

# 12<sup>th</sup> Avenue South Corridor Study River Drive to Main Avenue SE

MAY 2019

**METROCOG**  
FM REGIONAL TRANSPORTATION PLANNING ORGANIZATION



**Apex**  
Engineering Group

# Final Report



# 12<sup>th</sup> Avenue South Corridor Study

River Drive to Main Avenue SE  
Moorhead, Minnesota

## Final Report

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# EXECUTIVE SUMMARY

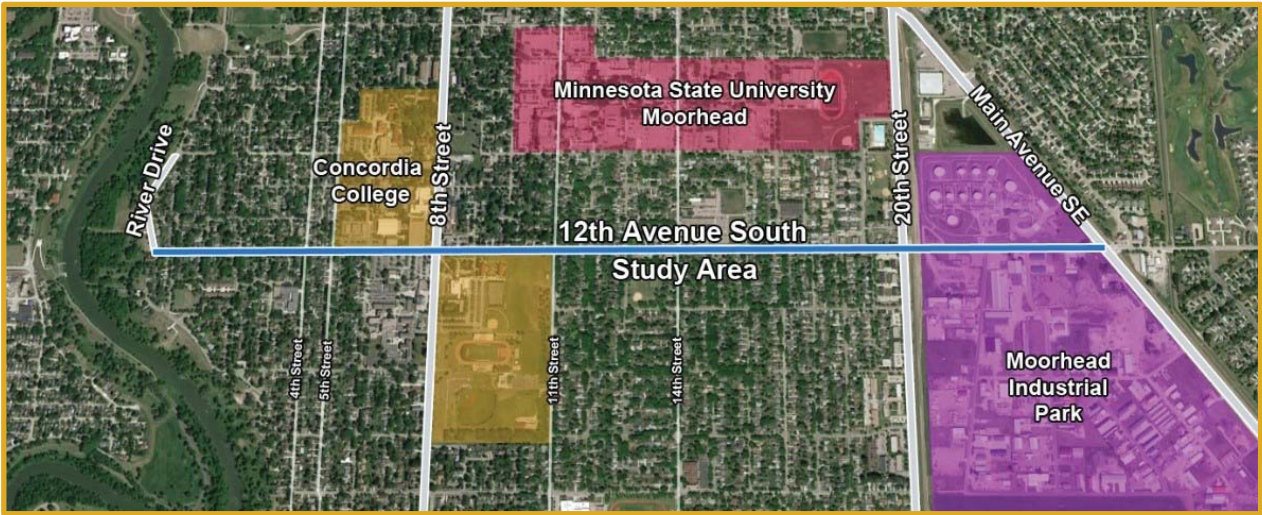
## Introduction

The 2014 Fargo-Moorhead Metropolitan Transportation Plan (MTP) identifies the 12<sup>th</sup> Avenue South corridor for a mid-term (2021-2030) Preservation and Rehabilitation project. The City of Moorhead currently has a project programmed for 2020 to construct improvements on 12<sup>th</sup> Avenue South.

The purpose of this study is to:

- Consider a context-sensitive approach that considers the needs of all transportation system users
- Evaluate the current and future needs along the corridor
- Encourage input from the general public and 12<sup>th</sup> Avenue South community through several outreach methods
- Identify short-term and long-range improvements that should be considered for future implementation
- Provide a framework for future project implementation and informed decision-making by City leaders

Different land uses exist along the corridor including residential, institutional, industrial and mixed-use. BNSF has five railroad tracks that cross the corridor just east of 20<sup>th</sup> Street.



An intersecting study is currently being conducted on US 10/75 which intersects the 12<sup>th</sup> Avenue South study corridor at the 8<sup>th</sup> Street (US 75) intersection. The teams for both studies have coordinated their efforts at the 8<sup>th</sup> Street (US 75) intersection. The 12<sup>th</sup> Avenue South study is using Year 2040 for future traffic volume development, while the US 10/75 study is using Year 2045. However, the intent is for the proposed improvements at the 8<sup>th</sup> Street intersection to be supported by both studies. The US 10/75 study will refer to this 12<sup>th</sup> Avenue South study regarding the recommended alternative improvements at 8<sup>th</sup> Street.

## Summary of Public Involvement

**Study Review Committee (SRC):** An SRC was formed to assist in the guidance and direction of this study. The SRC consisted of members from Metro COG, City of Moorhead, Concordia College, MATBUS, and Apex Engineering Group and its subconsultants.

**Public Participation Plan (PPP):** The study team developed a PPP document to guide the public engagement strategies for the 12<sup>th</sup> Avenue South study. The PPP identified the key stakeholders and outlined the various engagement tactics that would be used during the study.

**Public Input Meetings:** Two public input meetings (PIM) were held during the study:

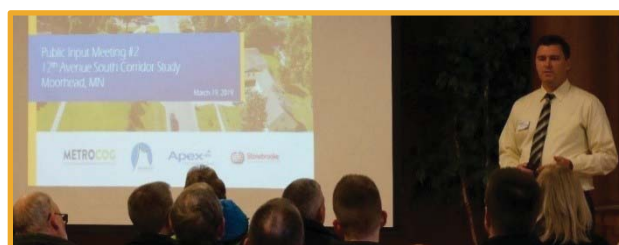
- PIM #1 in September 2018 (26 attendees)
- PIM #2 in March 2019 (40 attendees)

Each meeting utilized an open house format with informational handouts and displayed exhibits, as well as a formal presentation. The public meetings were held on the campus of Concordia College, in the Birkeland Lounge at Offutt Concourse.



**Online Surveys:** Two online surveys were made available to the public during the study. The surveys were accessible from weblinks on both the Metro COG and City websites.

- Online Survey #1 was available from July 3 – October 18, 2018. 172 responses were received. The most common corridor issues and needs identified by respondents were:
  - Pavement Condition
  - Pedestrian/Bicycle Connectivity and Safety
  - Railroad Crossing Improvement at 20<sup>th</sup> Street
  - Transit Facilities (benches, shelters)
  - Trees and Streetscaping
- Online Survey #2 was available from March 20 – April 22, 2019, and provided an opportunity to comment on and rank the proposed improvement alternatives. 26 responses were received:
  - River Drive to 8<sup>th</sup> Street – support for pedestrian/bicycle improvements, respondents slightly favored the shared thru-left at 8<sup>th</sup> Street vs. widening for a short right turn lane.
  - 8<sup>th</sup> Street to 20<sup>th</sup> Street – support for preserving trees over losing parking (on street bike lanes vs. widening sidewalk to create a path). Support for a future grade raise at 20<sup>th</sup> Street to improve the BNSF RR track crossing.
  - 20<sup>th</sup> Street to Main Avenue SE – support for adding off-street path.
  - Corridor-wide streetscaping opportunities – respondents generally supported these.



## Existing Conditions

- Traffic Conditions:
  - No corridor capacity issues were identified with the current two-lane and three-lane sections.
  - During AM and PM peak hours, all intersections currently operate at Level of Service (LOS) C or better, meaning that intersection delay is acceptable or better. The EB movement at 8<sup>th</sup> Street does have a slightly higher delay.
  - No queuing or traffic-backup issues were identified.
  - Crash data from 2011-2015 was reviewed, and none of the corridor intersections were above critical crash rates.
- Pavement condition: generally in average to below-average condition.
- Parking and Access: Many different parking conditions are present along the corridor, and there are many private access points due to the high number of residential areas.
- Sidewalks and Paths: There are no sidewalk or path facilities from 2<sup>nd</sup> Street to 6<sup>th</sup> Street (north side), from 9<sup>th</sup> Street to 11<sup>th</sup> Street (south side), and from 20<sup>th</sup> Street to Main Avenue SE (both sides).
- Utilities: Overhead power lines operated by Moorhead Public Service (MPS) run along the north side.
- Transit: MATBUS operates three routes along the corridor.
- Trees: 188 trees of varying species line corridor boulevards, including the “Crazy Tree” near 11<sup>th</sup> Street.

## Future 2040 No Build Conditions

If no improvements were made to the corridor, under projected 2040 traffic conditions the following occurs:

- The existing two-lane and three-lane roadway sections are adequate to handle future corridor traffic.
- During 2040 AM peak hour, all intersections currently operate at Level of Service (LOS) C or better, meaning that intersection delay is acceptable or better.
- During 2040 PM peak hour, 8<sup>th</sup> Street operates at LOS D (below acceptable), with the eastbound movement failing at LOS F. All other intersections operate at LOS C (acceptable) or better.
- No queuing or traffic-backup issues were identified with 2040 AM peak hour. The 8<sup>th</sup> Street eastbound thru and left turn movements do have queuing (backup) issues in the 2040 PM peak hour.



## Issue Identification and Needs Assessment

Issues and needs that were identified through SRC discussion and public input include:

### Traffic Operations and Roadway Geometrics:

- Increased future delay and queuing for eastbound traffic at 8<sup>th</sup> Street.
- A 10-foot offset shift across the intersection for eastbound traffic at 11<sup>th</sup> Street.
- At 20<sup>th</sup> Street, 3-foot vertical grade change between the intersection and the BNSF RR tracks. This grade change combined with steep cross slopes can create unsafe travel conditions. Future potential for a quiet zone should also be accounted for at this location.

### Pedestrian and Bicycle Mobility

- Survey respondents identified the need to complete gaps in sidewalk facilities and create continuous sidewalk and/or a continuous shared use path through the corridor.
- Better connectivity for bicycle facilities with the surrounding path network (either on-street or off-street).
- An ADA-compliant sidewalk crossing of the BNSF RR tracks at 20<sup>th</sup> Street.
- Upgrading curb ramps to current ADA standards.

### Transit Facilities

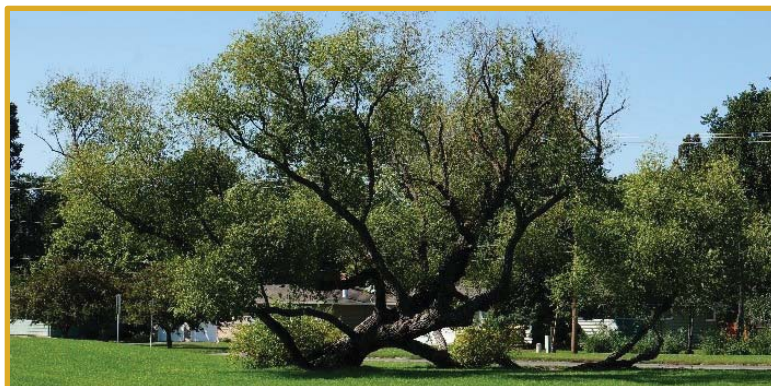
- Ensure proper access and mobility at MATBUS stops, particularly highly used stops at 19½ Street and 25<sup>th</sup> Street.

### Parking and Access Management

- Consolidate or eliminate private access points where possible.
- Review on-street parking usage and consider alternate uses for low-usage locations. Survey respondents indicated a preference for less on-street parking.

### Streetscaping and Trees

- Consider opportunities to incorporate decorative street paving and street art into the corridor, particularly through the Concordia College campus.
- Preserve boulevard trees to the extent possible.
- Take special care to avoid impacts to the “Crazy Tree” at the 11<sup>th</sup> Street intersection, which is considered a local landmark.
- Consider burying the overhead power lines to eliminate conflicts between trees and power lines.



## Study Recommendations

Based on input and analysis by the SRC along with public input and feedback, the following improvement alternatives are recommended for future implementation. Most of the recommendations are expected to be implemented with a planned project scheduled for 2020. Some improvements are identified as “long-range” as they will require a longer project development process and/or additional funding. Further environmental documentation or study may be required depending on the funding sources used by the City of Moorhead for future projects.

### Bicycle, Pedestrian, and Transit Route Improvements

- Install shared-lane markings “sharrows” from River Drive to 5<sup>th</sup> Street.
- Install a shared-use path on the south side of 12<sup>th</sup> Avenue S from 5<sup>th</sup> Street to 11<sup>th</sup> Street.
- Shift south curb to the north between 20<sup>th</sup> Street and Main Avenue SE to create a boulevard wide enough to install a shared-use path along the south side.
- Install on-street dedicated bike lanes on the north and south side of 12<sup>th</sup> Avenue South between 11<sup>th</sup> Street and 19 ½ Street.
- Install a crosswalk at 19 ½ Street.
- Install a concrete pad and waiting area with bench at the MATBUS stop west of 25<sup>th</sup> Street.
- Install pedestrian/bicycle crossing on east side of 20<sup>th</sup> Street at BNSF Railroad tracks.
- Improve curb ramps throughout the corridor to meet current ADA guidelines.

### Parking and Access Management

- Close parking lot driveways on 12<sup>th</sup> Avenue South:
  - North side directly east of 5<sup>th</sup> Street, and directly east of 8<sup>th</sup> Street.
  - South side directly west of 8<sup>th</sup> Street, directly west of 23<sup>rd</sup> Street, and directly west of 25<sup>th</sup> Street.
  - South side directly east of 23<sup>rd</sup> Street.
- Shift parking pullout on north side of 12<sup>th</sup> Avenue South near 7<sup>th</sup> Street further west.
- Remove parking area on south side of 12<sup>th</sup> Avenue South directly east of 9<sup>th</sup> Street.
- Shift parking lot driveway on south side of 12<sup>th</sup> Avenue South directly east of the BNSF RR tracks further east, away from the RR tracks.
- Install curb bump-outs around the southeast and southwest corners of the 6<sup>th</sup> Street and 7<sup>th</sup> Street intersections, to keep parking away from intersections and to shorten pedestrian crossing distances.
- Paint curb near access points to deter parking in the access line of sight.

### Roadway Geometrics and Traffic Operations

- Reassign eastbound lanes at 8<sup>th</sup> Street intersection with a shared thru/left turn lane and a designated right turn lane, to reduce delay (*this is supported as a long-range improvement*).
- Realign 11<sup>th</sup> Street intersection to eliminate horizontal offset and align the curb lines.
- Construct a grade raise at the 20<sup>th</sup> Street intersection by adjusting the cross-slope on the east half of the intersection to improve the vertical profile of 12<sup>th</sup> Avenue S at the BNSF RR tracks (*this is supported as a long-range improvement*).

### Streetscaping and Trees

- Incorporate improvements throughout the corridor as roadway improvements are implemented.
- Bury overhead power lines (*this is supported as a long-range improvement*).

## Estimated Costs for Recommended Improvements

Some of the recommended improvements were determined to be already included in the base cost for the 2020 programmed mill, overlay, and pavement rehab project. These improvements are shown in the first table. The second and third tables summarize the estimated costs for recommended short-range and long-range improvements. All costs are in 2019 dollars.

12th Avenue South Recommended Improvement Already Included in 2020 Base Project Mill & Overlay from 5 <sup>th</sup> St to 20 <sup>th</sup> St; Pavement Rehab from 20 <sup>th</sup> St to Main Ave SE	
Alternative	Estimated Cost
<b>Costs Already Included in 2020 Base Project for:</b>	
2B2 - On-Street Bike Lanes from 11th St to 19½ St	
2C - Crosswalk at 19 ½	
3C - Bus Stop Concrete Pad and Bench at 25th St	
4A - Corridor-Wide Sidewalk ADA Upgrades	
3D - Access Removal and Relocation from 20th to 25 <sup>th</sup> St	
4B - Corridor-Wide Curb Painting to Restrict Parking	
<b>Base Project Total (programmed in City CIP)</b>	<b>\$3,500,000</b>

12th Avenue South Short-Range Improvement Estimated Costs River Drive to Main Avenue SE	
Alternative	Estimated Cost
<b>Bicycle, Pedestrian, and Transit Improvements</b>	
1A2 - Sharrows and Shared-Use Path from River Dr to 8th	\$90,000
2A - Shared-Use Path from 9th to 11th	\$110,000
3A - RR PED Crossing East of 20th	\$450,000
3B - 10' Shared Use Path from 20th to Main Ave SE	\$250,000
<i>Subtotal</i>	<i>\$900,000</i>
<b>Parking and Access Management</b>	
1C - Access and Parking Area Removal & Realignment from 5th to 8th	\$50,000
1D - Curb Bump Outs at 6th and 7th	\$75,000
2D - Access and Parking Area Removal & Realignment from 8th to 10th	\$45,000
<i>Subtotal</i>	<i>\$170,000</i>
<b>Roadway Geometrics and Traffic Operations</b>	
1E1 - Short-Term Changes at SE Corner 8 <sup>th</sup> Street for Future Lane Reassignment	\$110,000
2E - Realign 11th St Intersection	\$150,000
<i>Subtotal</i>	<i>\$260,000</i>
<b>Streetscaping Improvements</b>	
4C - Corridor-Wide Landscaping/Streetscaping Improvements <i>Subtotal</i>	<i>\$415,000</i>
<b>Short Range Total</b>	<b>\$1,745,000</b>

<b>12th Avenue South Long-Range Improvement Estimated Costs River Drive to Main Avenue SE</b>	
<i>Alternative</i>	<i>Estimated Cost</i>
<b>1E1</b> – Long-Range Lane Reassignment and Re-Striping at 8 <sup>th</sup> St	\$75,000
<b>2F</b> - 20th St Intersection Grade Raise	\$1,250,000
<b>4D</b> - Bury Overhead Power Lines	\$1,350,000
<b>Long Range Total</b>	<b>\$2,675,000</b>





# 1.0 INTRODUCTION

## 1.1 Study Background

The Fargo-Moorhead Metropolitan Council of Governments (Metro COG) and the City of Moorhead (City) commissioned a study of the 12<sup>th</sup> Avenue South corridor between River Drive and Main Avenue SE in Moorhead. The 2014 Fargo-Moorhead Metropolitan Transportation Plan (MTP) classifies 12<sup>th</sup> Avenue South in Moorhead as a major collector west of 8<sup>th</sup> Street, and as a minor arterial east of 8<sup>th</sup> Street. The 2014 MTP also identifies this corridor for a mid-term (2021-2030) Preservation and Rehabilitation project. The City of Moorhead currently has a project programmed for 2020 to construct improvements on 12<sup>th</sup> Avenue South.

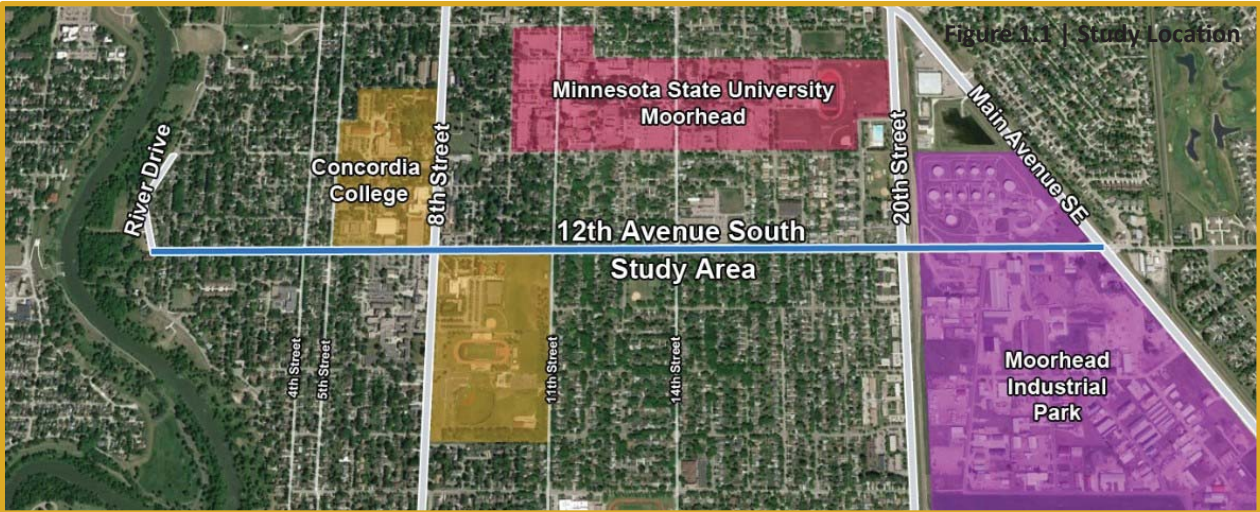
The purpose of this study is to:

- Consider a context-sensitive approach that consider the needs of all transportation system users
- Evaluate the current and future needs along the corridor
- Encourage input from the general public and 12<sup>th</sup> Avenue South community through several outreach methods
- Identify short-term and long-range improvements that should be considered for future implementation
- Provide a framework for future project implementation and informed decision-making by City leaders

## 1.2 Study Location

12<sup>th</sup> Avenue South is a 2-lane undivided roadway that runs east-west with a speed limit of 30 mph throughout the corridor (see Figure 1.1). The corridor has areas of on-street parking and on-street bike lanes. Different land uses exist along the corridor including residential, institutional, industrial and mixed-use. BNSF has five railroad tracks that cross the corridor just east of 20<sup>th</sup> Street. Key intersections along the corridor include:

- 4th Street
- 5th Street
- 8th Street (US 75)
- 11th Street
- 14th Street
- 20th Street
- Main Avenue SE



## 1.0 INTRODUCTION

12<sup>th</sup> Avenue South – West of 11<sup>th</sup> Street



12<sup>th</sup> Avenue South – East of 11<sup>th</sup> Street



Railroad Crossing at 20<sup>th</sup> Street



12<sup>th</sup> Avenue South  
Industrial Area East of 20<sup>th</sup> Street



## 1.3 Intersecting Study: US 10/75 Corridor Study

Metro COG, the City of Moorhead, and the Minnesota Department of Transportation (MnDOT) are conducting a corridor study on US 10/75 which intersects the 12<sup>th</sup> Avenue South study corridor at the 8<sup>th</sup> Street (US 75) intersection. The US 10/75 study started approximately three months after the start of the 12<sup>th</sup> Avenue South study, and as of this writing (May 2019) is still ongoing. The teams for both studies have coordinated their efforts at the 8<sup>th</sup> Street (US 75) intersection, particularly regarding the future traffic projection and analysis methodologies. The 12<sup>th</sup> Avenue South study is using Year 2040 for future traffic volume development, while the US 10/75 study is using Year 2045. However, the intent is for the proposed improvements at the 8<sup>th</sup> Street intersection to be supported by both studies. Preliminary analysis on the US 10/75 study does support the recommended alternative improvements at 8<sup>th</sup> Street from this study.

8<sup>th</sup> Street Intersection



## 2.0 SUMMARY OF PUBLIC INVOLVEMENT

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### 2.1 Study Review Committee Meetings

A Study Review Committee (SRC) was formed at the beginning of the Study process to provide general guidance on the direction of the study, to assist in identifying issues and reviewing alternatives, to evaluate information prior to public viewing, and to relay information back to other members of their respective agency.

A total of four in-person meetings and one conference call were held with the SRC during the study. In addition, a streetscaping and art meeting was held in December 2018 which was not an official SRC Meeting, but did have several members of the SRC in attendance.

- ➔ **SRC Meeting #1: May 16, 2018** | Kickoff meeting including study team introductions and initial discussions on issues, needs, traffic analysis process, and the public engagement plan.
- ➔ **SRC Conference Call: August 20, 2018** | The SRC reviewed and discussed comments on Draft Tech Memo #1 (Existing Conditions), confirmed the future traffic projection methodology, discussed the online survey, and reviewed the plan for the upcoming Public Meeting #1.
- ➔ **SRC Meeting #2: October 18, 2018** | The SRC debriefed on Public Meeting #1 and reviewed public comments received both at the meeting and through the online survey. Issue identification and needs were verified from the public input, and a discussion was held on alternative development.
- ➔ **Streetscape and Art Meeting: December 17, 2018** | This meeting was held to review concepts and ideas for streetscaping and street art near Concordia College.
- ➔ **SRC Meeting #3: March 8, 2019** | The SRC reviewed and discussed comments on Draft Tech Memo #3 (Alternative Development and Evaluation), summarized the coordination that was ongoing with the intersecting study on the US 10/75 corridor, and reviewed the plan for the upcoming Public Meeting #2.
- ➔ **SRC Meeting #4: April 30, 2019** | The SRC reviewed and discussed comments on the Draft Corridor Study Report and finalized arrangements for presentations to boards and councils to obtain approval for the final study report.

The SRC included participation from the following agencies and individuals:

#### **Metro COG**

Adam Altenburg

#### **City of Moorhead**

Kristie Leshovsky  
Jonathan Atkins  
Tom Trowbridge  
Steve Moore

#### **MATBUS**

Lori Van Beek

#### **Concordia College**

Roger Olson

#### **Apex Engineering Group**

Matt Kinsella  
Brent Muscha

#### **Stonebrooke Engineering**

Kate Miner

#### **Flint Group**

Chris Hagen

#### **Hanson Design Associates**

Jim Hanson

### 2.2 Public Participation Plan

The study team developed a Public Participation Plan (PPP) document to guide the public engagement strategies for the 12<sup>th</sup> Avenue South study. A copy of the full PPP document can be found in **Appendix A**.

The PPP identified the key stakeholders and outlined the various engagement tactics that would be used during the study.

### 2.3 Public Input Meetings

Two public input meetings were held during the study – one midway through the study and one near the end of the study. Each meeting utilized an open house format with informational handouts and displayed exhibits, as well as a formal presentation. The public meetings were held on the campus of Concordia College, in the Birkeland Lounge at Offutt Concourse. Advertising and notification tactics included:

- Posts on Metro COG and the City’s websites
- Boost posts on Facebook and on Metro COG and City social media channels
- Posts to Nextdoor neighborhood social network app
- Mailed notices from the City to properties adjoining the corridor
- Print ad in the Clay County Extra newspaper
- Shareable emails and alerts were provided to partners such as Concordia College, Minnesota State University Moorhead (MSUM), MATBUS, MState, Eventide, Moorhead Business Association, Downtown Moorhead, Inc., Clay County Board of Commissioners, Mayor and City Council and numerous city boards and commissions.
- Moorhead Community Access Media (MCAM) also aired an advertisement on community access television

#### ↳ *Public Input Meeting #1 – September 20, 2018*

At the first meeting, the Existing Conditions and Future Conditions traffic analyses were presented. The goal was to hear from the public regarding what they viewed as the key issues and needs along the corridor. Approximately 26 members of the public attended the meeting. Meeting materials and a transcript of comments received during and after the meeting can be found in **Appendix B**.

#### ↳ *Public Input Meeting #2 – March 19, 2019*

At the second meeting, the study issues and needs and proposed alternatives were presented. The results of the online survey were also summarized. The goal was to reflect back what the study team heard during the first round of comment and feedback, and to receive feedback on whether the proposed alternatives were in alignment with the public sentiment. Approximately 40 members of the public attended the meeting. Meeting materials and a transcript of comments received during and after the meeting can be found in **Appendix B**.



## 2.4 Online Surveys

Two online surveys were available to the public during the course of the study. The surveys were hosted on the SurveyMonkey platform and were accessible from weblinks on both the Metro COG and City of Moorhead websites.

### ↳ *Online Survey #1*

Online Survey #1 was available from July 3 – October 18, 2018, coinciding with the Issue Identification phase of the study. 172 survey responses were received. The survey consisted of 10 general questions about how the respondent used 12<sup>th</sup> Avenue South, what they saw as the key issues on the corridor, and what type of improvements they would be in favor of.

With that many responses being received, the comments received spanned across a large category of issues and needs. Overall, the most common topics commented on by respondents were:

- Pavement Condition
- Pedestrian/Bicycle Connectivity and Safety
- Railroad Crossing Improvement at 20<sup>th</sup> Street
- Transit Facilities (benches, shelters)
- Trees and Streetscaping

A complete summary of the survey questions and responses can be found in **Appendix C**.

### ↳ *Online Survey #2*

Online Survey #2 was available from March 20 – April 22, 2019, coinciding with the Alternative Development and Evaluation phase of the study. 26 survey responses were received. The survey consisted of 16 questions asking the respondent to rate the various proposed improvement alternatives on a scale of one to five stars. A complete summary of the survey questions and responses can be found in **Appendix C**.





## 3.0 EXISTING CONDITIONS

### 3.1 Traffic Operations

This section is intended to summarize the description of data collection, methodologies for modeling the corridor, as well as operational, queuing, and safety analysis for the Existing Conditions. The following nine intersections were identified and evaluated along the corridor:

1. Elm Street
2. 4<sup>th</sup> Street South
3. 5<sup>th</sup> Street South
4. 8<sup>th</sup> Street South
5. 11<sup>th</sup> Street South
6. 14<sup>th</sup> Street South
7. 17<sup>th</sup> Street South
8. 20<sup>th</sup> Street South
9. Main Avenue SE

Supporting data for the traffic analysis can be found in **Appendix D**.

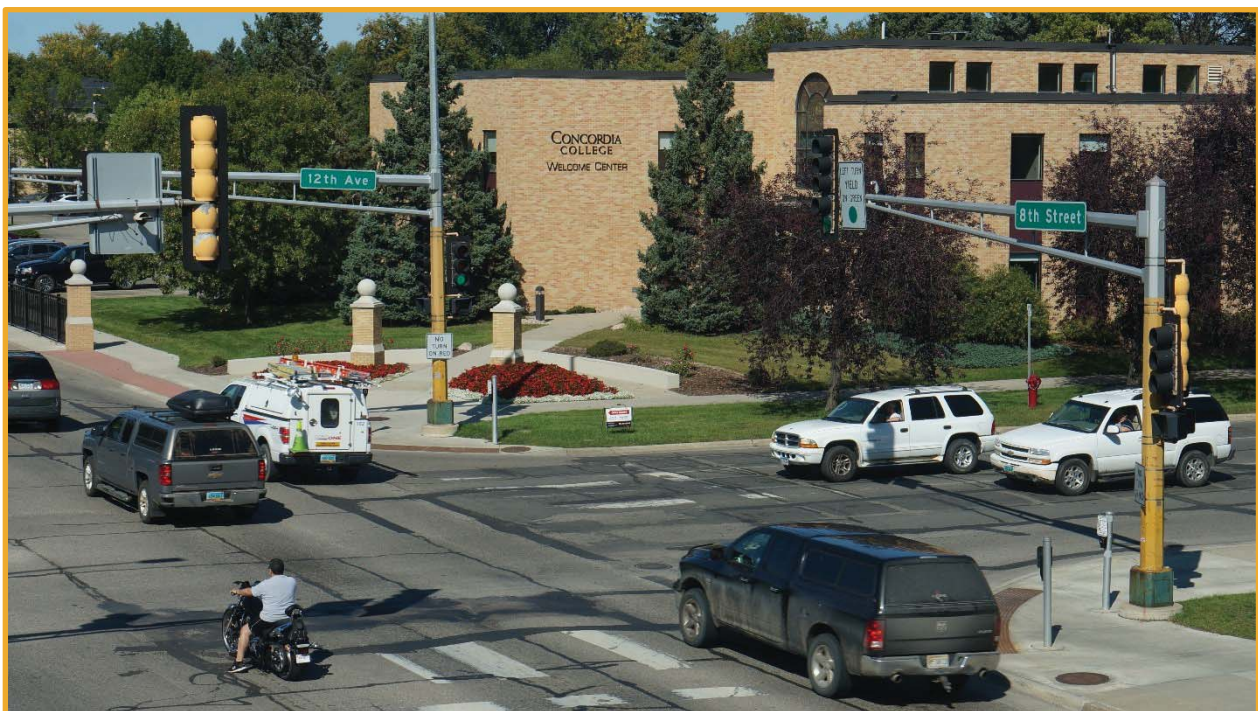
#### 3.1.1 DATA COLLECTION

In an effort to obtain all the data along the 12<sup>th</sup> Avenue S corridor necessary for both analyzing existing and proposed conditions, 12-hour turning movement counts for the nine intersections were collected in April 2018. The 2017 Average Annual Daily Traffic (AADT) volumes are required for safety analysis and were collected from MnDOT GIS layers.

**Figure 3.1** displays the existing AM and PM turning movement counts and lane configurations of each intersection along the study corridor.

Crash data was collected for the last full 5-year period for which data was fully available, 2011-2015 from the Minnesota Crash Mapping Analysis Tool (MCMAT) database.

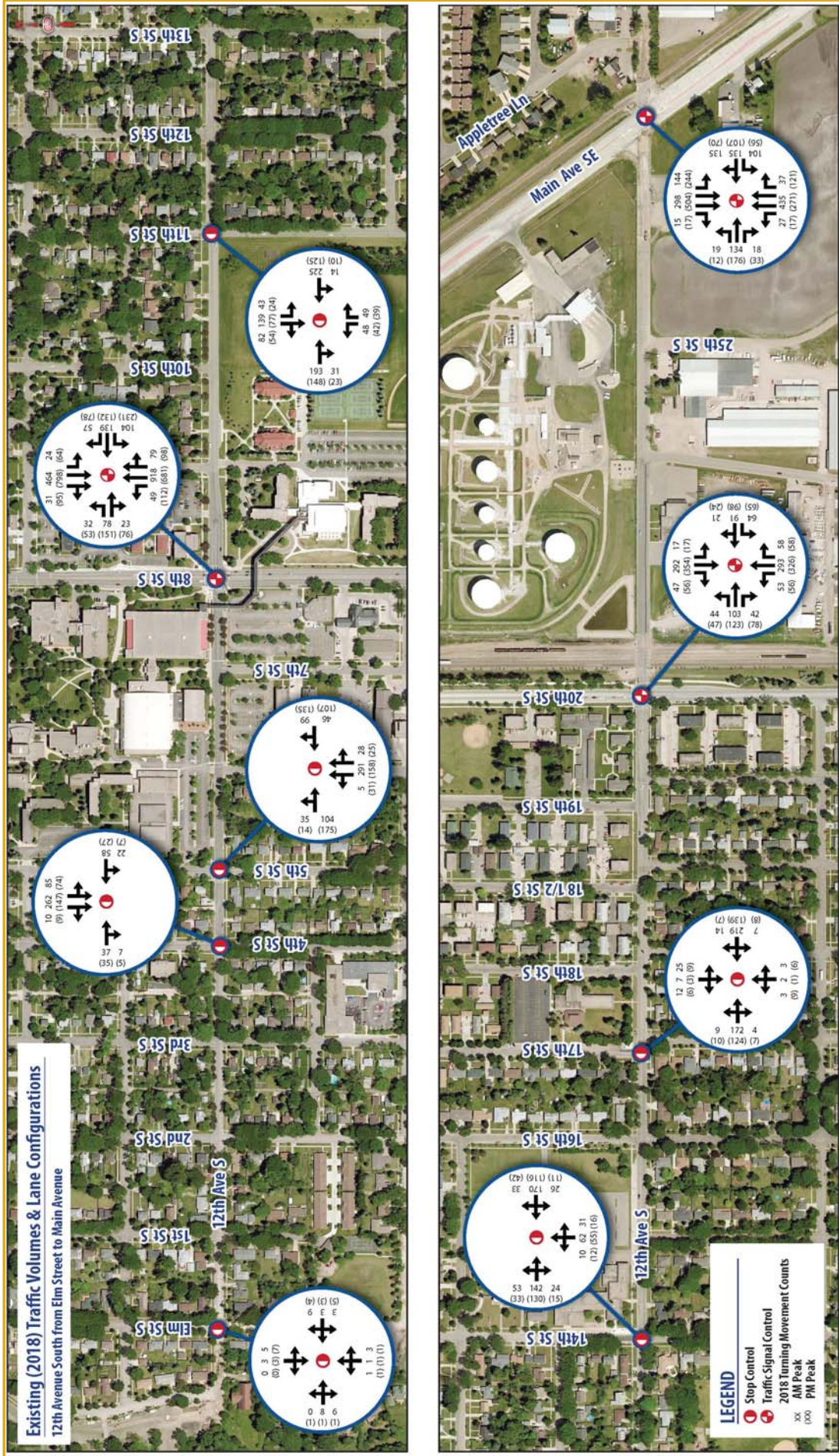
8<sup>th</sup> Street Intersection



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Figure 3.1 | Existing Traffic Volumes



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### 3.1.2 MODEL SET UP

An existing conditions traffic model in Synchro was created, which included in-place geometry such as number of thru lanes and turn lanes, storage lengths for turn lanes, link distances, speed limits, and existing signal timing parameters. Separate files were created for the AM Existing Conditions and PM Existing Conditions, using the turning movement counts collected. Following creation of the models in Synchro, the files were output to SimTraffic for further analysis.

SimTraffic is a microsimulation software package that is the companion to Synchro. SimTraffic uses network seeding and microsimulation to predict and analyze traffic operations. Analysis results are generally based on actual observations of the modeled conditions, not on calculated values based on Highway Capacity Manual (HCM) formulas.

Results of the analysis are displayed as measures of effectiveness (MOE). MOEs establish quantitative information about the performance of an intersection. The primary MOEs that are used in the study are delay, level of service (LOS), and queue lengths.

### 3.1.3 EXISTING CONDITIONS

Existing conditions include operational and queuing analysis of 2018 conditions as represented by the turning movement counts collected in April 2018. Safety analysis includes data from the last full five-year period for which data was available, 2011-2015. The following section includes methodology and results for operational, queuing, and safety analysis.

### 3.1.4 OPERATIONAL AND QUEUING ANALYSIS

The traffic operations analysis is based on methodologies documented in the Highway Capacity manual (HCM). The HCM contains analysis techniques for evaluating the operations of transportation facilities under various conditions, such as roadway and intersection configuration, intersection traffic control, type of roadway, number and type of lanes, impact due to presence of pedestrians, and many other factors.

#### ↳ *Delay and Level of Service*

Operational analysis results are described in terms of Level of Service (LOS) ranging from "A to F" with "A" operating with the least delay and "F" operating with the most delay. LOS is determined based on methodology from the HCM, which defines LOS based on control delay. Control delay is the wait time experienced by vehicles slowing down for a signal, roundabout, or stop sign plus the stop time and the time for a vehicle to speed up and traverse the intersection control into the traffic stream. The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersections on all approaches for a signalized or all-way stop intersection.

Intersection delay and corresponding LOS for signalized and unsignalized all-way stop intersections, as defined by HCM are presented in **Table 3.1**. The LOS delay thresholds for unsignalized intersections are lower than signalized intersections which accounts for the fact that drivers tend to accept longer delays at signals compared to stop or yield signs.

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, the threshold for acceptable level of intersection operations is commonly taken to be the border between LOS D and LOS E. LOS D is considered acceptable and LOS E is considered unacceptable during the peak hour.

**Table 3.1**  
**Intersection Control Delay and Level of Service Definitions**

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

### ↳ *Queuing Analysis*

Queuing at intersections can have serious traffic safety implications if expected queues exceed available storage. For example, if projected queuing for a left turning movement exceeds available storage in the turn lane, the queue can extend into the through lane and cause safety concerns with potential rear end crashes. Excessive queuing can also impede business, other private, or public access to and from the road. Finally, queuing analyses can determine whether queues are expected to dissipate during a signal cycle or on stop condition approaches, which can inform on the potential need for additional through lanes or other improvements.

Queuing values were taken from SimTraffic for average queue length and 95<sup>th</sup> percentile modeled queue length. The following criteria was used to identify “queuing issues” for particularly movements. A queuing issue was identified if any of the three conditions were met at a signalized intersection:

- Condition 1: 95th percentile queue length exceeds storage length and the movements operate at LOS E or LOS F
- Condition 2: Average queue length exceeds storage length
- Condition 3: 95th percentile queue length blocks upstream full access intersection

And at a stop-controlled intersection if the following was met:

- Condition 4: 95th percentile queue length exceeds 500 feet on a stop-controlled approach

### 3.1.5 CAPACITY ANALYSIS

The following subsections include planning level corridor-wide capacity analysis, intersection operations analysis, and queuing analysis.

#### ↳ *Existing Corridor Traffic Demand*

Existing traffic demands were analyzed along 12<sup>th</sup> Avenue S corridor. **Table 3.2** displays planning level capacity analysis using 2015 Average Annual Daily Traffic (AADT) volumes obtained from the Fargo-Moorhead Metropolitan Transportation Plan. The table shows that looking from a planning level only, the corridor is currently well below the planning level thresholds.

**Table 3.2**  
**2015 AADT and Capacity Analysis**

Segment	Existing Roadway Type	AADT		
		Section Capacity <sup>1</sup>	Existing 2015	Additional Capacity 2015 <sup>2</sup>
Elm Street to 4 <sup>th</sup> Street S	Two-Lane Undivided	10,000	3,100	6,900
4 <sup>th</sup> Street S to 5 <sup>th</sup> Street S	Two-Lane Undivided	10,000	3,100	6,900
5 <sup>th</sup> Street S to 8 <sup>th</sup> Street S	Two-Lane Undivided	10,000	5,200	4,800
8 <sup>th</sup> Street S to 11 <sup>th</sup> Street S	Two-Lane Undivided	10,000	7,000	3,000
11 <sup>th</sup> Street S to 14 <sup>th</sup> Street S	Two-Lane Undivided	10,000	5,750	4,250
14 <sup>th</sup> Street S to 17 <sup>th</sup> Street S	Two-Lane Undivided	10,000	4,700	5,300
17 <sup>th</sup> Street S to 20 <sup>th</sup> Street S	Two-Lane Undivided	10,000	3,900	6,100
20 <sup>th</sup> Street S to Main Ave SE	Three-Lane	18,000	4,900	13,100
Main Ave SE to Ridgeway St	Three-Lane	18,000	4,800	13,200

<sup>1</sup> Planning level capacities are highly dependent on assumptions used such as access spacing, peak hour percent, directional distribution, saturation flow rates, etc. Values should not be used for operational analysis or final design.

<sup>2</sup> Positive numbers indicate that additional capacity is available. Negative numbers indicate over capacity

### ➡ Existing Intersection Traffic Operations Analysis Results and Conclusions

**Table 3.3** displays a summary of AM and PM peak hour intersection delay by approach and by intersection, as well as their respective LOS. The reported approach and intersection delay was taken from SimTraffic and is based on the average of five 60 minute simulation runs. Note that intersection LOS is not defined by the HCM for thru-stop control intersections. This is because the minor approaches with relatively low percentages of overall traffic could experience excessive delay, while the mainline could experience little or no delay. The result likely would be low overall intersection delay, which on its face would indicate acceptable operations, when individual stop-controlled movements could be failing.

All intersections currently operate at LOS C or better during AM and PM Peak. During the PM Peak at 8<sup>th</sup> Street S the EB movement is operating at a LOS D with a delay of 38 sec/vehicle.

