adair Ave N	NB EB SB WB	A A A A	A A A A	1.1	A A A A	A A A A	0.9	A A A A	A A A A	1.0	A A A A	A A A A	0.9	C A A B	A A A B	7.0	B A A B	A A A B	7.1
38	CSAH 81 (Bottineau Blvd) / Wilshire Blvd	NB EB SB WB	A B B C	A B B C	9.5	A B B C	B B B C	10.6	A B B C	B B B C	11.3	A B B C	B B B C	11.1	A C B C	B B B C	15.1	A C B C	B B B C	14.8
39	Wilshire Blvd / Lakeland Ave N	NB EB SB WB	B - A A	A A A A	1.2	- B A A	A A A A	5.5	- B A A	A A A A	2.6	- B A A	A A A A	2.6	E E E E	A A A A	6.7	E E E E	A A A A	6.7
40	CSAH 81 (Bottineau Blvd) / Corvallis Ave N	NB EB SB WB	A B B C	A B B C	12.6	B B B C	B B B C	14.0	B B B C	B B B C	15.7	B B B C	B B B C	16.3	E E E E	D D D D	42.7	E E E E	D D D D	40.4
41	CSAH 81 (Bottineau Blvd) / 47th Ave N	NB EB SB WB	A E A D	A A A D	8.4	E A A D	A A A D	9.2	E B B D	A B B D	14.7	E B B D	A B B D	15.3	E B B D	A B B D	13.0	E B B D	A B B D	13.2
42	CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	NB EB SB WB	A - A C	A A A C	7.3	- A A C	A A A C	7.6	- A A C	A A A C	5.3	- A A C	A A A C	5.3	- A A C	A A A C	4.7	- A A C	A A A C	4.7
43	CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	NB EB SB WB	B D A A	B D A A	12.0	B D A A	B D A A	11.5	B D A A	B D A A	12.4	B D A A	B D A A	12.6	B D B A	B D B A	12.0	B D B A	B D B A	12.1
44	CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	NB EB SB WB	A - - A	A A A A	0.2	- - - A	A A A A	0.2	- - - A	A A A A	0.2	- - - A	A A A A	0.2	A A A A	A A A A	0.4	A A A A	A A A A	0.8

Not Applicable

# AM Level of Service and Intersection Delay

Scenario		2023										2050										
		Existing Condition				Existing + Freight Event				No Build		No Build + Freight Event		Build		Build + Freight Event		Mitigated Build				
#	Intersection	Appr	LOS		Avg. Delay (sec/veh)		LOS		Avg. Delay (sec/veh)		LOS		Avg. Delay (sec/veh)		LOS		Avg. Delay (sec/veh)		LOS		Avg. Delay (sec/veh)	
45	CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	NB EB SB WB	C D B D	C	26.7	C D B D	C	26.7	C D B D	C	26.8	C D B D	C	26.8	C D C D	D	35.3	C D C D	D	35.4	Not Applicable	
46	CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	NB EB SB WB	B B B C	B	11.6	B B B A	B	11.7	B B B A	B	12.1	B B B A	B	12.0	B B B B	B	12.7	B B B B	B	12.7		
47	CSAH 81 (Bottineau Blvd) / 41st Ave N	NB EB SB WB	A D A C	A	6.2	Not Applicable			A D A C	A	6.1	Not Applicable			B C B C	B	13.5	Not Applicable				
48	CSAH 81 (Bottineau Blvd) / 40th Ave N	NB EB SB WB	A E A C	A	7.2				A E A C	A	6.9				B D B C	B	13.3					
49	CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	NB EB SB WB	A - - A	A	0.3				A - - A	A	0.3				A - - A	A	0.4					
50	CSAH 81 (Bottineau Blvd) / 36th Ave N	NB EB SB WB	B C A D	B	17.4				B C A D	B	17.7				C C C D	C	28.9					
51	CSAH 81 (Bottineau Blvd) / 35th Ave N	NB EB SB WB	A C A A	A	4.3				A C A A	A	4.4				A D A A	A	5.0					
52	CSAH 81 (Bottineau Blvd) / Abbott Ave N	NB EB SB WB	A C A A	B	10.4				A C A A	B	10.7				A C B A	B	15.2					
53	CSAH 81 (W Broadway Ave) / N Oakdale Ave	NB EB SB WB	A A A A	A	0.9				A A A A	A	1.4				A A A A	A	1.3					
54	CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	NB EB SB WB	A A A A	A	7.4				A B A A	A	8.7				C C B B	B	19.0					
55	CSAH 153 (N Lowry Ave) / N Washburn Ave	NB EB SB WB	A A A A	A	0.4				A A A A	A	0.4				A A A A	A	1.3					
56	CSAH 81 (W Broadway Ave) SB Ramps / Theodore Wirth Pkwy	NB EB SB WB	A A A A	A	0.8				A A A A	A	1.3				A A A A	A	5.4					
57	CSAH 81 (W Broadway Ave) / N 29th Ave	NB EB SB WB	A D A D	B	10.5				A C A C	B	12.1				B D B C	B	18.4					
58	CSAH 81 (W Broadway Ave) / N 26th Ave	NB EB SB WB	B C A B	A	9.9				B C B B	B	16.0				C D C D	C	33.6					
59	CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McNair Ave	NB NE EB SB WB	D E C C D	C	34.1				D E C C D	C	33.5				C - D D A	D	38.3					
60	CSAH 81 (W Broadway Ave) / N Logan Ave	NB EB SB WB	A A C A	A	3.8				A A C A	A	4.2				A B D A	B	13.7					
61	CSAH 81 (W Broadway Ave) / N Knox Ave	NB EB SB WB	B A C A	A	7.4				B A C A	A	7.1				A A A A	A	1.8					
62	CSAH 81 (W Broadway Ave) / N James Ave	NB EB SB WB	A A A A	A	0.9				A A A A	A	0.9				B B B B	B	11.7					
63	N Hillside Ave / N 21st Ave / N Irving Ave	NB EB SB WB	A A A A	A	2.4				A A A A	A	2.3				A B A -	A	6.1					
64	CSAH 81 (W Broadway Ave) / N Irving Ave	NB EB SB WB	D A D A	A	6.9				D A D A	A	6.7				D A C A	B	10.8					
65	N 21st Ave / N Girard Ave	NB EB SB WB	A A A -	A	0.5				A A A -	A	0.7				A - A -	A	0.9					
															A B B B	B	11.3					
															A B A -	A	5.9					
															D A C A	B	10.6					
															A - A -	A	0.8					



# AM Level of Service and Intersection Delay

Scenario			2023				2050				2050				Build + Freight Event		Mitigated Build	
			Existing Condition		Existing + Freight Event		No Build		No Build + Freight Event		Build		Build + Freight Event		Mitigated Build			
#	Intersection	Appr	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)		
66	CSAH 81 (W Broadway Ave) / N Girard Ave	NB EB SB WB	C A C A	A	6.7	Not Applicable	C A C A	A 6.9	Not Applicable	C A C A	A 9.7	Not Applicable	C A D A	A 9.9				
67	N 21st Ave / N Fremont Ave	NB EB SB WB	- - A A	A	1.5		- A A A	A 1.9		- A A -	A 3.0		- A A -	A 3.1				
68	CSAH 81 (W Broadway Ave) / N Fremont Ave	NB EB SB WB	- B C C	B	19.7		- B C C	C 20.2		- C C C	C 24.3		- C C C	C 24.7				
69	N 21st Ave / N Emerson Ave	NB EB SB WB	A A - A	A	2.2		A A - A	A 2.6		A - - -	A 1.4		A - - -	A 1.4				
70	CSAH 81 (W Broadway Ave) / N Emerson Ave	NB EB SB WB	C A - A	A	9.7		C A - A	B 10.7		C B - A	B 16.8		C B - A	B 16.9				
71	CSAH 81 (W Broadway Ave) / N Dupont Ave	NB EB SB WB	C A B B	A	9.3		C B B B	A 8.3		C B C B	B 16.9		C B C B	B 17.3				
72	N 21st Ave / N Bryant Ave	NB EB SB WB	A A A A	A	4.1		A A A A	A 4.9		A - A -	A 1.5		A - A -	A 1.5				
73	N 21st Ave / N Aldrich Ave	NB EB SB WB	A A A A	A	3.4		A A A A	A 3.7		A - A -	A 1.3		A - A -	A 1.2				
74	CSAH 81 (W Broadway Ave) / N Aldrich Ave	NB EB SB WB	B A D A	A	6.5		C D A A	A 7.2		C C C B	C 20.8		B C C B	C 21.2				
75	N 21st Ave / N Lyndale Ave	NB EB SB WB	A A A A	A	2.5		A A B B	A 3.2		A - B -	B 10.9		A - B -	B 11.0				
76	CSAH 81 (W Broadway Ave) / N Lyndale Ave	NB EB SB WB	C A D C	C	21.2		D B D C	C 23.6		D B D C	C 31.9		D B D C	C 31.9				
77	N 21st Ave / N 4th St	NB EB SB WB	A A A A	A	2.5		A A A A	A 2.2		A - A A	A 7.9		A - A A	A 7.5				
78	CSAH 81 (W Broadway Ave) / N 4th St	NB EB SB WB	C B C A	B	10.7		B A C A	A 9.8		C B C B	B 15.4		C B C B	B 16.2				
79	N 21st Ave / I-94 EB Ramps	NB EB SB WB	Does not exist in Existing conditions		Does not exist in Existing conditions		Does not exist in 2050 No Build		Does not exist in 2050 No Build		- D D C	D 37.6	- C D C	D 35.2				
80	CSAH 81 (W Broadway Ave) / I-94 EB Ramps	NB EB SB WB	- A C D	C	25.7	- A C D	C 29.1	- B B C	C 21.2	- B B C	C 20.8							
81	CSAH 152 (N Washington Ave) / N 21st Ave	NB EB SB WB	A - A A	A	1.5	A - A A	A 1.5	B D C C	C 27.3	B D C D	C 27.7							
82	N 22nd Ave / N 2nd St	NB EB SB WB	B A A B	A	10.0	B A B B	B 11.0	A B A B	A 2.9	A B A B	A 2.9							
83	N 21st Ave / N 2nd St	NB EB SB WB	A A A B	A	2.5	A A B B	A 2.8	A B A B	A 5.1	A B A B	A 5.3							
84	CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	NB EB SB WB	C B B C	C	20.0	C B D B	C 21.8	D B D C	D 35.6	D B D C	C 33.9							
85	CSAH 81 (W Broadway Ave) / N 2nd St	NB EB SB WB	C A C B	B	12.1	C A C B	B 12.2	C B C C	B 19.5	C B C B	B 18.5							
86	CSAH 81 (W Broadway Ave) / W River Rd	NB EB SB WB	C A D A	A	5.8	C A D A	A 5.5	C A D A	A 8.6	C A D A	A 8.5							
87	CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	NB EB SB WB	B B B C	B	17.0	B B D D	B 17.9	C C D E	C 32.2	C C D C	C 32.6							