**Table 3.3**  
**2018 AM and PM Level of Service and Intersection Delay<sup>1</sup>**

Intersection			AM Peak Hour				PM Peak Hour			
Control	Location	Approach	LOS by Approach (Sec/Veh)		LOS by Intersection (Sec/Veh)		LOS by Approach (Sec/Veh)		LOS by Intersection (Sec/Veh)	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Thru-stop	Elm Street	NB	3	A	2	N/A <sup>2</sup>	4	A	2	N/A <sup>2</sup>
		WB	2	A			2	A		
		SB	4	A			4	A		
		EB	0	A			0	A		
All-way	4th Street S	NB	-	-	7	A	-	-	5	A
		WB	7	A			3	A		
		SB	7	A			6	A		
		EB	6	A			6	A		
All-way	5th Street S	NB	6	A	6	A	6	A	6	A
		WB	4	A			5	A		
		SB	-	-			-	-		
		EB	7	A			7	A		
Signalized	8th Street S	NB	16	B	15	B	25	C	26	C
		WB	16	B			24	C		
		SB	11	B			24	C		
		EB	21	C			38	D		
All-way	11th Street S	NB	4	A	8	A	4	A	6	A
		WB	9	A			8	A		
		SB	7	A			6	A		
		EB	8	A			5	A		
All-way	14th Street S	NB	5	A	7	A	6	A	6	A
		WB	7	A			6	A		
		SB	-	-			-	-		
		EB	6	A			7	A		
Thru-Stop	17th Street S	NB	4	A	2	N/A <sup>2</sup>	4	A	2	N/A <sup>2</sup>
		WB	2	A			2	A		
		SB	6	A			5	A		
		EB	2	A			2	A		
Signalized	20th Street S	NB	10	A	13	B	10	B	14	B
		WB	19	B			21	C		
		SB	12	B			13	B		
		EB	14	B			15	B		
Signalized	Main	NB	16	B	15	B	13	B	13	B
		WB	16	B			15	B		
		SB	11	B			10	B		
		EB	24	C			23	C		

<sup>1</sup> Delay for all movements taken from SimTraffic reports.

<sup>2</sup> LOS is undefined for two-way stop control intersections

➡ *Existing Queuing Analysis Results and Conclusions*

Synchro uses HCM based equations to determine queues. SimTraffic is a microscopic model that uses observations based on simulation to measure queues. For its robust features, we have used SimTraffic tool for reporting average queue and 95<sup>th</sup> percentile queue by turning movements for each of the nine key intersections.

**Tables 3.4 and 3.5** display a summary of existing storage lengths, average queues lengths, and 95<sup>th</sup> percentile modeled queue lengths for the AM and PM Peak Hours, respectively. Based on queuing analysis methodology previously identified, no queuing issues were identified along the corridor.

**Table 3.4**  
**2018 AM Queuing Summary**

Scenario		2018								
		Existing Condition								
Intersection	Appr	Storage (ft) <sup>2</sup>			Average Queue (ft) <sup>1</sup>			95th % Queue (ft) <sup>1</sup>		
		LT	TH	RT	LT	TH	RT	LT	TH	RT
Elm Street S (Thru-Stop)	EB	-	225	-	-	0	-	-	0	-
	WB	-	310	-	-	0	-	-	0	-
	NB	-	690	-	-	6	-	-	26	-
	SB	-	330	-	-	10	-	-	34	-
4th Street S (All-Way Stop)	EB	-	340	-	-	37	-	-	51	-
	WB	-	250	-	-	31	-	-	49	-
	NB	-	-	-	-	-	-	-	-	-
	SB	340	-	340	50	-	29	75	-	49
5th Street S (All-Way Stop)	EB	-	250	-	-	37	-	-	57	-
	WB	-	350	-	-	40	-	-	64	-
	NB	690	-	690	45	-	31	71	-	52
	SB	-	-	-	-	-	-	-	-	-
8th Street S (Signalized)	EB	130	315	-	24	50	-	56	91	-
	WB	160	390	160	52	56	28	95	105	70
	NB	130	710	710	40	160	143	107	244	223
	SB	120	670	670	16	81	51	55	130	104
11th Street S (All-Way Stop)	EB	-	530	-	-	54	-	-	82	-
	WB	-	340	-	-	49	-	-	76	-
	NB	645	-	645	22	-	27	47	-	52
	SB	650	-	650	26	-	50	49	-	80
14th Street S (All-Way Stop)	EB	-	545	-	-	42	-	-	65	-
	WB	-	350	-	-	54	-	-	90	-
	NB	-	645	-	-	34	-	-	55	-
	SB	-	-	-	-	-	-	-	-	-
17th Street S (Thru-Stop)	EB	-	315	-	-	2	-	-	16	-
	WB	-	240	-	-	2	-	-	19	-
	NB	-	645	-	-	8	-	-	30	-
	SB	-	1045	-	-	25	-	-	50	-
20th Street S (Signalized)	EB	170	300	170	26	41	14	56	82	33
	WB	180	885	-	31	38	-	66	80	-
	NB	200	645	200	25	77	14	55	140	34
	SB	220	1450	175	13	89	19	38	154	48
Main Avenue SE (Signalized)	EB	130	800	130	11	60	6	34	115	28
	WB	220	220	220	50	49	24	97	99	54
	NB	180	1250	500	9	97	47	26	153	104
	SB	240	530	500	42	51	27	86	96	63

<sup>1</sup> Queue for the movements taken from SimTraffic reports (60 min run)

<sup>2</sup> Thru lane storage is taken as the distance to the prior intersection

**Table 3.5  
2018 PM Queuing Summary**

Scenario		2018								
		Existing Condition								
Intersection	Appr	Storage (ft) <sup>2</sup>			Average Queue (ft) <sup>1</sup>			95th % Queue (ft) <sup>1</sup>		
		LT	TH	RT	LT	TH	RT	LT	TH	RT
Elm Street S (Thru-Stop)	EB	-	225	-	-	0	-	-	0	-
	WB	-	310	-	-	0	-	-	0	-
	NB	-	690	-	-	3	-	-	18	-
	SB	-	330	-	-	10	-	-	34	-
4th Street S (All-Way Stop)	EB	-	340	-	-	26	-	-	52	-
	WB	-	250	-	-	21	-	-	44	-
	NB	-	-	-	-	-	-	-	-	-
	SB	340	-	340	40	-	19	62	-	47
5th Street S (All-Way Stop)	EB	-	250	-	-	42	-	-	70	-
	WB	-	350	-	-	51	-	-	75	-
	NB	690	-	690	39	-	23	58	-	50
	SB	-	-	-	-	-	-	-	-	-
8th Street S (Signalized)	EB	130	315	-	43	126	-	119	253	-
	WB	160	390	160	104	63	49	164	148	98
	NB	130	710	710	86	168	154	169	264	250
	SB	120	670	670	55	172	157	129	264	250
11th Street S (All-Way Stop)	EB	-	530	-	-	44	-	-	67	-
	WB	-	340	-	-	41	-	-	65	-
	NB	645	-	645	24	-	24	49	-	48
	SB	650	-	650	17	-	37	42	-	59
14th Street S (All-Way Stop)	EB	-	545	-	-	38	-	-	57	-
	WB	-	350	-	-	45	-	-	68	-
	NB	-	645	-	-	31	-	-	52	-
	SB	-	-	-	-	-	-	-	-	-
17th Street S (Thru-Stop)	EB	-	315	-	-	2	-	-	16	-
	WB	-	240	-	-	1	-	-	10	-
	NB	-	645	-	-	14	-	-	39	-
	SB	-	1045	-	-	15	-	-	42	-
20th Street S (Signalized)	EB	170	300	170	29	50	22	65	91	46
	WB	180	885	-	31	50	-	63	103	-
	NB	200	645	200	27	86	18	54	160	56
	SB	220	1450	175	12	115	23	41	197	67
Main Avenue SE (Signalized)	EB	130	800	130	8	71	11	28	128	43
	WB	220	220	220	33	40	13	70	84	30
	NB	180	1250	500	7	71	23	20	121	66
	SB	240	530	500	58	64	45	104	115	87

<sup>1</sup> Queue for the movements taken from SimTraffic reports (60 min run)

<sup>2</sup> Thru lane storage is taken as the distance to the prior intersection



### 3.1.6 SAFETY ANALYSIS

Crash and traffic volume data were collected and analyzed for intersections along the corridor. Existing average daily traffic volumes were taken from the online MnDOT Traffic Mapping Application. The nine intersections identified and evaluated along the 12<sup>th</sup> Avenue S corridor include:

- Three traffic signal controls at 8<sup>th</sup> Street S, 20<sup>th</sup> Street S and Main Avenue SE
- Four All-Way Stops at 4<sup>th</sup> Street S, 5<sup>th</sup> Street S, 11<sup>th</sup> Street S and 14<sup>th</sup> Street S
- All other intersections operate as a thru-stop condition with the north-south approaches under stop control

#### ↳ *Crash Severity*

Crashes are generally divided into five severity levels. Each severity level is defined below:

- Fatal (F) – One or more deaths resulted due to injuries sustained from the crash, either at the scene or within 30 days of the crash.
- Incapacitating injury (A) – This is a severe injury that prevents continuation of normal activities such as a broken bone.
- Non-Incapacitating Injury (B) – This is an evident injury such as bruising, abrasions or minor lacerations, which do not incapacitate the individual.
- Possible Injury (C) – This is an injury that is claimed, reported, or indicated by behavior but without any obvious wound. This includes limping or a simple complaint of pain.
- Property Damage Only (PDO) – This is a crash that results in no injuries and only damage to property.

#### ↳ *Crash Rate and Severity Rate*

Crash rate, expressed as crashes per million entering vehicles at intersections, accounts for exposure and is used as a method to facilitate comparisons to other similar intersections or sections. Severity crash rate applies a weighted average to crashes more severe in nature, i.e. fatal crashes have the highest weighted multiplier. There were no Fatal or 'A' crashes at intersections, therefore severity rate was not calculated.

#### ↳ *Critical Crash Rate and Severity Rate*

Using critical rates to compare against observed crash rates is considered to be one of the most statistically valid methods for identifying hazardous locations. Critical rates account for the type of intersection (traffic control, approach speed, environment), amount of exposure measured in volume traveling through the intersection, and the random nature of crashes. This analysis uses a 99.5% confidence interval in calculating critical crash and severity rates.

#### ↳ *Critical Crash Index*

Critical Index is simply the actual rate divided by the critical rate. A critical index in excess of 1.0 indicates that the actual rate is higher than the critical rate, and thus, from a statistical perspective, the location can be considered hazardous for the particular measure of effectiveness under consideration (crash rate and severity rate).

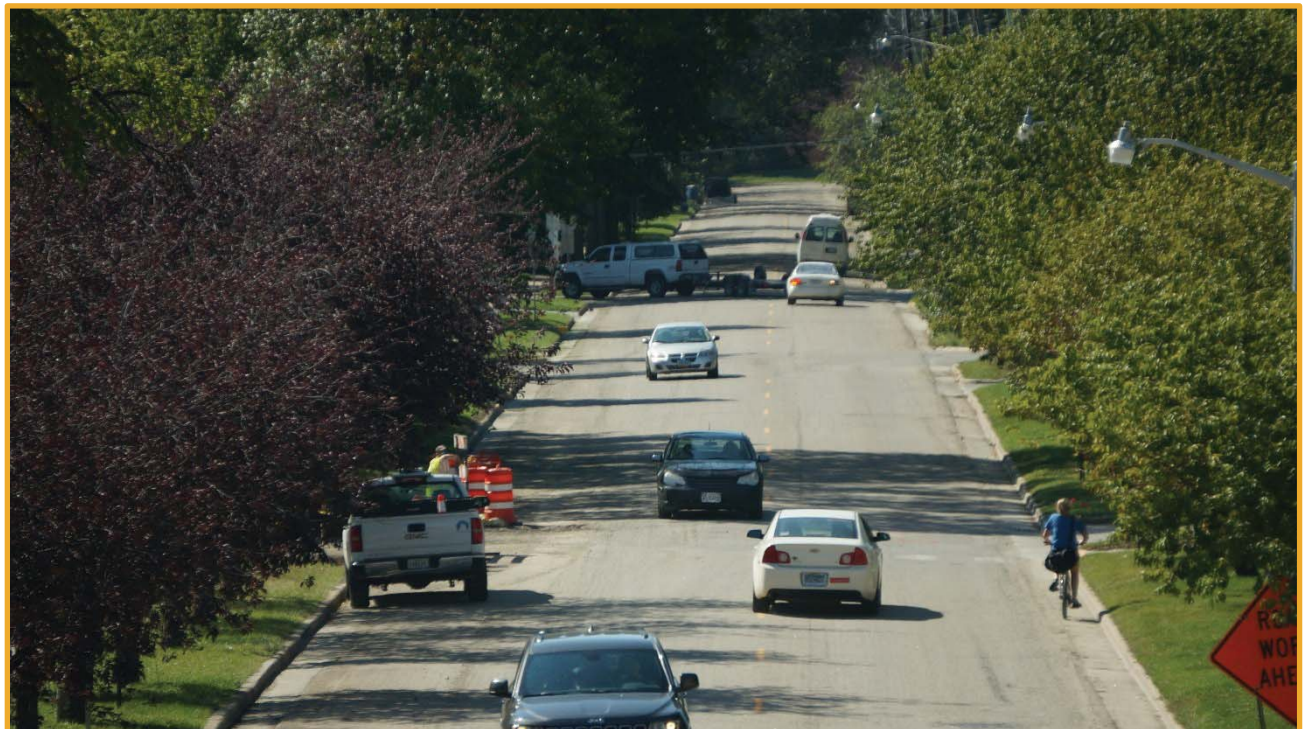
➔ *Safety Analysis Results and Conclusions*

Crashes from the five-year time period 2011-2015 were queried from the online MnDOT Crash Mapping Analysis Tool. The five-year state average crash rates for different roadway intersections and segments were obtained from MnDOT’s 2015 Intersection and Segment Toolkit and are listed in **Table 3.6**. These averages include intersections statewide in Minnesota. The table shows that there are three intersections with a crash rate slightly higher than the statewide average, but none of them above the critical crash rate. Indicating the intersections are operating with a normal and expected range.

**Table 3.6  
Intersection Crash Rates 2011-2015**

12th Avenue S Intersection with	Total Number of Crashes	Crash Types					Daily Entering Volume	Observed Crash Rate (crashes/MEV)	Average Crash Rate (crashes/MEV)	Critical Crash Rate (crashes/MEV)	Critical Index <sup>1</sup>
		PD	C	B	A	K					
Elm Street	0	0	0	0	0	0	-	-	-		-
4th Street S	1	1	0	0	0	0	7,850	0.07	0.35	0.79	0.09
5th Street S	1	1	0	0	0	0	6,500	0.08	0.35	0.84	0.10
8th Street S	34	25	7	2	0	0	24,550	0.76	0.70	1.03	0.74
11th Street S	2	1	1	0	0	0	8,050	0.14	0.35	0.78	0.18
14th Street S	4	4	0	0	0	0	5,675	0.39	0.35	0.87	0.45
17th Street S	1	0	1	0	0	0	5,350	0.10	0.18	0.59	0.17
20th Street S	19	12	6	1	0	0	17,475	0.60	0.52	0.86	0.70
Main Ave SE	10	5	4	1	0	0	14,650	0.37	0.52	0.89	0.42

<sup>1</sup> A Critical Index greater than 1.0 indicates a hazardous location



## 3.2 Construction History

The available history of construction on the 12<sup>th</sup> Avenue South corridor is shown in **Table 3.7**.

**Table 3.7 – Construction History**

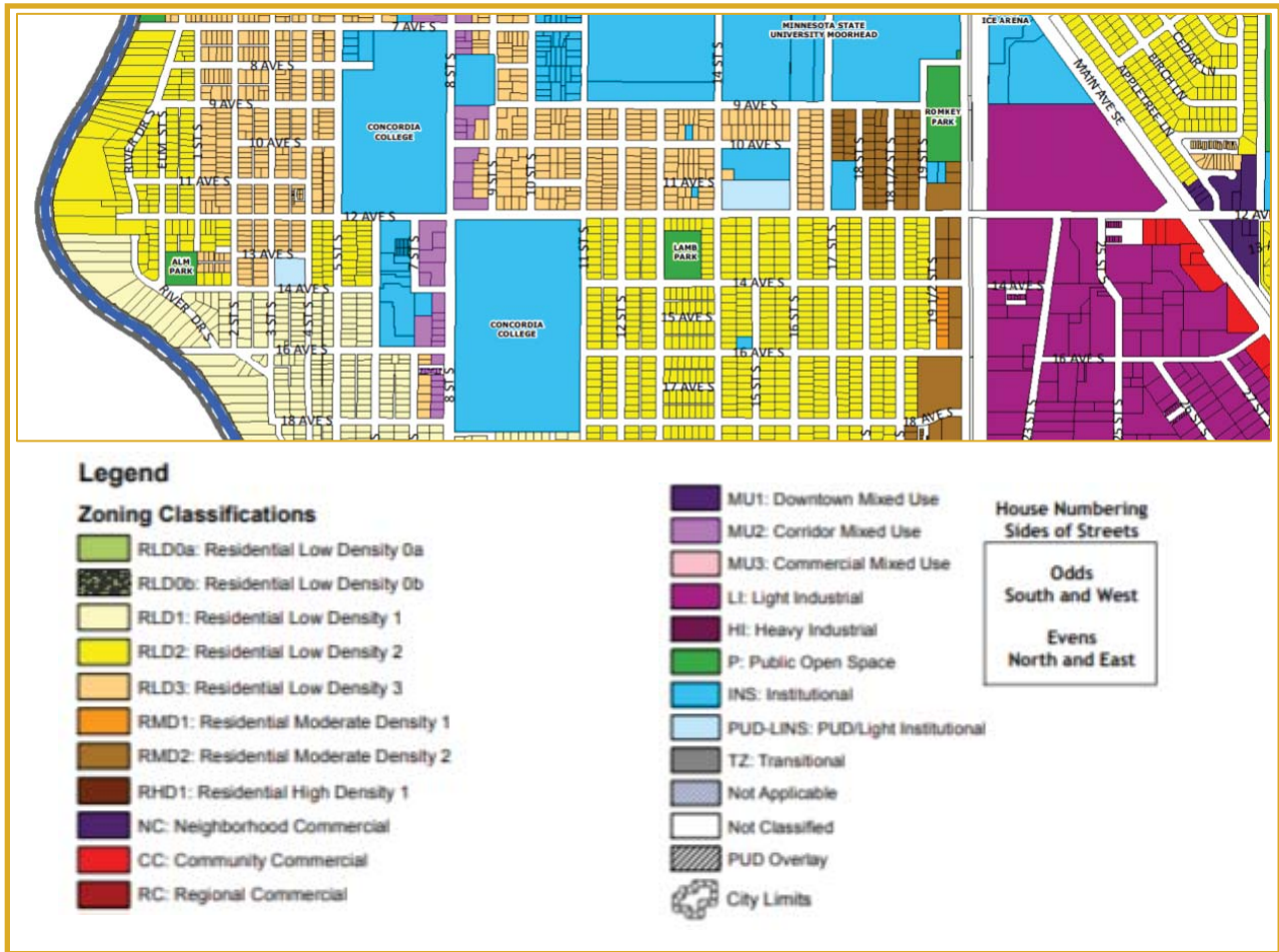
Year	Type of Work	Specific Location (if applicable)
<b>River Drive to 9<sup>th</sup> Street</b>		
Mid 1950s	Original Grading and Paving	
1988	Full depth asphalt reconstruction	8 <sup>th</sup> to 9 <sup>th</sup> St
1991	Full depth asphalt reconstruction, some curb replacement	4 <sup>th</sup> to 8 <sup>th</sup> St
2006	Rehab – 6" asphalt over 6" agg base	River Dr to 1 <sup>st</sup> St
2006	Mill and asphalt overlay	1 <sup>st</sup> St to 4 <sup>th</sup> St
<b>9<sup>th</sup> Street to 20<sup>th</sup> Street</b>		
Mid 1950s	Original Grading and Paving	
1994	Full depth asphalt reconstruction, some curb replacement (<50%)	
<b>20<sup>th</sup> Street to Main Avenue SE</b>		
1964	Original Grading and Paving – 2" asphalt over 8" soil cement base	
1979	Asphalt overlay (2")	
1988	Mill and asphalt overlay (4")	

### 3.3 Land Use

Between River Drive and 20<sup>th</sup> Street, land use is almost entirely low-density residential, with some moderate-density residential properties located just west of 20<sup>th</sup> Street. Institutional zoning is also present along the corridor (including Concordia College, Grace United Methodist Church, and the former Thomas Edison Elementary School), with some mixed-use also along the 8<sup>th</sup> Street north-south corridor.

East of 20<sup>th</sup> Street, zoning is light and heavy industrial. **Figure 3.2** shows the City’s zoning map along 12<sup>th</sup> Avenue South.

**Figure 3.2 | Zoning Map**



### 3.4 Geometry

The horizontal alignment is straight on 12th Avenue South, since it is a section line road. The vertical alignment is flat, with the exception of the area just east of 20<sup>th</sup> Street, where the road grade rises to meet the BNSF RR crossing grade.

### 3.5 Typical Section

The existing typical street sections found on the 12<sup>th</sup> Avenue South corridor are shown in **Table 3.8**. All segments have sidewalks/paths on both sides of the street, unless otherwise noted.

**Table 3.8**  
**Typical Section**

Segment	Street Width	Notes
River Drive to 4 <sup>th</sup> Street	36'	<ul style="list-style-type: none"> <li>• 2-lane with parking</li> <li>• No sidewalk on south side between River Drive and Elm Street (1 block)</li> <li>• No sidewalk on north side between 2<sup>nd</sup> Street and 4<sup>th</sup> Street (2 blocks)</li> </ul>
4 <sup>th</sup> Street to 7 <sup>th</sup> Street	32'	<ul style="list-style-type: none"> <li>• 2-lane with parking</li> <li>• No sidewalk on north side between 4<sup>th</sup> Street and 6<sup>th</sup> Street (2 blocks)</li> </ul>
7 <sup>th</sup> Street	46'	<ul style="list-style-type: none"> <li>• 2-lane with parking</li> <li>• Bus pullout on north side of street</li> </ul>
7 <sup>th</sup> Street to 8 <sup>th</sup> Street	42'	<ul style="list-style-type: none"> <li>• 3-lane (2 EB, 1 WB)</li> <li>• No parking</li> </ul>
8 <sup>th</sup> Street to 9 <sup>th</sup> Street	Varies 38' – 56'	<ul style="list-style-type: none"> <li>• 4-lane (3 WB, 1 EB)</li> <li>• No parking</li> </ul>
9 <sup>th</sup> Street to 15 <sup>th</sup> Street	36'	<ul style="list-style-type: none"> <li>• 2-lane with parking</li> <li>• No sidewalk on south side between 9<sup>th</sup> Street and 11<sup>th</sup> Street (2 blocks)</li> </ul>
15 <sup>th</sup> Street to 16 <sup>th</sup> Street	46'	<ul style="list-style-type: none"> <li>• 2-lane with parking</li> <li>• Bus pullout on north side of street</li> </ul>
16 <sup>th</sup> Street to 19 <sup>th</sup> Street	36'	<ul style="list-style-type: none"> <li>• 2-lane with parking</li> </ul>
19 <sup>th</sup> Street to 20 <sup>th</sup> Street	48'	<ul style="list-style-type: none"> <li>• 4-lane (3 EB, 1 WB)</li> <li>• No parking</li> </ul>
20 <sup>th</sup> Street to 25 <sup>th</sup> Street	50'	<ul style="list-style-type: none"> <li>• 3-lane with bike lanes both sides</li> <li>• No sidewalk either side</li> <li>• No parking</li> </ul>
25 <sup>th</sup> Street to Main Ave SE	56'	<ul style="list-style-type: none"> <li>• 4-lane (3 EB, 1 WB)</li> <li>• No sidewalk either side</li> <li>• No parking</li> </ul>

Note: Widths are from face of curb to face of curb.

### 3.6 Pavement Condition

The following sections summarize the existing pavement condition within the 12<sup>th</sup> Avenue South study corridor. The information provided is based on visual observation and construction history data.

#### ↳ *River Drive to 9<sup>th</sup> Street*

The existing pavement in this segment is asphalt and is generally in average condition, with some below-average areas present at the 4<sup>th</sup> Street, 7<sup>th</sup> Street, 8<sup>th</sup> Street (US 75), and 9<sup>th</sup> Street intersections. Some cracking and patching is present, and some potholes have formed near 8<sup>th</sup> Street and 9<sup>th</sup> Street. The River Drive to 4<sup>th</sup> Street segment was last rehabbed and overlaid in 2006, while the 4<sup>th</sup> Street to 9<sup>th</sup> Street segment dates to the late 1980s/early 1990s.

#### ↳ *9<sup>th</sup> Street to 20<sup>th</sup> Street*

The existing pavement in this segment is asphalt and dates to the mid-1990s. It is generally in average to below-average condition, with cracking (some large cracks) and patching present.

#### ↳ *20<sup>th</sup> Street to Main Avenue SE*

The existing pavement in this segment is asphalt and was last overlaid in the late 1980s. It is generally in average to below-average condition, with an area in particularly rough shape around the BNSF RR tracks just east of 20<sup>th</sup> Street.

### 3.7 Right of Way

The existing right of way width, as measured from the centerline of 12<sup>th</sup> Avenue South, varies throughout the corridor, as shown below in **Table 3.9**.

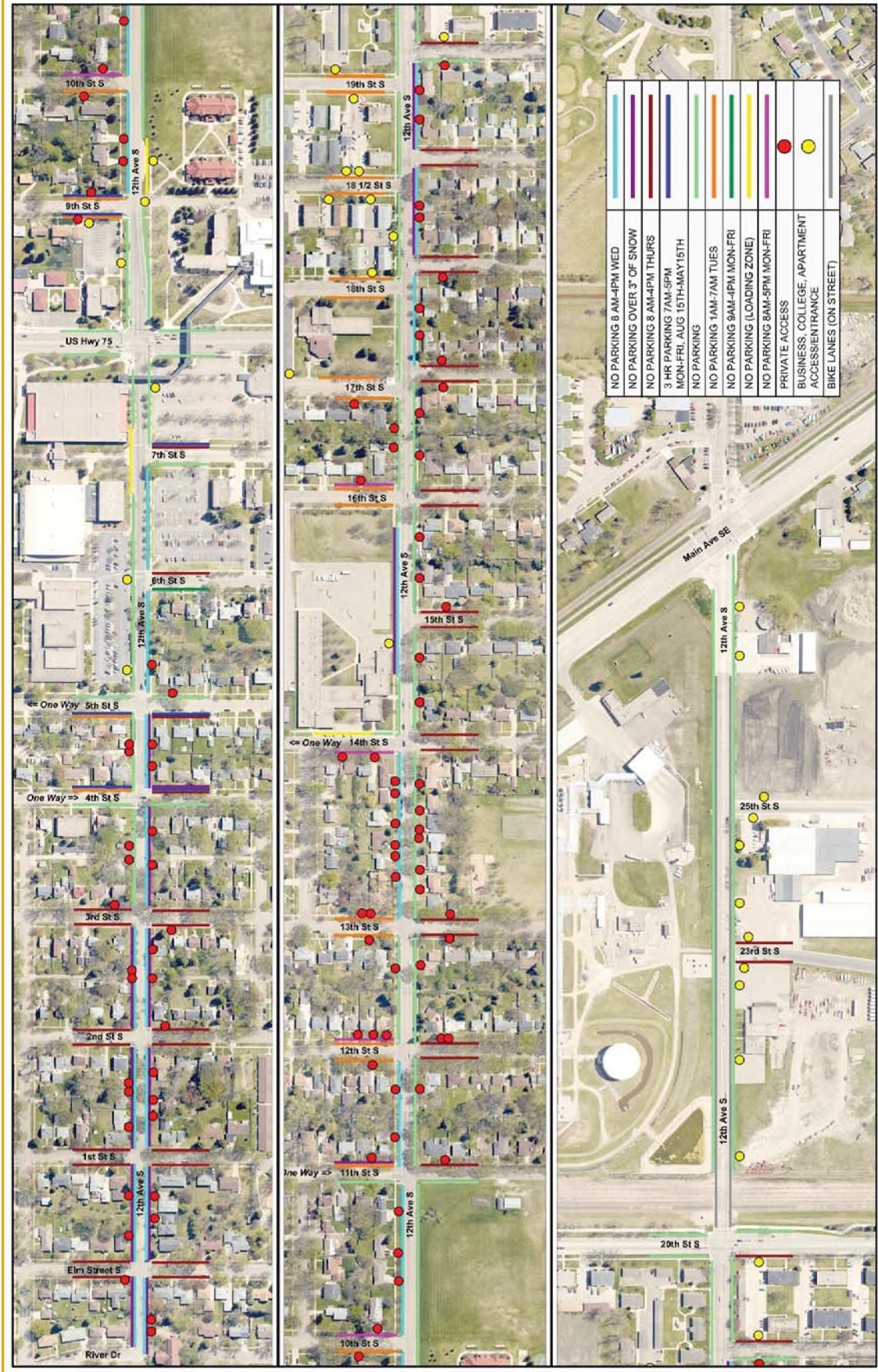
**Table 3.9**  
**Right of Way Width**

Segment	North ROW Width (typical)	South ROW Width (typical)
River Drive to 8 <sup>th</sup> Street	33'	33'
8 <sup>th</sup> Street to 11 <sup>th</sup> Street	40'	60'
11 <sup>th</sup> Street to 17 <sup>th</sup> Street	40'	40'
17 <sup>th</sup> Street to 18 <sup>th</sup> Street	40'	37.5'
18 <sup>th</sup> Street to 20 <sup>th</sup> Street	37.5'	37.5'
20 <sup>th</sup> Street to Main Avenue SE	36'	36'

### 3.8 Access and Parking

There are several different parking conditions and restrictions in place along 12<sup>th</sup> Avenue South. **Figure 3.3** on the next page shows the areas where parking is allowed or not allowed, and the restrictions (if any) that are in place. The location and type of access points along the corridor are also shown on **Figure 3.3**.

Figure 3.3 | Access and Parking



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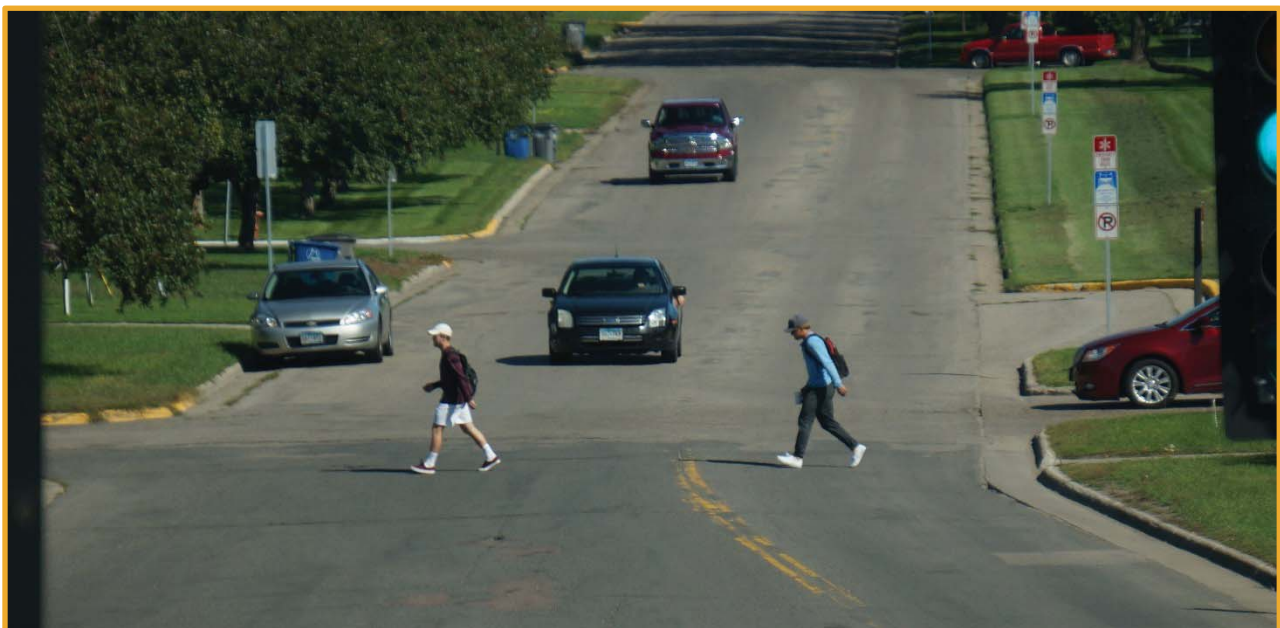


### 3.9 Pedestrian and Bicycle Facilities

**Figure 3.4** shows the existing sidewalk and bike lane facilities along the 12<sup>th</sup> Avenue South corridor. **Figure 3.5** on the next page shows the existing pedestrian volumes at each intersection for the AM Peak, PM Peak and Daily totals. The signals at the intersections with 8<sup>th</sup> Street S, 20<sup>th</sup> Street S and Main Avenue SE accommodate pedestrian crossings in each direction. In addition, throughout the corridor there are either signed or painted crosswalks at the following locations:

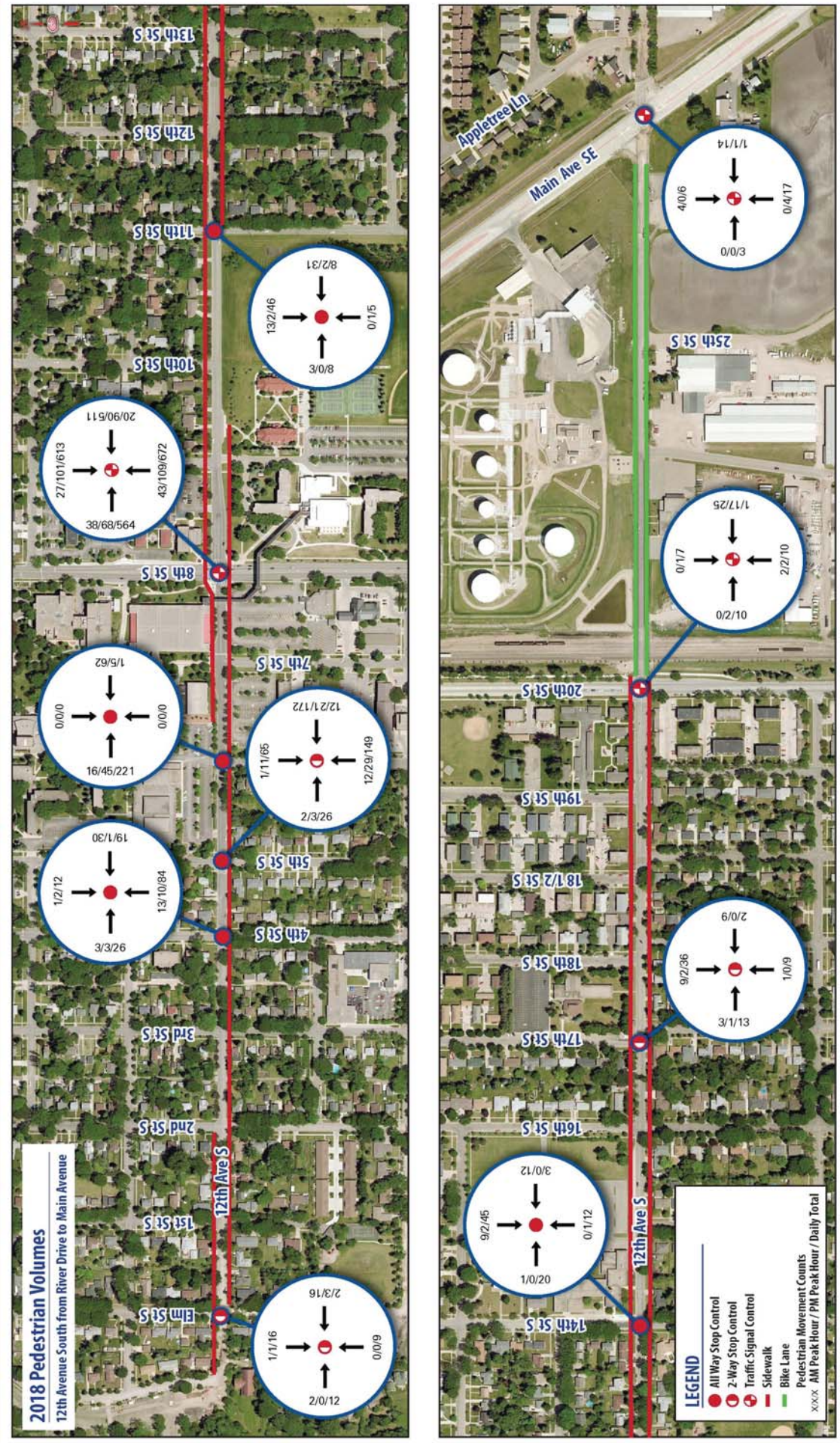
- 3<sup>rd</sup> Street S – signed crosswalk
- 4<sup>th</sup> Street S – painted crosswalk
- 5<sup>th</sup> Street S – painted crosswalk
- 6<sup>th</sup> Street S – signed crosswalk
- 7<sup>th</sup> Street S – signed and painted crosswalk

**Figure 3.4 | Sidewalks and Bike Lanes**



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Figure 3.5 | 2018 Pedestrian Volumes



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### 3.10 Lighting

Lighting along the 12<sup>th</sup> Avenue South corridor is summarized as follows:

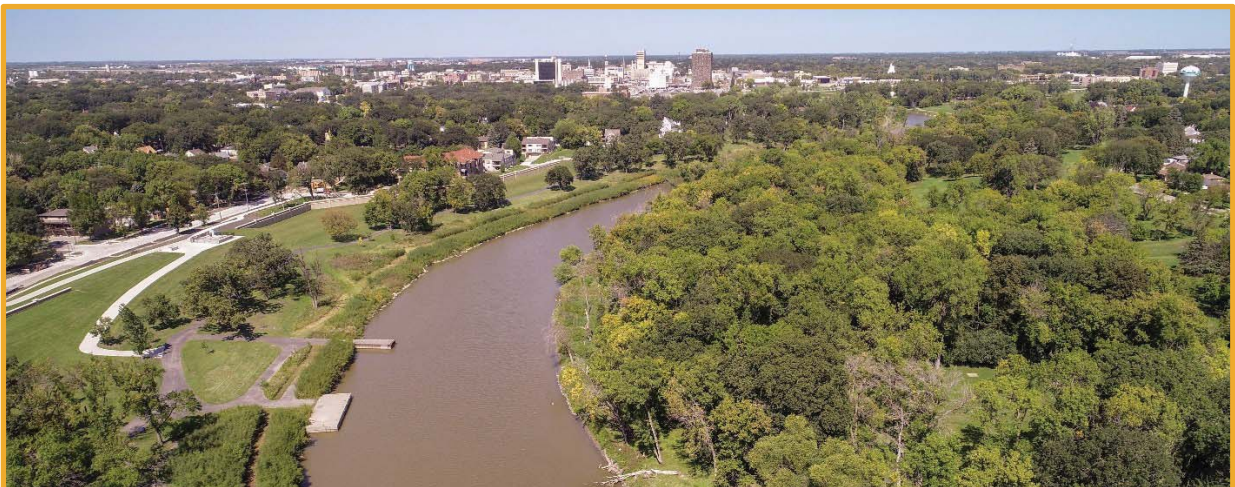
- ➔ **River Drive to 6th Street** | Street lights are present on the north side of the roadway at each intersection, attached to utility poles.
- ➔ **6th Street to 9th Street** | Traveling through the Concordia College campus area, street lighting is present, occasionally on both sides of the street, and smaller sidewalk/path lighting are also present.
- ➔ **9th Street to 20th Street** | Street lights are present on the north side of the roadway at each intersection, attached to utility poles, with the occasional light in between intersections.
- ➔ **20th Street to Main Avenue SE** | Street lights are present on the north side of the roadway at periodic spacing, attached to utility poles.

### 3.11 Drainage/Storm Sewer

The storm sewer facilities within the corridor can be summarized as follows:

- ➔ **River Drive to 1<sup>st</sup> Street** | runoff is collected and drains west along 12<sup>th</sup> Avenue South to an outfall to the Red River.
- ➔ **2<sup>nd</sup> Street to 6<sup>th</sup> Street** | runoff is collected and drains west to the alley between 2<sup>nd</sup> and 3<sup>rd</sup> Street, where it drains south to 16<sup>th</sup> Avenue South and then west to an outfall to the Red River.
- ➔ **7<sup>th</sup> Street to 8<sup>th</sup> Street** | runoff is collected and drains west along 12<sup>th</sup> Avenue South to 7<sup>th</sup> Street, then south to 14<sup>th</sup> Avenue South, then west to the alley between 2<sup>nd</sup> and 3<sup>rd</sup> Street, where it drains south to 16<sup>th</sup> Avenue South and then west to an outfall to the Red River.
- ➔ **9<sup>th</sup> Street to 14<sup>th</sup> Street** | runoff is collected and drains north along 10<sup>th</sup> Street, eventually working its way to the Red River.
- ➔ **15<sup>th</sup> Street to 20<sup>th</sup> Street** | runoff is collected and drains south along 16<sup>th</sup> Street, then west along 13<sup>th</sup> Avenue South, then south on 13<sup>th</sup> Street, then west along 16<sup>th</sup> Avenue South to an outfall to the Red River.
- ➔ **20<sup>th</sup> Street to Main Avenue SE** | runoff is collected and drains south along 25<sup>th</sup> Street and is discharged through a pumping station into Ditch 47, eventually working its way to the Red River.

#### Drainage Eventually Works its Way to the Red River



### 3.12 Utilities

#### 3.12.1 SANITARY SEWER

The City sanitary sewer facilities within the corridor can be summarized as follows:

- **River Drive to 8th Street** | Sanitary sewer lines run along 12<sup>th</sup> Avenue South from River Drive to 2<sup>nd</sup> Street and from 5<sup>th</sup> Street to 8<sup>th</sup> Street, in the center of the roadway. Sanitary sewer crossings of 12<sup>th</sup> Avenue South are present at each intersection. Material is primarily vitrified clay pipe (VCP) with sizes ranging from 8 to 12 inches. A 15 inch PVC pipe crosses at 2<sup>nd</sup> Street.
- **8th Street to 15th Street** | Sanitary sewer lines run along 12<sup>th</sup> Avenue South from 9<sup>th</sup> Street to 11<sup>th</sup> Street on the north side of the roadway, and from 11<sup>th</sup> Street to 15<sup>th</sup> Street in the center of the roadway. Sanitary sewer crossings of 12<sup>th</sup> Avenue South are present at the 10<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup>, 14<sup>th</sup>, and 15<sup>th</sup> Street intersections. Material is VCP with sizes ranging from 8 to 12 inches.
- **15th Street to Main Avenue SE** | East of 15<sup>th</sup> Street, there are no sanitary sewer lines that either run along or cross 12<sup>th</sup> Avenue South.