# AM Level of Service and Intersection Delay

Scenario		2023						2050												
		Existing Condition			Existing + Freight Event			No Build		No Build + Freight Event		Build		Build + Freight Event		Mitigated Build				
#	Intersection	Appr	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)				
88	N 17th Ave / N 2nd St	NB EB SB WB	A B A B	7.9	Not Applicable		A C A A	A A A A	Not Applicable		A C A A	B C A A	Not Applicable		A C B A	A B C A				
89	CSAH 152 (N Washington Ave) / N 15th Ave	NB EB SB WB	A A A A	1.1			A A A A	A A A A			B D C E	B D C D								
90	N 15th Ave / N 2nd St	NB EB SB WB	A A A -	1.0			A A A -	A A A -			A A A -	A A A -								
91	N Lyndale Ave / N Plymouth Ave	NB EB SB WB	B B B C	18.6			B C B D	C C C D			C D D F	D C C C								
92	CSAH 152 (N Washington Ave) / N Plymouth Ave	NB EB SB WB	B C D D	35.7			F D D F	E A A A			F F F C	E F F C								
93	N Plymouth Ave / N 2nd St	NB EB SB WB	B C C D	36.6			C C C F	B A A A			C B E F	B C C E								
94	CSAH 152 (N Washington Ave) / N 10th Ave	NB EB SB WB	C B C B	25.0			C C C B	C C C B			B B B E	B B B A								
95	N 10th Ave / N 2nd St	NB EB SB WB	B B A -	11.6			B B B -	B B B -			B B B -	B B B A								
96	CSAH 152 (N Washington Ave) / N 8th Ave	NB EB SB WB	A B A B	3.6			A B A B	A A A B			D D B C	D C B C								
97	N 10th Ave / N 3rd St	NB EB SB WB	B A B A	4.1			B A B A	A A A A			B B B -	B B B A								
98	N 10th Ave / N 4th St	NB EB SB WB	A A - A	1.4			A A - A	A A A A			Not analyzed in 2050 Build				Not analyzed in 2050 Build					
99	N 10th Ave / N 5th St	NB EB SB WB	A A B A	3.0			A A B A	A A B A			A C A -	A C A A								
100	N 8th Ave / N 5th St	NB EB SB WB	A A A -	2.7			A A A -	A A A -			B A A A	B A A A								
101	N 9th Ave / N 5th St	NB EB SB WB	Does not exist in Existing conditions				Does not exist in Existing conditions				Does not exist in 2050 No Build				Does not exist in 2050 No Build		A - A A	A A A A	A - A A	A A A A
102	N 8th Ave / N Oak Lake Ave	NB EB SB WB	A B A A	1.9			Not Applicable				A C A A	A A A A			Not Applicable		B C B E	C C C F	B E C F	E F C F
103	N 7th St / W Lyndale Ave	NB EB SB WB	- B B C	17.5							- F F C	F F C C					- F F C	F F C C		
104	N 7th St / E Lyndale Ave	NB EB SB WB	B B - B	14.5	B F - A	B E A A			C F - A	E E A A										
105	N 7th St / N Oak Lake Ave	NB EB SB WB	B C C C	20.7	D F D B	B E B B			D F C B	D E C B										
106	TH 55 (Olson Memorial Hwy) / N 7th St / N 8th Ave	NB EB SB WB	C B D D	28.3	C C D D	C C D D			E D C F	E D C F										
107	TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	NB EB SB WB	D B B B	18.4	D C B B	C C B B			D F D C	D F D C										
108	N 6th Ave / N 5th St	NB EB SB WB	B B A B	13.2	B B A B	B B A B			B B B B	B B B B										
109	N 6th Ave / N 3rd St	NB EB SB WB	A A A A	2.1	A A A A	A A A A			B A A A	B A A A										

### AM Level of Service and Intersection Delay

	Scenario		2023				2050									
			Existing Condition		Existing + Freight Event		No Build		No Build + Freight Event		Build		Build + Freight Event		Mitigated Build	
#	Intersection	Appr	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)
110	CSAH 152 (N Washington Ave) / N 6th Ave	NB EB SB WB	A B A C	A 8.8	Not Applicable	A C A C	A 8.6	Not Applicable	A D A C	B 14.9	Not Applicable	A D A C	B 13.7			
111	N 5th Ave / N 3rd St	NB EB SB WB	A A A A	A 2.3		A A A A	A 2.3		A A A A	A 3.2		A A A A	A 3.2			
112	CSAH 152 (N Washington Ave) / N 5th Ave	NB EB SB WB	B C B C	B 12.9		B C B C	B 13.3		B C A D	B 14.4		B C B D	B 15.9			
113	N 5th Ave / N 2nd St	NB EB SB WB	A A B -	A 9.7		A A B -	A 9.8		B A B -	B 10.7		B A B -	B 10.8			

# PM Level of Service and Intersection Delay

#	Scenario	Appr	2023				2050			
			Existing Condition		No Build		Build		Mitigated Build	
	Intersection		LOS	Avg. Delay (sec/vch)	LOS	Avg. Delay (sec/vch)	LOS	Avg. Delay (sec/vch)	LOS	Avg. Delay (sec/vch)
1	Oak Grove Pkwy / Xylon Ave	NB EB SB WB	Does not exist in Existing Conditions		Does not exist in 2050 No Build		B C A C	24.3		
2	CSAH 103 (W Broadway Ave) / 101st Ave N	NB EB SB WB	A C A -	6.7	F A -	54.8	Does not exist in 2050 Build			
3	CSAH 103 (W Broadway Ave) / Winnetka Ave N	NB EB SB WB	A A A -	0.5	F A -	52.8	Does not exist in 2050 Build			
4	CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	NB EB SB WB	B - B C	14.6	- A C	15.4	C C B D	25.8		
5	CSAH 103 (W Broadway Ave) / 99th Ave N	NB EB SB WB	Does not exist in Existing Conditions		Does not exist in 2050 No Build		B C C D	52.9		
6	CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	NB EB SB WB	B - B A	14.2	C - B B	18.8	C - C B	21.8		
7	CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	NB EB SB WB	A - B B	10.1	B - C B	18.8	C - C B	21.3		
8	CSAH 103 (W Broadway Ave) / 94th Ave N	NB EB SB WB	A A A A	2.1	A A A A	1.9	A F B D	20.3		
9	CSAH 103 (W Broadway Ave) / CSAH 30 (93rd Ave N)	NB EB SB WB	F F D E	69.5	F F D F	>100	F F F F	>100		
10	CSAH 103 (W Broadway Ave) / 92nd Ave N	NB EB SB WB	A A A A	2.7	C A C	70.9	A A A A	4.1		
11	CSAH 103 (W Broadway Ave) / Setzer Pkwy	NB EB SB WB	A A A B	1.9	F A F	>100	A A C	10.3		
12	CSAH 103 (W Broadway Ave) / 89th Ave N	NB EB SB WB	A A A -	2.0	F A -	>100	A A -	0.7		
13	CSAH 103 (W Broadway Ave) / Maplebrook Pkwy	NB EB SB WB	A B A A	2.9	F C F	>100	A A A C	9.0		
14	CSAH 103 (W Broadway Ave) / CSAH 109 (85th Ave N)	NB EB SB WB	C D D C	32.5	F C F	>100	F F F F	>100		
15	CSAH 103 (W Broadway Ave) / 84th Ave N	NB EB SB WB	A D A C	6.8	F A C	10.6	F A F	28.0		
16	CSAH 103 (W Broadway Ave) / College Park Dr	NB EB SB WB	A A A -	0.5	B A -	3.1	F A F	65.8		
17	CSAH 103 (W Broadway Ave) / 82nd Ave N	NB EB SB WB	A A A -	0.7	A B -	1.8	A A -	48.8		
18	CSAH 103 (W Broadway Ave) / Candlewood Dr	NB EB SB WB	A - A C	4.9	A A B	8.5	F A D	40.5		
19	CSAH 103 (W Broadway Ave) / 78th Ave N	NB EB SB WB	A B A A	1.1	C A B	1.5	F A F	24.7		
20	CSAH 103 (W Broadway Ave) / Shopping Center Access	NB EB SB WB	A B A B	9.3	B B B	12.3	D A A E	17.5		
21	CSAH 103 (W Broadway Ave) / CSAH 130 (Brooklyn Blvd) / CSAH 152	NB EB SB WB	C C C D	27.9	C C C	32.1	F D F	68.2		
22	CSAH 130 (Brooklyn Blvd) / Shopping Center Access (west of CSAH 103)	NB EB SB WB	C B C A	13.8	D C C A	26.0	D F F C	81.3		

Not applicable

# PM Level of Service and Intersection Delay

	Scenario	Appr	2023		2050				Mitigated Build	
			Existing Condition		No Build		Build			
#	Intersection		LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)
23	CSAH 130 (W Brooklyn Blvd) / Shopping Center Access (east of CSAH 103)	NB EB SB WB	A A A A	1.1	A A A A	A A A A	C A D D	B	14.8	Not applicable
24	CSAH 130 (W Broadway Ave) / 79th Ave N	NB EB SB WB	A B A B	9.3	C C B D	C 27.0 D E	D D C C	D	43.2	
25	CSAH 130 (W Broadway Ave) / 75th Ave N	NB EB SB WB	A A A B	1.8	A A A D	A A 4.5 D	B C C D	C	22.2	
26	CSAH 130 (W Broadway Ave) / 74th Ave N	NB EB SB WB	A A A A	1.6	A A A C	A A 1.0 D	A - A D	A	5.0	
27	CSAH 130 (W Broadway Ave) / 73rd Ave N	NB EB SB WB	A C A B	6.4	A C A B	A 8.3 B C	B D B C	B	16.1	
28	CSAH 81 (Bottineau Blvd) / 73rd Ave N	NB EB SB WB	A C C D	13.5	A C C D	B 17.7 C D	B C B D	B	18.3	
29	CSAH 81 (Bottineau Blvd) / CSAH 8 (W Broadway Ave) / 71st Ave N	NB EB SB WB	B D A D	18.7	B C B E	C 33.8 C F	C F C F	D	50.9	
30	CSAH 130 (W Broadway Ave) / 71st Ave N	NB EB SB WB	C A B D	17.7	D B C D	C 20.8 C D	C C C D	C	26.2	
31	CSAH 81 (Bottineau Blvd) / I-94 / I-694 WB Ramps	NB EB SB WB	A - A C	10.4	B - A C	B 14.5 A E	B - C C	C	29.3	
32	CSAH 81 (Bottineau Blvd) / I-94 / I-694 EB Ramps	NB EB SB WB	A - B D	14.1	A - B D	B 14.7 D D	C - D D	C	33.1	
33	CSAH 81 (Bottineau Blvd) / 63rd Ave N	NB EB SB WB	C D B D	29.6	E D B E	D 51.9 E E	F E E E	F	90.2	
34	63rd Ave N / Louisiana Ave N / Park and Ride Access	NB EB SB WB	A A C A	1.6	A A C A	A 2.8 A B	B B D B	C	20.8	
35	CSAH 81 (Bottineau Blvd) / CSAH 10 (Bass Lake Road)	NB EB SB WB	C C D D	35.2	C D D E	D 42.1 D D	B D A D	C	20.3	
36	CSAH 10 (Bass Lake Road) / Sherburne Ave	NB EB SB WB	B B C A	10.4	B B C A	B 12.2 C B	B B C B	B	12.4	
37	CSAH 10 (Bass Lake Road) / Adair Ave N	NB EB SB WB	B A A A	1.2	B A A A	A A 1.1 B	B A A B	A	5.9	
38	CSAH 81 (Bottineau Blvd) / Wilshire Blvd	NB EB SB WB	B B B B	10.9	B B B C	B 12.7 B C	D C B C	C	34.9	
39	Wilshire Blvd / Lakeland Ave N	NB EB SB WB	A - A A	4.9	A - B A	A 5.8 A A	A - F A	E	61.9	
40	CSAH 81 (Bottineau Blvd) / Corvallis Ave N	NB EB SB WB	B C C D	16.3	B C C D	B 17.0 C C	B C B C	B	19.8	
41	CSAH 81 (Bottineau Blvd) / 47th Ave N	NB EB SB WB	A E B D	9.3	A E B D	B 10.3 D E	B F B A	B	14.9	
42	CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	NB EB SB WB	A - A D	6.6	A - A D	A 6.5 D A	A - A D	B	10.8	
43	CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	NB EB SB WB	A E A A	6.5	A E A A	A 7.1 A A	B D B A	B	11.6	
44	CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	NB EB SB WB	A - - A	0.2	A - - A	A 0.3 A E	A - - E	B	12.0	

# PM Level of Service and Intersection Delay

#	Scenario	Appr	2025		2030		2040		2050		Mitigated Build	
			Existing Condition		No Build		Build		Build		Mitigated Build	
			LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)	LOS	Avg. Delay (sec/vsh)
45	CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	NB EB SB WB	C C C D	32.1	D C C D	34.6	D D E D	D	52.2	Not applicable		
46	CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	NB EB SB WB	B C B C	28.9	B D B D	33.3	B C B B	C	20.5			
47	CSAH 81 (Bottineau Blvd) / 41st Ave N	NB EB SB WB	A D A C	9.8	A D A C	9.8	C C B C	C	20.5			
48	CSAH 81 (Bottineau Blvd) / 40th Ave N	NB EB SB WB	A E A D	11.6	A B A D	11.6	E C C D	D	46.2			
49	CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	NB EB SB WB	A - - A	0.2	A - - A	0.3	A - - A	A	1.3			
50	CSAH 81 (Bottineau Blvd) / 36th Ave N	NB EB SB WB	C C B D	25.7	C C C D	26.8	C C C A	C	34.8			
51	CSAH 81 (Bottineau Blvd) / 35th Ave N	NB EB SB WB	A D A A	8.9	A D A A	9.7	A D A A	B	13.0			
52	CSAH 81 (Bottineau Blvd) / Abbott Ave N	NB EB SB WB	B D B A	21.8	B D B A	23.5	B D B A	B	18.3			
53	CSAH 81 (W Broadway Ave) / N Oakdale Ave	NB EB SB WB	A A A A	2.0	A A A A	2.5	A A B A	A	3.4			
54	CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	NB EB SB WB	A A A A	7.6	A B A A	9.3	D C B C	C	30.8			
55	CSAH 153 (N Lowry Ave) / N Washburn Ave	NB EB SB WB	B A A A	0.3	B A A A	0.4	B A A A	A	1.0			
56	CSAH 81 (W Broadway Ave) SB Ramps / Theodore Wirth Pkwy	NB EB SB WB	A A A A	1.4	A A A B	2.1	A A A A	A	5.2			
57	CSAH 81 (W Broadway Ave) / N 29th Ave	NB EB SB WB	A D B C	14.1	A D B C	14.1	C D C C	C	33.7			
58	CSAH 81 (W Broadway Ave) / N 26th Ave	NB EB SB WB	B C C C	21.4	B C C C	21.2	D D D D	D	39.6			
59	CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McHale Ave	NB EB SB WB	D E E D	55.6	D E E D	60.8	E - D E	E	65.8			
60	CSAH 81 (W Broadway Ave) / N Logan Ave	NB EB SB WB	A A C A	4.4	A C A A	5.1	- A A A	A	5.9			
61	CSAH 81 (W Broadway Ave) / N Knox Ave	NB EB SB WB	C A C A	8.5	C A C A	9.1	A A A A	A	2.0			
62	CSAH 81 (W Broadway Ave) / N James Ave	NB EB SB WB	B A B A	1.5	B A B A	1.8	B B B C	B	17.4	B	16.7	
63	N Hillside Ave / N 21st Ave / N Irving Ave	NB EB SB WB	A A A A	3.1	A A A A	3.2	A C A -	A	9.7	A	10.3	
64	CSAH 81 (W Broadway Ave) / N Irving Ave	NB EB SB WB	D A C A	8.7	D B C A	9.9	D A A A	B	11.5	A	10.9	
65	N 21st Ave / N Girard Ave	NB EB SB WB	A A A -	1.1	A A A -	1.6	A - - -	A	1.9	A	2.0	