#### 3.12.2 WATERMAIN

The watermain facilities within the corridor can be summarized as follows:

- **River Drive to 8th Street** | Water lines run along 12<sup>th</sup> Avenue South from River Drive to 2<sup>nd</sup> Street, on the north side of the roadway. Water line crossings of 12<sup>th</sup> Avenue South are present at each intersection except 7<sup>th</sup> and 8<sup>th</sup> Street. Material is a mix of cast iron pipe (CIP) and PVC pipe, with sizes ranging from 6 to 8 inches.
- **8th Street to 15th Street** | Water lines run along 12<sup>th</sup> Avenue South from 8<sup>th</sup> Street to 20<sup>th</sup> Street on the north side of the roadway. Water line crossings of 12<sup>th</sup> Avenue South are present at all intersections. Material is a mix of CIP and PVC pipe, with sizes ranging from 6 to 12 inches. There is a 12 inch asbestos cement pipe (ACP) that crosses at 20<sup>th</sup> Street.
- **20th Street to Main Avenue SE** | A 6 inch CIP water line (20<sup>th</sup> to 25<sup>th</sup> Street) and a 12 inch PVC water line (25<sup>th</sup> Street to Main Avenue SE) run along 12<sup>th</sup> Avenue South on the south side of the roadway. Lines of various size and type cross at the side streets.

#### 3.12.3 OTHER PUBLIC AND PRIVATE UTILITIES

Several overhead and underground public and private utilities are present within the corridor, as summarized below. The information provided is based on visual observation and available data.

- **Overhead facilities** | Moorhead Public Service (MPS) operates overhead power lines that run along the north right of way line through virtually the entire 12<sup>th</sup> Avenue South corridor, from Elm Street to Main Avenue SE. There are also numerous overhead service line crossings from this main line across to the south side of the roadway.
- **Underground facilities** | Several types of underground utilities are known to exist within the corridor. Exact location, ownership, and type of these facilities is undetermined. Some of the underground facilities believed to be present include:
  - Electric lines (MPS, BNSF, OTVR, Concordia College)
  - Gas lines (Xcel Energy)
  - Cable and/or fiber optic lines (Midcontinent Communications, Cable One, 702 Communications)

### 3.13 Railroad Crossings

Two railroad lines cross 12<sup>th</sup> Avenue South within the study corridor area:

- ↳ **BNSF Railway (BNSF)**
  - 5-track crossing located just east of 20<sup>th</sup> Street intersection
  - USDOT Crossing No. 062576Y
  
- ↳ **Otter Tail Valley Railroad (OTVR)** – This crossing is just east of the Main Avenue SE intersection but is within the functional area of the intersection.
  - 1-track crossing located just east of Main Avenue SE intersection
  - USDOT Crossing No. 080725V

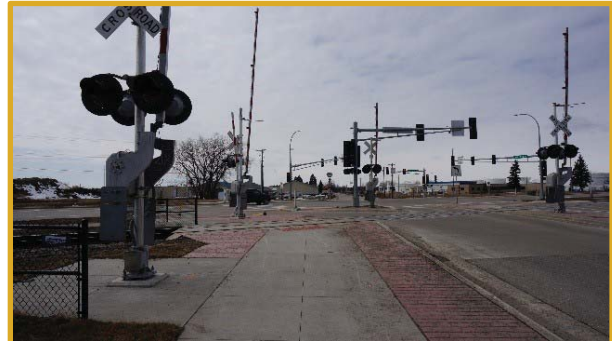
Both crossings are signalized and gated. Photos of each crossing can be found below.

There have been no accidents at either of these crossings since 1990, according to the data provided on the Federal Railroad Administration’s database.

*BNSF RR Crossing east of 20<sup>th</sup> Street*



*OTVR RR Crossing east of Main Avenue SE*



### 3.14 Transit

MATBUS operates three routes in Moorhead that travel either along or across the 12<sup>th</sup> Avenue South corridor. **Figure 3.6** shows the routes and designated bus stops, and also lists February 2018 and April 2018 monthly ridership data for certain stops along the routes, as well as bike loading data for the entire year of 2017.

- Route 1 – Crosses 12<sup>th</sup> Avenue South at the 5<sup>th</sup> Street and 8<sup>th</sup> Street intersections.
- Route 2 – Crosses 12<sup>th</sup> Avenue South at the 11<sup>th</sup> Street and 14<sup>th</sup> Street intersections.
- Route 3 – Travels along 12<sup>th</sup> Avenue South from 14<sup>th</sup> Street to Main Avenue SE, and also crosses at 20<sup>th</sup> Street.



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Figure 3.6 | MATBUS Routes and Ridership/Bike Loading Data



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### 3.15 Trees and Landscaping

The Street Tree Review is intended to be used as a resource while planning for improvements during the 12<sup>th</sup> Ave. South corridor study and help determine proposed corridor improvement impacts on the existing street trees. This review is not a recommendation for street tree removals.

Impacts on existing street trees should be carefully evaluated before recommending removals. The City Forester and community should be an integral part of those discussions. Community “ownership” of existing trees is common and often a very sensitive issue to adjacent property owners and the neighborhood.

The Forestry Department for the City of Moorhead has maintained and nurtured these trees to become an aesthetic, safe, integral and valued part of the existing corridor. Although some trees may be identified as ‘not the best tree’ for certain locations as we review these trees today, the site conditions, technology, knowledge and practices may not have been the same as when they were installed. For example, the City Forester is tasked with caring for very large trees beneath powerlines and trees with existing/upcoming problematic disease or pest issues. These trees may have originally been selected out of economy or from much more limited availability. Trees were also selected during times when particular diseases and/or pest issues were not in evidence as they are today.

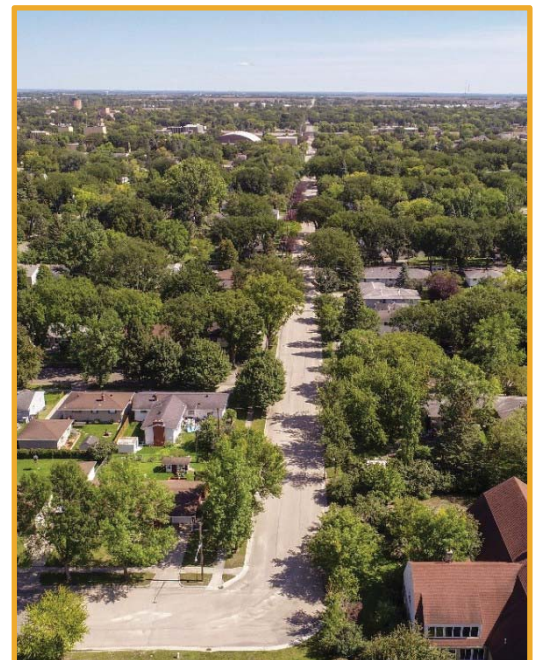
The 12th Avenue South corridor contains existing street trees of the following species:

- American Elm (58)
- Linden (8)
- Lilac Tree (2)
- Chokecherry (34)
- Maple (7)
- Pear (2)
- Crabapple (28)
- Hedges (7)
- Apple (1)
- Ash (26)
- Coffeetree (3)
- Hackberry (1)
- Amur Chokecherry (9)
- Hawthorn (2)

The corridor is dominated by large mature American Elm, Chokecherry, Crabapple, Green Ash, with lesser amounts of Amur Chokecherry, Linden and Maple and others.

The American Elm, Green Ash, Linden and Maple generally appear to be in good condition. Several of these large trees located beneath power lines, appear to be healthy, but have been topped to clear the powerlines. Topping increases the potential for disease by opening wounds, increases the maintenance and impacts the aesthetics.

The Chokecherry, Crabapple and Amur Chokecherry are at or past maturity. These trees are showing evidence of decline and or other health issues. Amur Chokecherry have large trunks, with several trunks/branches that appear to be splitting. Trunk rot is suspected. The Chokecherry are large and appear in generally good shape, but have the fungal disease ‘Black Knot’ in vary degrees from a few to numerous branches. Maintenance of the fungal disease is by frequent pruning, before the disease has a chance to enter main branches or the trunk. The Chokecherry trees located beneath power lines, have been topped, which increases the maintenance and impacts the aesthetics.



### 3.0 EXISTING CONDITIONS

Physical constraints on the existing street trees that are affecting the overall condition and evaluation of the trees include the width of the boulevard and overhead power lines. There are trees that are of large size with flare roots grown to the curb and are also lifting adjacent sidewalks. Overhead power lines have required the ‘topping’ of trees to keep branches from interfering with the lines.

**Table 3.10** and **Figure 3.7** show a summary of the existing street tree conditions and locations.

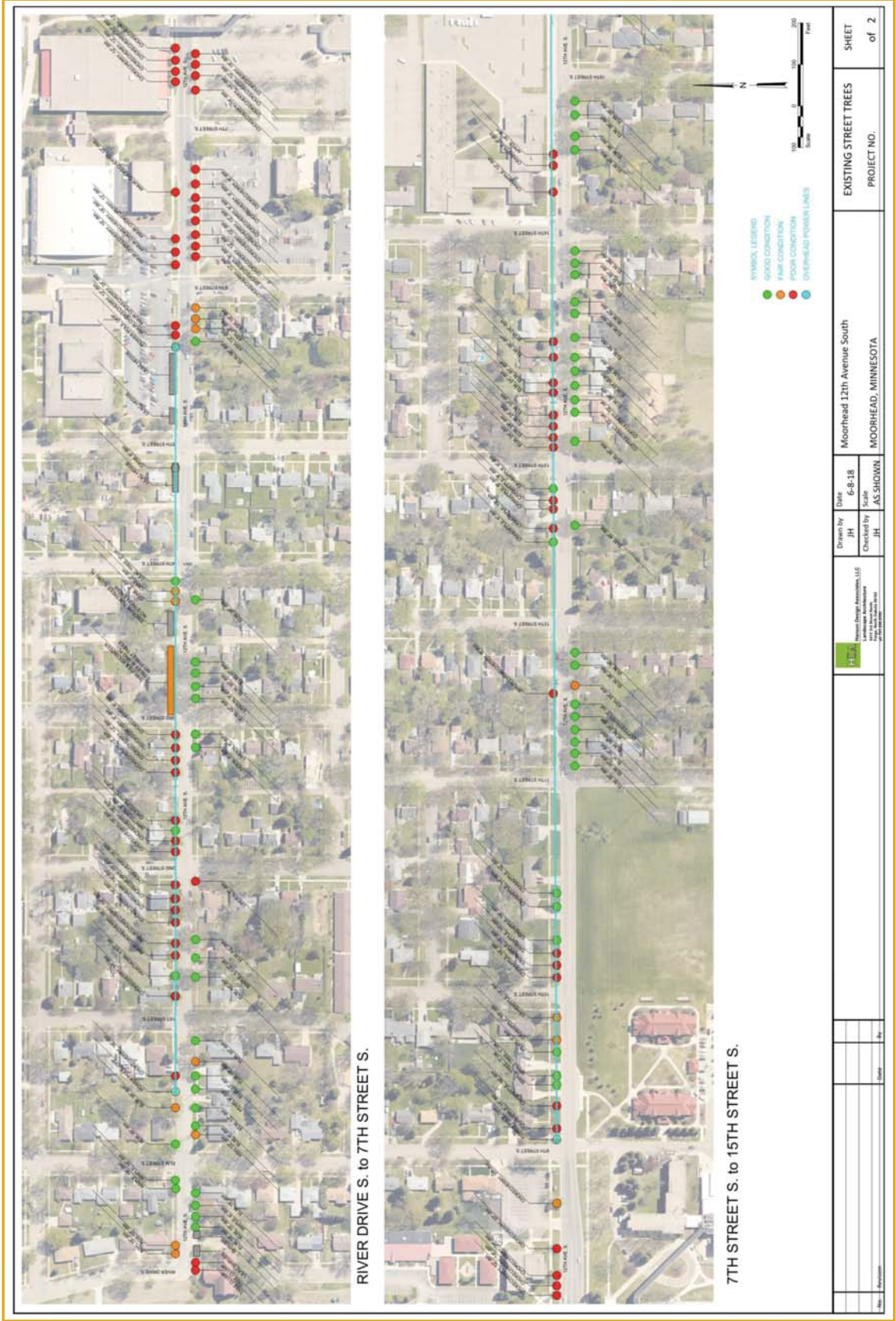
The following is a summary of the existing street trees. The summary indicates the street trees as in Condition 1, 2 or 3.

- **Condition 1:** Street Trees that appear healthy and are appropriate size/species for the location.
- **Condition 2:** Street Trees that appear in reasonably good health but may have one or more existing or potential negative issues.
- **Condition 3:** Street Trees that may be inappropriate for the location based on size/species, have evidence of disease, condition issues or already high-maintenance.

**Table 3.10**  
**Existing Tree Condition**

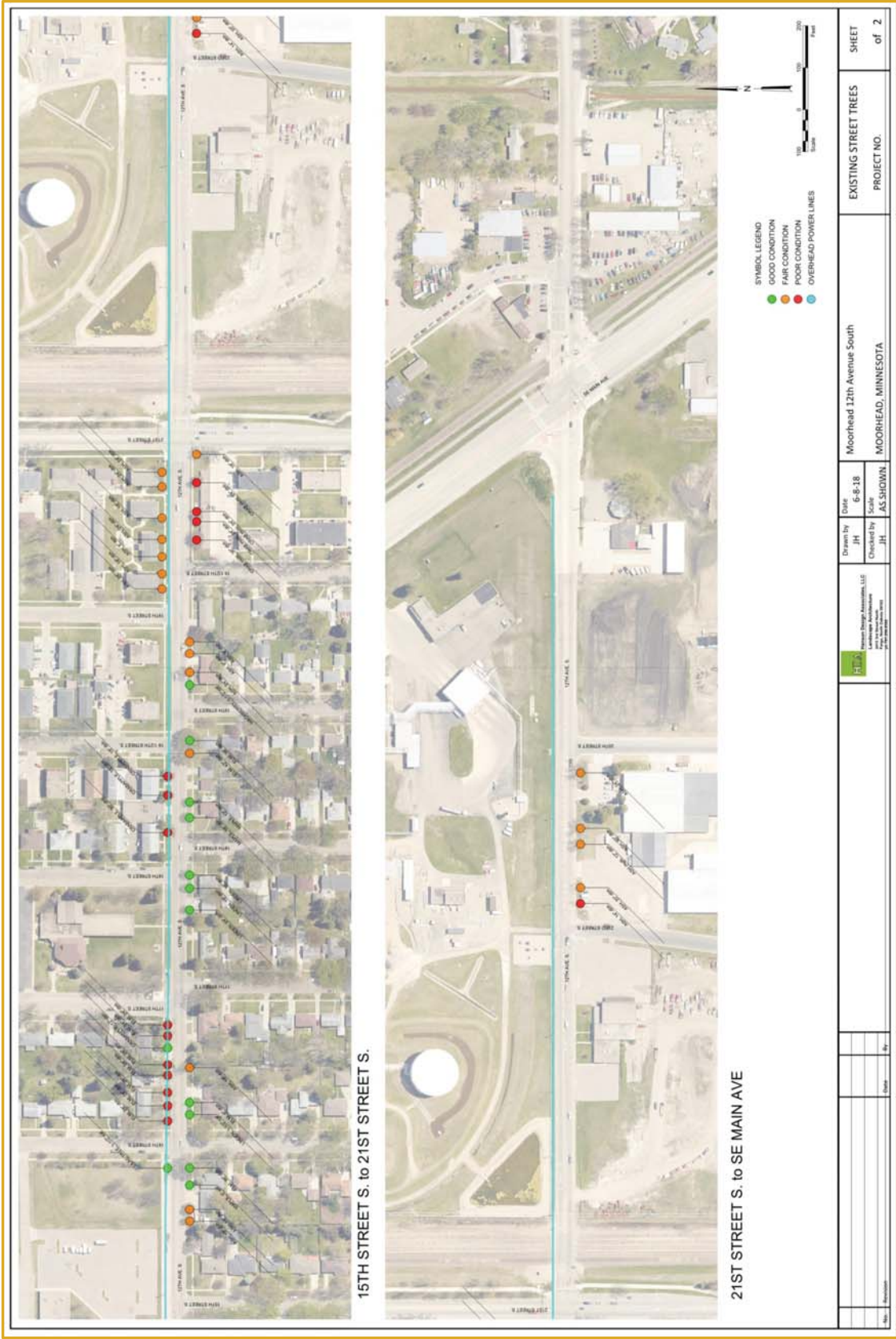
Species	No. of Trees	Condition			Notes
		1	2	3	
<b>American Elm</b>	58	40	3	15	<ul style="list-style-type: none"> <li>• Cond. 2 - Trees are lifting sidewalks and/or curbs.</li> <li>• Cond. 3 - Trees are beneath powerlines and have been topped.</li> </ul>
<b>Chokecherry</b>	34	0	1	33	<ul style="list-style-type: none"> <li>• Cond. 2 - Potential for fungal disease.</li> <li>• Cond. 3- Numerous topping and evident fungal disease.</li> </ul>
<b>Crabapple</b>	28	6	5	17	<ul style="list-style-type: none"> <li>• Cond. 2 - Some die-back, size issues for boulevard.</li> <li>• Cond. 3 - Significant trunk/branch issues, size issues.</li> </ul>
<b>Ash</b>	26	0	25	1	<ul style="list-style-type: none"> <li>• Cond. 2 - Future potential for Emerald Ash Borer.</li> <li>• Cond 3. – Tree topped.</li> </ul>
<b>Amur Chokecherry</b>	9	0	0	9	<ul style="list-style-type: none"> <li>• Cond. 3 - Trees are past maturity with stem/branch issues.</li> </ul>
<b>Linden</b>	8	7	0	1	<ul style="list-style-type: none"> <li>• Cond. 3 - Tree is suckering, which may be sign of health issues.</li> </ul>
<b>Maple</b>	7	7	0	0	
<b>Hedges</b>	7	0	7	0	<ul style="list-style-type: none"> <li>• Cond. 2 - Hedges are acting as buffers.</li> </ul>
<b>Coffeetree</b>	3	3	0	0	
<b>Hawthorn</b>	2	2	0	0	
<b>Lilac</b>	2	2	0	0	
<b>Pear</b>	2	2	0	0	
<b>Apple</b>	1	0	0	1	<ul style="list-style-type: none"> <li>• Cond. 3 - Inappropriate species for street tree.</li> </ul>
<b>Hackberry</b>	1	1	0	0	

Figure 3.7 | Existing Tree Locations and Conditions (1 of 2)



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Figure 3.7 | Existing Tree Locations and Conditions (2 of 2)



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## 4.0 FUTURE 2040 NO BUILD CONDITIONS

### 4.1 Future 2040 No Build Conditions

2040 was chosen as the analysis year so that analysis from this study will be consistent with regional planning. Future 2040 Annual Average Daily Traffic (AADT) were obtained from the Fargo-Moorhead 2040 Metropolitan Transportation Plan and can be found in **Table 4.1**. Table 4.1 also displays the planning level capacities and shows that the existing roadway sections today have adequate capacity to handle the 2040 projected volumes. Supporting data for the traffic analysis can be found in **Appendix D**.

**Table 4.1**  
**2015 and 2040 AADT and Capacity Analysis**

Segment	Existing Roadway Type	Section Capacity <sup>1</sup>	AADT			
			Existing 2015	Forecast 2040	Additional Capacity 2015 <sup>2</sup>	Additional Capacity 2040 <sup>2</sup>
Elm Street to 4th Street S	Two-Lane Undivided	10,000	3,100	4,700	6,900	5,300
4th Street S to 5th Street S	Two-Lane Undivided	10,000	3,100	4,700	6,900	5,300
5th Street S to 8th Street S	Two-Lane Undivided	10,000	5,200	4,900	4,800	5,100
8th Street S to 11th Street S	Two-Lane Undivided	10,000	7,000	9,700	3,000	300
11th Street S to 14th Street S	Two-Lane Undivided	10,000	5,750	9,500	4,250	500
14th Street S to 17th Street S	Two-Lane Undivided	10,000	4,700	8,700	5,300	1,300
17th Street S to 20th Street S	Two-Lane Undivided	10,000	3,900	9,200	6,100	800
20th Street S to Main Ave SE	Three-Lane	18,000	4,900	9,000	13,100	9,000
Main Ave SE to Ridgeway St	Three-Lane	18,000	4,800	10,600	13,200	7,400

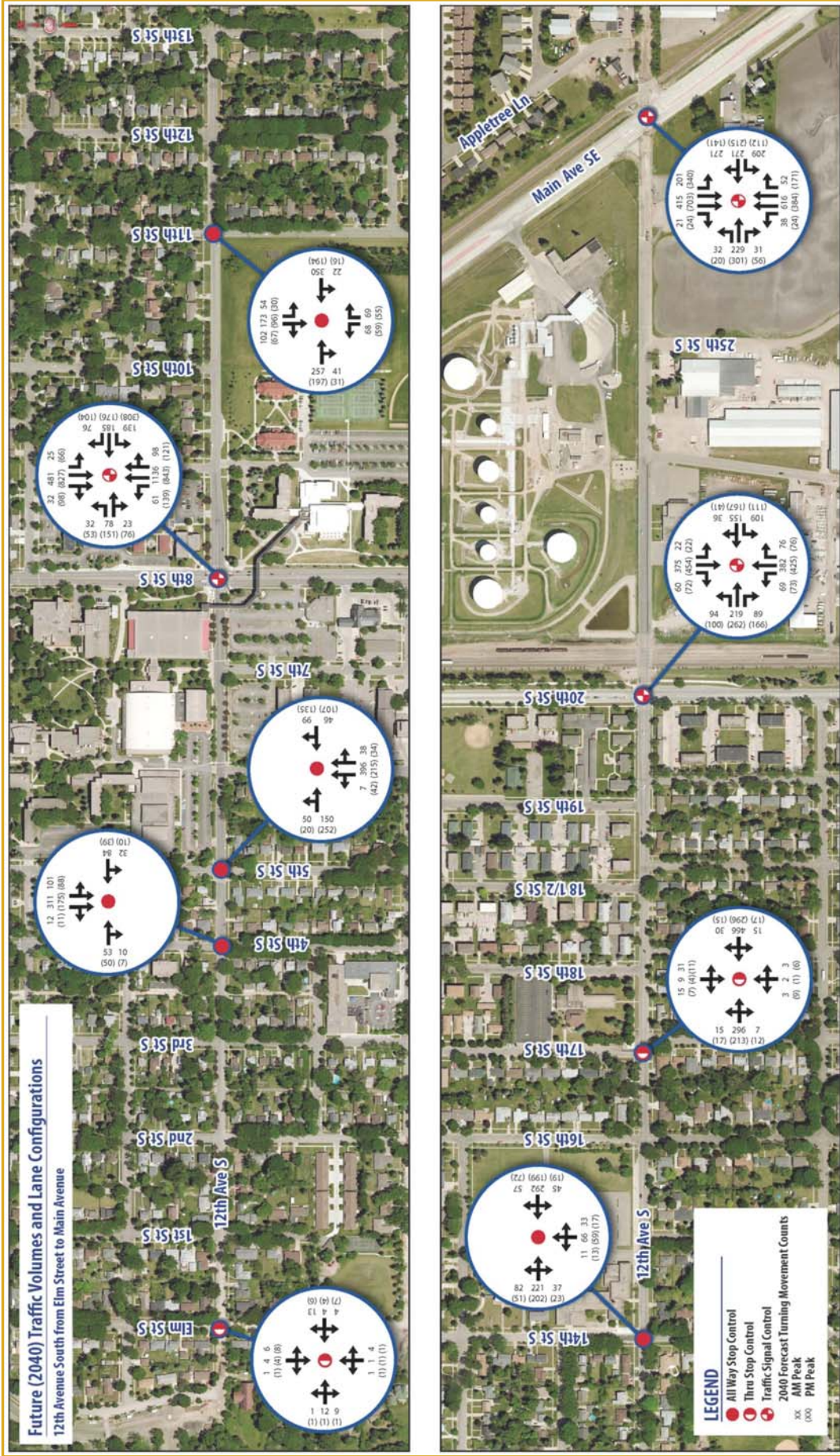
<sup>1</sup> Planning level capacities are highly dependent on assumptions used such as access spacing, peak hour percent, directional distribution, saturation flow rates, etc. Values should not be used for operational analysis or final design.

<sup>2</sup> Positive numbers indicate that additional capacity is available. Negative numbers indicate over capacity.

Using the 2015 and 2040 AADT volumes from the Fargo-Moorhead Metro COG an annual growth rate was calculated for each section of the corridor and the cross streets. This growth rate was applied to the 2018 existing turning movement counts to determine the future 2040 turning movement counts. **Figure 4.1** on the next page displays the 2040 projected AM and PM turning movement counts and existing lane configuration for the intersections along the corridor.

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Figure 4.1 | 2040 Traffic Volumes



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## 4.2 Future 2040 No Build Conditions Operational Analysis

Methodology for operational and queuing analysis was the same as that described in *Technical Memorandum #1 – Existing Conditions*. The geometric characteristics for the 2040 No Build models are the same as the 2018 Existing Conditions. Updated, projected 2040 turning movement volumes were input and model optimizations were completed for signal timings.

**Table 4.2** displays a summary of 2040 AM and PM peak hour intersection delay by approach and intersection, as well as their respective Level of Service (LOS). The reported delays for approach and intersections were taken from SimTraffic and is based on the average of five 60-minute simulation runs. LOS E is highlighted in yellow and LOS F is highlighted in red. Note that intersection LOS is not defined by the Highway Capacity Manual (HCM) for thru-stop control intersections. This is because the minor approaches with relatively low percentages of overall traffic could experience excessive delay, while the mainline could experience little or no delay. The result likely would be low overall intersection delay, which on its face would indicate acceptable operations, when individual stop-controlled movements could be failing.

In the **2040 AM peak hour**, all intersections operate with a LOS C or higher.

In the **2040 PM peak hour**, the intersection with 12<sup>th</sup> Avenue and 8<sup>th</sup> Street operates at an overall LOS D with the eastbound movements operating at a LOS F. All other intersections operate at a LOS C or higher.

**Table 4.2**  
2040 No Build AM and PM Intersection Delay and LOS

Intersection			AM Peak Hour				PM Peak Hour			
Control	Location	Approach	LOS by Approach (Sec/Veh)		LOS by Intersection (Sec/Veh)		LOS by Approach (Sec/Veh)		LOS by Intersection (Sec/Veh)	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Thru-stop	Elm Street	NB	4	A	2	N/A <sup>2</sup>	6	A	2	N/A <sup>2</sup>
		WB	2	A			2	A		
		SB	5	A			4	A		
		EB	0	A			0	A		
All-Way	4th Street S	NB	-	-	7	A	-	-	5	A
		WB	6	A			4	A		
		SB	7	A			6	A		
		EB	6	A			6	A		
All-Way	5th Street S	NB	7	A	6	A	7	A	7	A
		WB	4	A			5	A		
		SB	-	-			-	-		
		EB	7	A			9	A		
Signalized	8th Street S	NB	19	B	17	B	32	C	42	D
		WB	18	B			39	D		
		SB	12	B			31	C		
		EB	20	C			126	F		
All-Way	11th Street S	NB	5	A	10	A	5	A	7	A
		WB	12	B			10	A		
		SB	9	A			6	A		
		EB	9	A			7	A		
All-Way	14th Street S	NB	6	A	8	A	6	A	8	A
		WB	8	A			8	A		
		SB	-	-			-	-		
		EB	8	A			8	A		
Thru-Stop	17th Street S	NB	8	A	3	N/A <sup>2</sup>	5	A	3	N/A <sup>2</sup>
		WB	2	A			3	A		
		SB	9	A			6	A		
		EB	2	A			3	A		
Signalized	20th Street S	NB	15	B	19	B	16	B	22	C
		WB	25	C			30	C		
		SB	19	B			22	C		
		EB	19	B			22	C		
Signalized	Main	NB	24	C	23	C	20	B	22	C
		WB	23	C			21	C		
		SB	17	B			20	B		
		EB	31	C			32	C		

<sup>1</sup> Delay for all movements taken from SimTraffic reports.

<sup>2</sup> LOS is undefined for two-way stop control intersections

### 4.3 Future 2040 No Build Conditions Queuing Analysis

Tables 4.3 and 4.4 display storage lengths, average queue lengths, and 95<sup>th</sup> percentile queue lengths for the 2040 AM and PM Peak Hours, respectively. Queue lengths were taken from SimTraffic output. Red shading indicates average or 95<sup>th</sup> percentile queue lengths that exceed the available storage length.

Based on the queuing analysis methodology identified in Technical Memorandum # 1 where if the following criteria are met then “queuing issues” are identified:

- Condition 1: 95th percentile queue length exceeds storage length and the movements operate at LOS E or LOS F
- Condition 2: Average queue length exceeds storage length
- Condition 3: 95th percentile queue length blocks upstream full access intersection

And at a stop-controlled intersection if the following was met:

- Condition 4: 95th percentile queue length exceeds 500 feet on a stop-controlled approach

Based on the above criteria there are no intersections that experience queuing issues in the **2040 AM Peak hour**.

The following intersections experienced queuing issues in the **2040 PM Peak hour**:

- 8th Street S: Eastbound thru lane meets Condition 1 and Condition 2; and Eastbound left lane meets Condition 1.

**12<sup>th</sup> Avenue and 20<sup>th</sup> Street Intersection**



**Table 4.3**  
**2040 No Build AM Queuing Summary**

Scenario		2040								
		No Build								
Intersection	Appr	Storage (ft)			Average Queue (ft) <sup>1</sup>			95th % Queue (ft) <sup>1</sup>		
		LT	TH	RT	LT	TH	RT	LT	TH	RT
Elm Street S (Thru-Stop)	EB	-	225	-	-	0	-	-	0	-
	WB	-	310	-	-	0	-	-	0	-
	NB	-	690	-	-	4	-	-	22	-
	SB	-	330	-	-	10	-	-	34	-
4th Street S (All-Way Stop)	EB	-	340	-	-	29	-	-	52	-
	WB	-	250	-	-	37	-	-	62	-
	NB	-	-	-	-	-	-	-	-	-
	SB	340	-	340	55	-	31	80	-	50
5th Street S (All-Way Stop)	EB	-	250	-	-	44	-	-	73	-
	WB	-	350	-	-	42	-	-	70	-
	NB	690	-	690	53	-	38	78	-	65
	SB	-	-	-	-	-	-	-	-	-
8th Street S (Signalized)	EB	130	315	-	23	55	-	58	104	-
	WB	160	390	160	67	76	45	115	133	92
	NB	130	710	710	50	215	189	130	355	330
	SB	120	670	670	20	85	50	56	146	113
11th Street S (All-Way Stop)	EB	-	530	-	-	62	-	-	97	-
	WB	-	340	-	-	72	-	-	114	-
	NB	645	-	645	29	-	32	53	-	50
	SB	650	-	650	27	-	64	49	-	100
14th Street S (All-Way Stop)	EB	-	545	-	-	52	-	-	75	-
	WB	-	350	-	-	72	-	-	109	-
	NB	-	645	-	-	37	-	-	56	-
	SB	-	-	-	-	-	-	-	-	-
17th Street S (Thru-Stop)	EB	-	315	-	-	8	-	-	36	-
	WB	-	240	-	-	5	-	-	26	-
	NB	-	645	-	-	8	-	-	30	-
	SB	-	1045	-	-	28	-	-	54	-
20th Street S (Signalized)	EB	170	300	170	51	91	28	108	169	80
	WB	180	885	-	59	86	-	114	158	-
	NB	200	645	200	35	119	18	69	207	54
	SB	220	1450	175	22	155	30	96	250	92
Main Avenue SE (Signalized)	EB	130	800	130	21	120	21	71	217	90
	WB	220	220	220	111	120	62	200	223	140
	NB	180	1250	500	15	155	102	48	232	199
	SB	240	530	500	67	84	52	121	147	108

<sup>1</sup> Queue for the movements taken from SimTraffic reports (60 min run)

**Table 4.4  
2040 No Build PM Queuing Summary**

Scenario		2040								
		No Build								
Intersection	Appr	Storage (ft)			Average Queue (ft) <sup>1</sup>			95th % Queue (ft) <sup>1</sup>		
		LT	TH	RT	LT	TH	RT	LT	TH	RT
Elm Street S (Thru-Stop)	EB	-	225	-	-	0	-	-	0	-
	WB	-	310	-	-	0	-	-	0	-
	NB	-	690	-	-	2	-	-	14	-
	SB	-	330	-	-	10	-	-	33	-
4th Street S (All-Way Stop)	EB	-	340	-	-	28	-	-	50	-
	WB	-	250	-	-	26	-	-	48	-
	NB	-	-	-	-	-	-	-	-	-
	SB	340	-	340	49	-	22	74	-	46
5th Street S (All-Way Stop)	EB	-	250	-	-	59	-	-	104	-
	WB	-	350	-	-	56	-	-	86	-
	NB	690	-	690	46	-	30	70	-	57
	SB	-	-	-	-	-	-	-	-	-
8th Street S (Signalized)	EB	130	315	-	73	318	-	176	749	-
	WB	160	390	160	150	185	63	212	455	133
	NB	130	710	710	119	241	226	189	378	352
	SB	120	670	670	69	215	198	155	325	303
11th Street S (All-Way Stop)	EB	-	530	-	-	54	-	-	87	-
	WB	-	340	-	-	50	-	-	74	-
	NB	645	-	645	29	-	28	53	-	51
	SB	650	-	650	21	-	43	46	-	68
14th Street S (All-Way Stop)	EB	-	545	-	-	46	-	-	71	-
	WB	-	350	-	-	63	-	-	96	-
	NB	-	645	-	-	33	-	-	51	-
	SB	-	-	-	-	-	-	-	-	-
17th Street S (Thru-Stop)	EB	-	315	-	-	5	-	-	26	-
	WB	-	240	-	-	7	-	-	38	-
	NB	-	645	-	-	11	-	-	36	-
	SB	-	1045	-	-	17	-	-	44	-
20th Street S (Signalized)	EB	170	300	170	55	117	54	109	221	134
	WB	180	885	-	63	101	-	122	188	-
	NB	200	645	200	39	144	24	98	256	89
	SB	220	1450	175	16	193	48	44	330	146
Main Avenue SE (Signalized)	EB	130	800	130	19	148	38	71	250	125
	WB	220	220	220	56	93	26	110	158	62
	NB	180	1250	500	7	119	65	24	183	142
	SB	240	530	500	132	126	104	233	274	220

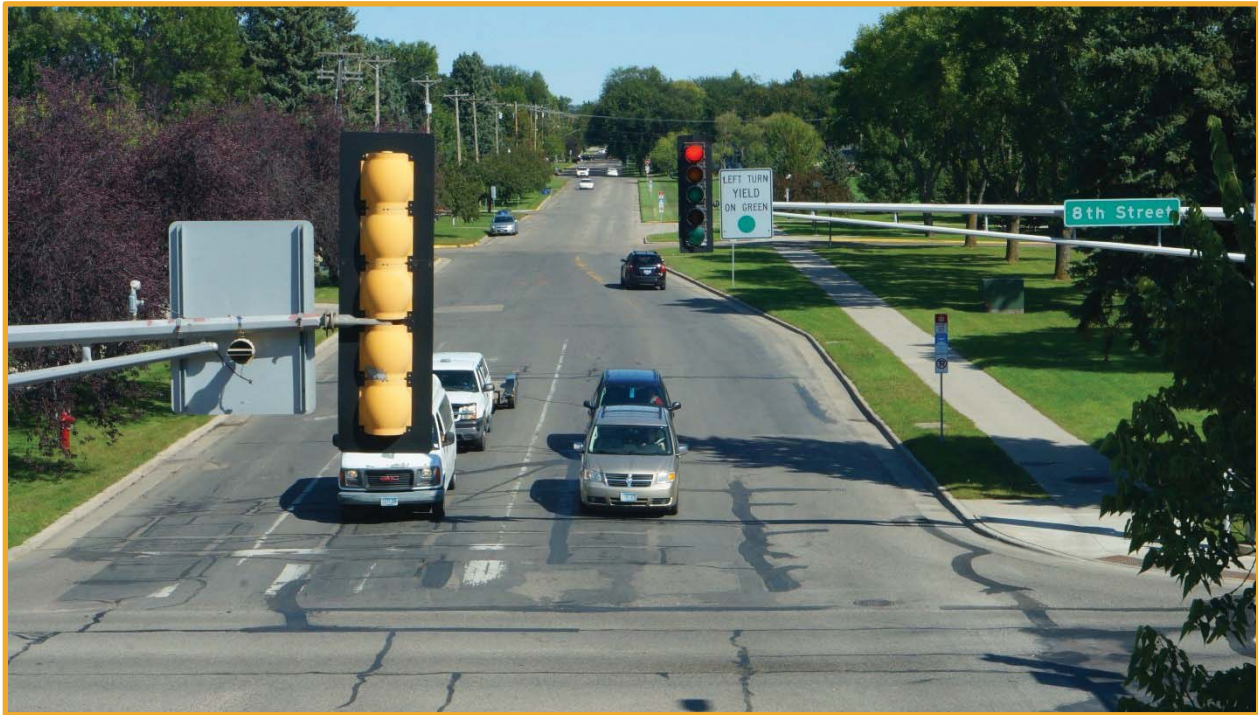
<sup>1</sup> Queue for the movements taken from SimTraffic reports (60 min run)



#### 4.4 Traffic Operations Conclusion

The 12<sup>th</sup> Avenue S corridor will be below planning level capacity thresholds for the Existing and Future No-Build conditions but will experience traffic operational failures for the eastbound movements at 8<sup>th</sup> Street S due to increased traffic volume and delay that will be generated by the year 2040.

12<sup>th</sup> Avenue S and 8<sup>th</sup> Street Intersection





## 5.0 ISSUE IDENTIFICATION AND NEEDS ASSESSMENT

The following issues have been identified along the corridor based on factors including stakeholder input, public input, existing conditions, and the 2040 projected traffic volumes. The study review committee met on several occasions to discuss the existing conditions, public input received, and streetscaping. Public input was gathered through an open-house format meeting that included a formal presentation, as well as an online survey.



### 5.1 Traffic Operations and Roadway Geometrics

Of the nine intersections evaluated along the corridor, all provided an acceptable Level of Service (LOS) of D or above in the existing and future condition analysis except the 8<sup>th</sup> Street South intersection. Here, the eastbound traffic experienced queuing issues and operated at a LOS F in the future 2040 PM Peak hour.

The intersections at 11<sup>th</sup> Street South and 20<sup>th</sup> Street South could be improved to provide more desirable geometric features including horizontal or vertical alignment adjustments. At the intersection of 12<sup>th</sup> Avenue South and 11<sup>th</sup> Street South, 12<sup>th</sup> Avenue is offset 10 feet horizontally across the intersection. Moorhead City Code 11-5-7 prohibits intersection jogs with centerline jogs of less than 150 feet. There are several streets intersecting 12<sup>th</sup> Avenue South with a centerline jog, though the impacts of realigning those streets would be significant.

#### 11th Street South Intersection, Facing East



At the 20<sup>th</sup> Street South intersection, there is a 3 foot vertical profile change between the intersection and the BNSF Railroad tracks 60 feet to the east. This vertical grade change combined with steep cross slopes can cause buses and other large vehicles stopped at the railroad tracks to lose traction and slide off the roadway in winter conditions.

The BNSF Railroad crossing east of 20<sup>th</sup> Street South should also be considered for quiet zone improvements. This location was evaluated in the City's previous *Quiet Zone Study*. Future improvements should be reflective of the recommendations of that study, accounting for any changes in current conditions.

**20th Street South Intersection, Facing North**



## 5.2 Pedestrian and Bicycle Mobility

Providing a safe and connected system for pedestrians and bicycle users was a clear concern from the respondents to the online survey for public input. Nearly all respondents agreed that a continuous sidewalk on both sides of the roadway, or a continuous shared use path on one side of the roadway would be an enhancement to the corridor. Over half of the respondents also noted the need for an improved crossing at the BNSF Railroad tracks east of 20<sup>th</sup> Street South.

Most of the sidewalk curb ramps throughout the corridor do not meet current ADA design guidelines. There are also curb ramps that could be moved to improve crossing locations, and some that could be removed as there is no connecting ramp on the other side of the roadway.

**Many Sidewalk Curb Ramps Do Not Meet Current ADA Guidelines or Do Not Align**



A theme of the 2014 *Moorhead River Corridor Master Plan* is to support enhanced recreational opportunities for the Red River corridor through enhanced connectivity to the river. This need was further supported through public input gathered in the 2016 *FM Metropolitan Bicycle and Pedestrian Plan* with two of the most common comments received relating to “better connectivity” and “more bike lanes”. As a result, the study team prioritized a short-term project for bike facilities on 12th Avenue South between the Red River and 20th street.

### 5.3 Transit Facilities

The current MATBUS stop locations were evaluated for improvements. MATBUS considers shelters for locations meeting a variety of criteria including open areas, available parking, surrounding amenities, commercial/educational/government/medical facility areas, high density, low income, and high ridership areas. The stop at 19 ½ Street South has the highest ridership but is near private property and not a good candidate for a shelter. Many public input comments were received regarding the stop at 25<sup>th</sup> Street South. Although there is not currently high enough ridership to warrant a shelter at this location, other enhancements can provide better access and mobility at the stop.

**MATBUS Riders Boarding Near 25th Street**



### 5.4 Parking and Access Management

Current Moorhead City Code 11-5-7 states the desired number of full access points for a Minor Arterial is 4 per mile with up to 8 per mile under conditional situations, and up to 16 per mile within the urban core at the discretion of the City Engineer. There are 106 access points within the two-mile corridor study area of 12<sup>th</sup> Avenue South, many of them being a private driveway or garage access. The consolidation or elimination of access points reduces the number of conflict points between motor vehicles, pedestrians, and bicycles. While it is not realistic to expect significant changes to private driveway access points, parking lot access and bus parking areas within the corridor can be improved.

The 2012 Moorhead Neighborhood Parking Study indicated that most areas east of 8<sup>th</sup> Street South have less than 25% on-street parking utilization. Over 20% of the respondents to the online public input survey said

that less on-street parking would improve the safety of the corridor, while only one percent desired more parking.

### 5.5 Streetscaping and Trees

The City of Moorhead has been working to incorporate arts and culture into community development and improvement projects. While artwork may not be appropriate for all areas, consideration should be given to areas of opportunity including both new development and redevelopment of existing neighborhoods. Artwork can be part of a successful formula to transform areas considered industrial or blighted.