# PM Level of Service and Intersection Delay

	Scenario	Appr	2023				2050							
			Existing Condition			No Build		Build		Mitigated Build				
#	Intersection		LOS		Avg. Delay (sec/veh)	LOS		Avg. Delay (sec/veh)	LOS		Avg. Delay (sec/veh)	LOS		Avg. Delay (sec/veh)
66	CSAH 81 (W Broadway Ave) / N Girard Ave	NB EB SB WB	B B D A	B	13.5	B C D A	B	16.3	C A D A	B	12.1	C A D A	B	11.8
67	N 21st Ave / N Fremont Ave	NB EB SB WB	- - A A	A	1.9	- - A A	A	2.1	- - A -	A	4.4	- - A -	A	4.8
68	CSAH 81 (W Broadway Ave) / N Fremont Ave	NB EB SB WB	- B C C	C	21.5	- B C C	B	19.2	- B C B	C	21.8	- B C B	C	22.1
69	N 21st Ave / N Emerson Ave	NB EB SB WB	A - - A	A	2.5	A - - A	A	3.2	- - - -	A	3.3	- - - -	A	3.0
70	CSAH 81 (W Broadway Ave) / N Emerson Ave	NB EB SB WB	C A - A	B	12.5	C - - A	B	11.5	D B - B	C	20.1	D B - B	B	19.8
71	CSAH 81 (W Broadway Ave) / N Dupont Ave	NB EB SB WB	B A B B	A	8.7	B A C B	A	9.9	C C C B	B	10.5	C A C A	B	10.9
72	N 21st Ave / N Bryant Ave	NB EB SB WB	A A A A	A	3.8	A A A A	A	4.5	A - A -	A	2.9	A - A -	A	2.3
73	N 21st Ave / N Aldrich Ave	NB EB SB WB	A A A A	A	3.4	A A A A	A	3.9	A - A -	A	3.7	A - A -	A	3.8
74	CSAH 81 (W Broadway Ave) / N Aldrich Ave	NB EB SB WB	D B D A	A	9.9	D B D A	B	15.0	D B E A	C	21.2	E B E A	C	21.3
75	N 21st Ave / N Lyndale Ave	NB EB SB WB	A B A B	A	6.5	A C A C	A	6.4	A - C -	C	22.6	A - B -	B	15.0
76	CSAH 81 (W Broadway Ave) / N Lyndale Ave	NB EB SB WB	C C D B	C	25.0	D C D C	C	31.5	E E C C	D	38.3	E B D C	D	35.8
77	N 21st Ave / N 4th St	NB EB SB WB	A A A A	A	3.6	A A A B	A	5.5	A - B B	B	11.5	A - B B	B	13.6
78	CSAH 81 (W Broadway Ave) / N 4th St	NB EB SB WB	D C D B	B	19.6	C C E B	C	22.4	D C E B	C	24.8	D C E B	C	26.5
79	N 21st Ave / I-94 EB Ramps	NB EB SB WB	Does not exist in Existing conditions			Does not exist in 2050 No Build			- D C D	D	39.0	- D C D	D	37.1
80	CSAH 81 (W Broadway Ave) / I-94 EB Ramps	NB EB SB WB	- B C C	C	24.0	- B C C	C	26.2	- B D C	C	29.3	- B D D	C	29.4
81	CSAH 152 (N Washington Ave) / N 21st Ave	NB EB SB WB	A - A A	A	2.0	A - A B	A	2.1	B E D D	D	37.8	C E D D	D	35.2
82	N 22nd Ave / N 2nd St	NB EB SB WB	A A A B	B	10.2	B B B B	B	11.6	A B A C	A	8.0	A B A C	A	7.3
83	N 21st Ave / N 2nd St	NB EB SB WB	A A A -	A	1.4	A A A -	A	1.6	B E C -	B	18.7	A B A -	A	4.9
84	CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	NB EB SB WB	D C C D	D	37.4	E C D D	D	46.1	D D E D	D	46.6	E D D D	D	47.2
85	CSAH 81 (W Broadway Ave) / N 2nd St	NB EB SB WB	C B C C	C	24.2	B C B D	C	31.6	F B F E	E	56.4	C B D D	C	31.0
86	CSAH 81 (W Broadway Ave) / W River Rd	NB EB SB WB	D D D A	B	10.9	D A D B	B	14.7	D B C E	D	36.3	D B C B	C	20.3
87	CSAH 152 (N Washington Ave) / N 17th Ave / I-94 WB Ramp	NB EB SB WB	B B B E	C	20.9	D D B F	D	37.6	E F F F	F	>100	E D D C	D	46.8



# PM Level of Service and Intersection Delay

#	Scenario	Appr	2023				2050							
			Existing Condition				No Build				Build			
	Intersection		LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)
88	N 17th Ave / N 2nd St	NB	A		A		F		F		A			
		EB	C	14.3	E	C	26.5		F	F	>100	E	C	21.2
		SB	A		B				F	F		B		
		WB	C		E				F	F		B		
89	CSAH 152 (N Washington Ave) / N 15th Ave	NB	A		A		B		B		B			
		EB	B	1.6	B	A	1.7		B	B	15.3	B	B	13.7
		SB	A		A				B			B		
		WB	B		B				B			B		
90	N 15th Ave / N 2nd St	NB	A		A		E		E		A			
		EB	A	1.6	A	A	1.7		B	C	30.2	A	A	4.3
		SB	A		-				B			A		
		WB	-		-				-			-		
91	N Lyndale Ave / N Plymouth Ave	NB	C		F		F		D		F			
		EB	C	24.1	E	E	57.7		D	F	>100	D	E	59.3
		SB	C		C				F			E		
		WB	C		B				D			C		
92	CSAH 152 (N Washington Ave) / N Plymouth Ave	NB	C		C		E		E		D			
		EB	C	24.5	F	E	60.4		F	F	>100	F	E	74.2
		SB	C		C				D			F		
		WB	C		C				C			C		
93	N Plymouth Ave / N 2nd St	NB	B		B		C		C		A			
		EB	B	35.0	B	E	74.3		F	F	>100	F	E	64.7
		SB	C		C				F			F		
		WB	E		F				F			F		
94	CSAH 152 (N Washington Ave) / N 10th Ave	NB	D		D		B		B		B			
		EB	D	31.6	D	D	35.3		-	B	18.4	-	B	19.0
		SB	C		C				B			B		
		WB	C		C				D			D		
95	N 10th Ave / N 2nd St	NB	B		B		C		C		B			
		EB	B	13.0	B	B	13.2		B	B	16.9	B	B	14.5
		SB	A		A				A			A		
		WB	-		-				-			-		
96	CSAH 152 (N Washington Ave) / N 8th Ave	NB	A		A		C		C		C			
		EB	A	5.9	A	A	5.6		D	C	26.2	C	C	27.7
		SB	A		A				B			C		
		WB	C		C				D			C		
97	N 10th Ave / N 3rd St	NB	C		C		A		A		A			
		EB	A	6.6	C	B	10.8		-	A	10.0	-	A	9.3
		SB	B		C				B			A		
		WB	A		A				-			-		
98	N 10th Ave / N 4th St	NB	B		B				Not analyzed in 2050 Build				Not analyzed in 2050 Build	
		EB	A	2.6	A	A	4.7							
		SB	-		-									
		WB	A		A									
99	N 10th Ave / N 5th St	NB	B		B		A		A		A			
		EB	B	4.4	A	A	7.3		C	A	8.7	C	A	7.2
		SB	B		B				A			A		
		WB	A		A				-			-		
100	N 8th Ave / N 5th St	NB	A		A		E		A		A			
		EB	A	3.7	A	A	3.6		A	C	25.4	A	A	8.4
		SB	A		-				E			B		
		WB	-		-				A			A		
101	N 9th Ave / N 5th St	NB	Does not exist in Existing conditions				Does not exist in 2050 No Build				A			
		EB									-			
		SB									B			
		WB									D			
102	N 8th Ave / N Oak Lake Ave	NB	A		A		B		E		B			
		EB	B	2.0	C	A	9.2		C	E	77.1	C	D	46.6
		SB	A		C				D			C		
		WB	A		C				F			F		
103	N 7th St / W Lyndale Ave	NB	-		-		-		-		-			
		EB	B	17.1	B	B	19.2		B	B	17.0	-	B	18.4
		SB	B		B				B			B		
		WB	B		C				C			C		
104	N 7th St / E Lyndale Ave	NB	B		B		C		C		C			
		EB	B	15.5	D	C	26.8		B	C	23.2	B	C	23.0
		SB	-		-				-			-		
		WB	B		C				B			B		
105	N 7th St / N Oak Lake Ave	NB	C		C		E		E		D			
		EB	D	23.7	C	D	45.4		C	D	36.8	D	D	42.8
		SB	C		C				C			D		
		WB	B		F				C			C		
106	TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	NB	C		F		F		F		F			
		EB	C	26.8	D	E	69.5		D	E	72.8	E	E	71.9
		SB	D		B				C			D		
		WB	C		E				F			E		
107	TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	NB	D		D		D		D		40.4	E	D	42.9
		EB	B	18.9	B	C	22.4		D	D		C		
		SB	B		B				C			C		
		WB	B		B				C			C		
108	N 6th Ave / N 5th St	NB	B		C		B		B		20.6	B		
		EB	B	17.2	B	B	18.3		C	C		C	C	20.5
		SB	B		B				B			A		
		WB	B		B				B			B		
109	N 6th Ave / N 3rd St	NB	A		A		C		C		12.8	C		
		EB	A	3.5	A	A	4.2		C	B		B		
		SB	A		A				B			A		
		WB	A		A				A			A		

## PM Level of Service and Intersection Delay

#	Scenario		2023			2050						
			Existing Condition			No Build		Build		Mitigated Build		
	Intersection	Appr	LOS	Avg. Delay (sec/veh)		LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	
110	CSAH 152 (N Washington Ave) / N 6th Ave	NB	A			A		A		B		
		EB	D			D		D		D		
		SB	A	B	12.6	A	B	B	C	C	20.5	
		WB	D			D		C		C		
111	N 5th Ave / N 3rd St	NB	A			B		B		B		
		EB	A			A		A		A		
		SB	B	A	4.0	B	A	A	A	A	A	A
		WB	A			A		A		A		
112	CSAH 152 (N Washington Ave) / N 5th Ave	NB	B			B		D		D		
		EB	D			D		D		D		
		SB	B	B	16.0	B	B	B	C	C	34.7	
		WB	C			C		D		D		
113	N 5th Ave / N 2nd St	NB	B			B		B		B		
		EB	B			B		D		D		
		SB	B	B	11.8	B	B	C	C	C	20.5	
		WB	-			-		-		-		

### Storage Length

[illegible]



### Storage Length

[illegible]

### Storage Length

[illegible]



## Storage Length

			2023			2050					
Scenario			Existing Condition			No Build			Build		
#	Intersection	Appr	Effective Storage Distance (feet)			Effective Storage Distance (feet)			Effective Storage Distance (feet)		
			LT	Th	RT	LT	Th	RT	LT	Th	RT
41	CSAH 81 (Bottineau Blvd) / 47th Ave N	NB	445	1085	175	445	1085	175	425	1085	175
		EB	50	50	50	50	50	50	50	50	50
		SB	470	2310	460	470	2310	460	450	2310	250
		WB	80	80	50	80	80	50	80	80	50
42	CSAH 81 (Bottineau Blvd) / TH 100 SB Ramps	NB	-	580	580	-	580	580	-	580	580
		EB	-	-	-	-	-	-	-	-	-
		SB	-	1085	-	-	1085	-	-	1085	-
		WB	970	-	535	970	-	535	970	-	535
43	CSAH 81 (Bottineau Blvd) / TH 100 NB Ramps	NB	-	570	460	-	570	460	-	570	460
		EB	1870	1870	1870	1870	1870	1870	1870	1870	1870
		SB	365	580	-	365	580	-	365	580	-
		WB	-	-	1435	-	-	1435	-	-	1435
44	CSAH 81 (Bottineau Blvd) / Lakeland Ave N (North)	NB	-	1000	130	-	1000	130	-	1000	130
		EB	30	30	30	30	30	30	30	30	30
		SB	370	1000	-	370	1000	-	370	1000	-
		WB	-	-	-	-	-	-	-	-	-
45	CSAH 81 (Bottineau Blvd) / CSAH 9 (42nd Ave N)	NB	510	725	260	510	725	260	510	725	260
		EB	150	335	150	150	335	150	150	335	150
		SB	225	1400	140	225	1400	140	225	1400	140
		WB	220	1665	225	220	1665	225	220	1665	225
46	CSAH 9 (42nd Ave N) / CSAH 8 (W Broadway Ave)	NB	800	800	800	800	800	800	350	800	800
		EB	540	540	540	540	540	540	540	540	540
		SB	380	380	380	380	380	380	290	380	380
		WB	315	315	315	315	315	315	315	315	315
47	CSAH 81 (Bottineau Blvd) / 41st Ave N	NB	410	885	445	410	885	445	140	885	445
		EB	320	320	320	320	320	320	320	320	320
		SB	270	725	725	270	725	725	270	725	725
		WB	185	185	185	185	185	185	185	185	185
48	CSAH 81 (Bottineau Blvd) / 40th Ave N	NB	320	3330	65	320	3330	65	320	3330	65
		EB	145	295	295	145	295	295	145	295	295
		SB	335	875	265	335	875	265	180	875	265
		WB	160	525	200	160	525	200	160	525	200
49	CSAH 81 (Bottineau Blvd) / Lakeland Ave N (South)	NB	-	1160	200	-	1160	200	-	1160	125
		EB	50	-	50	50	-	50	50	-	50
		SB	250	2150	-	250	2150	-	210	2150	-
		WB	-	-	-	-	-	-	-	-	-
50	CSAH 81 (Bottineau Blvd) / 36th Ave N	NB	440	530	380	440	530	380	280	530	380
		EB	220	270	220	220	270	220	220	270	220
		SB	330	3300	425	330	3300	425	330	3300	425
		WB	130	1130	1130	130	1130	1130	130	1130	1130



## Storage Length

#	Scenario		2023			2050					
			Existing Condition			No Build			Build		
			Effective Storage Distance (feet)			Effective Storage Distance (feet)			Effective Storage Distance (feet)		
	Intersection	Appr	LT	Th	RT	LT	Th	RT	LT	Th	RT
51	CSAH 81 (Bottineau Blvd) / 35th Ave N	NB	425	1240	-	425	1240	-	325	1240	-
		EB	160	-	160	160	-	160	160	-	160
		SB	-	1250	385	-	1250	385	-	1250	270
		WB	-	-	-	-	-	-	-	-	-
52	CSAH 81 (Bottineau Blvd) / Abbott Ave N	NB	550	2860	-	550	2860	-	300	2860	-
		EB	160	-	160	160	-	160	160	-	160
		SB	-	1250	385	-	1250	385	-	1250	385
		WB	-	-	-	-	-	-	-	-	-
53	CSAH 81 (W Broadway Ave) / N Oakdale Ave	NB	-	-	-	-	-	-	-	-	-
		EB	230	100	-	230	100	-	230	100	-
		SB	430	-	430	430	-	430	430	-	430
		WB	-	370	75	-	370	75	-	370	75
54	CSAH 153 (N Lowry Ave) / Theodore Wirth Pkwy	NB	305	610	610	305	610	610	580	580	580
		EB	120	250	250	120	250	250	80	235	235
		SB	560	560	185	560	560	185	1100	1100	100
		WB	120	370	370	120	370	370	160	380	380
55	CSAH 153 (N Lowry Ave) / N Washburn Ave	NB	480	-	480	480	-	480	480	-	480
		EB	-	270	-	-	270	-	-	185	-
		SB	-	-	-	-	-	-	-	-	-
		WB	-	270	-	-	270	-	-	270	-
56	CSAH 81 (W Broadway Ave) SB Ramps / Theodore Wirth Pkwy	NB	-	835	835	-	835	835	-	835	100
		EB	-	-	-	-	-	-	-	-	-
		SB	205	630	-	205	630	-	150	580	-
		WB	165	-	245	165	-	245	-	-	-
57	CSAH 81 (W Broadway Ave) / N 29th Ave	NB	600	1525	1525	600	1525	1525	120	1525	1525
		EB	445	445	445	445	445	445	445	445	445
		SB	90	800	800	90	800	800	90	800	800
		WB	345	345	345	345	345	345	345	345	345
58	CSAH 81 (W Broadway Ave) / N 26th Ave	NB	600	1000	1000	600	1000	1000	180	1000	1000
		EB	1000	1000	1000	1000	1000	1000	1000	1000	1000
		SB	600	1505	1505	600	1505	1505	140	1505	1505
		WB	430	430	430	430	430	430	430	430	430
59	CSAH 81 (W Broadway Ave) / CSAH 2 (N Penn Ave) / McNair Ave	NB	150	415	415	150	415	415	115	415	415
		NEB	310	310	310	310	310	310	-	-	-
		EB	600	1055	1055	600	1055	1055	600	1055	1055
		SB	180	655	655	180	655	655	140	655	655
		WB	600	765	765	600	765	765	600	765	765
60	CSAH 81 (W Broadway Ave) / N Logan Ave	NB	-	-	-	-	-	-	-	-	-
		EB	480	480	-	480	480	-	480	480	-
		SB	300	-	300	300	-	300	300	-	300
		WB	-	1520	1520	-	1520	1520	-	1520	1520