#### 5.5.1 STREETSCAPING AND ART

In 2016, CenturyLink commissioned seven works of art through the CenturyLink Moorhead Box Art Project contest that invited creatives to submit original works of art with a technology theme to be selected to wrap a CenturyLink utility box. There are 3 CenturyLink Box Art locations on 12th Avenue South. Additional locations should be encouraged whenever opportunities arise. Traffic signal cabinets and other City owned equipment should be considered and would be supported by the City of Moorhead.

The 2015 Sidewalk Art and Poetry Project selected two poems, “Sugar Beet Baby” and “Dreams are Precious”, to stamp into the sidewalk at two locations within the study corridor. This should be considered for incorporation with improvement work on the corridor.



The industrial area from 20<sup>th</sup> Street South to Main Avenue Southeast is a good opportunity to incorporate landscape enhancements. An enhanced pedestrian, bicycle, and landscape linkage would create a safer and more aesthetic access. Public comments reinforce this concept as this section of the corridor could become a much-improved connection to residential areas east of Main Avenue Southeast.

#### 5.5.2 CONCORDIA COLLEGE

The Concordia College Campus is a significant portion of the 12th Avenue Corridor Study area. Roadway improvements are an opportunity to enhance the campus visibility and pedestrian circulation across 12<sup>th</sup> Avenue South. This can be accomplished by incorporating campus site elements into the design of the corridor such as colored/stamped concrete sidewalks or crosswalks, light poles, monuments and signage, plantings, and artwork.

The 2010 Concordia College Campus Master Plan by EYP/Architecture Engineering P.C. includes features to enhance the visitor’s progression through campus and heighten the sense of campus aesthetics, and to ensure consistent visual imagery of Concordia College. Improvements identified along the 12<sup>th</sup> Avenue South corridor include:

- Primary Pedestrian Gateway Crossing at the intersection of 8<sup>th</sup> Street South
- Pedestrian Gateway & Crossway at 6<sup>th</sup> Street South and 7<sup>th</sup> Street South

- Campus Identification at 5<sup>th</sup> Street South and 11<sup>th</sup> Street South
- Vehicular Gateway to parking lots between 8<sup>th</sup> Street South and 9<sup>th</sup> Street South
- Landscape Improvement from 5<sup>th</sup> Street South to 11<sup>th</sup> Street South

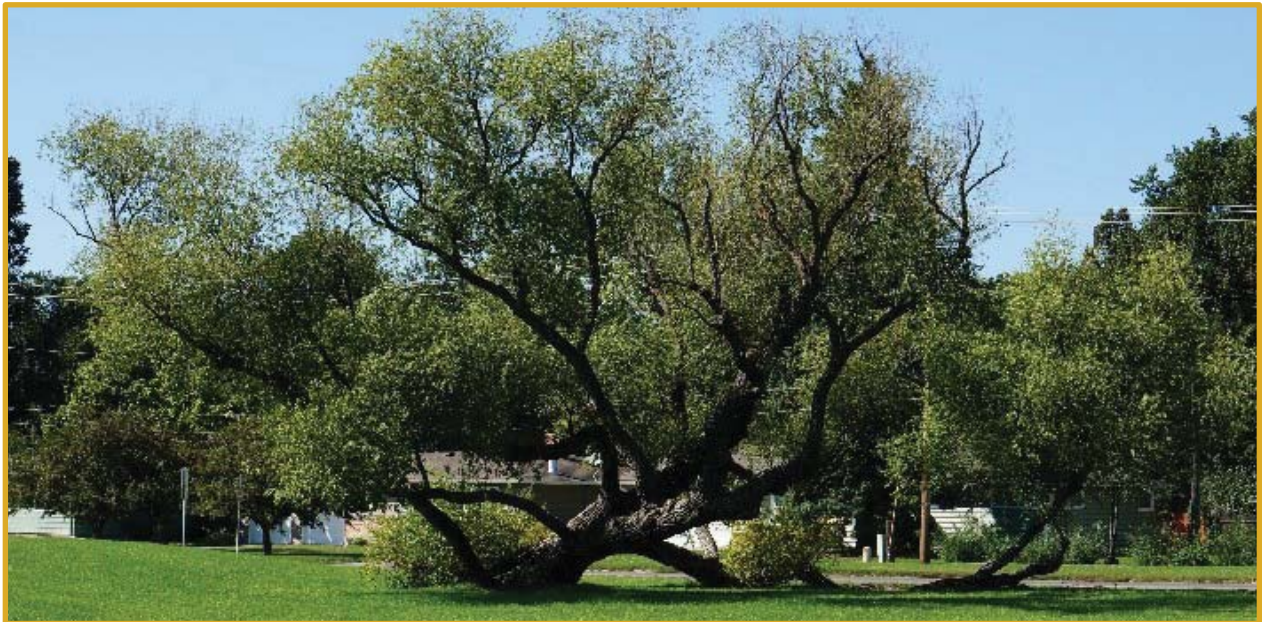
**Figure 5.1 | Concordia Master Plan at 12<sup>th</sup> Avenue South and 8<sup>th</sup> Street South**



### 5.5. TREES

There is a very old willow tree that is a community landmark on the Concordia grounds located outside the right-of-way on the south side of 12<sup>th</sup> Avenue South just west of 11<sup>th</sup> Street South. The tree was likely planted sometime in the early 1950's.

#### The "Crazy Tree" is a Local Landmark



The very large, multi-trunk tree is very popular in the community because of its unusual form, size and age. The trunks are very large diameter and are laying in a nearly horizontal configuration that makes for a unique and interesting form. The tree is visited often, is popular for photography, and is frequently climbed on.

The tree is in a lawn area, with a low levee located directly to the southwest of the tree. There are soccer fields located further southwest. The tree was pruned in 2017 to remove dead wood.

There were several large trunks removed on the southwest side that were impacted from the installation of the levee in the early 2000's. The tree is probably in decline and additional impact to the surrounding area around the tree will likely speed up the decline. Further development in the area surrounding the tree should be minimized to preserve the tree. Foot traffic from visitors, as it currently occurs, creates a certain amount of soil compaction, which can be detrimental to the tree. Activity from equipment, changes to grades, and increases in visitation from pedestrians will further compact the soil surrounding the tree. Since the tree has always existed in lawn, the lawn should remain.

Concordia has expressed an interest in having a path or sidewalk that can be utilized by their equipment between 9<sup>th</sup> Street South and 11<sup>th</sup> Street South. The area on top of the levee would be a preferred location since this area has already been disturbed. If a path must be located within the right-of-way and continuous along 12<sup>th</sup> Avenue South, it should be located as far away from the tree as possible.

The City Forester indicated a preference to keeping all existing viable trees along the corridor. Results from the public input survey showed that over half of survey respondents noted that existing boulevard trees should be preserved, while many also agreed that new streetscape improvements such as landscaping, lighting, or special paving/artwork would enhance the corridor. Representatives from Concordia College expressed a preference for replacing all chokecherry trees along campus if possible.

A final issue that impacts not only trees, but also several other areas of need, is the presence of overhead power lines owned by Moorhead Public Service in the north boulevard along over 80% of the corridor. Existing trees require continual trimming to prevent limbs from damaging the lines. The location of the poles in the boulevard also limits the feasibility of any significant improvements or changes to the north side of 12<sup>th</sup> Avenue.

### **Overhead Power Lines are Strung through Mature Trees Along the 12th Avenue South Corridor**





## 6.0 ALTERNATIVE DEVELOPMENT AND EVALUATION

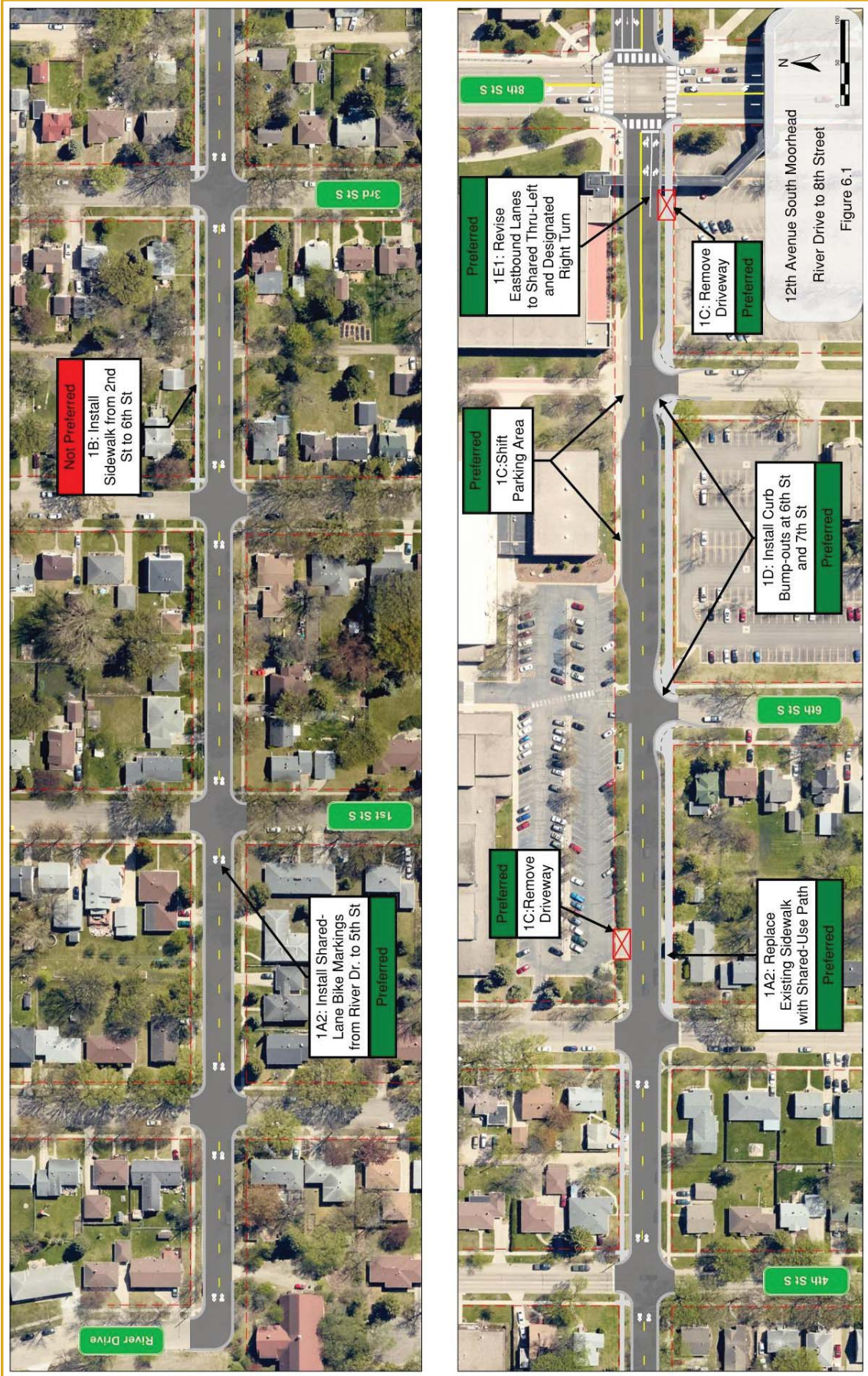
Based on the 2040 projected traffic volumes, the existing lane configurations of the 12<sup>th</sup> Avenue South corridor meet the planning-level capacity requirements. As such, the future build alternatives assume that the existing lane configurations will be maintained, and the improvement alternatives developed for this study focus more on improving the specific issue/need areas addressed within each segment. The costs presented are planning level construction estimates using 2019 dollars and do not include engineering fees, right of way purchase, extensive utility relocations, or other unknown design details. Detailed cost estimates can be found in **Appendix E**.

### 6.1 River Drive South to 8<sup>th</sup> Street South

Table 6.1 Segment 1: River Drive South to 8 <sup>th</sup> Street South				
Improvement Alternative	Issue/Need Addressed	Estimated Cost	Impacts	SRC Recommendation
1A1: Install shared lane markings (Sharrows)	Bike Route Connectivity	\$7,500	Low: Pavement markings	Not Preferred
1A2: Replace existing south sidewalk with an 8' shared-use path from 5 <sup>th</sup> St to 8 <sup>th</sup> St and install Sharrows from River Dr to 5 <sup>th</sup> St <i>Figure 6.1</i>	Bike Route Connectivity	\$90,000	Medium: Right of way; 2 driveways; up to 16 existing trees	Preferred – Short Range
1B: Install 5' sidewalk on north side between 2 <sup>nd</sup> St and 6 <sup>th</sup> St <i>Figure 6.1</i>	Pedestrian Route Connectivity	\$110,000	High: ROW, 8 driveways; up to 17 existing trees; OH power lines and other private utilities	Not Preferred
1C: Close parking lot access points near 5 <sup>th</sup> St and 8 <sup>th</sup> St, and shift parking area near 7 <sup>th</sup> St <i>Figure 6.1</i>	Parking and Access Management	\$50,000	Medium: Reduced parking lot access/ increased access congestion; existing trees; private utilities	Preferred – Short Range
1D: Install curb bump-outs at 6 <sup>th</sup> St and 7 <sup>th</sup> St intersections <i>Figure 6.1</i>	Parking and Access Management	\$75,000	Medium: Reduced parking; pavement, curb, and sidewalk reconstruction	Preferred – Short Range
1E1: Reassign eastbound lanes at 8 <sup>th</sup> St intersection with a shared left/thru and a designated right by shifting curb <i>Figure 6.1</i>	Traffic Operations	\$110,000 (Short-term) \$75,000 (Long-range)	Medium: Traffic signal revisions, signal controller/cabinet; pavement, curb, and sidewalk reconstruction; drainage	Preferred – Long Range (C & G and signal pole work in SE corner to be done in short-term)
1E2: Widen 12 <sup>th</sup> Ave to install designated eastbound right turn lane at 8 <sup>th</sup> St. <i>Figure 6.2</i>	Traffic Operations	Dependent on Skyway Pier impacts	High: The widening would impact a pier for the Concordia Skyway. This pier would need to be relocated and the skyway may need to be redesigned. Impacts to the pier could be limited by installing a 50' turn lane with 30' taper.	Not Preferred

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Figure 6.1 | River Drive to 8<sup>th</sup> Street



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Figure 6.2 | 8<sup>th</sup> Street Intersection



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6.2 8<sup>th</sup> Street South to 20<sup>th</sup> Street South

Table 6.2 Segment 2: 8 <sup>th</sup> Street South to 20 <sup>th</sup> Street South				
Improvement Alternative	Issue/Need Addressed	Estimated Cost	Impacts	SRC Recommendation
2A: Install 8' or 10' shared-use path on south side from 8 <sup>th</sup> St to 11 <sup>th</sup> St, staying south of the "Crazy Tree" <i>Figure 6.3</i>	Bike Route Connectivity	\$110,000	Low: Right of way; Concordia College property	Preferred – Short Range
2B1: Install shared lane markings (Sharrows)	Bike Route Connectivity	\$10,000	Low: Pavement markings	Not Preferred
2B2: Add 6' designated on-street bike lanes on each side of 12 <sup>th</sup> Ave S <i>Figure 6.3 &amp; 6.4</i>	Bike Route Connectivity	\$30,000	Medium: Pavement markings; signs; elimination of parking along 12 <sup>th</sup> Ave could place additional stress on side-street parking	Preferred – Short Range
2B3: Replace existing south sidewalk with an 8' shared-use path from 11 <sup>th</sup> St to 20 <sup>th</sup> St <i>Figure 6.3 &amp; 6.4</i>	Bike Route Connectivity	\$305,000	High: Right of way, 20 driveways; up to 49 existing trees; private utilities	Not Preferred
2C: Install crosswalk at 19½ St <i>Figure 6.4</i>	Pedestrian Route Connectivity	\$5,000	Low: Pavement markings	Preferred – Short Range
2D: Remove parking area on south side near 9 <sup>th</sup> St, realign approach into campus lots, remove driveway to parking lot <i>Figure 6.3</i>	Access Management	\$45,000	Low: Temporary access restrictions	Preferred – Short Range
2E: Realign 11 <sup>th</sup> St intersection to improve horizontal alignment <i>Figure 6.3</i>	Roadway Geometrics	\$150,000	High: Right of way; driveways; pavement; drainage; curb; existing trees; private utilities; drainage	Preferred – Short Range
2F: Construct grade raise of 20 <sup>th</sup> St intersection to improve vertical profile with BNSF RR Tracks <i>Figure 6.4</i>	Roadway Geometrics	\$1,250,000	High: Right of way; apartment driveway and parking lot; drainage; traffic signals; pavement; curb; sidewalks; existing trees; private utilities	Preferred – Long Range

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Figure 6.3 | 8<sup>th</sup> Street to 13<sup>th</sup> Street



Figure 6.3

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Figure 6.4 | 14<sup>th</sup> Street to 20<sup>th</sup> Street

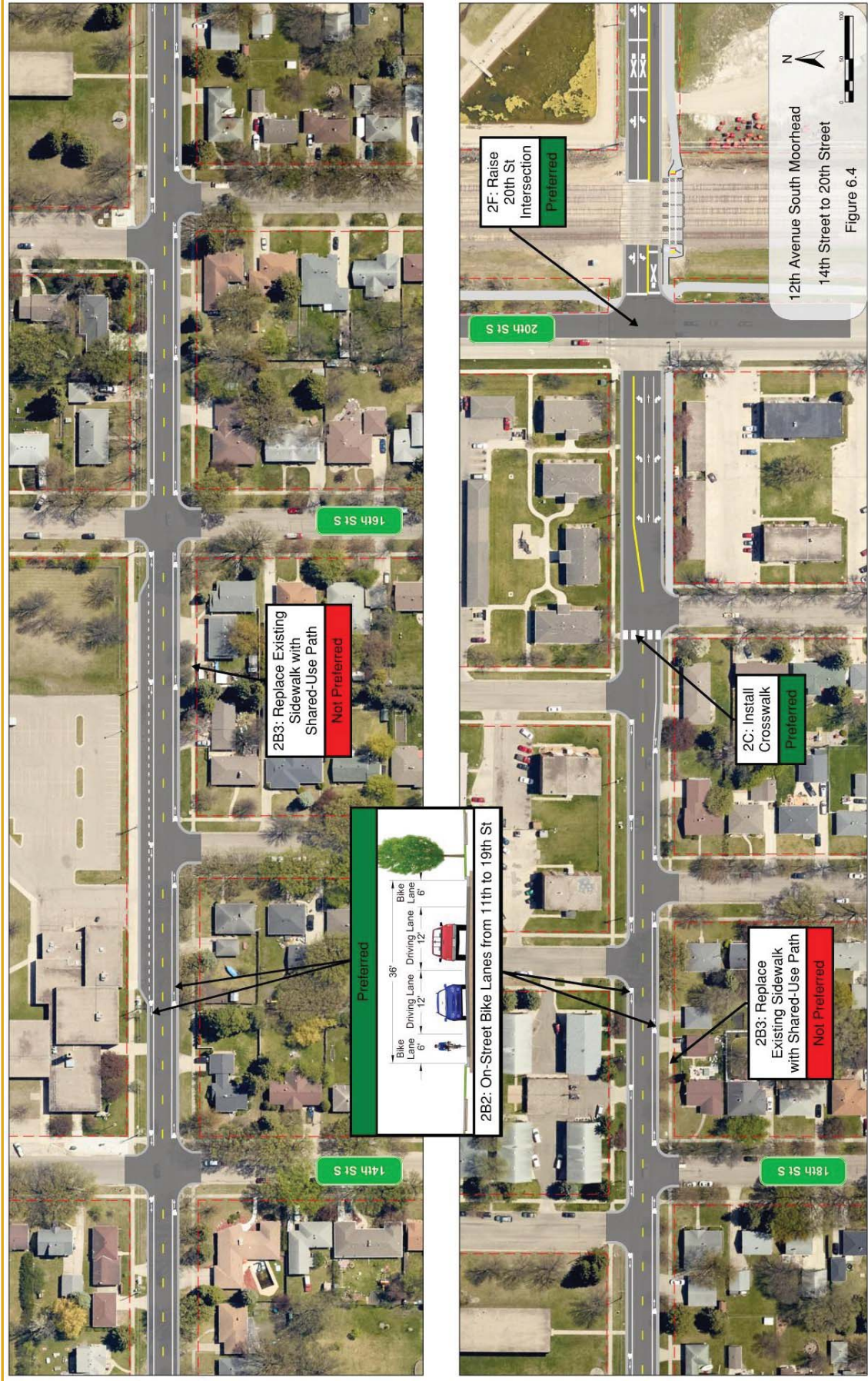


Figure 6.4

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6.3 20<sup>th</sup> Street South to Main Avenue Southeast

Table 6.3 Segment 3: 20 <sup>th</sup> Street South to Main Avenue SE				
Improvement Alternative	Issue/Need Addressed	Cost	Impacts	SRC Recommendation
3A: Construct pedestrian/bicycle crossing on east side of 20 <sup>th</sup> Street South at BNSF Railroad tracks <i>Figure 6.5</i>	Bike and Pedestrian Route Connectivity	\$450,000	High: Right of way/private property; railroad crossing; drainage; private utilities	Preferred – Short Range
3B: Add new 10' shared-use path on south side (remove existing on-street bike lanes, shift south curb line 10' north to accommodate off-street path) <i>Figure 6.5</i>	Bike Route Connectivity	\$250,000	Medium: Right of way/private property; existing trees; drainage	Preferred – Short Range
3C: Install concrete pad and concrete waiting area with a bench at 25 <sup>th</sup> Street South bus stop <i>Figure 6.5</i>	Transit Facilities	\$5,000	Low	Preferred – Short Range
3D: Shift private business driveway east of the BNSF Railroad tracks <i>Figure 6.5</i>	Parking and Access Management	\$15,000	Low	Preferred – Short Range

Railroad Crossing at 20<sup>th</sup> Street

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Figure 6.5 | BNSF RR Crossing to Main Avenue SE

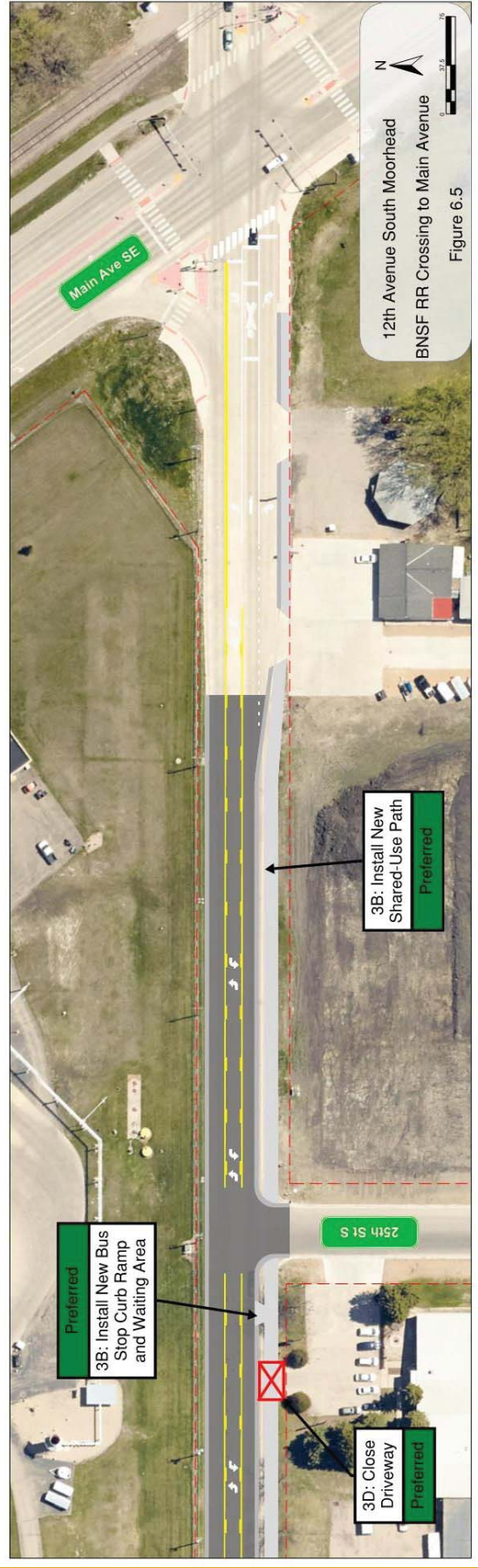


Figure 6.5

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## 6.4 Corridor-Wide Improvements

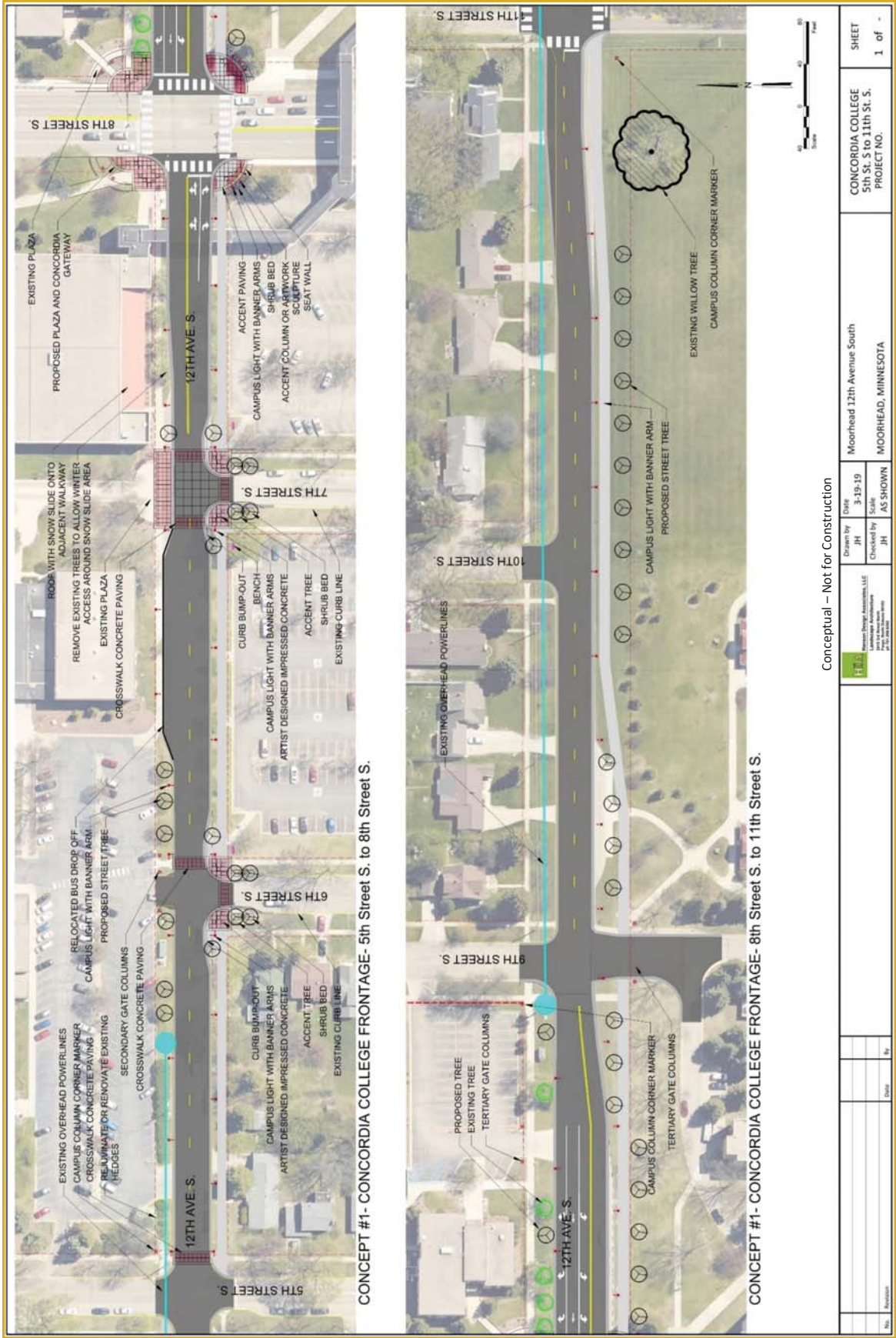
<b>Improvement Alternative</b>	<b>Issue/Need Addressed</b>	<b>Cost</b>	<b>Impacts</b>	<b>Recommendation</b>
4A: Upgrade existing sidewalks & paths to current ADA standards	Bike and Pedestrian Route Connectivity	\$200,000	Medium: Curb & gutter; drainage; up to 99 curb ramps	Preferred – Short Range
4B: Review and enforce parking policies, paint curb to restrict parking near accesses	Parking and Access Management	\$15,000	Low: Changes in parking policy may cause confusion; additional parking on side-streets	Policy Changes – Not Preferred; Curb Painting – Preferred Short Range
4C: Streetscaping improvements <i>Figure 6.6 &amp; 6.7</i>	Trees and Streetscaping	\$415,000 <i>*See Below</i>	Low: Improvements can be incorporated with roadway improvements	Preferred – Short & Long Range
4D: Bury overhead electric lines <i>Figure 6.6 &amp; 6.7</i>	Trees and Streetscaping	\$1,350,000	High: Right of way; driveways; existing trees; sidewalks	Supported -Long Range

\*Streetscape/Landscape Improvements cost estimate includes:

- Boulevard Trees (35 of 1½") = \$15,000
- Accent Trees (8 of 1½") = \$3,500
- Accent Shrubs (50) = \$3,500
- Accent Perennials (300) = \$7,500
- Landscape Edging = \$2,500
- Planting Bed Area Topsoil = \$1,000
- Landscape Mulch = \$3,500
- 18" High Concrete Accent Seatwall = \$16,500
- Accent Columns at 8<sup>th</sup> Street (4) = \$30,000
- Accent Paving for Crosswalks = \$35,000
- Regular Concrete for Accent Paving = \$15,000
- Accent Paving for Bumpouts = \$35,000
- Accent Paving for 8<sup>th</sup> Street Gateway = \$39,000
- Concrete sidewalk at 8<sup>th</sup> Street = \$3,000
- Benches (3) = \$5,000
- Lightpoles with Banner Arms (48) = \$200,000

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Figure 6.6 | Corridor-Wide Landscaping/Streetscaping

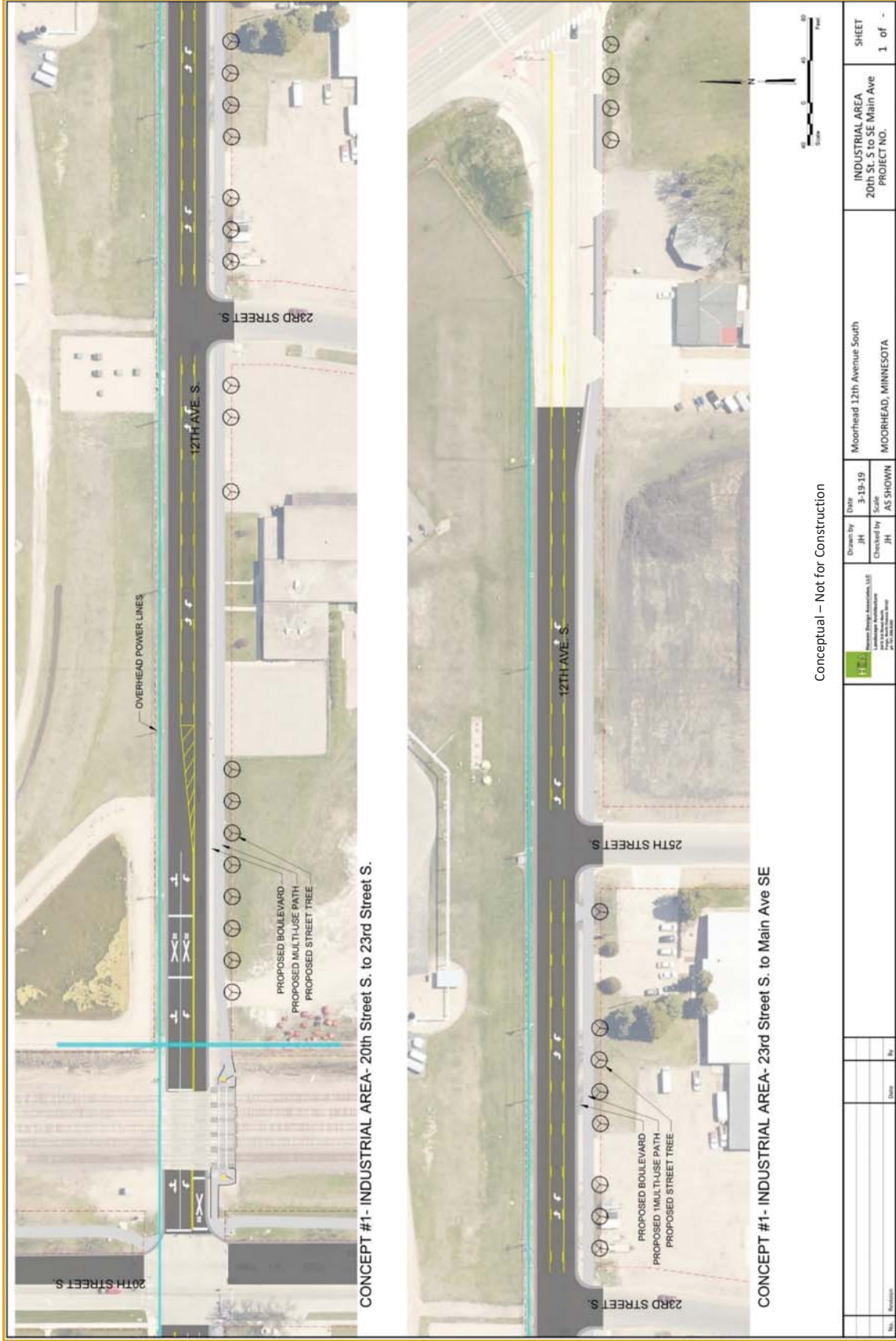


Conceptual – Not for Construction

No. Revision	Date	By	For		Drawn By JH	Date 3-19-19
					Checked by JH	Scale AS SHOWN
				Moorhead 12th Avenue South MOORHEAD, MINNESOTA		SHEET CONCORDIA COLLEGE 5th St. S to 11th St. S. PROJECT NO.
						1 of -

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Figure 6.7 | Corridor-Wide Landscaping/Streetscaping



<table border="1"> <tr> <td>Drawn by</td> <td>JH</td> <td>Date</td> <td>3-19-19</td> </tr> <tr> <td>Checked by</td> <td>JH</td> <td>Scale</td> <td>AS SHOWN</td> </tr> </table>	Drawn by	JH	Date	3-19-19	Checked by	JH	Scale	AS SHOWN	Moorhead 12th Avenue South MOORHEAD, MINNESOTA	INDUSTRIAL AREA 20th St. S to SE Main Ave PROJECT NO.	SHEET 1 of 1
Drawn by	JH	Date	3-19-19								
Checked by	JH	Scale	AS SHOWN								

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## 7.0 ENVIRONMENTAL DOCUMENTATION

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### 7.1 Scope of Environmental Impact Analysis

This corridor study did not include an in-depth evaluation of the environmental impacts or coordination with potentially affected agencies typically involved in implementing transportation projects. The following information is presented for discussion and as a reference for identification of potential future environmental impacts.

### 7.2 Natural Resources

#### 7.2.1 LAND USE AND RIGHT OF WAY

As documented in the “Existing Conditions” portion of the study, the land use throughout the corridor is a mix of low to moderate density residential, mixed-use, institutional, and light and heavy industrial zoning. It is not anticipated that any of the proposed alternatives would significantly impact the existing land use so this aspect was not analyzed further.

The existing right of way varies throughout the corridor. The proposed improvement alternatives are generally designed to stay within the existing right of way, although alternatives that include removing and replacing the existing sidewalk with a wider shared-use path, or installing a new path where one does not exist, may require temporary construction easements or purchase of permanent easements or right of way. These areas include:

- South side of 12<sup>th</sup> Avenue S from 5<sup>th</sup> Street S to 8<sup>th</sup> Street S
- 20<sup>th</sup> Street S to Main Avenue SE.

The properties in these areas will need to be further evaluated if these alternatives are implemented.

#### 7.2.2 WETLANDS AND WILDLIFE

According to the US Fish and Wildlife Wetlands Mapper application, there are no wetlands within the corridor study area. The nearest bodies of water include the Red River which is approximately 750 feet west of the study area and a county drain approximately 1000’ east of the study area. It is not anticipated that any of the proposed alternatives would significantly impact those water bodies or other potentially unknown wetlands.

#### 7.2.3 TREES

There are many existing boulevard trees throughout the corridor study area, most notably from River Drive to 20<sup>th</sup> Street SE. These trees are discussed more in-depth in the “Existing Conditions” and “Issue Identification and Needs Assessment” sections of this study. The majority of these trees are mature American Elm, Chokecherry, Crabapple, and



Green Ash. Overall there are 70 trees in good condition, 41 trees in fair condition, and 77 in poor condition. Many of the trees in poor condition are Crabapple trees near Concordia College campus that are past maturity and showing evidence of health decline or other health issues. Concordia has indicated that they would like to replace these trees.

The “Crazy Tree” is a local landmark located in the southwest corner of 12<sup>th</sup> Avenue South and 11<sup>th</sup> Street. Because of the historical and social nature of this tree, the alternatives were developed for that area focused on reducing or eliminating impacts to the tree.

Some of the improvement alternatives include removing and replacing existing sidewalks in the boulevard with a wider shared-use path. These improvements to the bicycle and pedestrian facilities would have negative impacts to the existing boulevard trees either traumatizing the root structure or requiring the tree to be removed completely. While this could be an opportunity to replace large overgrown trees with a more appropriately sized tree for a boulevard environment, the City Forester indicated a desire to keep all existing trees. The trees also have sentimental value to the public, especially the residents along the corridor and removal would likely not be favorable.

### 7.3 Utility Impacts

The major private utilities identified in the “Existing Conditions” analysis include overhead power lines owned by Moorhead Public Service (MPS) and several underground utilities. The exact location and ownership of the underground utilities is unknown and further analysis would be required on any alternatives chosen that would potentially impact these utilities.

The overhead power lines owned by MPS extend through 80% of the corridor. The City expressed a desire to bury these lines for aesthetic and maintenance concerns. MPS was contacted to discuss the possibility of burying these lines and they indicated that these lines serve a large population along the corridor and burying them would take a significant effort. The impacts of such an undertaking would include temporary service disruptions, localized earthwork, and traffic impacts. MPS estimated a cost of \$1,350,000 to bury the power lines throughout the corridor.

### 7.4 Section 4(f)

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 prohibits federal transportation agencies from using land from publicly owned parks, recreation areas (including recreational trails), wildlife and water fowl refuges, or public and private historic properties, unless there is no feasible and prudent alternative to that use and the action includes all possible planning to minimize harm to the property resulting from such a use.

Potential Section 4(f) properties include:

- Parks and recreation areas
- Wildlife or waterfowl refuges and wildlife management areas
- Cultural and archeological resources and sites
- Historic sites, bridges, and highways
- Landscapes
- School playgrounds
- Fairgrounds
- Public multiple-use land holdings
- Wild and scenic rivers
- Planned facilities
- Bikeways (recreational) and trails
- Public golf courses



There are properties along the corridor that would likely be protected under Section 4(f). City parks including Alm Park, Lamb Park, and Romkey Park are not directly adjacent to 12<sup>th</sup> Avenue South but are within one city block. Concordia College has recreational facilities directly south of 12<sup>th</sup> Avenue South east of 8<sup>th</sup> Street.

The 2014 Moorhead River Corridor Master Plan provides a vision for developing recreational and habitat enhancement to the area along the Red River. The Plan included potential future projects that may be within the area of future improvements on 12<sup>th</sup> Avenue South.

This study did not include an analysis of possible historical, archeological, or cultural resources.

### 7.5 Section 6(f)

The purpose of Section 6(f) of the Land and Water Conservation Act (LAWCON) is to develop and provide accessibility to outdoor recreation resources. It prohibits use of any land purchased with LAWCON funds for any purpose other than recreational use unless replacement land with equal usefulness is provided.

A search of the listing of park lands purchased with LAWCON funds indicates that there are currently no Section 6(f) protected lands within the corridor study area.

### 7.6 Environmental Justice and Social Considerations

In accordance with Executive Order 12898 “Federal Actions to Address Environmental Justice Minority Populations and Low-Income Populations”, environmental justice must be addressed to the greatest extent practicable and permitted by law in all federal planning and programming activities. The intent of the order is to promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income populations access to public information and public participation. Future projects along the corridor could have federal funding and may be considered a federal project required to comply with this order.

A review of 2010 census data shows a high concentration of low-income and minority households along certain areas of the 12<sup>th</sup> Avenue South corridor, particularly between 17<sup>th</sup> Street and 20<sup>th</sup> Street. It is not expected that the proposed improvements would negatively impact a particular area of the corridor more than another, however there will need to be further analysis with any future project.



## 8.0 STUDY RECOMMENDATIONS

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### 8.1 Summary of Recommendations

Based on input and analysis by the Study Review Committee along with public and stakeholder input, the following improvement alternatives are recommended for future implementation. Most of the recommendations are expected to be implemented with a planned project scheduled for 2020. Some improvements are indicated as “long-range” as they will require a longer project development process and/or additional funding. Further environmental documentation or study may be required depending on the funding sources used by the City of Moorhead for future projects.

The following is a summary of the preferred recommendations for the corridor.

#### 8.1.1 BICYCLE, PEDESTRIAN, AND TRANSIT ROUTE IMPROVEMENTS

- Install shared-lane markings “sharrows” from River Drive to 5<sup>th</sup> Street.
- Install a shared-use path on the south side of 12<sup>th</sup> Avenue S from 5<sup>th</sup> Street to 11<sup>th</sup> Street.
- Shift south curb to the north between 20<sup>th</sup> Street and Main Avenue SE to create a boulevard wide enough to install a shared-use path along the south side.
- Install on-street dedicated bike lanes on the north and south side of 12<sup>th</sup> Avenue S between 11<sup>th</sup> Street and 19 ½ Street.
- Install a crosswalk at 19 ½ Street.
- Install a concrete pad and waiting area with bench at the MATBUS stop west of 25<sup>th</sup> Street.
- Install pedestrian/bicycle crossing on east side of 20<sup>th</sup> Street at BNSF Railroad tracks.
- Improve curb ramps throughout the corridor to meet current ADA guidelines.