## Storage Length

			2023			2050					
Scenario			Existing Condition			No Build			Build		
#	Intersection	Appr	Effective Storage Distance (feet)			Effective Storage Distance (feet)			Effective Storage Distance (feet)		
			LT	Th	RT	LT	Th	RT	LT	Th	RT
61	CSAH 81 (W Broadway Ave) / N Knox Ave	NB	180	180	180	180	180	180	-	-	180
		EB	90	1520	-	90	1520	-	-	300	-
		SB	-	-	-	-	-	-	-	-	-
		WB	-	250	250	-	250	250	-	-	-
62	CSAH 81 (W Broadway Ave) / N James Ave	NB	225	225	225	225	225	225	225	225	225
		EB	265	265	-	265	265	-	135	1900	-
		SB	790	-	790	790	-	790	790	-	790
		WB	-	380	380	-	380	380	-	380	380
63	N Hillside Ave / N 21st Ave / N Irving Ave	NB	225	225	225	225	225	225	225	225	-
		EB	1235	1235	1235	1235	1235	1235	1235	-	1235
		SB	425	425	425	425	425	425	425	425	425
		WB	385	385	385	385	385	385	-	-	-
64	CSAH 81 (W Broadway Ave) / N Irving Ave	NB	225	225	225	225	225	225	225	225	225
		EB	175	340	340	175	340	340	125	340	340
		SB	215	215	215	215	215	215	215	215	215
		WB	210	410	410	210	410	410	125	410	410
65	N 21st Ave / N Girard Ave	NB	335	335	-	335	335	-	-	335	-
		EB	390	-	390	390	-	390	-	-	-
		SB	-	415	415	-	415	415	-	415	-
		WB	-	-	-	-	-	-	-	-	-
66	CSAH 81 (W Broadway Ave) / N Girard Ave	NB	80	80	80	80	80	80	80	80	80
		EB	200	440	440	200	440	440	125	440	440
		SB	330	330	330	330	330	330	330	330	330
		WB	130	320	320	130	320	320	125	320	320
67	N 21st Ave / N Fremont Ave	NB	-	-	-	-	-	-	-	-	-
		EB	-	-	-	-	-	-	-	-	-
		SB	420	420	-	420	420	-	-	420	-
		WB	345	-	-	345	-	-	-	-	-
68	CSAH 81 (W Broadway Ave) / N Fremont Ave	NB	-	-	-	-	-	-	-	-	-
		EB	-	320	320	-	320	320	-	320	320
		SB	90	325	325	90	325	325	115	325	325
		WB	310	310	-	310	310	-	125	310	-
69	N 21st Ave / N Emerson Ave	NB	335	335	335	335	335	335	-	335	-
		EB	345	345	-	345	345	-	-	-	-
		SB	-	-	-	-	-	-	-	-	-
		WB	-	350	350	-	350	350	-	-	-
70	CSAH 81 (W Broadway Ave) / N Emerson Ave	NB	90	555	555	90	565	565	115	565	565
		EB	310	310	-	310	310	-	125	310	-
		SB	-	-	-	-	-	-	-	-	-
		WB	-	315	315	-	315	315	-	315	315

## Storage Length

	Scenario		2023			2050					
			Existing Condition			No Build			Build		
#	Intersection	Appr	Effective Storage Distance (feet)			Effective Storage Distance (feet)			Effective Storage Distance (feet)		
			LT	Th	RT	LT	Th	RT	LT	Th	RT
71	CSAH 81 (W Broadway Ave) / N Dupont Ave	NB	555	555	555	555	555	555	555	555	555
		EB	305	305	305	305	305	305	125	305	305
		SB	140	140	140	140	140	140	140	140	140
		WB	320	320	320	320	320	320	125	320	320
72	N 21st Ave / N Bryant Ave	NB	335	335	335	335	335	335	-	335	-
		EB	350	350	350	350	350	350	-	-	-
		SB	410	410	410	410	410	410	-	410	-
		WB	345	345	345	345	345	345	-	-	-
73	N 21st Ave / N Aldrich Ave	NB	335	335	335	335	335	335	-	335	-
		EB	345	345	345	345	345	345	-	-	-
		SB	410	410	410	410	410	410	-	410	-
		WB	345	345	345	345	345	345	-	-	-
74	CSAH 81 (W Broadway Ave) / N Aldrich Ave	NB	600	600	600	600	600	600	600	600	600
		EB	110	320	320	110	320	320	125	320	320
		SB	325	325	325	325	325	325	325	325	325
		WB	145	310	310	145	310	310	125	310	310
75	N 21st Ave / N Lyndale Ave	NB	160	320	320	160	320	320	-	320	-
		EB	345	345	345	345	345	345	-	-	-
		SB	410	410	410	410	410	410	-	410	-
		WB	345	345	345	345	345	345	-	-	-
76	CSAH 81 (W Broadway Ave) / N Lyndale Ave	NB	115	335	335	115	335	335	115	335	335
		EB	150	305	305	95	305	305	125	305	100
		SB	160	315	315	160	315	315	160	315	315
		WB	105	700	700	105	700	700	135	700	700
77	N 21st Ave / N 4th St	NB	330	330	330	330	330	330	-	330	330
		EB	345	345	345	345	345	345	-	-	-
		SB	410	410	410	420	420	420	420	420	-
		WB	130	130	130	130	130	130	295	-	295
78	CSAH 81 (W Broadway Ave) / N 4th St	NB	150	150	150	150	150	150	150	150	150
		EB	115	115	115	115	115	115	115	115	115
		SB	345	345	345	345	345	345	345	345	345
		WB	165	165	165	165	165	165	165	165	165
79	N 21st Ave / I-94 EB Ramps	NB	Does not exist in Existing conditions			Does not exist in 2050 No Build			-	-	-
		EB							-	330	330
		SB							350	3120	3120
		WB							320	320	-
80	CSAH 81 (W Broadway Ave) / I-94 EB Ramps	NB	-	-	-	-	-	-	-	-	-
		EB	-	190	70	-	190	70	-	190	70
		SB	300	3500	600	300	3500	600	325	325	325
		WB	415	415	-	415	415	-	220	415	-

### Storage Length

[illegible]

## Storage Length

	Scenario		2023			2050					
			Existing Condition			No Build			Build		
#	Intersection	Appr	Effective Storage Distance (feet)			Effective Storage Distance (feet)			Effective Storage Distance (feet)		
			LT	Th	RT	LT	Th	RT	LT	Th	RT
91	N Lyndale Ave / N Plymouth Ave	NB	890	890	890	890	890	890	890	890	890*
		EB	120	305	305	120	305	305	120	305	305
		SB	120	335	335	120	335	335	120	335	335
		WB	250	1210	1210	250	1210	1210	250	1210	1210
92	CSAH 152 (N Washington Ave) / N Plymouth Ave	NB	155	310	310	155	310	310	450	500	500
		EB	150	295	90	150	295	90	150	295	90
		SB	105	315	315	105	315	315	105	720	720
		WB	150	310	95	150	310	95	150	310	95
93	N Plymouth Ave / N 2nd St	NB	260	260	260	260	260	260	260	260	260
		EB	305	305	305	305	305	305	305*	305	305
		SB	330	330	330	330	330	330	330*	330	330
		WB	1040	1040	1040	1040	1040	1040	1040*	1040	1040
94	CSAH 152 (N Washington Ave) / N 10th Ave	NB	115	250	250	115	250	250	-	620	620
		EB	350	350	350	350	350	350	-	-	-
		SB	90	175	175	90	175	175	550	550	-
		WB	310	310	310	310	310	310	100	-	310
95	N 10th Ave / N 2nd St	NB	210	210	-	210	210	-	800	800	-
		EB	150	-	300	150	-	300	150	-	300
		SB	-	300	300	-	300	300	-	300	300
		WB	-	-	-	-	-	-	-	-	-
96	CSAH 152 (N Washington Ave) / N 8th Ave	NB	670	670	670	670	670	670	870	870	870
		EB	400	400	400	400	400	400	400	400	400
		SB	330	330	330	330	330	330	330	330	330
		WB	100	100	100	100	100	100	100	100	100
97	N 10th Ave / N 3rd St	NB	260	260	260	260	260	260	-	260	-
		EB	370	370	370	370	370	370	-	-	-
		SB	215	215	215	215	215	215	-	215	-
		WB	355	355	355	355	355	355	-	-	-
98	N 10th Ave / N 4th St	NB	1410	-	1410	1410	-	1410	Not analyzed in 2050 Build		
		EB	-	360	360	-	360	360			
		SB	-	-	-	-	-	-			
		WB	370	370	-	370	370	-			
99	N 10th Ave / N 5th St	NB	695	695	695	695	695	695	695	695	-
		EB	600	600	600	600	600	600	600	-	600
		SB	340	340	340	340	340	340	-	380	380
		WB	350	350	350	350	350	350	-	-	-
100	N 8th Ave / N 5th St	NB	890	890	-	890	890	-	890	890	890
		EB	855	-	855	855	-	855	780	780	780
		SB	-	680	680	-	680	680	380	380	380
		WB	-	-	-	-	-	-	350	350	350



## Storage Length

#	Scenario	Appr	2023			2050					
			Existing Condition			No Build			Build		
			Effective Storage Distance (feet)			Effective Storage Distance (feet)			Effective Storage Distance (feet)		
	Intersection		LT	Th	RT	LT	Th	RT	LT	Th	RT
101	N 9th Ave / N 5th St	NB	Does not exist in Existing conditions			Does not exist in 2050 No Build			-	380	380
		EB							-	-	-
		SB							165	165	-
		WB							350	-	350
102	N 8th Ave / N Oak Lake Ave	NB	185	185	185	185	185	185	185	185	185
		EB	1440	1440	1440	1440	1440	1440	1440	1440	1440
		SB	625	625	625	625	625	625	625	625	625
		WB	810	810	810	810	810	810	780	780	780
103	N 7th St / W Lyndale Ave	NB	-	-	-	-	-	-	-	-	-
		EB	-	490	490	-	490	490	-	490	490
		SB	3200	3200	1250	3200	3200	1250	1250	1250	1250
		WB	220	440	-	220	440	-	220	440	-
104	N 7th St / E Lyndale Ave	NB	740	890	890	740	890	890	740	890	890
		EB	210	400	-	210	400	-	210	400	-
		SB	-	-	-	-	-	-	-	-	-
		WB	-	745	285	-	745	745	-	745	745
105	N 7th St / N Oak Lake Ave	NB	100	100	100	100	100	100	100	100	100
		EB	730	730	730	105	730	730	105	730	730
		SB	160	150	150	160	150	150	150	150	150
		WB	535	535	535	150	535	535	150	535	535
106	TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	NB	350	540	520	350	540	540	350	540	290
		EB	-	335	345	-	335	345	-	335	345
		SB	460	460	460	250	460	460	250	460	460
		WB	600	600	600	200	600	600	200	600	600
107	TH 55 (Olson Memorial Hwy) / N Oak Lake Ave / Border Ave	NB	675	890	890	675	890	890	675	890	890
		EB	130	420	275	130	420	275	130	420	275
		SB	250	250	80	250	250	80	250	250	80
		WB	195	300	100	195	300	300	195	300	300
108	N 6th Ave / N 5th St	NB	305	305	305	305	305	305	305	305	305
		EB	395	395	395	395	395	395	395	395	395
		SB	880	880	880	880	880	880	1015	1015	1015
		WB	335	335	335	335	335	335	335	335	335
109	N 6th Ave / N 3rd St	NB	345	345	345	345	345	345	345	345	345
		EB	360	360	360	390	390	390	360	360	360
		SB	230	230	230	230	230	230	230	230	230
		WB	340	340	340	340	340	340	340	340	340
110	CSAH 152 (N Washington Ave) / N 6th Ave	NB	150	310	310	150	310	310	150	310	310
		EB	345	345	345	345	345	345	345	345	345
		SB	105	210	210	105	210	210	105	210	210
		WB	145	145	145	145	145	145	340	340	340

## Storage Length

Scenario			2023			2050					
			Existing Condition			No Build			Build		
#	Intersection	Appr	Effective Storage Distance (feet)			Effective Storage Distance (feet)			Effective Storage Distance (feet)		
			LT	Th	RT	LT	Th	RT	LT	Th	RT
111	N 5th Ave / N 3rd St	NB	200	200	200	200	200	200	200	200	200
		EB	310	310	310	310	310	310	310	310	310
		SB	340	340	340	340	340	340	340	340	340
		WB	350	350	350	350	350	350	350	350	350
112	CSAH 152 (N Washington Ave) / N 5th Ave	NB	180	720	720	180	720	720	180	720	720
		EB	335	335	335	335	335	335	335	335	335
		SB	150	310	310	150	310	310	150	310	310
		WB	350	350	350	350	350	350	350	350	350
113	N 5th Ave / N 2nd St	NB	770	770	-	770	770	-	380	380	-
		EB	350	-	350	350	-	350	350	-	350
		SB	-	340	340	-	340	340	-	340	340
		WB	-	-	-	-	-	-	-	-	-

### Analysis Notes:

Storage Length for through lanes is measured to the nearest upstream full access public intersection.

\* Storage length modified under Mitigated Build conditions as detailed in Section 6.1.



Intersection	Appr	Movement	Peak Period	Scenario(s) with Queuing Issue						Reasoning for Queuing Issue (In Build Conditions)	Mitigation Proposed?	
				2023		2050						
				Existing Conditions	AM Existing + Freight Event	No Build	AM No Build + Freight Event	Build	AM Build + Freight Event			
Oak Grove Pkwy / Xylon Ave	NB	-										
	EB	-										
	SB	-										
	WB	-										
CSAH 103 (W Broadway Ave) / 101st Ave N	NB	-										
	EB	Left/Right	PM			X						
	SB	-										
	WB	-										
CSAH 103 (W Broadway Ave) / Winnetka Ave N	NB	-										
	EB	Left/Right	AM PM			X X						
	SB	-										
	WB	-										
CSAH 103 (W Broadway Ave) / Oak Grove Pkwy	NB	-										
	EB	-										
	SB	-										
	WB	-										
CSAH 103 (W Broadway Ave) / 99th Ave N	NB	-										
	EB	-										
	SB	-										
	WB	-										
CSAH 103 (W Broadway Ave) / TH 610 WB Ramps	NB	-										
	EB	-										
	SB	-										
	WB	-										
CSAH 103 (W Broadway Ave) / TH 610 EB Ramps	NB	-										
	EB	-										
	SB	-										
	WB	-										
CSAH 103 (W Broadway Ave) / 94th Ave N	NB	-										
	EB	Left	AM PM					X X		Movement operates at LOS E or worse Average back-of-queue exceeds storage length, movement operates at LOS E or worse	No No	Movement does not impact upstream intersections Movement does not impact upstream intersections
	SB	Through	AM			X						
	WB	Left/Through/Right	AM			X						



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Intersection	Appr	Movement	Peak Period	Scenario(s) with Queuing Issue						Reasoning for Queuing Issue (In Build Conditions)	Mitigation Proposed?	
				2023		2050						
				Existing Conditions	AM Existing + Freight Event	No Build	AM No Build + Freight Event	Build	AM Build + Freight Event			
N 21st Ave / N 4th St	NB	-										
	EB	-										
	SB	-										
	WB	-										
CSAH 81 (W Broadway Ave) / N 4th St	NB											
	EB	Left/Through/Right	AM	X		X		X		95th percentile queue exceeds storage length	No	Movements operates at LOS D or better
	SB		PM	X		X		X				
	WB	Left/Through/Right	AM					X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft; movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
N 21st Ave / I-94 EB Ramps	NB	-										
	EB	-										
	SB	-										
	WB	Left/Through	PM					X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
CSAH 81 (W Broadway Ave) / I-94 EB Ramps	NB	-										
	EB	Through	AM					X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft; movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
		Right	AM				X		95th percentile queue exceeds storage length	No	Movement operates at LOS D or better	
			PM	X		X		X		95th percentile queue exceeds storage length	No	Movement operates at LOS D or better
		SB	Left	PM					X		95th percentile queue exceeds storage length	No
	Through/Right		PM					X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
	WB	Left	AM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft; movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM	X		X		X		95th percentile queue exceeds storage length		Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length

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Intersection	Appr	Movement	Peak Period	Scenario(s) with Queuing Issue						Reasoning for Queuing Issue (In Build Conditions)	Mitigation Proposed?	
				2023		2050						
				Existing Conditions	AM Existing + Freight Event	No Build	AM No Build + Freight Event	Build	AM Build + Freight Event			
CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave)	NB	Left	PM	X		X						
		Through	PM	X		X						
		Right	PM	X		X		X	95th percentile queue exceeds storage length	No	Intersection operates at LOS D; capacity is already being increased by adding westbound right turn lane at the intersection; adding more lanes may negatively impact pedestrian operation	
	EB	Left	PM					X	95th percentile queue exceeds storage length, movement operates at LOS E	No	Intersection operates at LOS D; capacity is already being increased by adding westbound right turn lane at the intersection; adding more lanes may negatively impact pedestrian operation	
		Left	AM					X	95th percentile queue exceeds storage length, movement operates at LOS F	No	Intersection operates at LOS D; capacity is already being increased by adding westbound right turn lane at the intersection Adding more lanes may negatively impact pedestrian operation	
	SB	Through	PM					X	95th percentile queue exceeds storage length, movement operates at LOS E	No	Intersection operates at LOS D; capacity is already being increased by adding westbound right turn lane at the intersection; adding more lanes may negatively impact pedestrian operation	
			AM				X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length	
		Right	PM				X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft; movement operates at LOS D or better, and average back of queue does not exceed storage length	
			AM	X			X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft; movement operates at LOS D or better, and average back of queue does not exceed storage length	
	WB	Through	PM	X		X		X	95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length	
			AM	X			X		95th percentile queue exceeds storage length	Yes	Provide right turn lane at this approach	
		Right	PM	X	X		X		95th percentile queue exceeds storage length	No	Mitigation at CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave) is expected to have a positive impact to this movement (anticipated to operate at LOS D)	
			Through/Right	PM	X			X		95th percentile queue exceeds storage length	No	Mitigation at CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave) is expected to have a positive impact to this movement (anticipated to operate at LOS C)
	CSAH 81 (W Broadway Ave) / N 2nd St	NB	Left	PM					X	95th percentile queue exceeds storage length, movement operates at LOS F	No	Mitigation at CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave) is expected to have a positive impact to this movement (anticipated to operate at LOS D)
			Through	PM					X	95th percentile queue exceeds storage length, movement operates at LOS F		
			Right	PM					X	95th percentile queue exceeds storage length, movement operates at LOS F	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
		EB	Through/Right	PM	X				X	95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
		SB	Left	PM					X	95th percentile queue exceeds storage length, movement operates at LOS F	No	Mitigation at CSAH 81 (W Broadway Ave) / CSAH 152 (N Washington Ave) is expected to have a positive impact to this movement (anticipated to operate at LOS D)
Through/Right			PM					X	95th percentile queue exceeds storage length, movement operates at LOS F			
WB		Through/Right	PM				X		X	95th percentile queue exceeds storage length, movement operates at LOS F		