#### 8.1.2 PARKING AND ACCESS MANAGEMENT

- Close parking lot driveways:
  - North side of 12<sup>th</sup> Avenue S directly east of 5<sup>th</sup> Street
  - South side of 12<sup>th</sup> Avenue S directly west of 8<sup>th</sup> Street
  - North side of 12<sup>th</sup> Avenue S directly east of 8<sup>th</sup> Street
  - South side of 12<sup>th</sup> Avenue S directly west of 23<sup>rd</sup> Street
  - South side of 12<sup>th</sup> Avenue S directly east of 23<sup>rd</sup> Street
  - South side of 12<sup>th</sup> Avenue S directly west of 25<sup>th</sup> Street.
- Shift parking pullout on north side of 12<sup>th</sup> Avenue S near 7<sup>th</sup> Street further west, away from the intersection.
- Remove parking area on south side of 12<sup>th</sup> Avenue S directly east of 9<sup>th</sup> Street.
- Shift parking lot driveway on south side of 12<sup>th</sup> Avenue S directly east of the BNSF Railroad tracks further east, away from the railroad tracks.
- Install curb bump-outs around the southeast and southwest corners of the 6<sup>th</sup> Street and 7<sup>th</sup> Street intersections.
- Paint curb near access points to deter parking in the access line of sight.

8.1.3 ROADWAY GEOMETRICS AND TRAFFIC OPERATIONS

- Reassign eastbound lanes at 8th Street intersection with a shared thru/left turn lane and a designated right turn lane (*this is supported as a long-range improvement*).
- Realign 11<sup>th</sup> Street intersection to eliminate horizontal offset and align the curb lines.
- Construct a grade raise at the 20<sup>th</sup> Street S intersection by adjusting the cross-slope on the east half of the intersection to improve the vertical profile of 12<sup>th</sup> Avenue S at the BNSF Railroad tracks (*this is supported as a long-range improvement*).

8.1.4 STREETSCAPING AND TREES

- Incorporate improvements throughout the corridor as roadway improvements are implemented.
- Bury overhead power lines (*this is supported as a long-range improvement*).

8.2 Estimated Cost for Recommended Improvement Alternatives

The tables below show the estimated costs for the recommended improvement alternatives listed above. Some of the recommended improvements were determined to be already included in the base cost for the 2020 programmed mill, overlay, and pavement rehab project. These improvements are shown in **Table 8.1**. **Tables 8.2 and 8.3** summarize the estimated costs for short-range and long-range improvements. All costs are in 2019 dollars.

**Table 8.1**  
**Recommended Improvements Already Included in 2020 Base Project Cost**

12th Avenue South Recommended Improvement Already Included in 2020 Base Project Mill & Overlay from 5 <sup>th</sup> St to 20 <sup>th</sup> St Pavement Rehab from 20 <sup>th</sup> St to Main Ave SE	
<i>Alternative</i>	<i>Estimated Cost</i>
<b>Costs Already Included in 2020 Base Project for:</b> 2B2 - On-Street Bike Lanes from 11th St to 19½ St 2C - Crosswalk at 19 ½ 3C - Bus Stop Concrete Pad and Bench at 25th St 4A - Corridor-Wide Sidewalk ADA Upgrades 3D - Access Removal and Relocation from 20th to 25 <sup>th</sup> St 4B - Corridor-Wide Curb Painting to Restrict Parking	
<b>Base Project Total (programmed in City CIP)</b>	<b>\$3,500,000</b>

**Table 8.2**  
**Short-Range Improvement Alternative Estimated Costs**

<b>12th Avenue South  Short-Range Improvement Estimated Costs  River Drive to Main Avenue SE</b>	
<i>Alternative</i>	<i>Estimated Cost</i>
<b>Bicycle, Pedestrian, and Transit Improvements</b>	
<b>1A2</b> - Sharrows and Shared-Use Path from River Dr to 8th	\$90,000
<b>2A</b> - Shared-Use Path from 9th to 11th	\$110,000
<b>3A</b> - RR PED Crossing East of 20th	\$450,000
<b>3B</b> - 10' Shared Use Path from 20th to Main Ave SE	\$250,000
<i>Subtotal</i>	\$900,000
<b>Parking and Access Management</b>	
<b>1C</b> - Access and Parking Area Removal & Realignment from 5th to 8th	\$50,000
<b>1D</b> - Curb Bump Outs at 6th and 7th	\$75,000
<b>2D</b> - Access and Parking Area Removal & Realignment from 8th to 10th	\$45,000
<i>Subtotal</i>	\$170,000
<b>Roadway Geometrics and Traffic Operations</b>	
<b>1E1</b> – Short-Term Changes at SE Corner 8 <sup>th</sup> Street for Future Lane Reassignment	\$110,000
<b>2E</b> - Realign 11th St Intersection	\$150,000
<i>Subtotal</i>	\$260,000
<b>Streetscaping Improvements</b>	
<b>4C</b> - Corridor-Wide Landscaping/Streetscaping Improvements	\$415,000
<i>Subtotal</i>	\$415,000
<b>Short Range Total</b>	<b>\$1,745,000</b>

**Table 8.3**  
**Long-Range Improvement Alternative Estimated Costs**

<b>12th Avenue South  Long-Range Improvement Estimated Costs  River Drive to Main Avenue SE</b>	
<i>Alternative</i>	<i>Estimated Cost</i>
<b>1E1</b> – Long-Range Lane Reassignment and Re-Striping at 8 <sup>th</sup> St	\$75,000
<b>2F</b> - 20th St Intersection Grade Raise	\$1,250,000
<b>4D</b> - Bury Overhead Power Lines	\$1,350,000
<b>Long Range Total</b>	<b>\$2,675,000</b>



Appendix A  
Public Participation Plan







# **12TH AVENUE SOUTH MOORHEAD CORRIDOR STUDY**

## **PUBLIC PARTICIPATION PLAN**

**IN COLLABORATION WITH METRO COG, CITY OF MOORHEAD, AND APEX ENGINEERING GROUP**

**Updated August 2018**

## **OVERVIEW**

Moorhead has programmed a project to construct improvements along 12th Avenue South in 2020. This roadway has served as a vital corridor through the city for decades. It is the policy of the Fargo-Moorhead Metropolitan Council of Governments (Metro COG) and the City of Moorhead (City) to use a context-sensitive approach to design that considers the complete streets needs of all transportation system users (motor vehicles, transit, pedestrians and bicycles) as well as the needs of adjacent and nearby property owners, including the preservation or addition of parking, trees and landscaping.

Engaging area property owners, residents, workers, students and users of this street and the surrounding sidewalks is a key component of the study, asking for input and feedback on needs, issues, alternatives, benefits and constraints.

## **PROJECT PURPOSE AND NEED**

The purpose and need of this study is to identify and analyze a range of complete streets and aesthetic design elements along 12th Avenue South, between River Drive and Main Avenue SE to enhance the safety and comfort of all users along the corridor while providing reasonable traffic operations for motor vehicles and preserving and enhancing the character of the neighborhood.

## **KEY STAKEHOLDERS**

- Home owners and renters
- Commuters (vehicle, bicycle, pedestrian, public transit)
- Staff and students of adjacent and nearby colleges and universities (Concordia, MSUM, MState)
- Public and private K-12
- Businesses, churches, organizations (specifically Eventide, Sanford, MHD industrial park tenants, and LAC/A Place For Hope)
- City, State and county officials
- Moorhead business, civic and community organizations (MBA, River Keepers)
- City staff, core community services
- MHD Public Schools transportation/buses and MAT bus
- BNSF RR and Otter Tail Valley RR

## **ENGAGEMENT STRATEGY**

Use multiple, existing communication channels already reaching stakeholders to boost awareness and engagement:

1. Provide shareable content for partners to reach their audiences.
2. Make it easy to engage and participate.

## GOALS, MEASUREMENT

Effectiveness of public engagement efforts will be measured and reviewed throughout the study period, allowing us to make changes in communication channels and messaging if necessary. The key measurement will be balance of input shared:

- Engagement goal is to have a representative cross-section of stakeholders share input.
- Measured by monitoring survey results together with public meeting attendance.

## OVERALL MESSAGES

- The City of Moorhead and Metro COG initiated this study of 12th Avenue South in Moorhead to support the current and future needs of all users of this street, including residents, walkers, bikers, transit users and motorists.
- As a user of 12th Avenue South, your insight and input is needed to help shape the future of this important corridor through Moorhead.
- Recommendations for alternatives and improvements will be developed using applicable standards together with your input and analysis of data and existing conditions.
- Information about the corridor study as well as key information and opportunities to give your input will be posted on the City of Moorhead's website, at <http://www.cityofmoorhead.com/departments/engineering/current-projects/12th-ave-study> (final website address TBD)

## MESSAGE PILLARS FOR SOCIAL CHANNELS

- Input opportunities, how, where to share your input
  - Link to survey, [https://www.surveymonkey.com/r/Moorhead\\_12th\\_Avenue](https://www.surveymonkey.com/r/Moorhead_12th_Avenue)
  - Link to city website, study page
- Shared data, insight, input
  - Data collected, key facts, findings, observations
  - Ideas and input already shared
- Key dates/events
  - Survey open, [https://www.surveymonkey.com/r/Moorhead\\_12th\\_Avenue](https://www.surveymonkey.com/r/Moorhead_12th_Avenue)
  - Public meetings
    - Thursday, September 20, 2018; 4 – 7 p.m
    - Tentative February 2019.

## PUBLIC PARTICIPATION SCHEDULE AND TACTICS

TIMING	AUDIENCE	TACTICS	DETAILS/WHO
<b>PREPARE ASSETS</b>  <b>JULY – AUG 2018</b>	All	<ul style="list-style-type: none"> <li>Develop study page on MHD city website</li> </ul>	Develop page on city’s website as home base for communications. Jonathan Atkins is liaison for city.
		<ul style="list-style-type: none"> <li>Develop, set-up survey</li> </ul>	Flint/Apex shared starter questions; Adam Altenburg/SRC edited; survey ready June 2018; link went live on City website on July 3 <sup>rd</sup> .
		<ul style="list-style-type: none"> <li>Define messaging, talking points, key words, hashtag(s)</li> </ul>	Flint to develop; will draft overall messages, email messaging, e-notifications, and social posts
		<ul style="list-style-type: none"> <li>Develop study graphics, meeting signage, map, flyer</li> </ul>	Flint will develop in combination with messaging, includes study timeline graphically
		<ul style="list-style-type: none"> <li>Develop PSA script, spot for MCAM</li> </ul>	Flint will draft script for review; MCAM will produce together with Flint
	Targeted stakeholders	<ul style="list-style-type: none"> <li>Develop/define email lists</li> </ul>	Flint/APEX will identify with SRC; Flint will maintain database for updates from survey participants
<b>SURVEY ANNOUNCEMENT</b>  <b>START COMMUNICATIONS WEEK OF AUG 27, 2018</b>  <b>(CLASSES START THIS WEEK AT CONCORDIA, MSUM, MSTATE)</b>	All	Study announced, survey opportunity shared through channels	Flint will coordinate distribution: <ul style="list-style-type: none"> <li>E-notification</li> <li>Media advisory</li> <li>Email to lists</li> <li>Alerts to MAT riders</li> <li>Post to Facebook, Metro COG, Moorhead, Next Door</li> <li>Shareable posts and emails for partners, employers: Concordia, MSUM, MState, Eventide, MAT, MHD schools</li> </ul>
		Pitch story to print publications, survey and meeting opportunity	Flint will pitch story to Clay County Extra and student newspapers, The Concordian and The Advocate
		Begin airing of PSA promoting public meeting/survey opportunity of MCAM	Flint will coordinate with MCAM/Tony Tilton, general mgr.

<b>ADVERTISE PUBLIC MTG #1</b>  <b>WEEK OF SEPT 10</b>	All	Advertise public meeting	Paid advertisement for public meeting in Clay County Extra (Metro COG)
<b>PROMOTE PUBLIC MTG #1</b>  <b>WEEK BEFORE, WEEK OF</b>	All	Promote public meeting on social channels, MCAM	Boost posts on Facebook (Flint) Flint will coordinate distribution: <ul style="list-style-type: none"> <li>• E-notification</li> <li>• Media advisory</li> <li>• Email to lists</li> <li>• Alerts to MAT riders</li> <li>• Post to Facebook, Metro COG, Moorhead, Next Door</li> <li>• Promote live opportunity via Facebook</li> </ul> MCAM PSA continues to air Shareable posts and emails for partners, employers: Concordia, MSUM, MState, Eventide, MAT, MHD schools
<b>PROMOTE PUBLIC MTG #1</b>  <b>WED, SEPT 19</b>	Residents	Coffee with the Mayor topic	Share survey opportunity and public meeting with attendees (tentative)
<b>PUBLIC MTG #1</b>  <b>THURS, SEPT 20, 4 – 7 PM. 2018 (SET UP AT 3)</b>	All	Public Meeting at Concordia College, Birkeland Lounge, Offutt Concourse;	Flint/APEX set-up, directional signs Open House format with formal presentation at scheduled time <ul style="list-style-type: none"> <li>• Share maps, corridor video</li> <li>• Gather comments; paper surveys available</li> <li>• Graphic of study timeline</li> </ul> Leverage Facebook Live from public meeting: <ul style="list-style-type: none"> <li>• Share frequently asked questions/take questions</li> <li>• Ask attendee to be interviewed</li> </ul> Walk viewers through the meeting virtually Flint will coordinate/formal presentation filmed, aired through playback on MCAM

<b>SRC MTG #2 OCT 2018</b>	SRC	Study Review Committee Mtg #2	APEX to facilitate; update on tech memos #1 and #2; survey results; public meeting recap
<b>UPDATE TO PUBLIC OCT 2018</b>	All	Post updated information to webpage; email database	Flint/APEX will supply content
<b>SRC MTG #3 DEC 2018</b>	SRC	Study Review Committee Mtg #3	APEX to facilitate; update on tech memos #3;
<b>DRAFT CORRIDOR STUDY REPORT  FEB 2019</b>	SRC	Draft report submitted to SRC	APEX to submit/share draft report to SRC
<b>PROMOTE PUBLIC MEETING #2  3 WEEKS BEFORE</b>	All	Begin airing of PSA promoting public meeting #2 on MCAM	Flint will write/coordinate production and airing with MCAM/Tony Tilton, general mgr.
		Pitch story to print publications, opportunity to weigh in online and at meeting	Flint will pitch story to Clay County Extra and student newspapers, The Concordian and The Advocate
<b>ADVERTISE PUBLIC MEETING #2  WEEK BEFORE</b>	All	Advertise public meeting	Paid advertisement for public meeting in Clay County Extra (Metro COG)
<b>PROMOTE PUBLIC MEETING #2  WEEK BEFORE, WEEK OF</b>	All	Promote public meeting on social channels, MCAM	Boost posts on Facebook (Flint) Flint will coordinate distribution: <ul style="list-style-type: none"> <li>• E-notification</li> <li>• Media advisory</li> <li>• Email to lists</li> <li>• Alerts to MAT riders</li> <li>• Post to Facebook, Metro COG, Moorhead, Next Door</li> </ul> Continue airing PSA on MCAM Shareable posts and emails for partners, employers: Concordia, MSUM, MState, Eventide, MAT, MHD schools
<b>PUBLIC MTG #2  FEB 2019</b>	All	TBD	Flint/APEX set-up, directional signs. Format TBD <ul style="list-style-type: none"> <li>• Alternatives and recommendations developed will be shared for input and discussion</li> </ul>

			<p>Leverage Facebook Live from public meeting:</p> <ul style="list-style-type: none"> <li>• Share summary of study work to date</li> <li>• Slideshow of alternatives</li> </ul>
		Aired/played back on MCAM	Flint will coordinate/formal presentation filmed, aired through playback on MCAM/Tony Tilton, mgr.
<b>SRC MTG #4</b> <b>MARCH 2019</b>	SRC	Study Review Committee Mtg #4	APEX to facilitate; discussion of Draft Corridor Study comments; public meeting recap
<b>PRESENTATIONS TO BOARDS AND COMMISSIONS</b> <b>MARCH/APRIL 2019</b>	Moorhead Planning Commission and City Council; TTC and Policy Board	Presentations to boards and commissions	APEX to present (Note some are taped/televised as part of regular MCAM programming)
<b>UPDATE TO PUBLIC</b> <b>APRIL 2019</b>	All	Post updated information to webpage; email database	Flint/APEX will supply content
<b>FINAL STUDY RELEASED</b> <b>MAY 2019</b>	All	Post updated information, link to study on webpage; email link to database	<p>Flint/APEX will supply content.</p> <p>Boost posts on Facebook (Flint)</p> <p>Flint will coordinate distribution:</p> <ul style="list-style-type: none"> <li>• E-notification</li> <li>• Media advisory</li> <li>• Email to lists</li> <li>• Alerts to MAT riders</li> <li>• Post to Facebook, Metro COG, Moorhead, Next Door</li> </ul> <p>Shareable posts and emails for partners, employers: Concordia, MSUM, MState, Eventide, MAT, MHD schools</p>

## **DRAFT Q&A**

### **Why is a study of 12th Avenue South in Moorhead being conducted?**

The City has a project for this corridor programmed for construction in 2020. This study will guide the final design of the project to ensure that it meets the current and future needs of all users of this street, including residents, walkers, bicyclists, transit users and motorists.

### **Why are you asking for public input?**

Sharing input from your unique perspective will help identify local needs and provide guidance to the City to design context-sensitive solutions and help shape the future of this vital corridor through Moorhead.

### **How will my input be used?**

Your input on how you use 12th Avenue South, and any challenges or improvements you'd like to see supports the long-range planning for this corridor. Your input will be used during the project team's analysis of solutions to address each challenge, which will be presented as concepts for public review and discussion.

### **What is the study process?**

The study team will use the community's ideas and comments to determine possible improvements for all types of transportation along this corridor. Additional analysis is completed and design options are developed. You will have the opportunity to review and comment on the alternatives developed. Further research is completed on those alternatives, including their economic feasibility, and the final study is presented to the Metro COG. The study period from start to end is approximately one year.

As improvements identified as part of the study are introduced and move forward, public involvement and comment is an essential component of the vetting process. Upon completion of the study, the City will proceed to final design of the project, incorporating those elements of the study that were recommended in the final study.

### **Will I see ideas submitted?**

Input received as well as analysis completed will be shared on the corridor study page on the city of Moorhead's website <http://www.cityofmoorhead.com/departments/engineering/current-projects/12th-ave-study>  
(final website address TBD)

### **How is this study funded?**

This study is funded with a combination of federal transportation funds and City of Moorhead funds. Further questions about the funding and management of this project can be viewed at [www.cityofmoorhead.com/12thAveStudy.com](http://www.cityofmoorhead.com/12thAveStudy.com) (final website address TBD) or by contacting Metro COG Project Manager, Adam Altenburg.



Appendix B  
Public Input Meeting Attendee List, Comment Transcripts, and  
Other Materials



**Moorhead 12<sup>th</sup> Avenue South Corridor Study**  
**Attendee List for Public Input Meeting #1 – 09/20/18**

<b>No.</b>	<b>Attendee</b>
1	Karen Vosburg
2	Don Larew
3	Cindy Bossart
4	Tim Powers
5	Cheryl Revie
6	Ian Revie
7	Darrell Vasvick
8	JoAnn Walker
9	Joel Wehri
10	Phyllis Murray
11	Roy Murray
12	Denese Norris
13	Benny Peterson
14	Iola Peterson
15	Jeff Were
16	Patricia Beiswenger
17	Jean Hollaar
18	Julia Walk
19	Matt Kammerer
20	Sandra Rather
21	Jonathan Steinward
22	Roger Koppang
23	Barrett Voigt
24	Stan Struble
25	Jim Dustin
26	Juan Cabanela

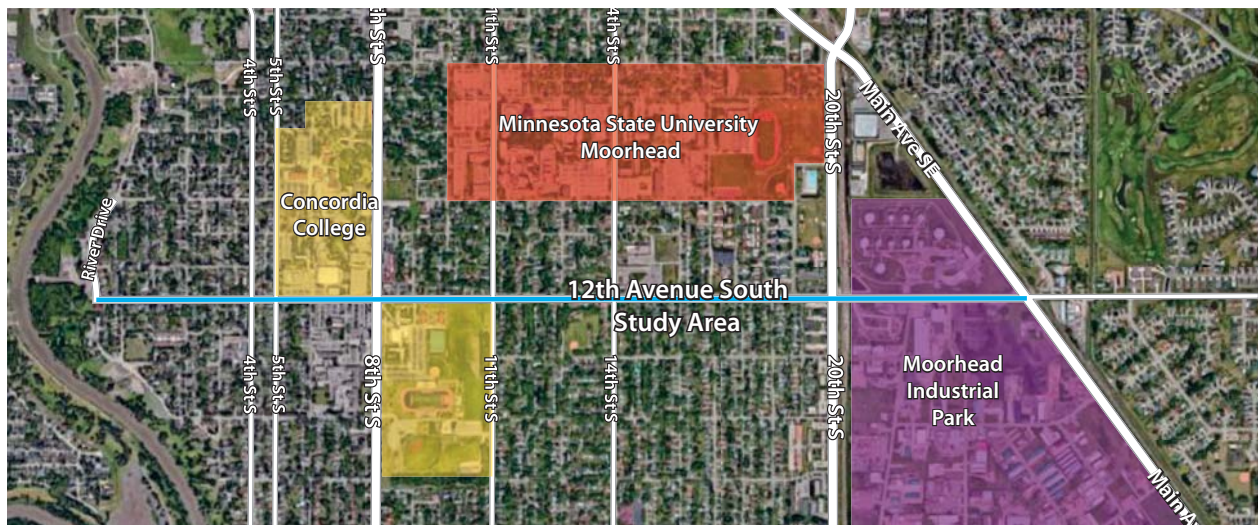
## Moorhead 12<sup>th</sup> Avenue South Corridor Study

### Transcript of Comment Forms Received at Public Input Meeting #1 – 09/20/18

No.	Comment
1	Fire hydrant is too close to driveway – has been hit several times.
2	I would like to see crosswalk across 12 <sup>th</sup> Ave S at 19½ St, sidewalks east of 20 <sup>th</sup> St S, and street trees east of 20 <sup>th</sup> St S.
3	There are three blocks on the north side of 12 <sup>th</sup> Ave S, from 4 <sup>th</sup> St to 2 <sup>nd</sup> St approximately, where our kids had to walk on the street 30 years ago, and they still have to today. There needs to be sidewalk on that side of street also.  Bad corner at 3 <sup>rd</sup> St, when turning right there is a deep “dip”.
4	Need sidewalk to be completed on north side of 12 <sup>th</sup> Ave S from 2 <sup>nd</sup> St to 6 <sup>th</sup> St.
5	As a daily bus rider, I really need MATBUS service to stop in front of A Place for Hope in the 12 <sup>th</sup> Ave S industrial park at 2419 12 <sup>th</sup> Ave S. If possible, could MATBUS place a shelter at this address? Also, request that the City fills in the hole approximately 5-10 feet from the bus stop sign.
6	Would like to see more connectivity in bike lanes – west of 20 <sup>th</sup> St is great! Would be nice to see that continue to 8 <sup>th</sup> St.
7	Keep on improving bus service on 12 <sup>th</sup> Ave S from 20 <sup>th</sup> St to Hwy 52 (Main Avenue). A Place for Hope has many members who currently use the bus service and the service we have is appreciated. There is no shelter available for several blocks down on 20 <sup>th</sup> St, so there are a lot of people who have to wait in bitter cold temperatures and extreme winds. This is exceptionally bad when the train stops the bus.
8	We appreciate the bus stopping at A Place for Hope at 2419 12 <sup>th</sup> Ave S. It would be great to have 7-day bus stops and a shelter for the cold weather days.

# 12th Avenue South CORRIDOR STUDY

The City of Moorhead and the Fargo-Moorhead Metropolitan Council of Governments (Metro COG) have partnered to study a section of 12th Avenue South in Moorhead, beginning at the west end at River Drive and extending east to the intersection with Main Avenue. The purpose of the study is to evaluate current and future needs along the corridor, and to identify short-term and long-range improvements for consideration.



This corridor has served as a vital east to west roadway through the community since it was first paved in the 1950s and 1960s. The city has planned for improvements to be constructed in 2020 using an approach to design that considers the needs of everyone who uses 12th Avenue South – vehicles, transit, pedestrians and bicycles – as well as the needs of adjacent and nearby property owners including adding or preserving parking, trees and landscaping.

This study will include public input on what needs, issues and improvements would be desirable for the future in addition to technical analysis that identifies current and future conditions and impacts for all types of users of 12th Avenue South.

## STUDY BENEFITS

This study will help influence improvements planned for the 2020 construction season.

Results will help identify and prioritize short-term and long-range planning.

The study allows the city to consider the needs and wishes of all stakeholders.



## QUESTIONS AND ANSWERS ABOUT THIS CORRIDOR STUDY:

### What is a corridor study?

A corridor study is a focused look at current and future needs of all types of users and stakeholders for a specified roadway, or corridor, through the City of Moorhead. Using a combination of data and public input, the study process identifies needs, issues, alternatives, benefits and constraints.

### Why is a study of 12th Avenue South in Moorhead being conducted now?

This study was initiated by the City of Moorhead and Metro COG to support the current and future needs of all users of this street, a “complete streets” design approach that looks at the needs of residents, walkers, bikers, transit users and motorists. This study will inform future construction improvements planned for 2020, as portions of the pavement are already classified as below-average condition.

### What kind of input are you asking for?

We’ll be seeking your input at multiple points in the study. Initially, we’re hoping to hear what your ideas, needs and concerns are for what this avenue could provide into the future. As part of a complete streets design approach, we are asking those who currently use this corridor on foot or by car, bike or bus, as well as live or own property on or adjacent to 12th Avenue to share comments. An online survey is available at: [www.surveymonkey.com/r/Moorhead\\_12th\\_Avenue](http://www.surveymonkey.com/r/Moorhead_12th_Avenue)

After alternatives and recommendations are developed, we’ll be asking for your feedback again.

### How will my input be used?

Your initial input helps us validate current needs and issues, as well as anticipate what future needs will be for this avenue. After alternatives and recommendations are developed, your feedback will help guide plans and priorities for both short-term and long-term improvements.

Information about the study, including technical memos and reports, will be posted to:

[www.cityofmoorhead.com/departments/engineering/current-projects/12th-ave-s](http://www.cityofmoorhead.com/departments/engineering/current-projects/12th-ave-s)

[www.fmmetrocog.org/projects-rfps/12th-avenue-south-corridor-study](http://www.fmmetrocog.org/projects-rfps/12th-avenue-south-corridor-study)

Please direct all questions and comments to:

Apex Engineering, Matt Kinsella: 701-373-7987  
[matt.kinsella@apexenggroup.com](mailto:matt.kinsella@apexenggroup.com)

## CURRENT FACTS ABOUT 12TH AVENUE SOUTH:

**3,100 - 7,000** vehicles move along segments of 12th Avenue each day.

**900+** MATBUS riders a month use one of 9 bus stops for 3 routes currently driving on or crossing 12th Avenue.

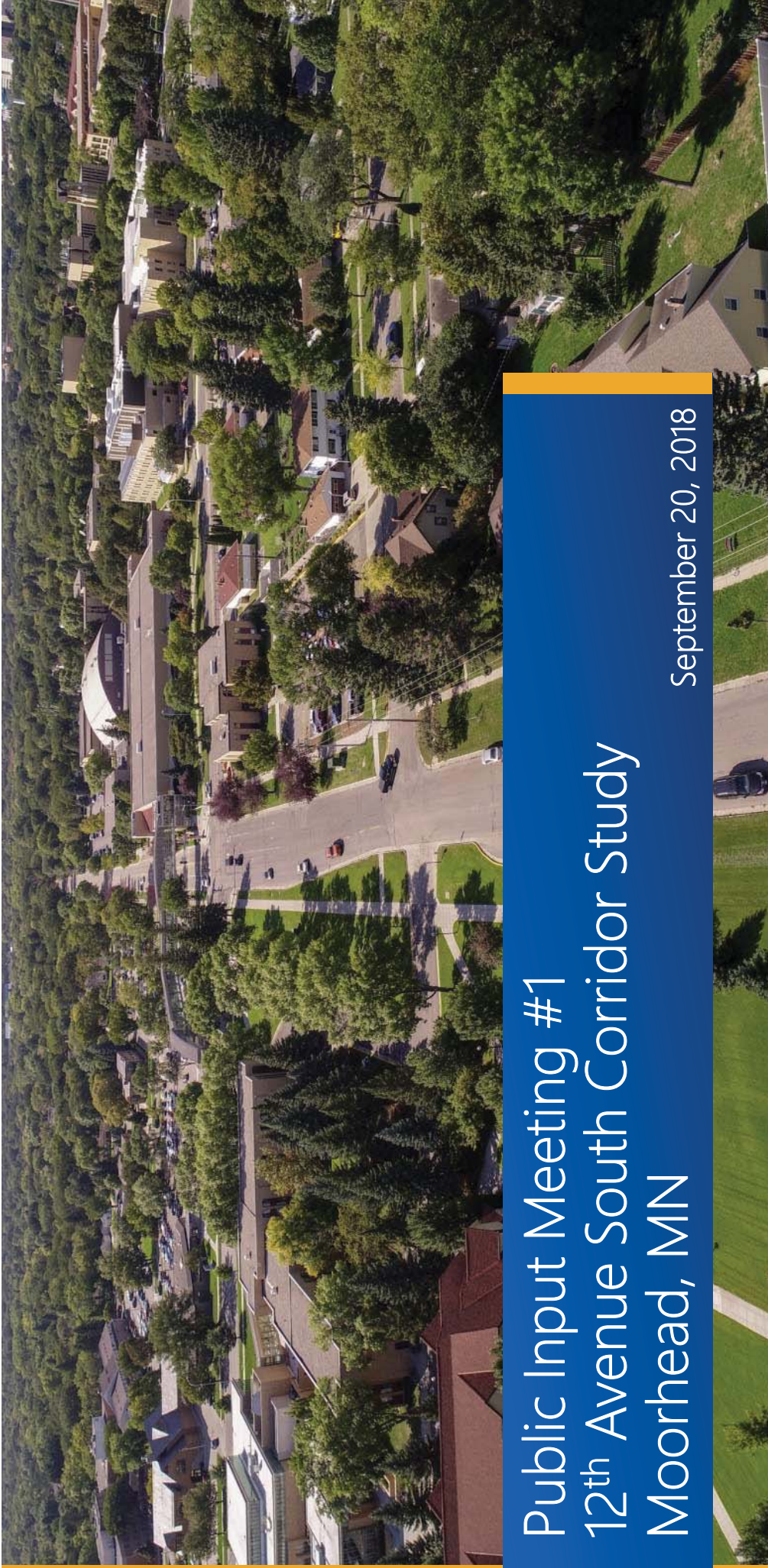
**2,400+** daily pedestrian crossing movements are made at the intersection of 12th Avenue South and 8th Street while area colleges are in session.

**9** key intersections, **2** that are signalized, will be evaluated and studied, including 24-hour turning movement counts, wait times, queue length and crash data.

In the **Mid-1950s** 12th Avenue South was first graded and paved from River Drive to 20th Street, and the section from 20th Street east to Main Avenue SE was graded and paved in 1964.

**188** trees and hedges are planted in the boulevard, plus the landmark “Crazy Tree” grows on the corner of Concordia College’s campus.





# Public Input Meeting #1 12<sup>th</sup> Avenue South Corridor Study Moorhead, MN

September 20, 2018



# Introductions – Presenters



**Matt Kinsella**  
Project Manager



**Brent Muscha**  
Design Engineer



**Kate Miner**  
Traffic Analysis





# Introductions – Other Team Members



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**Kristie Leshovsky**  
**Tom Trowbridge**  
**Jonathan Atkins**  
**Steve Moore**



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**Adam Altenburg**



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**Roger Olson**



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**Lori Van Beek**

## Getting Started

- Please Sign In
- Study Handout
- Comment Form
- Online Survey Station
- Title VI Public Participation Survey (Optional)
- Tonight's Goal – To Hear from You

# Tonight's Agenda

- Study Overview
- Existing Traffic Conditions
- Future Traffic Conditions (No Build)
- Other Study Elements
- Study Schedule and Next Steps



# Study Overview



# Why is the Study Needed?

- Vital East-West Corridor in the Area Network
- Evaluate Current and Future Needs
- Upcoming 2020 Construction Project
- Inform Short-Term and Long-Range Planning

## What Do You See as Issues and Needs?



# Existing Traffic Conditions

- **Data Collection**
  - Average Annual Daily Traffic (AADT)
  - Turning Movement Counts
  - Historical Crash Data
  - Existing Geometrics and Traffic Control
- **High-Level Capacity Analysis**
- **Operational Analysis**
- **Safety Analysis**



# Existing Traffic Conditions

- High Level Capacity Analysis
  - 2-lane roadway capacity 10,000 vehicles/day
  - 3-lane roadway capacity 18,000 vehicles/day
- 12<sup>th</sup> Avenue currently carries between 3,100 and 7,000 vehicles/day



# Existing Traffic Conditions

- Operational Analysis
  - Synchro/SimTraffic
  - ♦ Intersection Control Delay

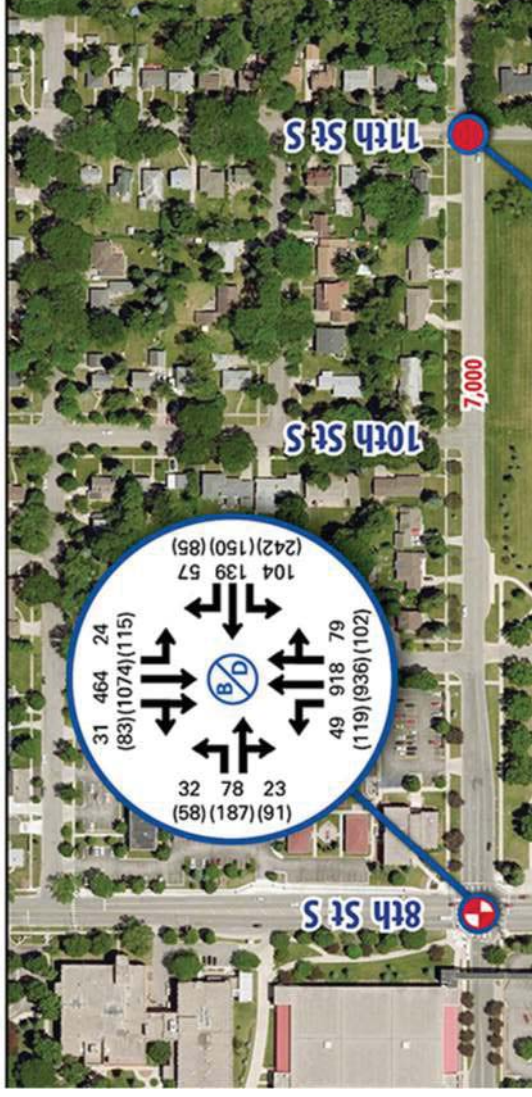
Level of Service (LOS)	Average Delay (seconds/vehicle)	
	Signalized Intersection	Unsignalized Intersection
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

- ♦ Queuing Analysis



# Existing Traffic Conditions

- Operational Analysis Results
  - Level Of Service
    - ◆ All intersections operating at LOS D or higher
      - EB Left turn movement at 8<sup>th</sup> St.
  - Queuing
    - ◆ 8<sup>th</sup> Street – Eastbound issues
    - ◆ 8<sup>th</sup> Street – Left Turn issues building



# Existing Traffic Conditions

- **Crash Analysis**
  - Reviewed crash data from 2011-2015
  - Data indicated no crash issues within that timeframe



# Future 2040 NO BUILD Traffic Conditions

- Traffic Projections
- High-Level Capacity Analysis
- Operational Analysis



# Future 2040 NO BUILD Traffic Conditions

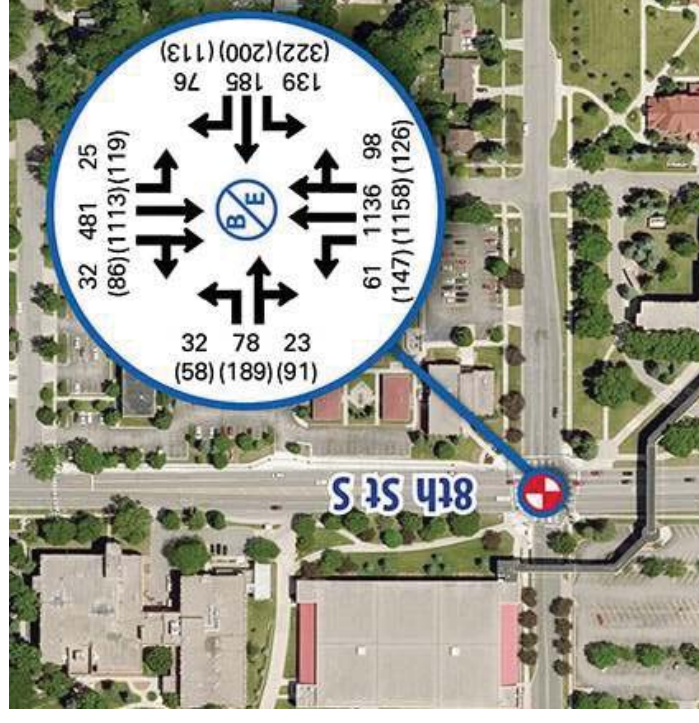
- Traffic Projections
  - Fargo-Moorhead 2040 Long Range Transportation Plan
- High-Level Capacity Analysis
  - 9,700 vehicles/day highest future



# Future 2040 NO BUILD Traffic Conditions

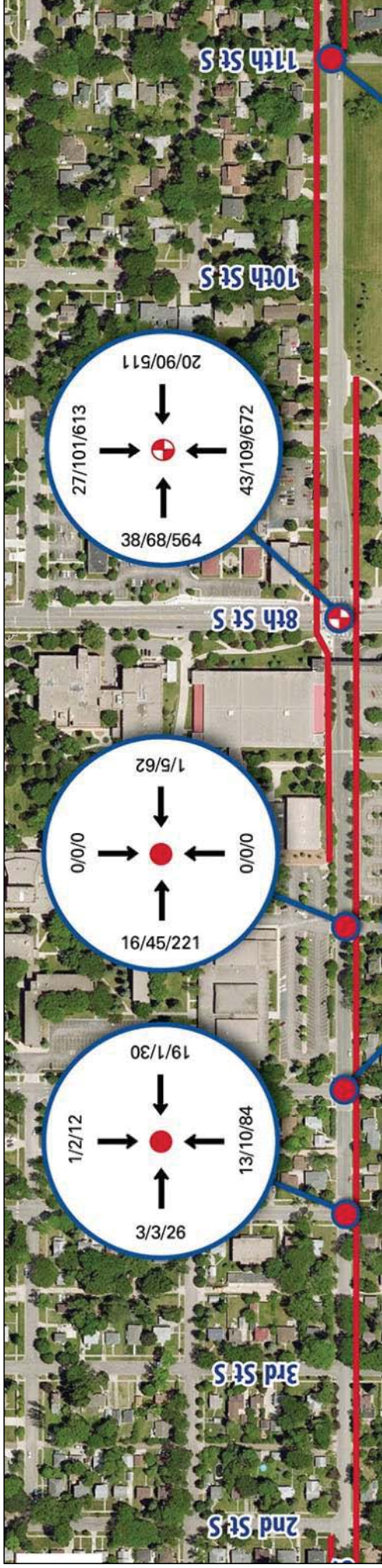
## ■ 2040 Operational Analysis Results

- Level Of Service
  - ◆ 8<sup>th</sup> Street LOS E
    - Failing movements – NB and EB
  - ◆ Main Avenue – LOS E for certain movements
- Queuing
  - ◆ 8<sup>th</sup> Street – issues get worse
  - ◆ Main Avenue – starting to see issues



# Pedestrian and Bicycle Facilities

- Lack of connectivity – gaps
- 2,400+ crossing movements per day at 8<sup>th</sup> Street



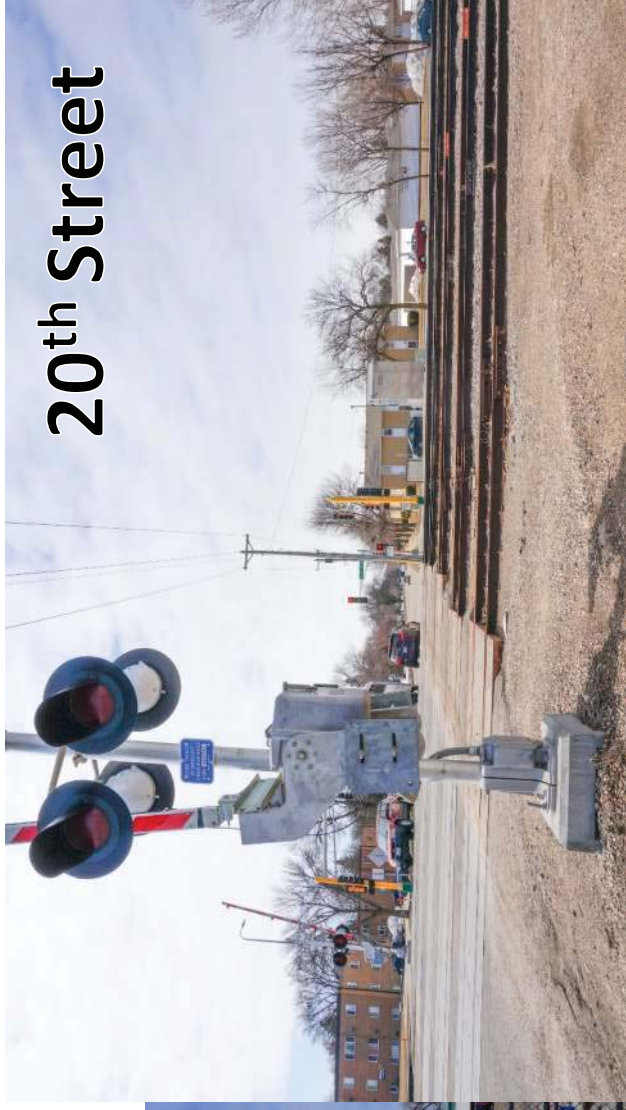
# MATBUS Transit

- 900+ riders use one of the 9 bus stops along 3 routes
- Nearly 100 bike loadings in 2017



# Railroad Crossing

- Pedestrian and Bicycle Crossing



20<sup>th</sup> Street



Main Ave SE

















# Access

- Moorhead City Code – Access Spacing for Minor Arterials
  - Recommended: 8 access points per mile
  - Maximum: 16 access points per mile within urban core
- 12<sup>th</sup> Avenue South Corridor – 2.0 Miles Long
  - 30 Intersections
  - 76 Driveways (Private or Business)
  - Average 53 access points per mile