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Intersection	Appr	Movement	Peak Period	Scenario(s) with Queuing Issue						Reasoning for Queuing Issue (In Build Conditions)	Mitigation Proposed?		
				2023		2050							
				Existing Conditions	AM Existing + Freight Event	No Build	AM No Build + Freight Event	Build	AM Build + Freight Event				
N Lyndale Ave / N Plymouth Ave	NB	Left	PM					X		95th percentile queue exceeds storage length, movement operates at LOS F	Yes	Provide right turn lane at this approach	
		Through/Right	PM					X		95th percentile queue exceeds storage length, movement operates at LOS F			
	EB	Through	AM				X						
			PM				X		X		95th percentile queue exceeds storage length, movement operates at LOS E	No	Already an issue under No Build conditions
		Right	AM				X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM				X		X		95th percentile queue exceeds storage length	No	Already an issue under No Build conditions
		SB	Left	AM						X		95th percentile queue length exceeds storage length and intersection operates at LOS E	Yes
	PM								X		95th percentile queue exceeds storage length, movement operates at LOS F		
	Through		AM						X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM				X		X		95th percentile queue exceeds storage length, movement operates at LOS F	No	Already an issue under No Build conditions
	Right		AM						X		95th percentile queue exceeds storage length	No	Movement operates at LOS D or better
			PM				X		X		95th percentile queue exceeds storage length, movement operates at LOS F	No	Already an issue under No Build conditions
	WB	Left	AM				X		X		95th percentile queue length exceeds storage length and intersection operates at LOS F	Yes	Implement protected-permissive left phase
			PM						X		95th percentile queue exceeds storage length, movement operates at LOS E		

Intersection	Appr	Movement	Peak Period	Scenario(s) with Queuing Issue						Reasoning for Queuing Issue (In Build Conditions)	Mitigation Proposed?	
				2023		2050						
				Existing Conditions	AM Existing + Freight Event	No Build	AM No Build + Freight Event	Build	AM Build + Freight Event			
CSAH 152 (N Washington Ave) / N Plymouth Ave	NB	Left	PM					X		95th percentile queue exceeds storage length, movement operates at LOS F	No	Already an issue under No Build conditions; overall intersection operates at LOS E under 2050 No Build and 2050 Mitigated Build conditions; eastbound approach delay improves compared to 2050 No Build conditions
		Through/Right	PM	X		X						
	EB	Left	AM			X						
		Through	PM			X		X		95th percentile queue exceeds storage length, movement operates at LOS F	Yes	Implement protected-permissive left phase
			AM	X		X		X		95th percentile queue exceeds storage length, movement operates at LOS F		
		Right	PM	X		X		X		95th percentile queue exceeds storage length, movement operates at LOS F		
			AM			X		X		95th percentile queue exceeds storage length, movement operates at LOS F		
		PM					X		95th percentile queue exceeds storage length, movement operates at LOS F			
	SB	Left	AM			X		X		95th percentile queue exceeds storage length, movement operates at LOS F	No	Already an issue under No Build conditions; overall intersection delay expected to improve from 2050 No Build conditions; queuing issue not expected to have significant impact on upstream study intersection of CSAH 152 (N Washington Ave) / N 15th Ave (operates at LOS A in 2050 Mitigated Build Conditions)
		Through	AM			X						
		Right	AM			X						
	WB	Left	AM	X		X		X		95th percentile queue exceeds storage length, movement operates at LOS E	No	Average delay of movement is within 2 seconds of LOS D/E threshold; queuing issue anticipated in No Build conditions with movement expected to operate at LOS F
		Through	AM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM	X		X		X				

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Intersection	Appr	Movement	Peak Period	Scenario(s) with Queuing Issue						Reasoning for Queuing Issue (In Build Conditions)	Mitigation Proposed?	
				2023		2050						
				Existing Conditions	AM Existing + Freight Event	No Build	AM No Build + Freight Event	Build	AM Build + Freight Event			
N 7th St / Oak Lake Ave N	NB	Left/Through	AM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM	X		X		X		95th percentile queue exceeds storage length, movement operates at LOS E	No	Already an issue under Existing and No Build conditions
		Right	AM	X		X						
			PM	X		X		X		95th percentile queue exceeds storage length	No	Movement operates at LOS D or better
	EB	Left	AM			X		X		95th percentile queue exceeds storage length, movement operates at LOS E	No	Already an issue under No Build conditions with overall intersection operating at LOS E
		Through	AM			X		X		95th percentile queue exceeds storage length, movement operates at LOS E	No	Already an issue under No Build conditions with overall intersection operating at LOS E
		Right	AM			X		X		95th percentile queue exceeds storage length, movement operates at LOS E		
	SB	Left	AM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
		Through/Right	AM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
			PM	X		X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length
	WB	Through/Right	PM			X		X		95th percentile queue exceeds storage length	No	Queuing issue is already anticipated to develop under the 2050 No Build conditions with the movement delay improving during the 2050 Mitigated Build conditions

Intersection	Appr	Movement	Peak Period	Scenario(s) with Queuing Issue						Reasoning for Queuing Issue (In Build Conditions)	Mitigation Proposed?			
				2023		2050								
				Existing Conditions	AM Existing + Freight Event	No Build	AM No Build + Freight Event	Build	AM Build + Freight Event					
TH 55 (Olson Memorial Hwy) / N 7th St / N 6th Ave	NB	Left	AM					X		95th percentile queue exceeds storage length, movement operates at LOS F	No	Approach delays anticipated to be similar or better compared to 2050 No Build conditions		
			PM					X		95th percentile queue exceeds storage length, movement operates at LOS F				
		Through/Right	PM			X		X		95th percentile queue exceeds storage length, movement operates at LOS F				
	EB	Through	AM			X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length		
			PM					X		95th percentile queue exceeds storage length, movement operates at LOS E	Yes	Implement eastbound right overlap phase		
		Right	AM			X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length		
			PM			X		X		95th percentile queue exceeds storage length	No	Queuing issue was due to distance to upstream intersection being less than 400 ft, movement operates at LOS D or better, and average back of queue does not exceed storage length		
		SB	Left	AM	X		X		X		95th percentile queue exceeds storage length, movement operates at LOS E	No	Mitigations in adjacent or nearby intersections are expected to have a positive impact to the operation of the overall intersection improving from LOS E under Base Build conditions to LOS D under Mitigated Build conditions	
				PM					X		95th percentile queue exceeds storage length, movement operates at LOS E			
	Through		AM	X		X		X		95th percentile queue exceeds storage length				
			PM			X		X		95th percentile queue exceeds storage length				
	Right	AM	X		X		X		95th percentile queue exceeds storage length					
		PM			X		X		95th percentile queue exceeds storage length					
	WB	Left	AM			X		X		95th percentile queue exceeds storage length, movement operates at LOS F	Yes			Implement protected-permissive left phase
			PM					X		95th percentile queue exceeds storage length, movement operates at LOS F				
		Right	PM			X								



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Intersection	Appr	Movement	Peak Period	Scenario(s) with Queuing Issue						Reasoning for Queuing Issue (In Build Conditions)	Mitigation Proposed?	
				2023		2050						
				Existing Conditions	AM Existing + Freight Event	No Build	AM No Build + Freight Event	Build	AM Build + Freight Event			
CSAH 152 (N Washington Ave) / N 6th Ave	NB	-										
	EB	Left	PM					X		95th percentile queue exceeds storage length, movement operates at LOS E	No	
		Through	PM					X		95th percentile queue exceeds storage length, movement operates at LOS E		
		Right	AM					X		95th percentile queue exceeds storage length	No	
			PM					X		95th percentile queue exceeds storage length	No	
	SB	Through	AM	X		X		X		95th percentile queue exceeds storage length	No	
			PM			X		X				
	WB	-										
	N 5th Ave / N 3rd St	NB	-									
		EB	-									
SB		-										
WB		-										
WB		-										
CSAH 152 (N Washington Ave) / N 5th Ave	NB	Through/Right	PM					X		95th percentile queue exceeds storage length	No	
	EB	-										
	SB	Through/Right	AM	X		X		X		95th percentile queue exceeds storage length	No	
			PM	X		X		X		95th percentile queue exceeds storage length	No	
	WB	Left	PM					X		95th percentile queue exceeds storage length, movement operates at LOS E	No	
		Through/Right	PM					X		95th percentile queue exceeds storage length	No	
N 5th Ave / N 2nd St	NB	-										
	EB	-										
	SB	-										
	WB	-										

Analysis Notes:

For the purposes of defining queuing issues, a queue within 25 feet of the noted storage length is considered to be exceeding storage length to account for variability in measurements.