# Parking

## At Least 9 Different Types of Parking Restrictions

NO PARKING 8 AM-4PM WED	
NO PARKING OVER 3" OF SNOW	
NO PARKING 8 AM-4PM THURS	
3 HR PARKING 7AM-5PM MON-FRI, AUG 15TH-MAY15TH	
NO PARKING	
NO PARKING 1AM-7AM TUES	
NO PARKING 9AM-4PM MON-FRI	
NO PARKING (LOADING ZONE)	
NO PARKING 8AM-5PM MON-FRI	
PRIVATE ACCESS	
BUSINESS, COLLEGE, APARTMENT ACCESS/ENTRANCE	
BIKE LANES (ON STREET)	



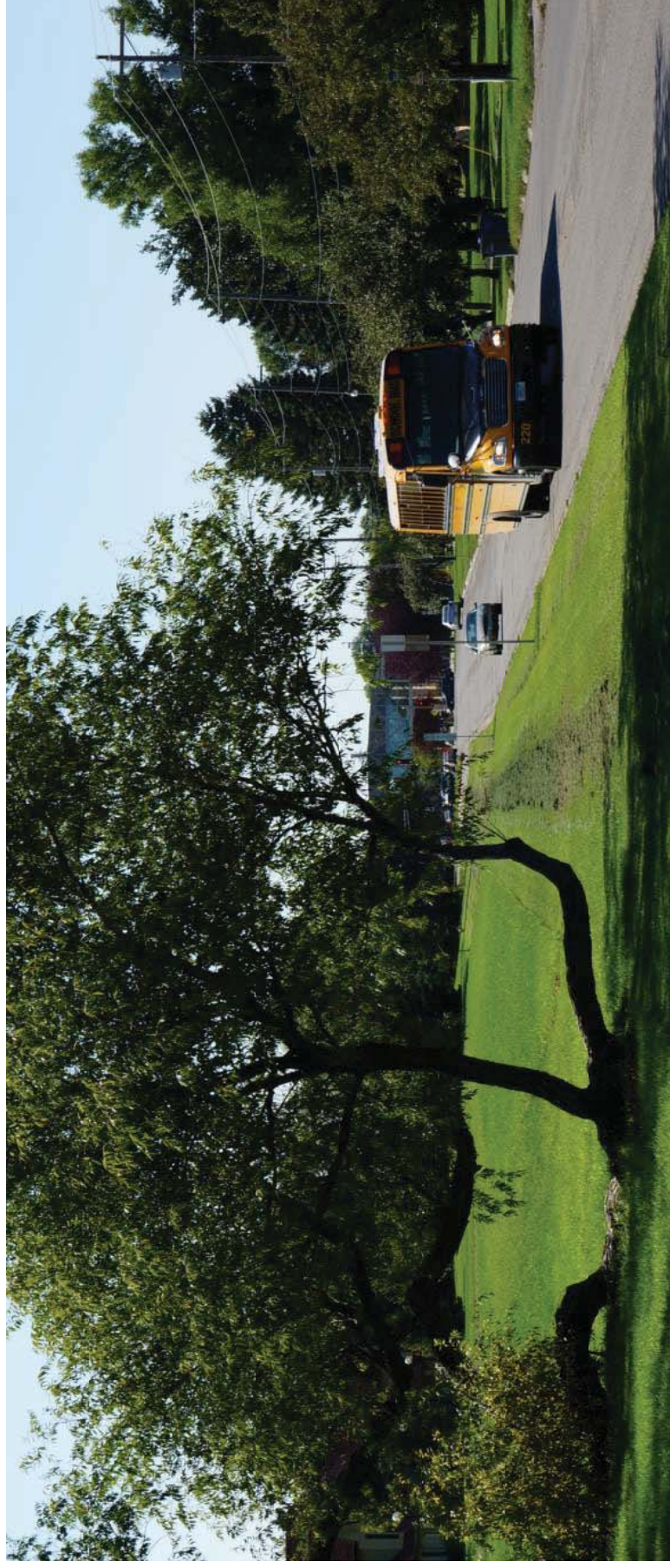
## Available Right of Way

- Limited Right of Way on this Corridor
  - Typically 33-40 feet available each side of centerline
  - Additional Space Available between 8<sup>th</sup> and 11<sup>th</sup> Street



# Trees and Landscaping

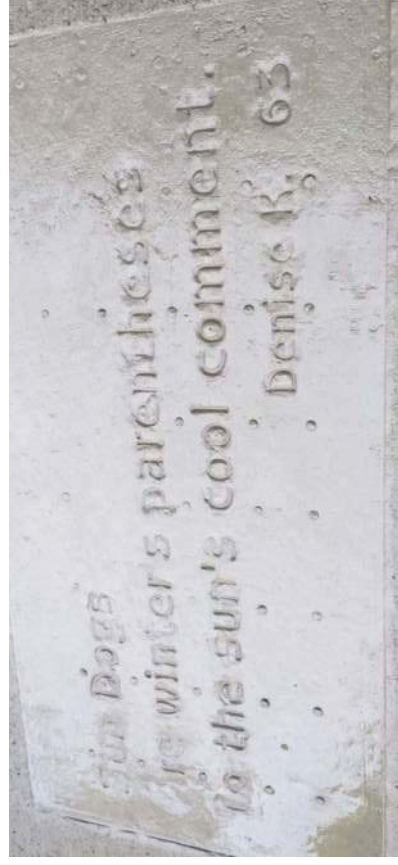
- 188 boulevard trees + the “Crazy Tree”



**METROCOG**  
FARGO-MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

# Streetscape Ideas

- Possible Aesthetic Enhancements:
  - Street artwork/stamping
  - Sidewalk art
  - Utility box art
  - MATBUS shelters/bench art



# Study Schedule and Next Steps

- September 2018 – January 2019: Alternative Development
- February 2019: Draft Study Report
- February 2019: Public Meeting #2
- March – April 2019: Board and Council Approvals
- May 2019: Final Study Report
- Spring - Summer 2020: Construction



# Multiple Ways to Provide Input

- Talk to team members tonight
- Complete online survey at the computer station
- Complete comment forms – leave here or mail in
- Email your comments – contact info is provided on forms and handout
- Attend next public meeting in February



# Thank You for Attending!

- Questions and Comments





**Moorhead 12<sup>th</sup> Avenue South Corridor Study**  
**Attendee List for Public Input Meeting #2 – 03/19/19**

<b>No.</b>	<b>Attendee</b>
1	Timothy Stone
2	Sheri Larson
3	Sharon Weber
4	Andrea Cook
5	Faye Cook
6	Leonard Cook
7	Russell Pfaff
8	Kirsten Frantsvog
9	Karl Stumo
10	Marv Degerness
11	Benny Peterson
12	Iola Peterson
13	Roger Koppang
14	Jim Haney
15	Coralie Wai
16	Tim Myers
17	Don Swenson
18	Don Larew
19	Steve Busse
20	Forrest Steinhoff

<b>No.</b>	<b>Attendee</b>
21	Harold Kaste
22	Denese Norris
23	Mike Edenburg
24	Charles Franklin
25	Carolyn Kramer
26	Alan Cooper
27	Janine Hanson
28	Don Buegel
29	Jeff Werre
30	Marilyn Proulx
31	Jeremy Mattson
32	Nick Walberg
33	Chad Johnson
34	Nicole Mattson
35	Jenny Mongeau
36	Dr. J.E. Kreps
37	Steve Schaefer
38	Tim Wollenson
39	Jonathan Gilmour
40	Kenyon Williams

## Moorhead 12<sup>th</sup> Avenue South Corridor Study

### Transcript of Comments Received During and After Public Input Meeting #2 – 03/19/19

No.	Comment
1	A mic would have been nice so that we could hear better.
2	That “Crazy Tree” identified on the corner of Concordia College campus is a very valuable tree and is grossly neglected. It struggles every year to overcome dying branches. This tree should be renamed, identified publicly with a small metal sign on a plaque, and a small metal fence of sorts should be placed along the street and avenue and by all means – no more children climbing on trunk and branches. This tree would bring in a lot of money to Concordia by “donate to the tree” on a yearly basis. I am making comparison to the “Lone Cypress” tree growing out of a solid rock out on Monterey Peninsula near Pebble Beach Golf Course and 17 Mile Drive and Carmel-By-The-Sea.
3	Tough job! Sounds like you have studied this thoroughly.
4	<ol style="list-style-type: none"> <li>1. Visuals were hard to read</li> <li>2. Please repeat comments from the front so we know what question is being addressed.</li> <li>3. Less lasting. Choose the big ideas.</li> <li>4. Is there a reason a bike path needs to be considered with 12<sup>th</sup> Ave.</li> <li>5. Any of you want presentation coaching?</li> </ol>
5	Will the curb be taken? - Only if absolutely necessary
6	Changes to street parking? - In some spots to make room for a bike lane/path if that alternative is used.
7	Elimination of 12 <sup>th</sup> Ave parking will push the vehicles to the already busy side streets. - Agreed, no perfect option but we will try to do what is best
8	What is the slope goal for the RR crossing? What is it currently? - We would like to be under 5%, it is currently around 10%
9	Is there going to be a visibility issue with the crosswalk at the proposed bus stop with the cars making the corner off of 20 <sup>th</sup> onto 12 <sup>th</sup> Ave from the north? - We can move the crosswalk, however there should be enough room to see and stop
10	How common is the bike/car path? How is safety with these? - They are growing in popularity and education is key with safety. People will use them more and more and the more common that they are they more people will be bike aware in these areas.
11	It would be great to have some turning lanes on the major N/S Streets. The road is so tight, will be interesting to see if there will be home purchases. Any way to widen it by Concordia?
12	My big ask would be to improve the bikeability and walkability of 12th Ave between Main and 20th Street. It’s really dangerous as it is now, even with the bike lanes. I’m sure I’m not the only one that would suggest this but thought I would pass it along. At one point last summer we were considering having our daughter bike to MSUM for College for Kids but because of that Corridor, we decided against it.
13	Second time I request this: consider doing something with 12th Ave S east of Hwy 52, specifically at the intersection of Ridgewood Boulevard and 12th Ave S. Consider cutting trees and relocating street signs at intersection of Appletree Lane or whatever the name of the street is that intersects with 12th Ave S, just passed the railroad tracks. They obstruct the view of traffic when turning east, onto 12th Ave S.

# 12th Avenue South CORRIDOR STUDY

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# Public Input Meeting #2 12th Avenue South Corridor Study Moorhead, MN

March 19, 2019



# Introductions – Presenters



**Matt Kinsella**  
Project Manager



**Kate Miner**  
Traffic Analysis



**Brent Muscha**  
Design Engineer

**Hanson Design Associates**

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**Jim Hanson**  
Streetscaping/Landscaping



# ■ Introductions – Other Team Members ■



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**Kristie Leshovsky**  
**Tom Trowbridge**  
**Jonathan Atkins**  
**Steve Moore**



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**Adam Altenburg**



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**Roger Olson**



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**Lori Van Beek**

# Getting Started

- Please Sign In
- Study Handout
- Comment Card
- Title VI Public Participation Survey (Optional)
- Tonight's Goal – To Get Your Feedback



# Tonight's Agenda

- Study Overview
- Study Issues and Needs
- Proposed Alternatives
- Study Schedule and Next Steps



# Study Overview



# Why is this Study Needed?

- Vital East-West Corridor in the Area Network
- Evaluate Current and Future Needs
- Upcoming 2020 Construction Project
- Inform Short-Term and Long-Range Planning



# Concurrent Study – US 10/75 Corridor

- Overlap at 8<sup>th</sup> Street Intersection
- Coordination Between Study Teams
- Traffic Projections
  - Our Study = 2040 Projections
  - US 10/75 = 2045 Projections
- Preliminary Analysis Shows Proposed Improvements are Supported by Both Studies



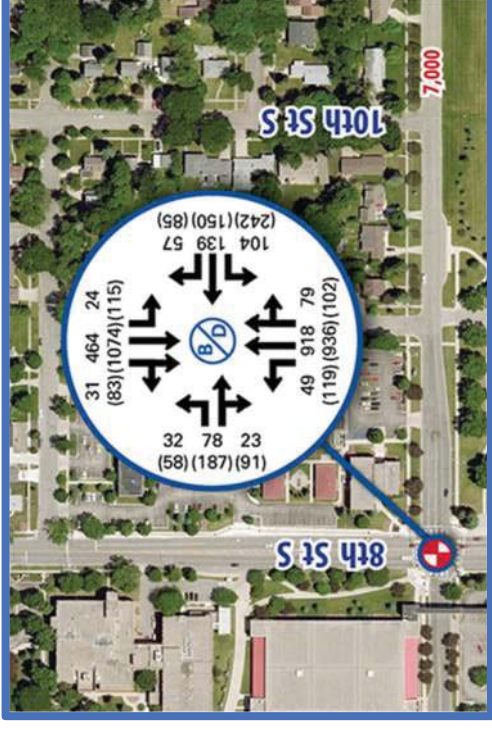
# Existing Traffic Conditions

- High Level Capacity Analysis
  - 2-lane roadway capacity = 10,000 vehicles/day
  - 3-lane roadway capacity = 18,000 vehicles/day
- 12<sup>th</sup> Avenue South currently carries between 3,100 and 7,000 vehicles/day



# Existing Traffic Conditions

- Operational Analysis Results
  - Level Of Service
    - ◆ All intersections operating at LOS D or higher
      - EB Left turn movement at 8<sup>th</sup> Street
  - Queuing – no issues
  - Crashes – no issues



Level of Service (LOS)	Average Delay (seconds/vehicle)	
	Signalized Intersection	Unsignalized Intersection
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B	> 10 and ≤ 20	> 10 and ≤ 15
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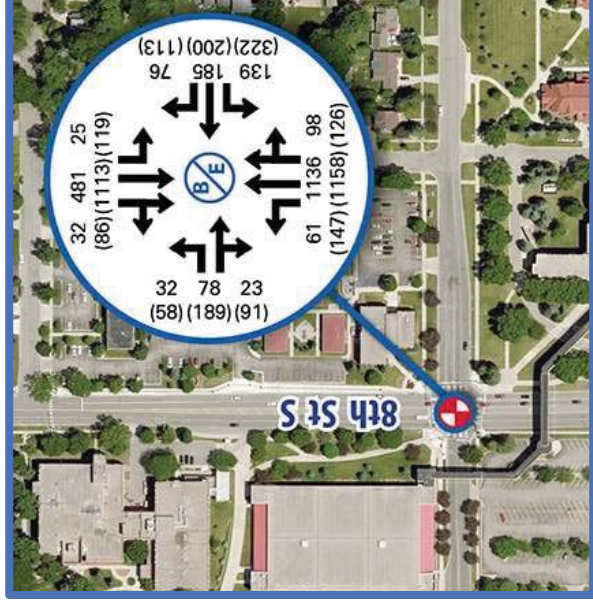
# Future 2040 NO BUILD Traffic Conditions

- Traffic Projections
  - Fargo-Moorhead 2040 Long Range Transportation Plan
- High-Level Capacity Analysis
  - 9,700 vehicles/day highest future (8<sup>th</sup> St to 11<sup>th</sup> St)



# Future 2040 NO BUILD Traffic Conditions

- 2040 Operational Analysis Results
  - Level Of Service
    - ◆ 8<sup>th</sup> Street = LOS D
      - Failing movements – EB
  - Queuing
    - ◆ 8<sup>th</sup> Street – issues get worse for EB movements



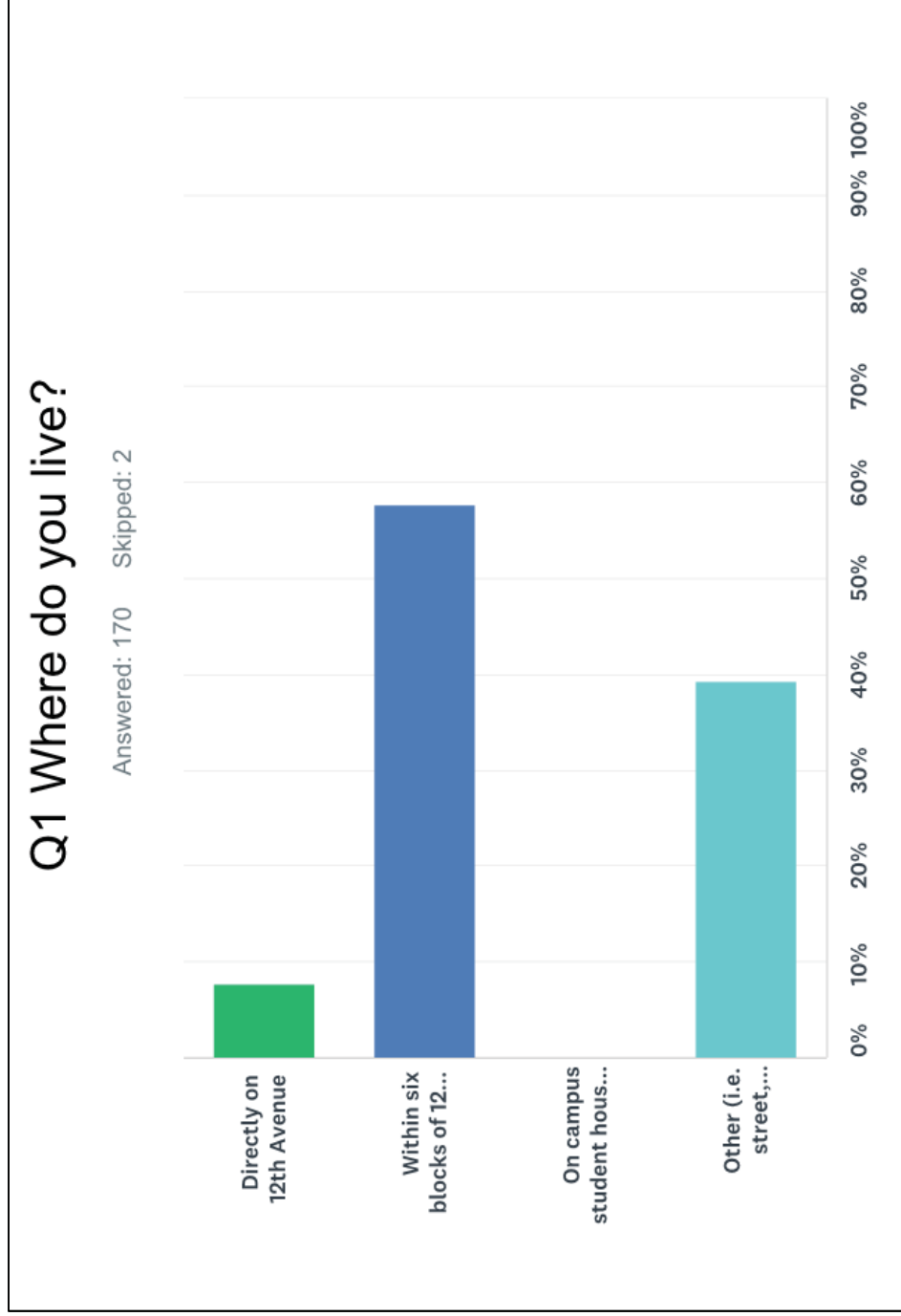


# Previous Public Input Opportunities

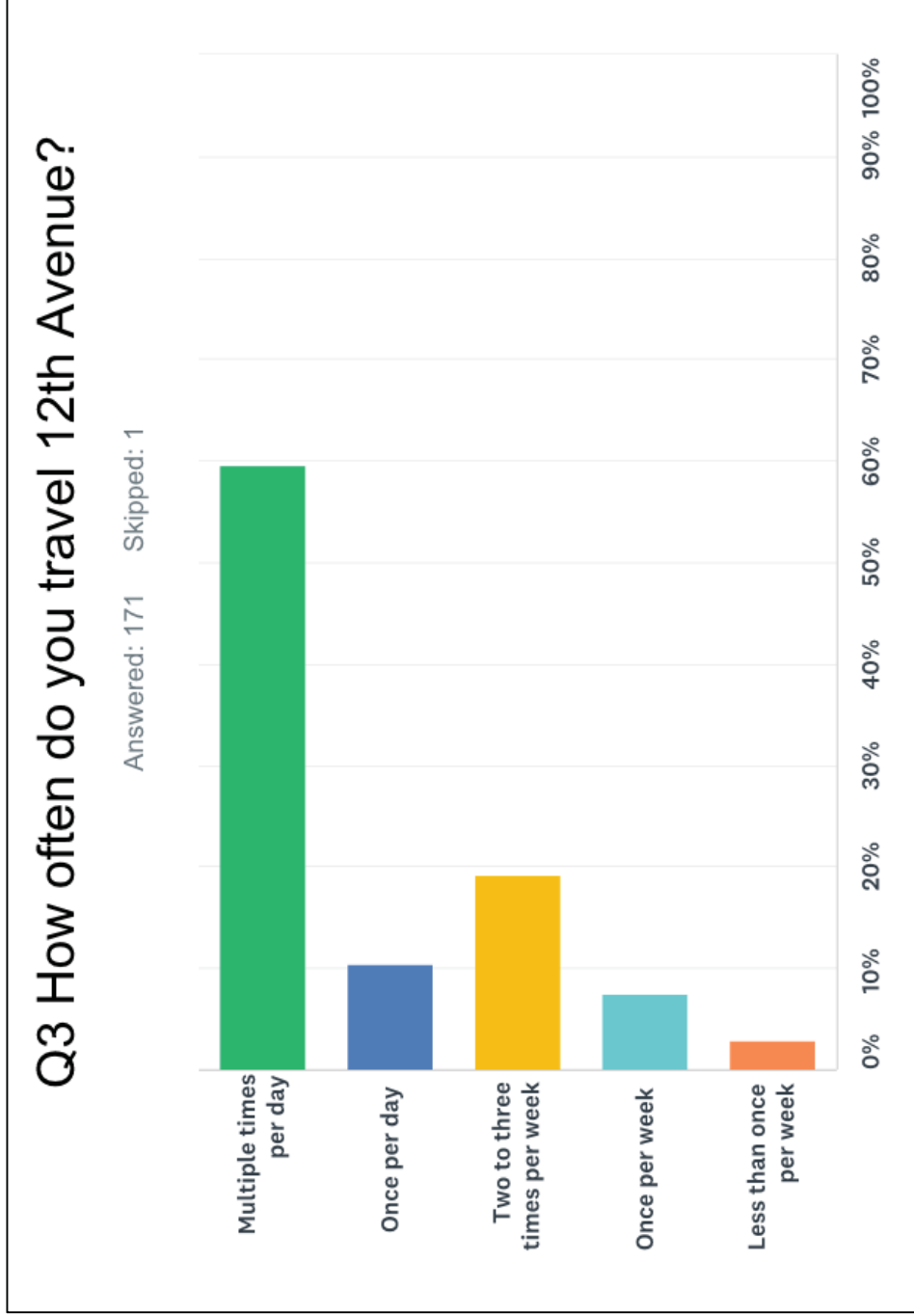
- Online survey available from July 3 – October 15, 2018
  - 172 survey responses were received
- Public Input Meeting #1 – held on September 20, 2018
  - 25 attendees signed in



# What We Heard From You



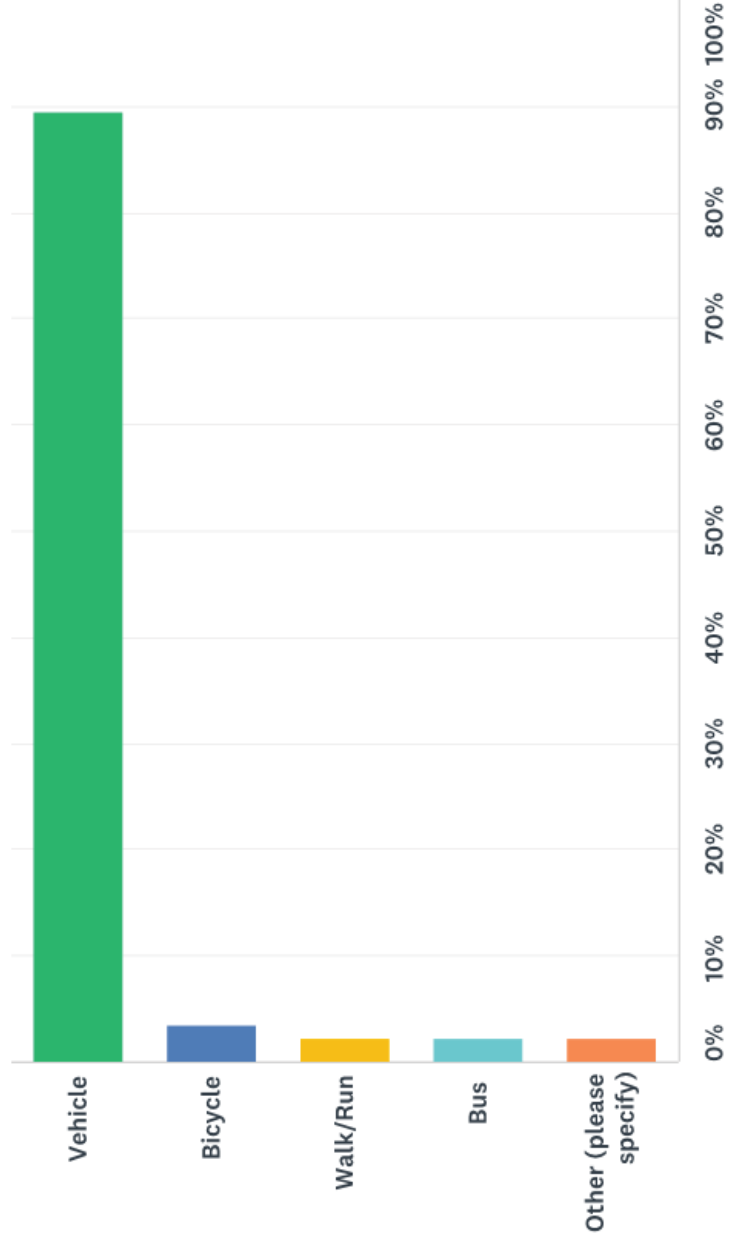
# What We Heard From You



# What We Heard From You

## Q4 How do you most often travel 12th Avenue?

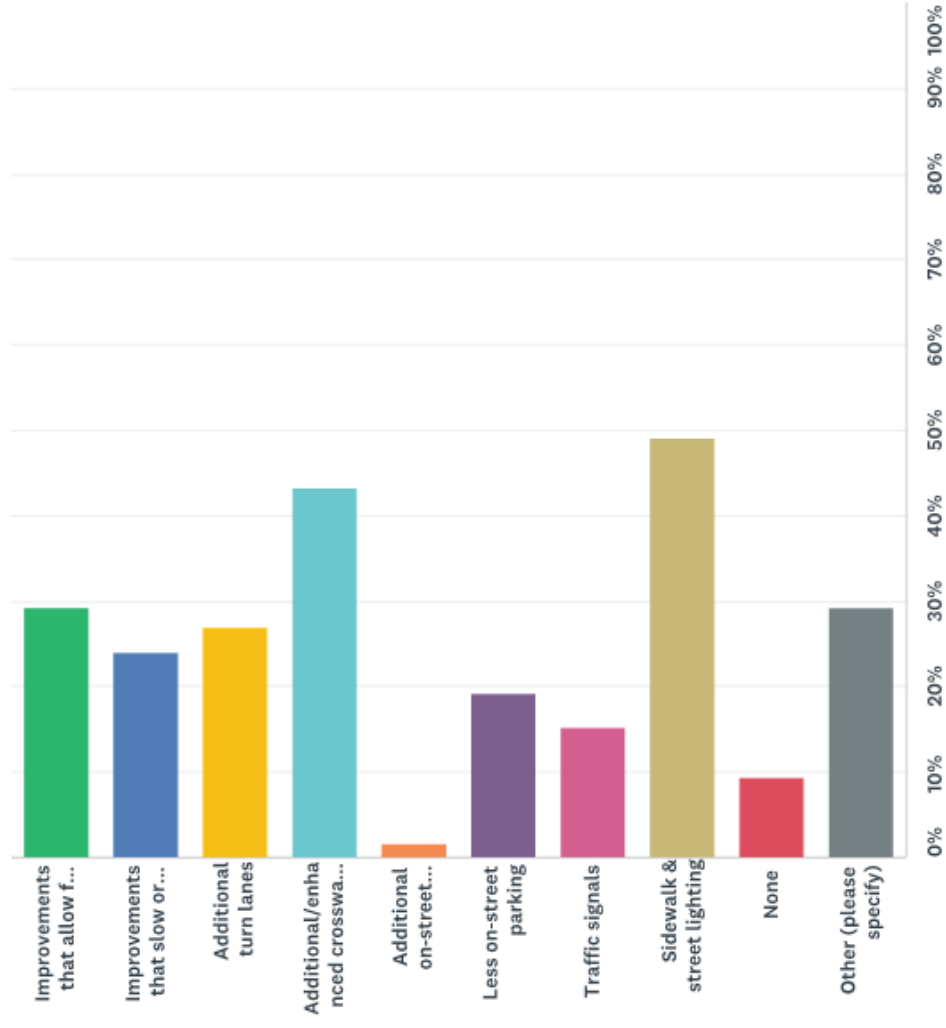
Answered: 171 Skipped: 1



# What We Heard From You

Q6 What roadway or safety improvements do you feel are needed along 12th Avenue? (select all that apply)

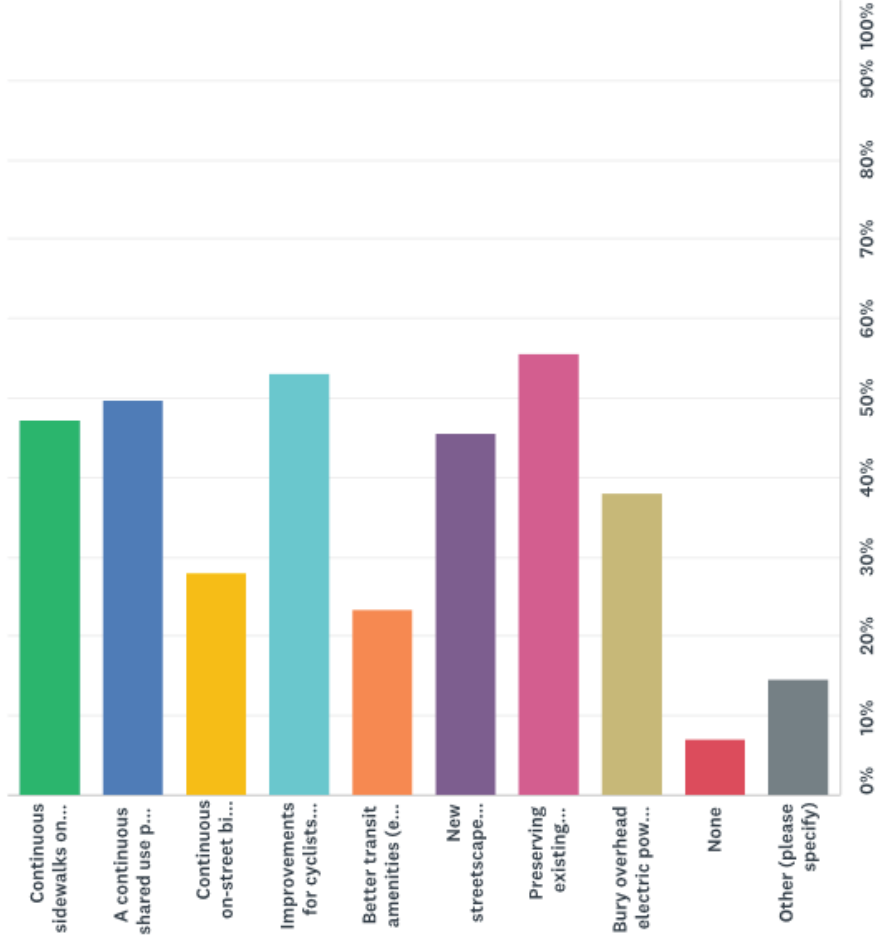
Answered: 171 Skipped: 1



# What We Heard From You

Q7 What multi-modal (bicycle/pedestrian/transit) or aesthetic improvements do you feel would enhance 12th Avenue? (select all that apply)

Answered: 171 Skipped: 1

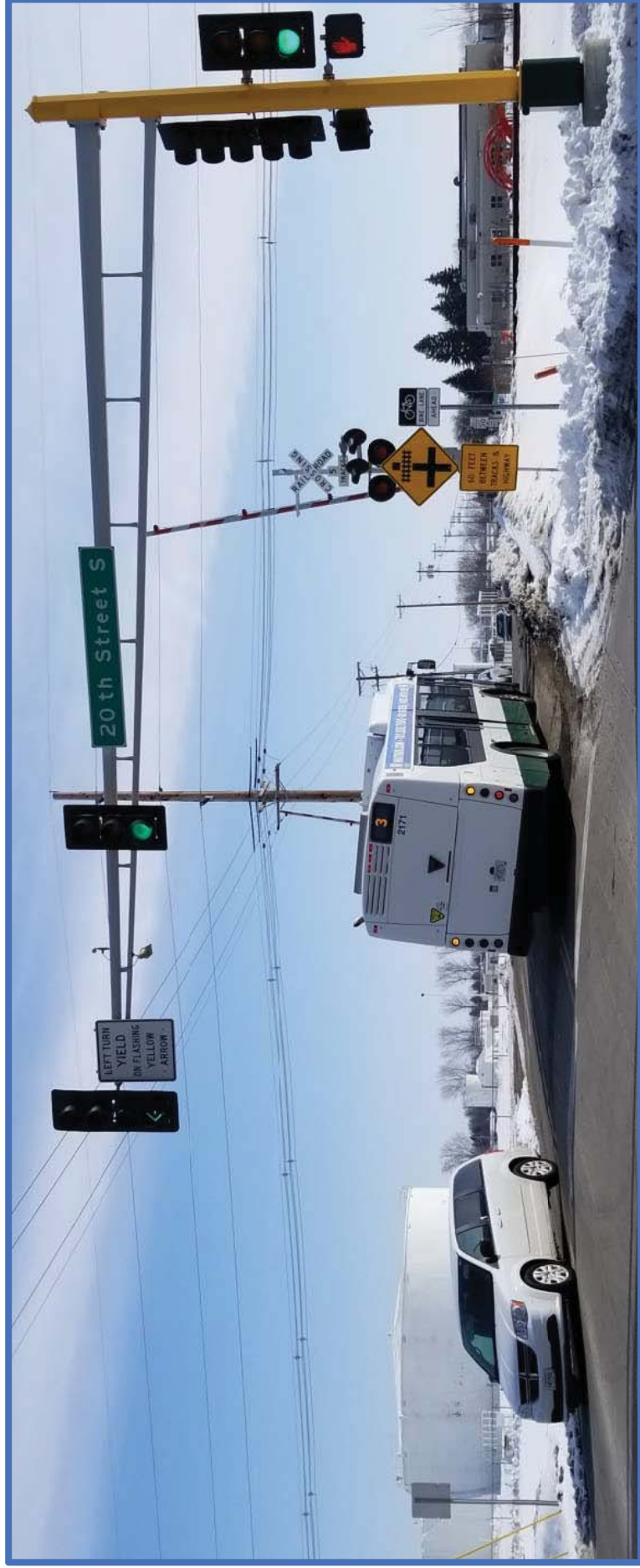


# What We Heard From You

## Top Commented Categories:

- Pavement Condition
- Pedestrian and Bicycle Connectivity and Safety
- Railroad Crossing Improvement
- Transit Facilities
- Trees and Streetscaping

# Issues and Needs



**METROCOG**  
FARGO-MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS



# Issues and Needs

## Considerations

- Public Input
  - Meeting
  - Survey
- Stakeholder Input
- Traffic



# Issues and Needs

## Traffic Operations and Geometric Improvements

- No Additional Capacity (Widening) Required
- Delay for Eastbound Traffic at 8<sup>th</sup> Street
- 12<sup>th</sup> Avenue Horizontal Offset at 11<sup>th</sup> Street Intersection
- Steep Vertical Grade at BNSF Railroad east of 20<sup>th</sup> Street



# Issues and Needs

## Pedestrian and Bicycle Connectivity

- Making Connections
  - Sidewalks & Bike Paths
  - Access to the Red River
- Update to Current Standards
- Improve BNSF Crossing



# Issues and Needs

## Transit Improvements

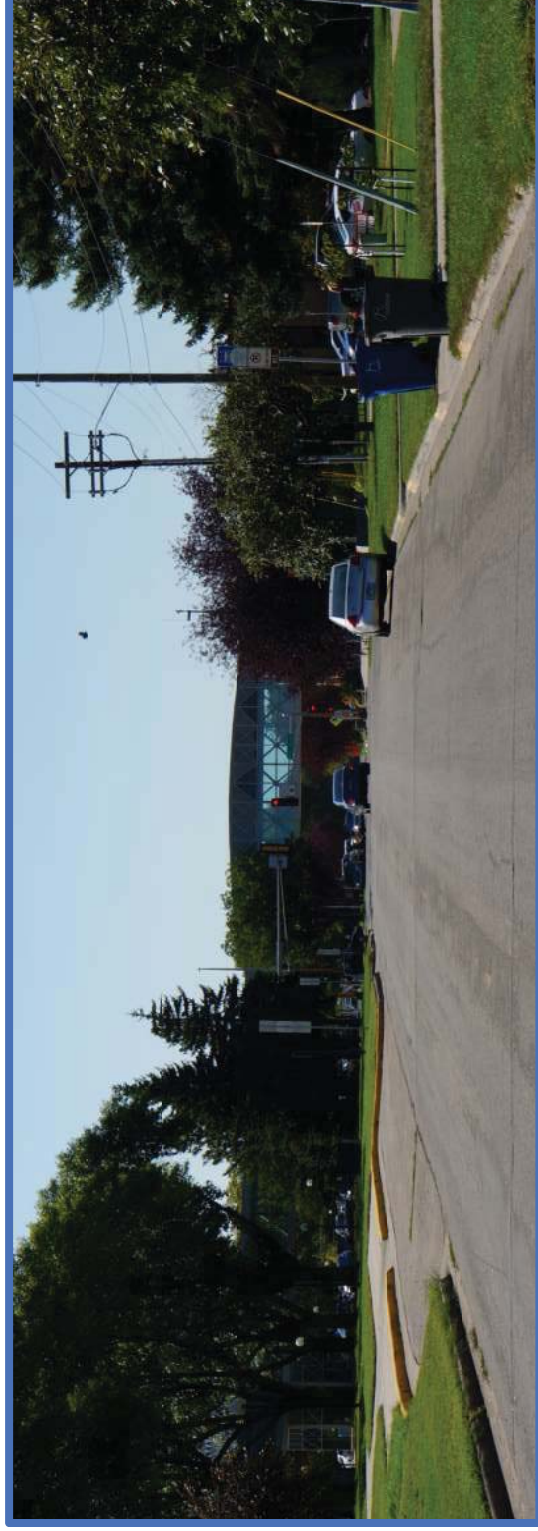
- 19 1/2 Street
  - Most Heavily Used
  - Private Property Constraints
- 25th Street (A Place for Hope)
  - Limited Access
  - Riders Loading from Driveway



# Issues and Needs

## Parking and Access Management

- Reduce Access Conflicts
- On-Street Parking
- Pull-Out Parking/Loading Areas



# Issues and Needs

## Streetscaping and Trees

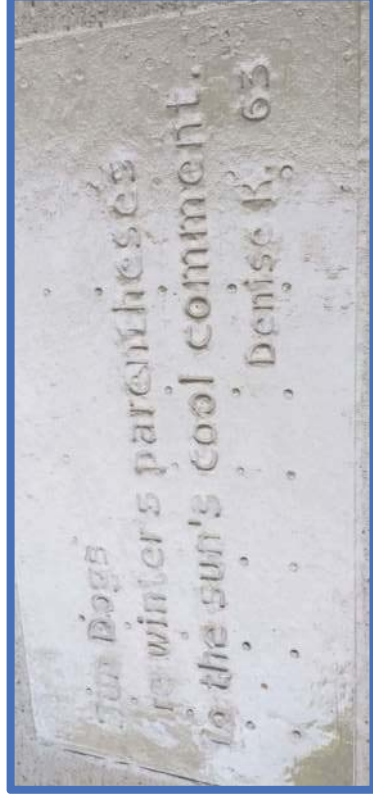
- Concordia-Area Enhancements
- Industrial-Area Enhancements
- Preservation of Existing Trees



# Streetscape Ideas

## Possible Aesthetic Enhancements

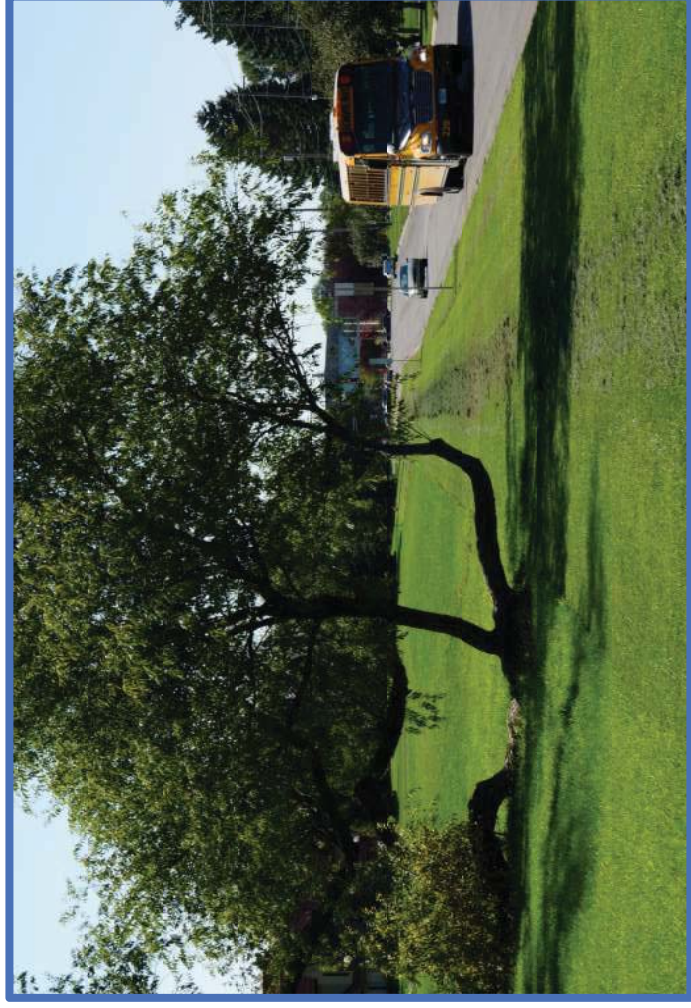
- Street artwork/stamping
- Sidewalk art
- Utility box art
- MATBUS shelters/bench art



# Issues and Needs

## Alternative Development & Evaluation

- Three Segments
  - River Drive to 8<sup>th</sup> Street
  - 8<sup>th</sup> Street to 20<sup>th</sup> Street
  - 20<sup>th</sup> Street to Main Avenue
- Meet a Need
- Address an Issue
- Feasibility and Cost

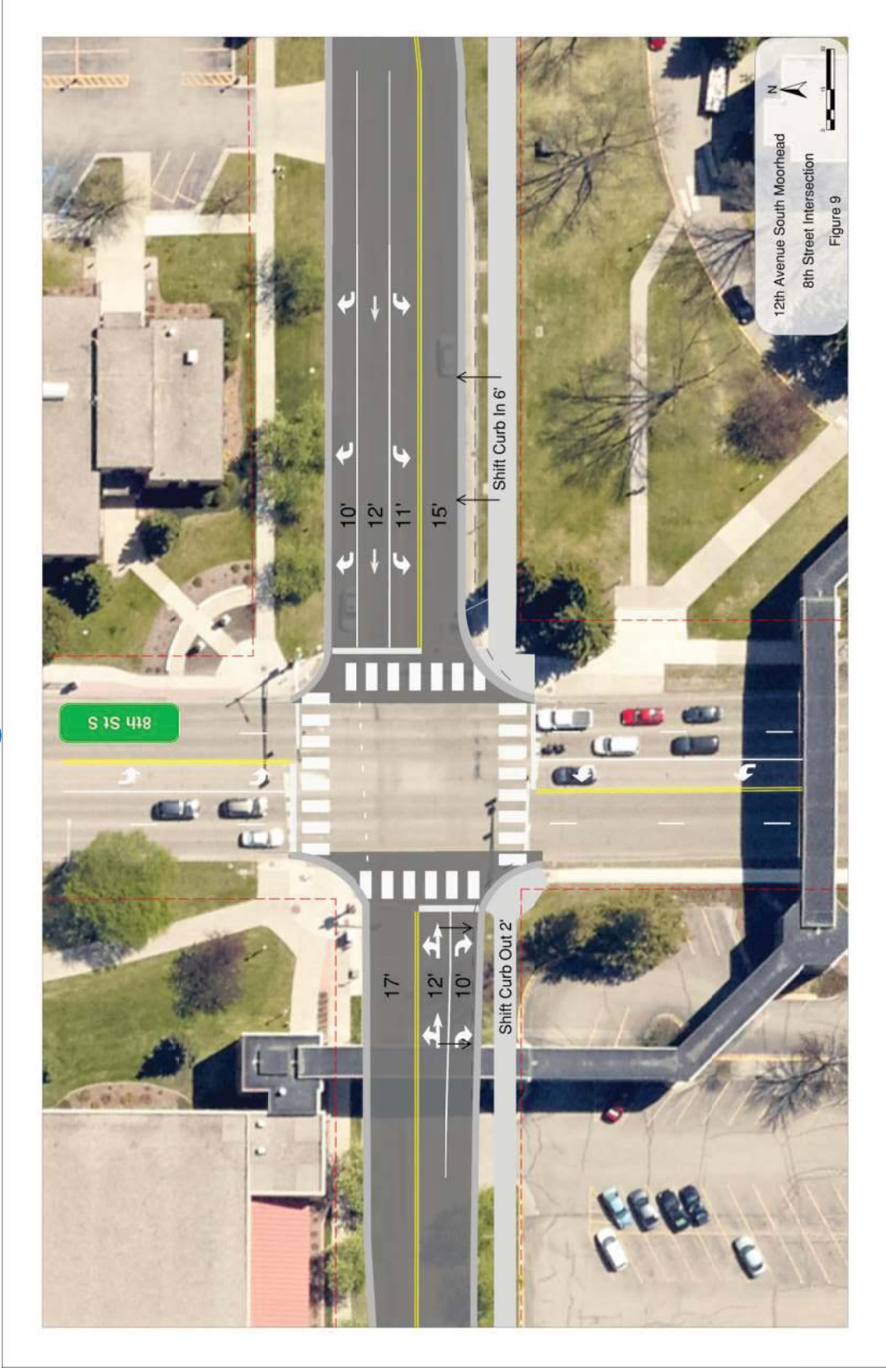




# River Dr to 8th Street Alternatives



# 8th Street Lane Configuration



**METROCOG**  
FARGO MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

# 8th Street to 20th Street Alternatives



# 8th Street to 20th Street Alternatives



# 20th Street to Main Ave Alternatives

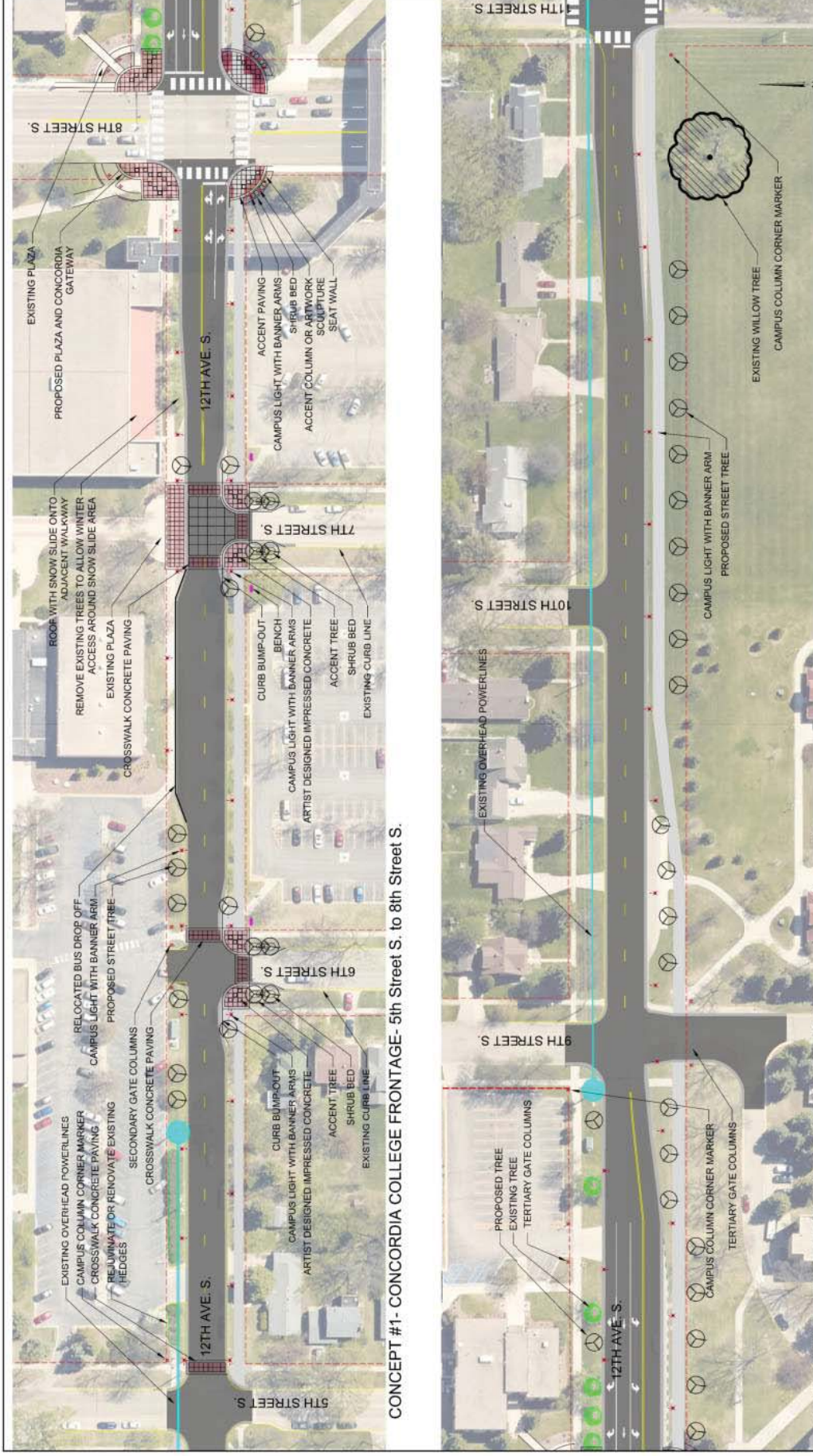


12th Avenue South Moorhead  
BNSF RR Crossing to Main Avenue

Figure 12



# Concordia-Area Streetscaping

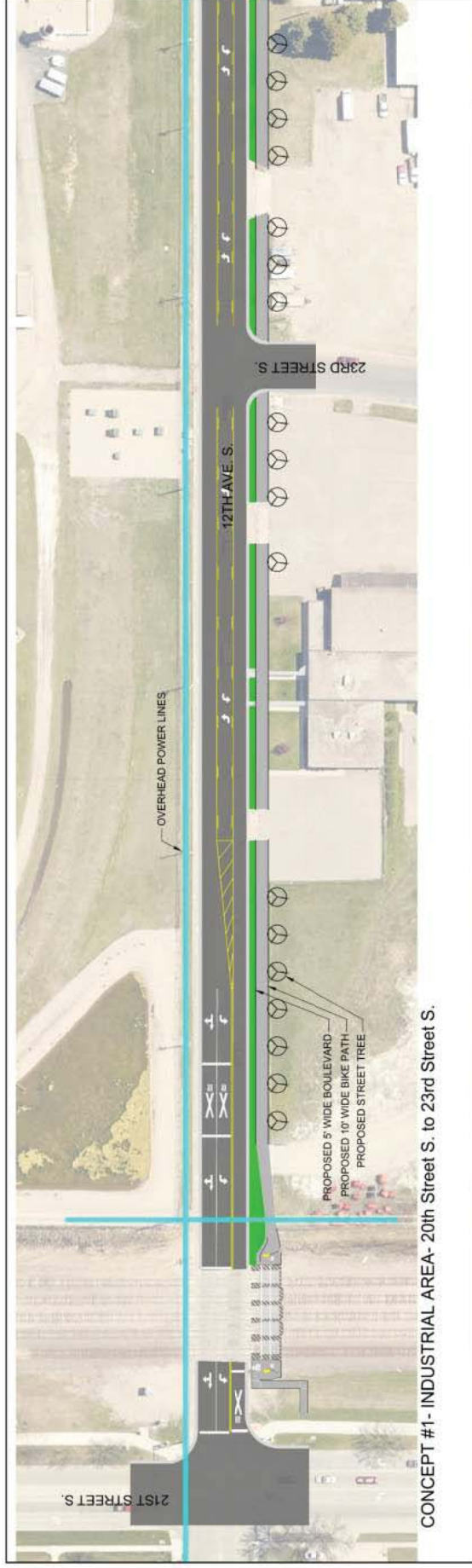


CONCEPT #1- CONCORDIA COLLEGE FRONTAGE- 5th Street S. to 8th Street S.



**METROCOG**  
FARCO MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

# Industrial-Area Streetscaping



CONCEPT #1- INDUSTRIAL AREA- 20th Street S. to 23rd Street S.



**METROCOG**  
FARGO-MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

# Multiple Ways to Provide Input

- Talk to team members tonight
- New online survey link available starting [tonight](#)
  - Provide your feedback on the alternatives presented
- Complete comment forms – leave here or mail in
- Email your comments:
  - Contact info is provided on forms and handout



# Study Schedule and Next Steps

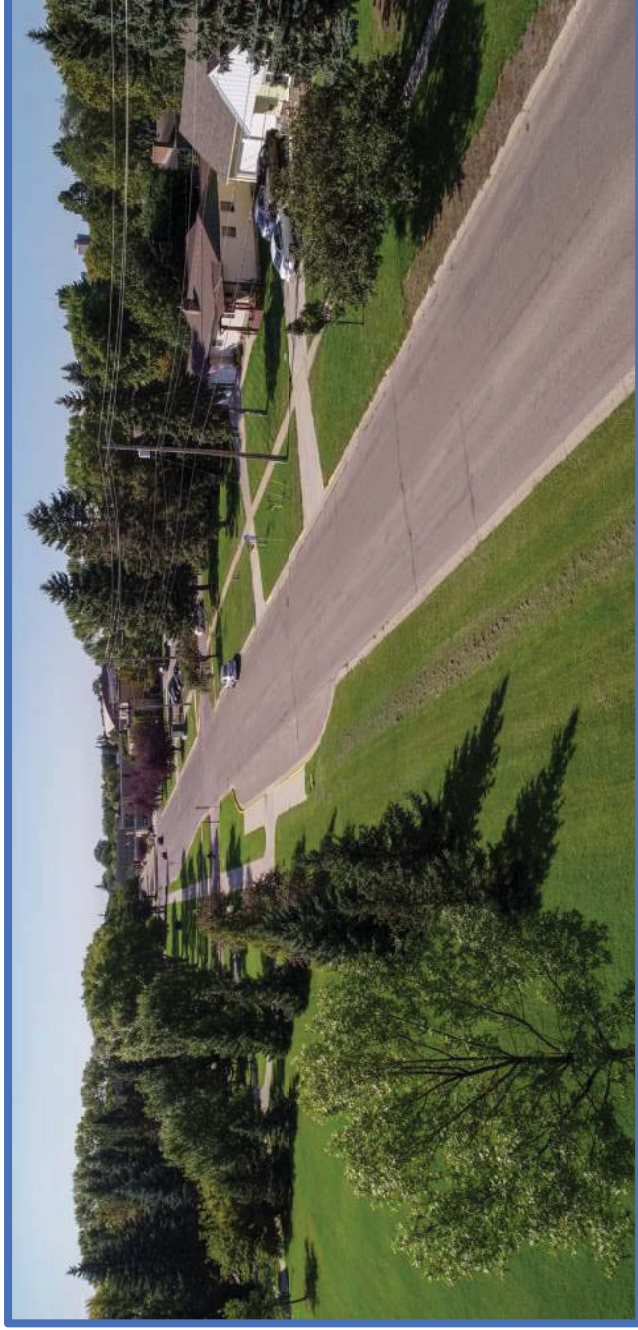
- May 2018: Study Kickoff
- July - October 2018: 1<sup>st</sup> Online Survey Available
- September 2018: Public Input Meeting #1
- March 2019: Public Input Meeting #2
- April 2019: 2<sup>nd</sup> Online Survey Available
- April 2019: Draft Study Report
- May 2019: Board and Council Approvals
- May 2019: Final Study Report



**Spring - Summer 2020: Construction**

# Thank You for Attending!

- Questions and Comments

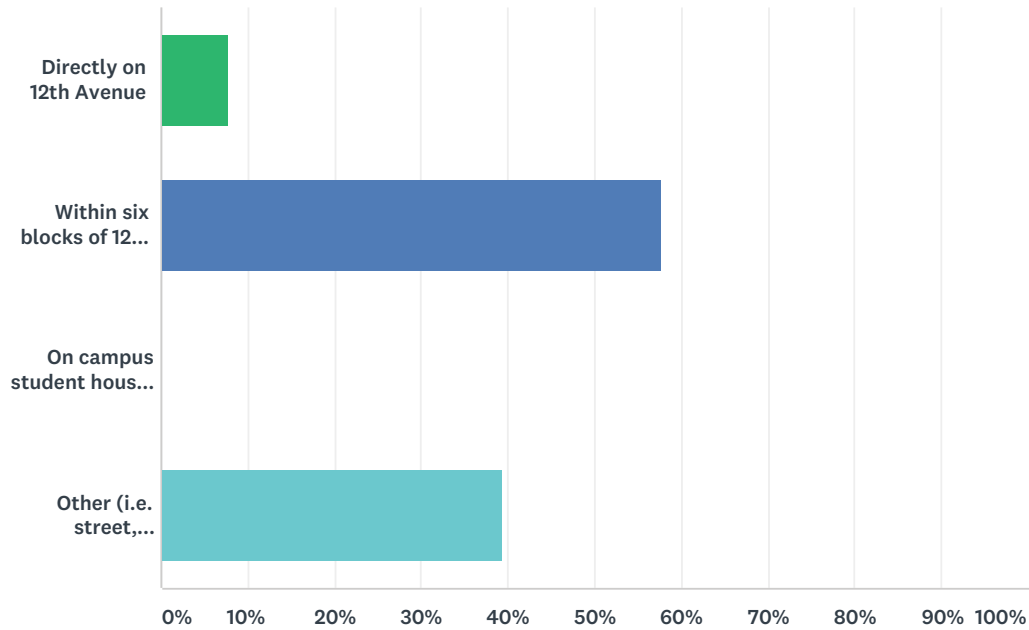


Appendix C  
Online Survey Summaries



# Q1 Where do you live?

Answered: 170 Skipped: 2



ANSWER CHOICES	RESPONSES
Directly on 12th Avenue	7.65% 13
Within six blocks of 12th Avenue	57.65% 98
On campus student housing (input hall name or apartment name below)	0.00% 0
Other (i.e. street, neighborhood, student housing hall, city)	39.41% 67
Total Respondents: 170	

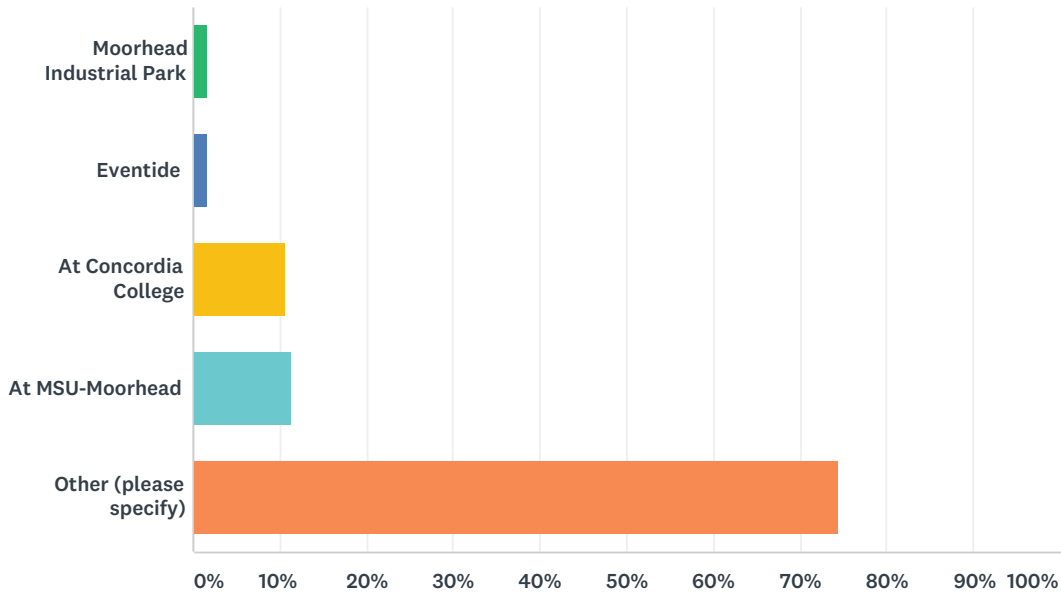
#	OTHER (I.E. STREET, NEIGHBORHOOD, STUDENT HOUSING HALL, CITY)	DATE
1	Own rental on 12 Ave and property right off 12th Ave in Industrial Park	10/9/2018 11:16 PM
2	Just north of MSUM	10/9/2018 3:44 PM
3	Fargo	10/9/2018 3:06 PM
4	Within 8 blocks of 12th Avenue	10/9/2018 11:53 AM
5	18th St. S.	10/9/2018 11:10 AM
6	City	10/9/2018 10:50 AM
7	I live In Dilworth, Mn	10/9/2018 9:45 AM
8	3922 6th St S, Moorhead	10/9/2018 9:08 AM
9	Village Green	10/9/2018 9:04 AM
10	11th St S	10/9/2018 8:38 AM
11	8 blocks south of 12th Avenue	10/9/2018 12:37 AM
12	6th ave n Moorhead	10/8/2018 8:27 PM
13	Barnesville	10/8/2018 6:07 PM

14	1215 2nd Ave s	10/8/2018 5:59 PM
15	By Horizon, but I use the street all the time & used to live on it	10/8/2018 4:42 PM
16	Fargo	10/8/2018 4:25 PM
17	41st Ave S	10/8/2018 4:22 PM
18	South Moorhead, 40045 South Rivershore Drive	10/8/2018 2:39 PM
19	Brookdale	10/8/2018 2:38 PM
20	1207 4th Ave S Moorhead	10/8/2018 2:12 PM
21	6th Ave N	10/8/2018 1:38 PM
22	between 11th & 12th	10/8/2018 1:25 PM
23	13th Street S	10/8/2018 1:23 PM
24	In Fargo	10/8/2018 1:20 PM
25	Between 18 & 19th avenues south	10/8/2018 1:16 PM
26	north moorhead	10/8/2018 1:08 PM
27	12th Ave N.	10/3/2018 10:40 PM
28	Near Fleet Farm in Fargo	9/20/2018 8:21 PM
29	529 Maple Ln	9/20/2018 1:28 PM
30	Morningside subdivision	9/19/2018 7:48 PM
31	Elm st south	9/18/2018 7:40 AM
32	Ridgewood Edition. I am working, cannot attend meeting. Please make sure you read my survey. Thank you.	9/17/2018 2:52 PM
33	20th Ave / 8th St S	9/17/2018 9:46 AM
34	N/A	9/17/2018 8:30 AM
35	37th ave and 4th st south	9/16/2018 10:27 PM
36	Meadows lane	9/16/2018 10:19 AM
37	30th Street South in Village Green area	9/16/2018 7:52 AM
38	South of the interstate	9/16/2018 4:34 AM
39	Glyndon, MN	9/15/2018 10:44 PM
40	3400 10 th St S	9/15/2018 1:37 PM
41	Ellen Hopkins Area	9/14/2018 9:18 PM
42	5th St S	9/14/2018 9:13 PM
43	North Moorhead	9/14/2018 6:41 PM
44	Fargo	9/14/2018 4:24 PM
45	Dilworth	9/14/2018 3:15 PM
46	Lived directly on 12th Ave until 8/1/18. Now live one block away.	9/14/2018 2:29 PM
47	418 5TH ST S	9/14/2018 2:07 PM
48	4th ave and 12th st s	9/14/2018 1:36 PM
49	In Moorhead	9/14/2018 1:33 PM
50	North Moorhead	9/14/2018 11:59 AM
51	1202 Elm st. S.	9/14/2018 9:43 AM
52	South Fargo	9/14/2018 8:08 AM
53	South Moorhead	9/13/2018 4:55 PM

54	Fargo	9/13/2018 2:24 PM
55	neighborhood	9/13/2018 1:53 PM
56	1411 20th St. S.	9/13/2018 1:04 PM
57	Fargo	9/13/2018 12:44 PM
58	Fargo, ND	9/13/2018 12:30 PM
59	Westmoor Greens Neighborhood	9/13/2018 9:25 AM
60	4326 South Rivershore Drive	9/13/2018 8:30 AM
61	10 the st and 21 ave	9/11/2018 8:31 AM
62	south Moorhead	9/6/2018 10:57 AM
63	Near 34th St.	8/24/2018 6:26 PM
64	Brook Ave	8/22/2018 2:58 PM
65	Westminster Dr	7/29/2018 11:11 PM
66	33rd st. N	7/25/2018 11:18 PM
67	South Moorhead	7/18/2018 1:56 PM

## Q2 Where do you work/go to school?

Answered: 169 Skipped: 3



ANSWER CHOICES	RESPONSES
Moorhead Industrial Park	1.78% 3
Eventide	1.78% 3
At Concordia College	10.65% 18
At MSU-Moorhead	11.24% 19
Other (please specify)	74.56% 126
<b>TOTAL</b>	<b>169</b>

#	OTHER (PLEASE SPECIFY)	DATE
1	fargo	10/12/2018 7:34 AM
2	North Fargo	10/11/2018 5:52 PM
3	Fargo	10/10/2018 9:57 PM
4	Retired	10/10/2018 11:02 AM
5	FARGO	10/9/2018 4:48 PM
6	Retired	10/9/2018 3:44 PM
7	West Fargo	10/9/2018 11:53 AM
8	Retired	10/9/2018 11:48 AM
9	Downtown Fargo	10/9/2018 11:35 AM
10	downtown Moorhead	10/9/2018 11:10 AM
11	Around the block of 8th street and 24th ave south	10/9/2018 9:45 AM
12	off of 30th Ave.	10/9/2018 9:35 AM
13	Moorhead Public Library	10/9/2018 9:08 AM



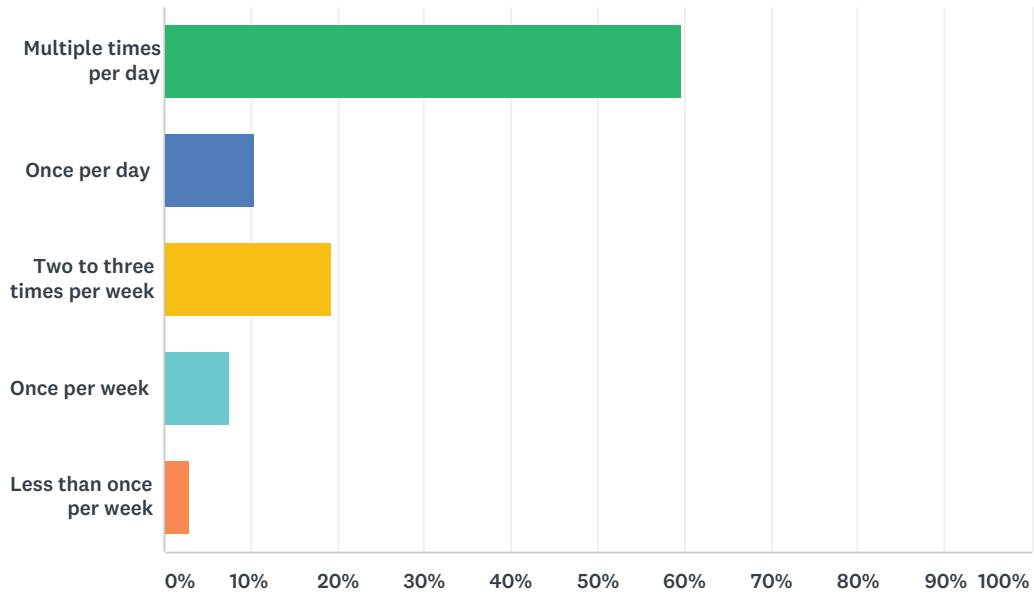
14	Fargo Airport	10/9/2018 9:04 AM
15	NDSU	10/9/2018 8:38 AM
16	Hornbachers main Ave	10/9/2018 5:20 AM
17	Work at home	10/9/2018 1:30 AM
18	Work remotely	10/9/2018 12:37 AM
19	Downtown Fargo	10/8/2018 10:52 PM
20	Fargo	10/8/2018 10:46 PM
21	Downtown Fargo	10/8/2018 9:50 PM
22	Sanford/ Mstate	10/8/2018 9:28 PM
23	Fargo	10/8/2018 8:39 PM
24	Office at CCRI and clients all over Moorhead.	10/8/2018 8:27 PM
25	Horizon Middle School	10/8/2018 8:05 PM
26	West Fargo	10/8/2018 6:23 PM
27	I work for the city of Moorhead	10/8/2018 6:07 PM
28	Moorhead public schools	10/8/2018 5:59 PM
29	Retired	10/8/2018 5:39 PM
30	I work in Dilworth	10/8/2018 5:08 PM
31	Don't work/school	10/8/2018 4:42 PM
32	Our Redeemer	10/8/2018 4:22 PM
33	Farmstead Care	10/8/2018 3:32 PM
34	Fargo	10/8/2018 3:08 PM
35	Sanford I94 Hospital	10/8/2018 2:49 PM
36	Children go to school at MHS and Horizon MS.	10/8/2018 2:39 PM
37	Our Redeemer Lutheran Church	10/8/2018 2:36 PM
38	Fargo	10/8/2018 2:19 PM
39	Fargo	10/8/2018 2:18 PM
40	Home	10/8/2018 2:12 PM
41	Downtown Moorhead	10/8/2018 1:38 PM
42	St Joes	10/8/2018 1:23 PM
43	Near MSUM	10/8/2018 1:20 PM
44	Granddaughter goes to Horizon Middle School	10/8/2018 1:16 PM
45	Work from home, but our kids attend Horizon and Dodd's.	10/8/2018 1:11 PM
46	on main ave in moorhead, daughter goes to ellen hopkins	10/8/2018 1:08 PM
47	MatBus	10/3/2018 10:40 PM
48	Fargo downtown	9/28/2018 4:34 PM
49	Fargo	9/24/2018 10:27 PM
50	City of Moorhead	9/21/2018 8:15 AM
51	fargo downtown	9/20/2018 4:27 PM
52	Fargo	9/20/2018 9:11 AM
53	Work out of my home with travel regionally	9/20/2018 5:36 AM
54	Fargo	9/19/2018 7:48 PM

55	Retired	9/19/2018 5:28 PM
56	Robert Asp, Horizon Middle School, North Fargo	9/19/2018 4:22 PM
57	retired	9/19/2018 3:17 PM
58	Moorhead public schools, MSUM, Park Christian	9/19/2018 9:47 AM
59	FARGO	9/18/2018 1:33 PM
60	the meadows	9/18/2018 9:20 AM
61	Mapleton Nd	9/18/2018 7:40 AM
62	West Fargo	9/17/2018 9:19 PM
63	courthouse	9/17/2018 5:04 PM
64	I live near 12th Avenue, but I work in Fargo	9/17/2018 11:22 AM
65	South Moorhead	9/17/2018 10:45 AM
66	North Moorhead	9/17/2018 9:46 AM
67	N/A	9/17/2018 8:30 AM
68	Fargo	9/17/2018 8:06 AM
69	Various locations - in home tutoring at students residence	9/16/2018 11:18 PM
70	Mhd water plant	9/16/2018 10:27 PM
71	Retired	9/16/2018 8:48 PM
72	Glyndon	9/16/2018 6:50 PM
73	Elementary School So. of town	9/16/2018 11:27 AM
74	Retired	9/16/2018 10:19 AM
75	NDSU	9/16/2018 7:52 AM
76	City of Moorhead	9/15/2018 10:44 PM
77	Retired	9/15/2018 4:52 PM
78	Dorothy Dodds Elementary school	9/15/2018 1:37 PM
79	North Side of Fargo	9/15/2018 1:10 PM
80	NDSU	9/15/2018 10:49 AM
81	Horizon Middle School	9/14/2018 9:51 PM
82	North Fargo	9/14/2018 9:18 PM
83	retired	9/14/2018 9:13 PM
84	34th st & 29th ave	9/14/2018 9:02 PM
85	north Fargo	9/14/2018 7:45 PM
86	Son's daycare at Our Redeemer, work downtown Moorhead	9/14/2018 6:57 PM
87	Self employed professional photographer	9/14/2018 6:41 PM
88	NDSU	9/14/2018 5:00 PM
89	East of Moorhead	9/14/2018 4:53 PM
90	at home	9/14/2018 4:48 PM
91	retired	9/14/2018 4:39 PM
92	Clay County	9/14/2018 4:24 PM
93	Retired from NDSU	9/14/2018 3:52 PM
94	Air national guard	9/14/2018 3:30 PM
95	retired	9/14/2018 2:33 PM

96	South Fargo	9/14/2018 2:29 PM
97	South Fargo	9/14/2018 2:21 PM
98	work in South Moorhead and South Fargo, but kids at schools - Concordia, St Joes, Horizon and MHS	9/14/2018 2:07 PM
99	Home	9/14/2018 1:36 PM
100	in Fargo	9/14/2018 1:34 PM
101	Downtown	9/14/2018 1:33 PM
102	Fargo	9/14/2018 1:20 PM
103	Fargo	9/14/2018 12:29 PM
104	Fargo	9/14/2018 11:59 AM
105	VA Hospital	9/14/2018 9:43 AM
106	Downtown Fargo	9/13/2018 11:39 PM
107	Robert Asp elementary	9/13/2018 6:32 PM
108	Downtown Fargo	9/13/2018 4:55 PM
109	The Village Family Services	9/13/2018 2:24 PM
110	Hector airport	9/13/2018 1:30 PM
111	Disabled	9/13/2018 1:04 PM
112	Fargo	9/13/2018 12:33 PM
113	downtown	9/13/2018 9:25 AM
114	Hornbacher's	9/13/2018 8:30 AM
115	Home	9/11/2018 8:31 AM
116	Fargo	9/7/2018 2:48 PM
117	Work in the urban progress zone of downtown.	8/24/2018 6:26 PM
118	Fargo	8/22/2018 3:38 PM
119	Work from home	8/22/2018 2:58 PM
120	Downtown Fargo	8/21/2018 3:56 PM
121	City of Moorhead	8/9/2018 8:49 PM
122	NDSU	8/3/2018 11:00 AM
123	Drive throughout Moorhead	7/29/2018 11:11 PM
124	All over the metro	7/25/2018 11:18 PM
125	Downtown Moorhead	7/18/2018 1:56 PM
126	Fargo public schools	7/10/2018 8:15 AM

### Q3 How often do you travel 12th Avenue?

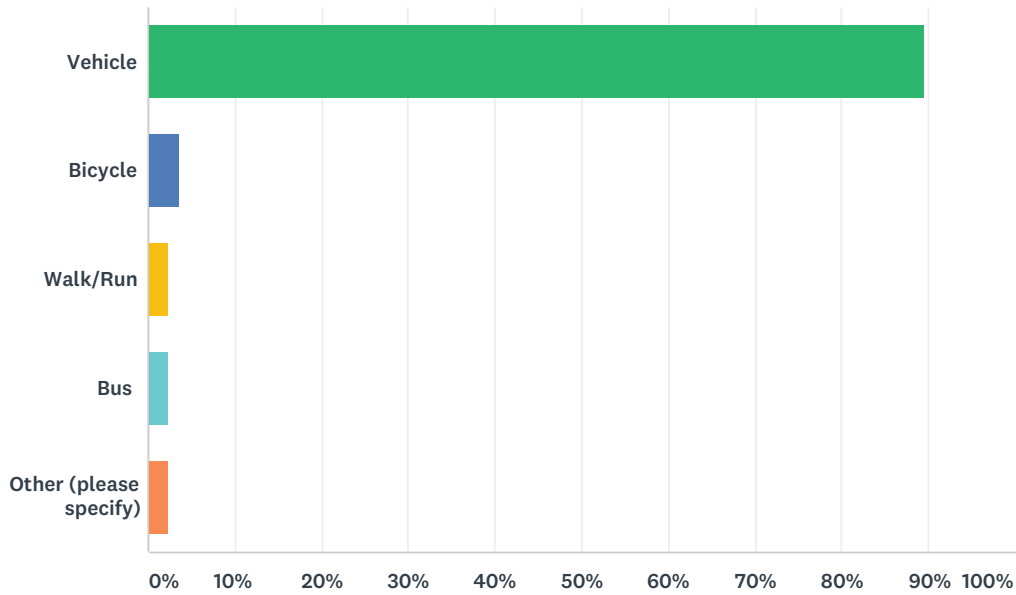
Answered: 171 Skipped: 1



ANSWER CHOICES	RESPONSES	
Multiple times per day	59.65%	102
Once per day	10.53%	18
Two to three times per week	19.30%	33
Once per week	7.60%	13
Less than once per week	2.92%	5
<b>TOTAL</b>		<b>171</b>

### Q4 How do you most often travel 12th Avenue?

Answered: 171 Skipped: 1

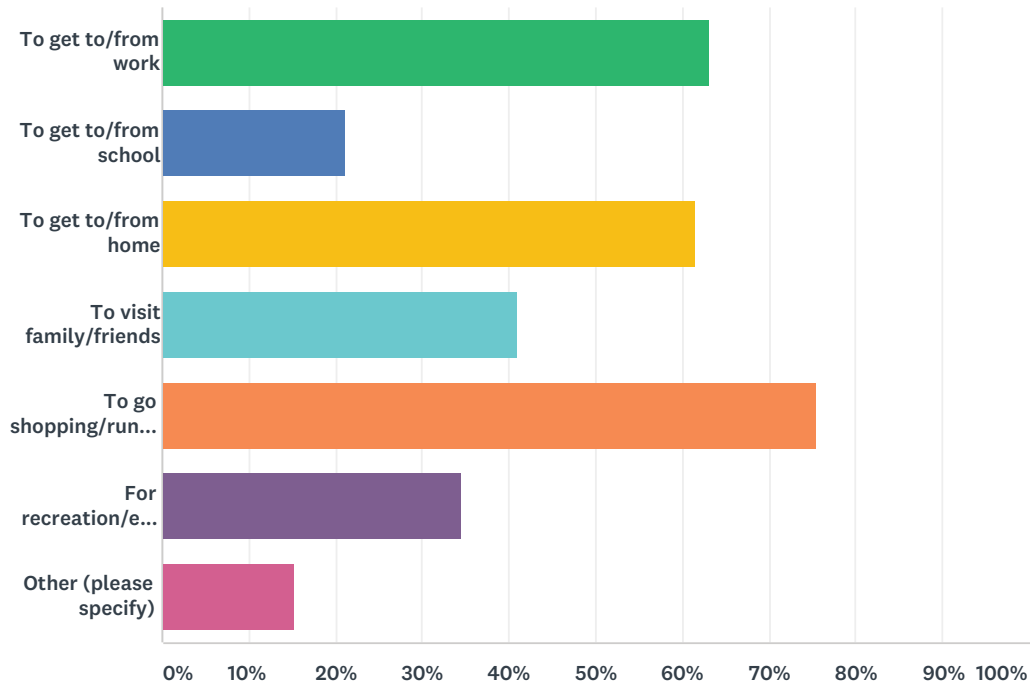


ANSWER CHOICES	RESPONSES	
Vehicle	89.47%	153
Bicycle	3.51%	6
Walk/Run	2.34%	4
Bus	2.34%	4
Other (please specify)	2.34%	4
<b>TOTAL</b>		<b>171</b>

#	OTHER (PLEASE SPECIFY)	DATE
1	Almost exclusively by bicycle; PLEASE INCLUDE BIKE LANES	9/16/2018 7:52 AM
2	.	9/14/2018 9:43 AM
3	Vehicle - but I would like to use my bike more	9/13/2018 9:25 AM
4	Rollerblade, bus, and vehicle. I frequently drive on 12th for work, but will often rolleblade when going to work or downtown. Occasionally use the bus.	8/24/2018 6:26 PM

### Q5 For what reasons do you use 12th Avenue? (check all that apply)

Answered: 171 Skipped: 1



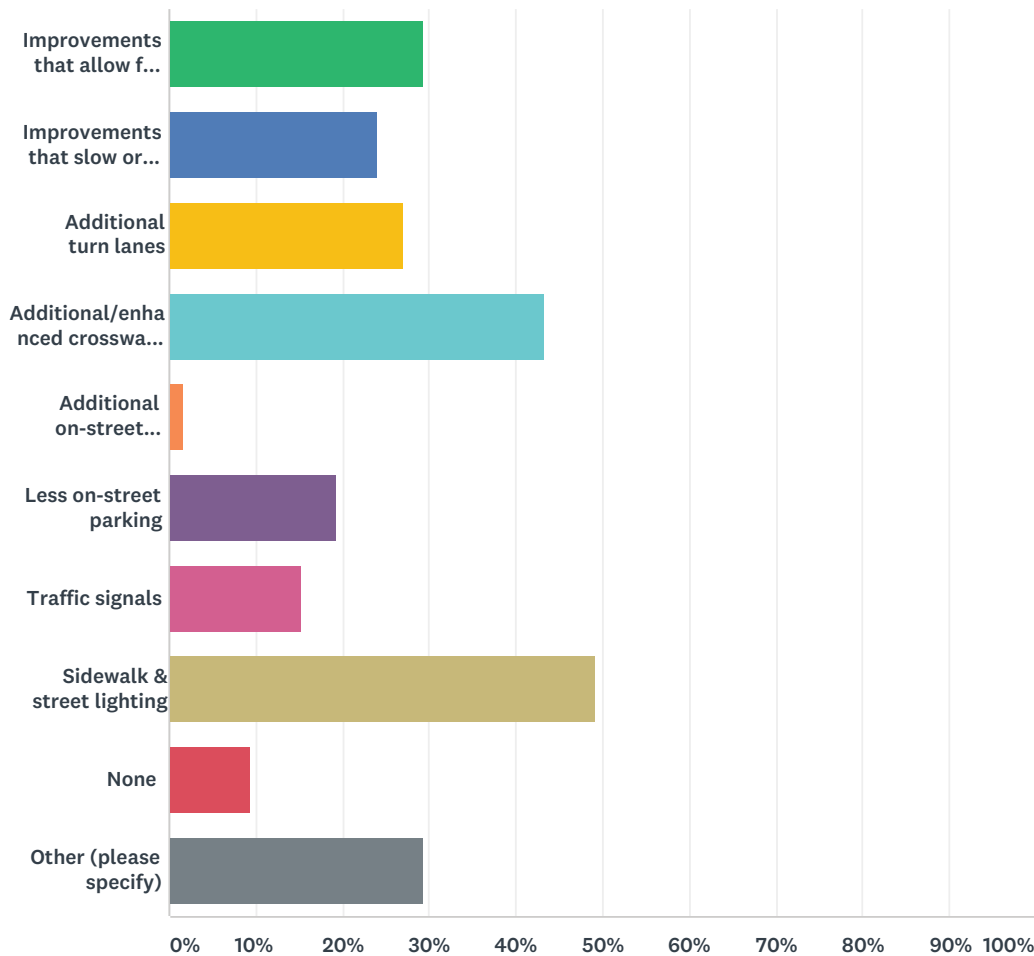
ANSWER CHOICES	RESPONSES
To get to/from work	63.16% 108
To get to/from school	21.05% 36
To get to/from home	61.40% 105
To visit family/friends	40.94% 70
To go shopping/run errands	75.44% 129
For recreation/exercise/parks	34.50% 59
Other (please specify)	15.20% 26
Total Respondents: 171	

#	OTHER (PLEASE SPECIFY)	DATE
1	Walking my dog	10/10/2018 9:57 PM
2	Medical appts.	10/10/2018 11:02 AM
3	I live on the Edge od Dilworth and I have to either backtrack and grab HWY 10 to the interstate or drive by the golf course with the curves of the road still cutting through town the backway.	10/9/2018 9:45 AM
4	I also across 12th Ave S on my daily walk.	10/9/2018 8:38 AM
5	To get to daycare services	10/8/2018 6:51 PM
6	Work	10/8/2018 6:07 PM
7	To/from the Library	10/8/2018 4:42 PM
8	Drop off and pick up child from daycare	10/8/2018 4:25 PM

9	Walking pets	10/8/2018 3:08 PM
10	to/from youth hockey arena	10/8/2018 2:49 PM
11	To go out to eat	10/8/2018 1:16 PM
12	dance class held at church	10/8/2018 1:08 PM
13	to walk my dogs	9/19/2018 8:33 PM
14	My child goes to daycare at Our Redeemer. I travel on 12th after dropping him off and going to pick him up.	9/17/2018 9:19 PM
15	To get to my church, to get to N. Fargo, via Main St.	9/17/2018 2:52 PM
16	Go to the lake country	9/16/2018 8:48 PM
17	Drive on for only 1/2 block to get to 20th St.	9/16/2018 11:27 AM
18	Chiropractor appointments	9/16/2018 10:19 AM
19	To complete work duties	9/15/2018 10:44 PM
20	It will be a main detour route during the 20th st underpass. Also to get my son to and from school, Horizon.	9/15/2018 1:37 PM
21	go to frequent medical appointments at clinics	9/14/2018 2:33 PM
22	.	9/14/2018 9:43 AM
23	Kids activities at MSUM	9/13/2018 8:30 AM
24	Alternative route if trains are blocking Main and 20th/21st.	8/24/2018 6:26 PM
25	Work	7/29/2018 11:11 PM
26	Avoid trains	7/25/2018 11:18 PM

## Q6 What roadway or safety improvements do you feel are needed along 12th Avenue? (select all that apply)

Answered: 171 Skipped: 1



ANSWER CHOICES	RESPONSES	
Improvements that allow for quicker travel through the corridor	29.24%	50
Improvements that slow or calm traffic through the corridor	23.98%	41
Additional turn lanes	26.90%	46
Additional/enhanced crosswalk pavement and markings	43.27%	74
Additional on-street parking	1.75%	3
Less on-street parking	19.30%	33
Traffic signals	15.20%	26
Sidewalk & street lighting	49.12%	84
None	9.36%	16
Other (please specify)	29.24%	50



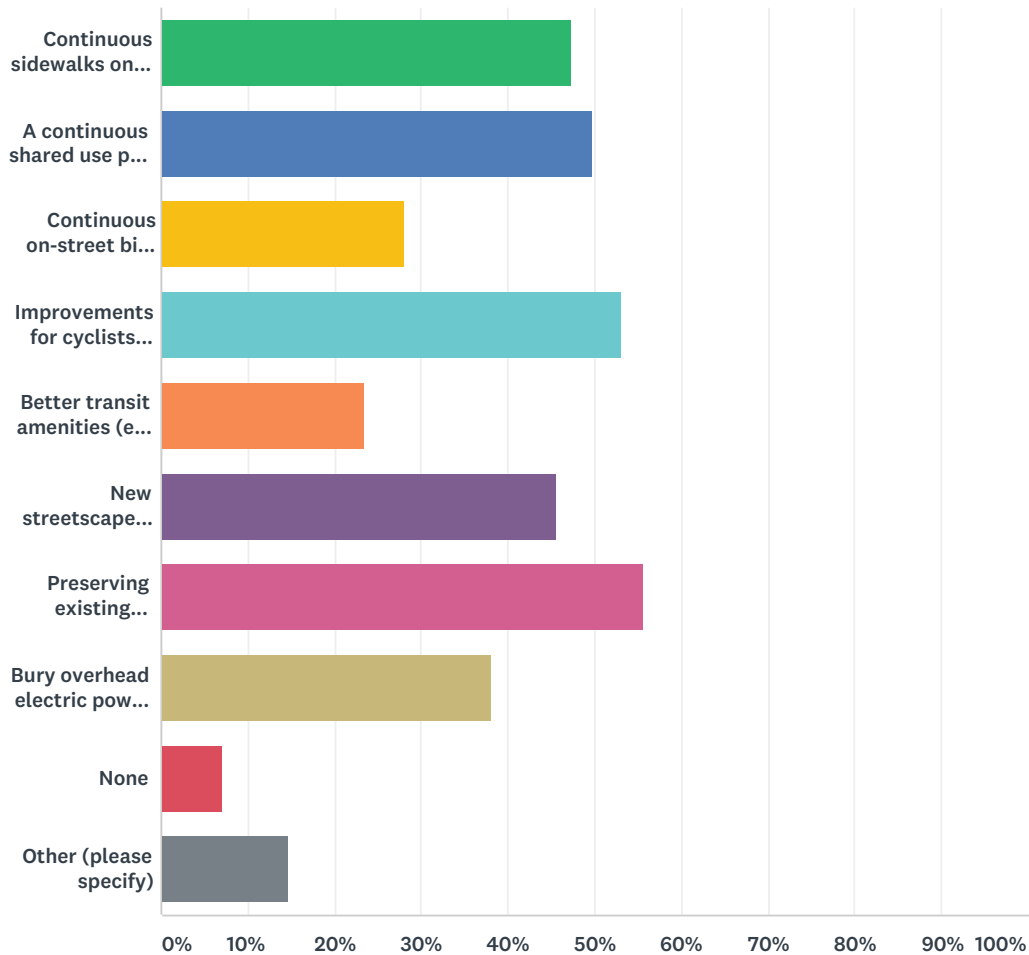
Total Respondents: 171

#	OTHER (PLEASE SPECIFY)	DATE
1	Enforcement of current Laws concern pedestrians not obeying traffic laws. Also enforcement of the laws concerning motorized vehicles on sidewalks near Concordia campus.	10/14/2018 10:30 AM
2	Fix the actual road - it's horrible from 11th St to 20th St S	10/11/2018 5:52 PM
3	A site of buses to get out of traffic to load and unload passengers	10/9/2018 4:48 PM
4	Enhanced bike lane	10/9/2018 3:44 PM
5	Landscaping, public art, places of business, independent eateries (NOT fast food or fast coffee chains found elsewhere)	10/9/2018 11:35 AM
6	make sure there is better warning sign to not ride bike over the bridge. probably make a tunnel like barrier for people on sidewalk or bike can do away fromm the cold winter nights. better sidewalks and some places put in sidewalks for the first time. Also should fix the humpty dumpty part of the road, but right now it catches anyone going to fast.	10/9/2018 9:45 AM
7	Bike Lane is needed	10/9/2018 9:04 AM
8	Add sidewalks between Main Ave and 20th St	10/8/2018 10:46 PM
9	More open lanes of travel.	10/8/2018 9:28 PM
10	Bike path upkeep	10/8/2018 6:23 PM
11	LEAVE THIS ROAD ALONE!	10/8/2018 5:46 PM
12	a much needed bike lane from 8th St. S. to Old 52 along 12th ave s.	10/8/2018 5:08 PM
13	Seems fine the way it is - just regular maintenance.	10/8/2018 4:42 PM
14	It currently feels like an over-used residential street rather than a traffic artery.	10/8/2018 2:38 PM
15	The road needs to be redone. It is very rough to travel in between Concordia and 20th St. Street lights instead of stop signs would improve flow of traffic.	10/8/2018 1:20 PM
16	The surface needs to be smoothed and repaved. It is very uneven, rolling, bumpy.	10/8/2018 1:16 PM
17	Not sure if sidewalk & street lighting means lighting of sidewalks or presence of sidewalks. There are areas where there are major gaps in the presence of sidewalks that should be addressed (SE Main - 20 St). Traffic light at 12th Av & Ridgewood Blvd as traffic volumes increase it's hard to make a left onto 12 Av S.	9/21/2018 8:15 AM
18	Additional signs	9/20/2018 8:21 PM
19	BIKE LANES between SE Main & 20th St. Real ones; not just ones painted in the gravel at the edge. And a sidewalk or bike path on the same portion. It is simply dangerous!	9/20/2018 4:42 PM
20	none where i am at	9/20/2018 4:27 PM
21	improved space for bike riders	9/20/2018 5:36 AM
22	bike lane	9/19/2018 8:33 PM
23	regrading/repaving road surface, especially between 16th Street and 20th Street	9/19/2018 9:47 AM
24	Resurface would help	9/18/2018 6:58 PM
25	Better maintainence of the intersections in the winter. They are too slippery!	9/18/2018 1:48 PM
26	Pavement maintained well enough for bicycle use.	9/17/2018 5:04 PM
27	Why stop at 2th Ave S and Main? You need to continue east on Main, consider improvemnts. Consider a traffic light at 12th Ave S and Ridgewood Edition. Take signs and trim trees obstructing view when turning east, from Appleteree Lane. The school traffic is difficult to manage at times when trying to turn from Ridgewood onto 12th Ave S. Keep the traffic signal at 12th Ave S and Main just like it is set up now. We endured a horrible traffice light situation for many years until you finally replaced the traffic signals a few years ago. Leave those alone, do not change. Please	9/17/2018 2:52 PM
28	Better bike safety improvements.	9/17/2018 12:52 PM

29	Demarcated bike lanes, transit shelters with heat coils, boulevard medians with trees, better pedestrian crossing at RR tracks on 20th St, sidewalks east of 20th Street	9/17/2018 8:06 AM
30	Underpass at 20 th Street	9/16/2018 8:48 PM
31	East of 20th street the 30mph speed limit seems too slow	9/16/2018 10:19 AM
32	Bike lanes	9/16/2018 7:52 AM
33	slow traffic at west end in residential neighborhood; bike lane between Concordia and Main	9/15/2018 10:49 AM
34	Mostly neighborhood homes.....residential. Does not need to have faster traffic flow.	9/14/2018 9:37 PM
35	Bridge connecting 12th Ave to 13th Ave S in Fargo for traffic and pedestrians/bikes.	9/14/2018 9:18 PM
36	It could've use some center striping last Fall, really needs it now between 8th and 20th streets.	9/14/2018 4:53 PM
37	round-about	9/14/2018 4:48 PM
38	Use of the existing skywalk at 8th Street and 12th Avenue	9/14/2018 4:24 PM
39	Smooth pavement.	9/14/2018 2:29 PM
40	In particular the corner at 8th is dangerous for biking/walking children. No turn on red is regularly violated putting bikes/pedestrians at great risk. More kids biking across 20th to the middle school is tricky as well.	9/14/2018 2:21 PM
41	Needs to be wider, no room for head to head when vehicles are parked on each side and even sometime when 1 side (snow)	9/14/2018 1:34 PM
42	Bike lane	9/14/2018 1:20 PM
43	.	9/14/2018 9:43 AM
44	The major problem I deal with is college student/pedestrians that seem unable to follow the traffic signals and step out into the street and impede those vehicles that are trying to turn. Nothing anyone can do about that.	9/13/2018 6:32 PM
45	Bicycle Facilities; ADA compliant sidewalks	9/13/2018 4:55 PM
46	fix the railroad crossing by 20th st	9/13/2018 1:30 PM
47	Level out the RR crossing	9/7/2018 2:48 PM
48	Better bike lanes. The ones that run through the industrial park are constantly covered in debris, broken glass, loose gravel, and potholes. I've nearly wiped out several times and have been almost hit by traffic because the city doesn't properly take care of or, quite frankly, care about anything other than moving vehicular traffic.	8/24/2018 6:26 PM
49	Rail road underpass. Bike lanes throughout.	8/3/2018 11:00 AM
50	Street sweeper never cleans the south bike lane on 12th. Biking on gravel is dangerous. T	7/10/2018 8:15 AM

## Q7 What multi-modal (bicycle/pedestrian/transit) or aesthetic improvements do you feel would enhance 12th Avenue? (select all that apply)

Answered: 171 Skipped: 1



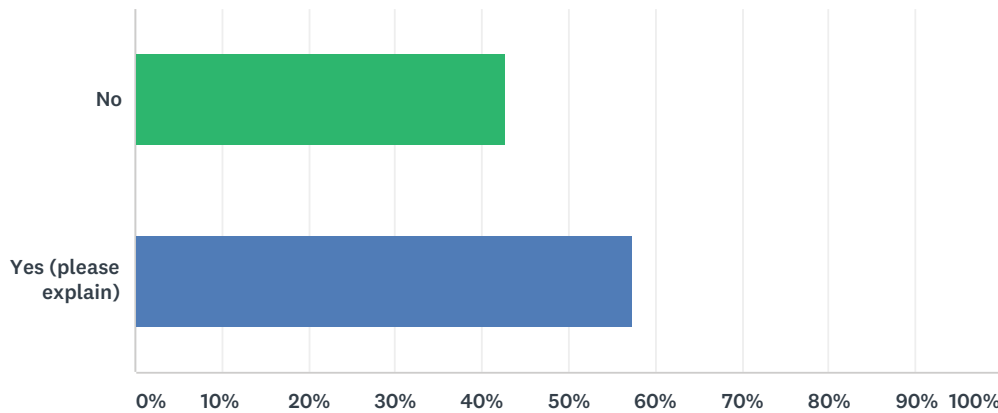
ANSWER CHOICES	RESPONSES	
Continuous sidewalks on both sides of the street	47.37%	81
A continuous shared use path (walking, bicycling, skating, etc.) on one side of the road	49.71%	85
Continuous on-street bike lanes	28.07%	48
Improvements for cyclists and pedestrians at the railroad crossing near 20th Street	53.22%	91
Better transit amenities (e.g. transit shelters, benches) for MATBUS users	23.39%	40
New streetscape improvements (e.g. lighting, landscaping, seating, special sidewalk paving, public art/sidewalk art)	45.61%	78
Preserving existing boulevard trees	55.56%	95
Bury overhead electric power lines	38.01%	65
None	7.02%	12
Other (please specify)	14.62%	25

Total Respondents: 171

#	OTHER (PLEASE SPECIFY)	DATE
1	Keep pedestrians and bicyclists off the street. Vehicles and pedestrians don't mix. The sheer size differences between bikes and cars makes a simple mistake a tragedy.	10/14/2018 10:30 AM
2	I already answered half of that	10/9/2018 9:45 AM
3	Greenery and safety features for pedestrian travel in industrial park	10/8/2018 7:01 PM
4	separate walk / bike paths would be nice. It isn't safe to bike on 12th.	10/8/2018 6:23 PM
5	Resurfacing - currently very bumpy and bouncy pavement.	10/8/2018 2:39 PM
6	Redo pavement. The rough pavement looks bad and would improve curb appeal and travel along the road.	10/8/2018 1:20 PM
7	Improved pedestrian safety at busy intersections	10/8/2018 1:16 PM
8	Or replacement of boulevard trees if some have to be removed for safety improvements.	9/21/2018 8:15 AM
9	Off street bike lane, I ride here with my son frequently	9/19/2018 7:48 PM
10	No sidewalk art !	9/18/2018 6:58 PM
11	Monitor traffic between Main and 34th St. on 12th Ave S. Drivers are always speeding that section of 12th Ave S as they also do from Main to 20th St. S., on 12th Ave.	9/17/2018 2:52 PM
12	A boulevard median with trees and public art along the whole avenue. Also street trees east of the RR tracks. I can see the ugly storage tanks and industrial buildings from my house. It makes Moorhead look really dumpy and ugly.	9/17/2018 8:06 AM
13	I don't view bike lanes as an "enhancement" but a priority/necessity	9/16/2018 7:52 AM
14	Remove stop signs if you want it to be a corridor of traffic.	9/15/2018 4:56 PM
15	diversify tree and other boulevard plantings	9/15/2018 10:49 AM
16	Bridge connecting 12th Ave to 13th Ave S in Fargo for traffic and pedestrians/bikes.	9/14/2018 9:18 PM
17	Don't lose the "Crazy Tree!" It is a landmark!	9/14/2018 5:00 PM
18	Roundabouts?	9/14/2018 3:15 PM
19	On-street bike lanes would be good where the streets are wide enough. Speeding bicyclers who don't use warning bells that come up behind unsuspecting sidewalk pedestrians are not appreciated.	9/14/2018 2:33 PM
20	.	9/14/2018 9:43 AM
21	Would roundabout help traffic flow at 20th Street?	9/14/2018 8:08 AM
22	improving the look through the industrial park area on the east end, plant trees, etc	9/13/2018 1:30 PM
23	Some cars like to go as fast as possible between 11th & 14th Streets. I still want to park my car on 12th avenue. No way do I want a bike trail on the street and lose my parking. Keep them off the busy streets. Powerlines were promised to be buried in the 1950s and never were. I want my boulevard trees for shading my home. Please do not widen this street! Use 20th and 8th street as major throughfares.	9/13/2018 12:33 PM
24	Trail policies from the 2004 Comprehensive plan calls for sidewalks on both sides of streets. Either start following your own plans or start a new one!	8/24/2018 6:26 PM
25	Street sweeper can't effectively clean this stretch of road. Please try to clean the gravel.	7/10/2018 8:15 AM

## Q8 Are there any intersections or portions of 12th Avenue that you have safety concerns with?

Answered: 157 Skipped: 15



ANSWER CHOICES	RESPONSES	
No	42.68%	67
Yes (please explain)	57.32%	90
TOTAL		157

#	YES (PLEASE EXPLAIN)	DATE
1	As I mentioned earlier the amount of motorized vehicle traffic on the sidewalks on the corner of 8th and main is disturbing. The other day while trying to take a right turn from 12th heading east to eighth heading south, the light turned green for me. Naturally I had to wait for the pedestrians to cross first. So did the guy on the atv on the sidewalk. When it cleared for me to take my turn he pulled right out in front of me.	10/14/2018 10:30 AM
2	intersection at 20th st. This intersection needs to be redone and lower the cross slope so there is not such a bump.	10/12/2018 7:34 AM
3	Section between 11th St & 20th St is full of uneven road - dips & heaves.	10/11/2018 5:52 PM
4	20th st and old 52	10/10/2018 9:57 PM
5	8th Street /Hwy 75 Pedestrians not obeying crossing signals & turning cars not obeying signals.	10/10/2018 11:02 AM
6	20 th street 8th street Cars blowing thru red lights	10/9/2018 3:44 PM
7	12th Ave & 20th Street	10/9/2018 3:06 PM
8	Main Ave, 20th St, train crossings, 11th St	10/9/2018 11:35 AM
9	Where it appears opened up the speed limit is still 30, most people do not do that	10/9/2018 9:45 AM
10	It can be difficult as a pedestrian to cross 12th Ave S at the intersections of 11th St and 14th St.	10/9/2018 8:38 AM
11	From 20th st to hwy 52	10/9/2018 5:20 AM
12	Concordia students frequently jaywalk at 12th and 8th street even though Concordia has provided an enclosed walkway at considerable expense.	10/8/2018 10:52 PM
13	8th st/12th ave needs better traffic flow for vehicles	10/8/2018 9:28 PM
14	12th avenue from 20th street to Main Avenue is not safe for pedestrians. The bike lane is consistently full of dirt and gravel, making it dangerous.	10/8/2018 8:05 PM

15	Commuting on 12th ave south with the increased traffic from the underpass diversion is difficult. Seems to be too much traffic trying to use the roadway. 12th Avenue intersections at 20th and 8th street and dangerous as traffic does not stop when their light turns red. Many times vehicles through the yellow and red lights. I literally see it happening daily. So much so that when my light turns green I choose to wait extra and check.	10/8/2018 6:51 PM
16	Ridgewood and 12th. Traffic goes by on 12th at a high rate of speed. 45 mph + in a 30 is common. Either make it a faster road with stop signs leading up to it or add some stop lights.	10/8/2018 6:23 PM
17	20th Street over the tracks and possible across main Ave can be hairy.	10/8/2018 5:59 PM
18	12th Ave and 5th street	10/8/2018 5:39 PM
19	Many motorists do not come to a full stop at multiple intersections. Especially 11th St. S. and 12th Ave and 14th St. S. and 12th Ave.	10/8/2018 5:08 PM
20	The one way streets that connect to 12th, they aren't clearly marked and I've often found myself encountering someone driving the wrong way down the one ways	10/8/2018 4:25 PM
21	Our Redeemer has a daycare and with all the continuous traffic from the stop sign on 14th St, it is very difficult for all the daycare vehicles to turn from 16th St back on to 12th Ave. Also, the daycare kids go on stroller and bike rides along 12th Ave and have to cross it to get to lamb park. Ensuring their safety is important.	10/8/2018 4:22 PM
22	12th and 8th. The no right on red is dumb. Rarely anyone in cross walk...	10/8/2018 3:08 PM
23	The railroad track at 20th and 12th is a challenge	10/8/2018 3:08 PM
24	12th Ave and 20th Street. There is significant contour/bounciness in the at intersection. Smooth out that intersection. It's hard on my car and I drive slowly through that intersection.	10/8/2018 2:39 PM
25	20th street. 8th street is OK, but probably can be improved.	10/8/2018 2:38 PM
26	Visibility is low when entering the corridor and lack of pedestrian crossings means kids are frequently running across the street to the bus stop on the south side.	10/8/2018 2:36 PM
27	It is hard to see oncoming traffic and unsafe when entering 12th Ave from Appletree lane.	10/8/2018 2:18 PM
28	The intersection of 12th & 20th w/ the railroad crossing -- and the neighborhood around that same area is a bit sketchy.	10/8/2018 1:38 PM
29	The acceleration of westbound traffic from the last stop sign on 4 street all the way to River drive.	10/8/2018 1:25 PM
30	The lousy workmanship of the road. Stop cutting into the roads and making them crappy.	10/8/2018 1:23 PM
31	The stop sign at 12th and 11th st is bad and should be improved.	10/8/2018 1:20 PM
32	11 and 14th streets	10/8/2018 1:16 PM
33	Pedestrians walking near the industrial park. They walk on the road and it is very unsafe. They need a sidewalk.	9/28/2018 4:34 PM
34	The shared use bike path between 20th st and main is covered in dirt rocks along with being at a steep grade that is not safe for my elementary age children to travel.	9/24/2018 10:27 PM
35	Hard to make safe left onto 12 Av S from Ridgewood Blvd during peak traffic.	9/21/2018 8:15 AM
36	I wish there was a sign about the amount space between the intersection and the railroad tracks.	9/20/2018 8:21 PM
37	Virtually all of them. MNDOT's attempts at crossing safety at 12th Av & 8th St are a joke. Each quadrant is unique. What ever happened to standardization? The 20th St bike path at 12th Av directs bikes and pedestrians to the middle of the intersection. How weird is that.	9/20/2018 4:42 PM
38	Even though outside of the current discussion, there is a need for a MARKED crosswalk for pedestrians on 12th Ave S AT 36th and 38th Street South by the Junior High. High traffic volumes make it a safety hazard for children trying to cross at those two intersections. thanks	9/20/2018 4:00 PM
39	Crossing the severely jarring railroad tracks at 20th. I am worried it will harm my shocks/struts of my car. Also, buses (which have to stop) stop at the railroad tracks and trap vehicles in the intersection (both, traveling east on 12th at Main and 20th) when the light hurriedly turns red, allowing north/south-bound traffic to go. This is a hazard! Perhaps a lane for buses or ability for cars to get around the yielding buses. Not sure of the correct fix.	9/20/2018 11:13 AM
40	Biking from 16th Street to Main Avenue is treacherous.	9/19/2018 8:33 PM

41	20th st railroad	9/19/2018 7:48 PM
42	12th Ave S and 3rd St S - major bus hub for school age children and no protection from vehicles during those times	9/19/2018 4:22 PM
43	Every intersection on 12th avenue that is near a campus is a safety concern for pedestrians and bicyclists using the sidewalks. I've seen several near-accidents at stop signs where vehicles come in too quickly and nearly hit pedestrians and bicyclists	9/19/2018 3:09 PM
44	At the one ways	9/18/2018 6:58 PM
45	East of 20th St. With no sidewalk, I have either walked on the grounds (which are uneven, dirty, etc.) or on the street/gutter (which is dirty, unsafe).	9/18/2018 4:38 PM
46	In the winter, 12th Ave and 14th Street and 12th Ave and 11th St.	9/18/2018 1:48 PM
47	8TH STREET HWY 52 20TH ST	9/18/2018 1:33 PM
48	12th and 14th. It would be nice to have additional turning lanes if possible.	9/17/2018 9:19 PM
49	12th Avenue and 11th Street. 12th Ave and 14th street. Lots of accidents there and very icy in the winter. Need more room for the MAT bus stops.	9/17/2018 3:03 PM
50	Ridgewood and 12th Ave S. Main and 12th Ave S., 20th St. S. and Main Ave (on railroad tracks)	9/17/2018 2:52 PM
51	11th Street - especially in the fall people don't notice that the road is switching from 1-way to 2-way.	9/17/2018 12:52 PM
52	20th St intersection (East Side) - A better transition to and from bike lanes on 12th Ave to bike path on 20th St. Heading west the bike lane just ends before the tracks. There is no safe way for a cyclist to head north or south on the bike path from 12th Ave. The cyclist either has to go to the intersection in the right turn lane to head north or cross all traffic to head south. Some type of paved bike lane/path which merges 20th St and 12th Ave on the west side of tracks would be helpful.	9/17/2018 9:46 AM
53	1. 20th St S intersection. There are no sidewalks east of 20th Street. 2. There is no crosswalk on 19 1/2 St S to cross the road. The road is too wide to cross and is very scary to cross. I would never let my children cross the street alone. 3. The yellow line at the intersection with the Concordia tree needs to be re-centered. Most drivers have the expectation that road is perfectly divided in half. I have seen a lot of close collisions at this intersection where cars are making a left-hand turn.	9/17/2018 8:06 AM
54	20th Street and 12th ave street lights slow the flow of traffic needs timing work	9/16/2018 10:27 PM
55	Crosswalks to Concordia	9/16/2018 6:50 PM
56	12 Ave/Main Ave SE. When EB on 12 Ave, visibility of SB Main Ave is non existent unless you completely turn around in your seat due to the angles of the road.	9/16/2018 4:34 AM
57	8th St, 20th St, Hwy 52	9/15/2018 4:52 PM
58	12th ave and Main/old 52. Especially in the winter, intersection gets extremely slippery making it hard for vehicles stopping at the speed limits.	9/15/2018 1:37 PM
59	It should be a 4-way stop at 12th Avenue and Elm. The new striping down 12th from Concordia west is hazardous --forces vehicles into parked cars because lane is too narrow on half of street.	9/15/2018 10:49 AM
60	8th St and 12th Ave crosswalks	9/14/2018 9:18 PM
61	Traffic is sometimes quite heavy on 12th avenue. Entering from neighborhood intersections, especially in winter when snow banks obscure vision, can be quite challenging. (Lived on 16th St for many years)	9/14/2018 9:13 PM
62	12th and Main when travelling East. Get behind a City bus, or any longer vehicle that has to stop for tracks, and you will find yourself in the intersection with a red light. The light does not stay green long for 1 or 2 vehicles.	9/14/2018 4:53 PM
63	8th street and 12th ave	9/14/2018 4:48 PM
64	8th Street and 12th Avenue and 20th Street and 12th Avenue	9/14/2018 4:24 PM

65	Intersection with 8th Street where Concordia students won't use the elevated walkway Concordia students do not always use the designated xing area south of the Memorial Auditorium on the east side of that intersection. Also intersection with 18th or 19th Streets where people are crossing to the bus stop including young people	9/14/2018 3:52 PM
66	Train tracks and stop lights close together.	9/14/2018 3:15 PM
67	When driving East on 12th Ave S in heavier traffic, it is difficult to see pedestrians and bicyclers that cross 12th Ave S to get to Concordia College and back from the street that borders the west end of Meritcare parking lot.	9/14/2018 2:33 PM
68	At 12th Ave and 8th Street I would like to see electronic "no turn on red" signs that could change. During the summer when there are less Concordia students at the cross walks, right turns on red could be allowed.	9/14/2018 2:29 PM
69	8th, 20th, and Main ~ In particular the corner at 8th is dangerous for biking/walking children. "No turn on red" is regularly violated putting bikes/pedestrians at great risk. There are more and more kids biking across 20th and Main to the middle school. It is tricky as well.	9/14/2018 2:21 PM
70	Crossing at 20th, and again at the highway. This is a major route to the middle school and I am not comfortable having my kids travel it. I have them go to the high school and through the back way, but now that it is so torn apart there, I am unsure of how to get them to or from school in the spring when they bike...	9/14/2018 2:07 PM
71	at the crossing 8th and at the rail road crossing	9/14/2018 1:34 PM
72	stretch between SE Main & 20th needs bike and pedestrian amenities/connectivity	9/14/2018 1:33 PM
73	Make 11th St, north of 12th Ave, non one-way street	9/14/2018 1:20 PM
74	8th Street is much better than in the past, but always a point of concern with the high volume of traffic year round.	9/14/2018 8:08 AM
75	In addition to the railroad crossing near 20th Street, bicycle and pedestrian travel is difficult all the way from 20th Street to Main Ave	9/13/2018 11:39 PM
76	Again, the problem is mainly with college student/pedestrians that step out in front of vehicles, especially on where the one way streets intersect 12th avenue.	9/13/2018 6:32 PM
77	12th and 4th - people stop quickly and briefly 12th and 5th - people stop quickly and briefly - barely looking 12th and 6th - Concordia students cross without looking 12th and 8th - very busy intersection 12th and 20th - the grade change creates it difficult to cross quickly heading east on a bicycle	9/13/2018 4:55 PM
78	The need for bus shelters, especially one at the corner of 12th Avenue and 19th St. S	9/13/2018 1:42 PM
79	12th ave and 20th street, mainly on the eastern part of the intersection, rough railroad crossing, would like a right turn lane for westbound to northbound traffic and for the left/center turn lane to connect east of the tracks so when trains back up traffic two lanes of cars can form and not have to wait until west of the tracks for the left turn lane (center turn lane is blocked by cross-hatches on the east side of tracks)	9/13/2018 1:30 PM
80	Speeds along the avenue. Would also like large trucks off the street. Some curb drainage is horrible. Mosquito traps. Also continue to enforce Concordia students from walking across cross walks when it show red on the sign for no crossing. Most are good. Otherwise ban and force them to use the skyway.	9/13/2018 12:33 PM
81	12th Ave and 20th Street - RR crossing could be improved.	9/13/2018 9:25 AM
82	12th Avenue and 20th Street, specifically when you cross the railroad tracks.	9/13/2018 8:30 AM
83	18th st and 12 Ave. 12 and 12. Used by children to get to the pool	9/11/2018 8:31 AM
84	RR crossing	9/7/2018 2:48 PM
85	5th Street (northbound one way) -- erratic pedestrian crossings in the area	9/6/2018 10:57 AM
86	12th and 20th, 8th and 12th, , SE Main and 12th, and even though it's not part of the study 12th and 34th. All of these areas are filled with speeding cars who don't care about pedestrians or cyclists and will frequently stop within crosswalks and ignore red lights when turning right. Additionally, the mixed use path between SE Main and 34th St on 12th lacks proper lighting at night. It's difficult for cars to see anyone who may be using the path.	8/24/2018 6:26 PM



87	20th St railroad crossing	8/22/2018 2:58 PM
88	Train crossing	8/21/2018 3:56 PM
89	Rail road at grade crossings at 20th St and Main Ave	8/3/2018 11:00 AM
90	8th ave with the Concordia students	7/25/2018 11:18 PM

## Q9 What is the most important issue(s) you believe should be addressed along the 12th Avenue corridor?

Answered: 115 Skipped: 57

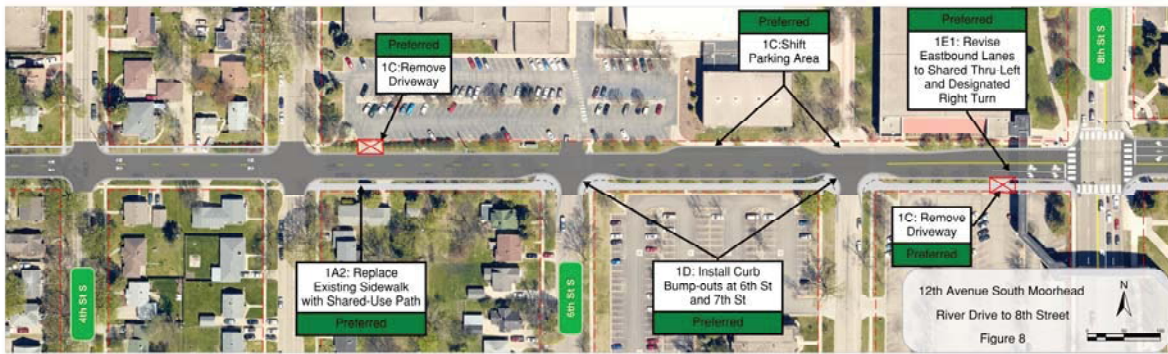
#	RESPONSES	DATE
1	The use of motorized vehicles in sidewalks	10/14/2018 10:30 AM
2	Just needs new pavement so it is not so ruff.	10/12/2018 7:34 AM
3	Actual road.	10/11/2018 5:52 PM
4	Sidewalk from 20th straight through past Horizon Middle School	10/10/2018 9:57 PM
5	Pedestrian/bicycle/vehicle safety.	10/10/2018 11:02 AM
6	Conditions of the road itself, lighting, and visible markings of crosswalks	10/9/2018 11:16 PM
7	safety	10/9/2018 4:48 PM
8	Above	10/9/2018 3:44 PM
9	Safety, efficiency, beauty	10/9/2018 11:35 AM
10	the weather	10/9/2018 9:45 AM
11	I am not sure if it is an issue but I think 12th Ave has and will continue to be a popular thorough-way from 8th street to 20th and to Main, especially due to the Horizon Middle School and Dorothy Dodds elementary. Therefore, I think getting traffic through in a faster, more efficient way might be a positive improvement for the future.	10/9/2018 9:08 AM
12	Issues checked on question #7.	10/9/2018 8:38 AM
13	Sidewalks and bike lanes, please!	10/9/2018 7:37 AM
14	Bike/walking paths and keeping quiet neighborhood feel	10/9/2018 5:20 AM
15	Maintaining the integrity of the respective neighborhoods is of utmost importance, especially as more and more properties near and along 12th Avenue are converted to rentals. Traffic lights in residential areas should be avoided. I would rather see more amenities for pedestrians and cyclists at the expense of automobile convenience. Twelfth Avenue should never be an artery at any point west of 20th street.	10/8/2018 10:52 PM
16	Improve lanes of travel	10/8/2018 9:28 PM
17	Speed limits should be increased and a bike path should be added between Old 52 and 34th Street	10/8/2018 8:39 PM
18	Sidewalks/path continuously on at least one side between 20th street and Main Avenue	10/8/2018 8:05 PM
19	The industrial park area is an eye sore.	10/8/2018 7:01 PM
20	Too much traffic with the detours	10/8/2018 6:51 PM
21	Make it smooth. Way too bumpy and uneven.	10/8/2018 6:07 PM
22	Just leave the road alone. 1. We don't need more construction 2. This road and traffic flows fines 3. We don't want to pay for updates that are not needed	10/8/2018 5:46 PM
23	Keep residential areas residential. More lighting.	10/8/2018 5:39 PM
24	bike and pedestrian safety!!!!	10/8/2018 5:08 PM
25	Preserve that beautiful strange tree	10/8/2018 4:25 PM
26	Get rid up bumps	10/8/2018 3:08 PM
27	level grade of the road surface. It's very uneven now.	10/8/2018 2:39 PM

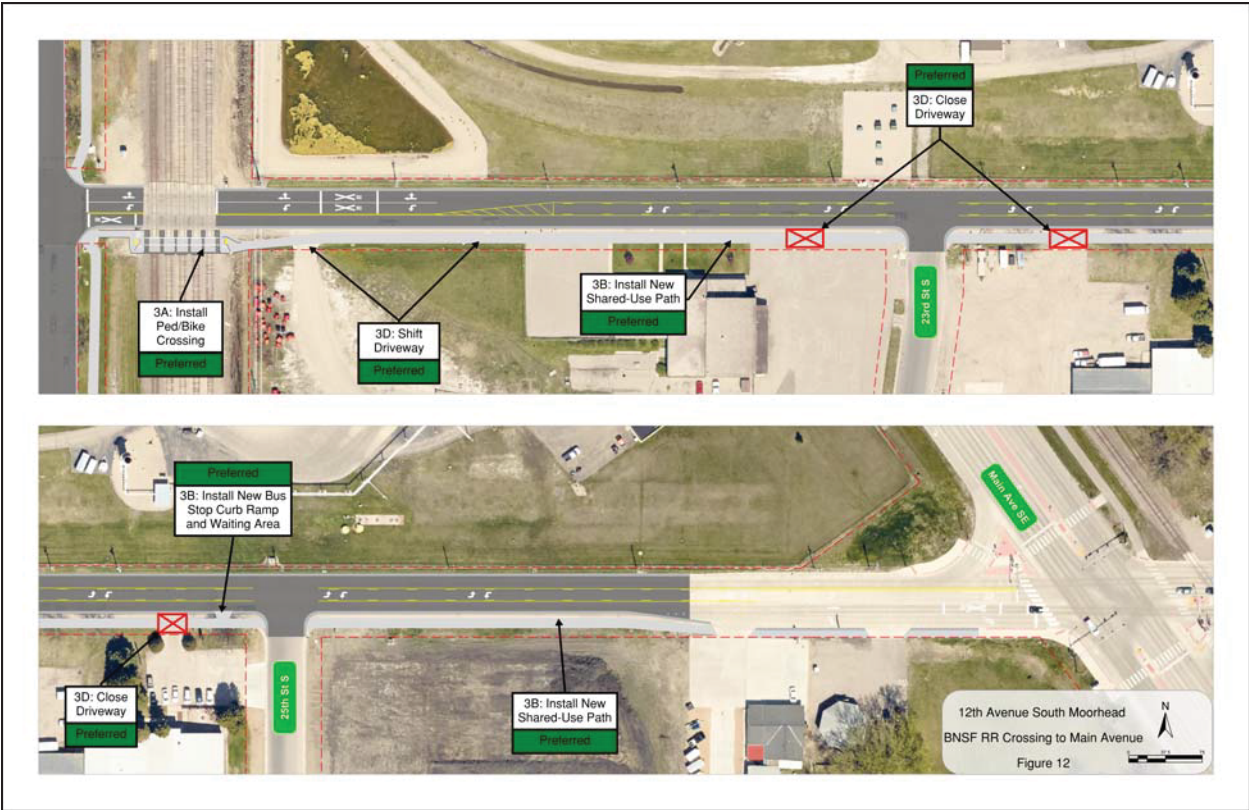
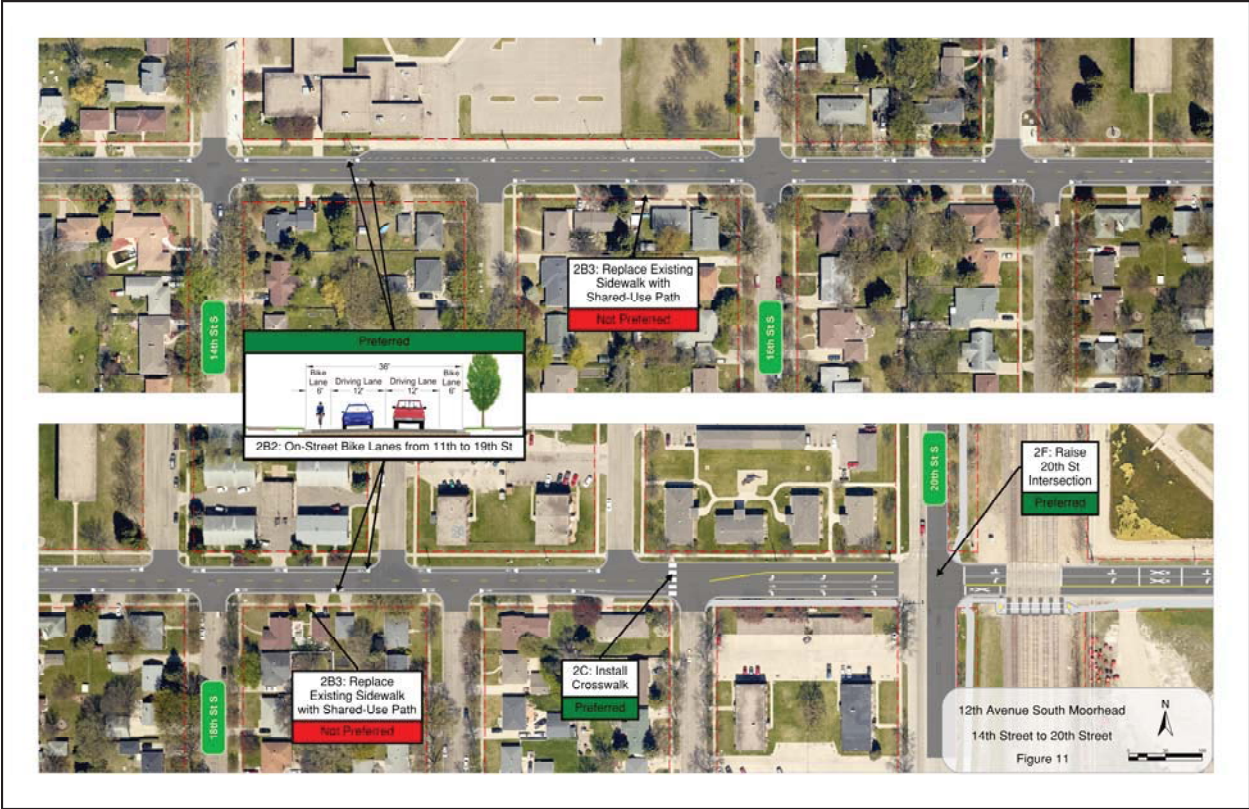
28	If the city intends this to be a main corridor, looking at the nature of the full set of intersections is probably in order.	10/8/2018 2:38 PM
29	Keeping it safe, but keeping it as a way to get across town without many stop signs or stop lights.	10/8/2018 2:36 PM
30	Safety at intersections for vehicles entering 12th ave and pedestrians crossing 12th ave	10/8/2018 2:18 PM
31	Keep the tree!	10/8/2018 2:12 PM
32	Safety, ease of travel.	10/8/2018 1:38 PM
33	Create a 4Way stop at the intersection of 12 Ave and 2nd street	10/8/2018 1:25 PM
34	When laying down the pavement/concrete - ENSURE it last for more than 5 years without feeling like you are on a roller coaster and need a kidney belt. Get rid of the annoying side street stuff - utility lines and boxes. Dedicate bikes and peds on one side of the street and in their dedicated (off the street) drive. Cars and bikes DO NOT mix. If signals go up, they should "sense" when the lane has emptied and immediately change for the other direction - unlike the 12th ave and 20th intersection.	10/8/2018 1:23 PM
35	Redoing the road.	10/8/2018 1:20 PM
36	Rough surfaces, pedestrian safety and street lighting.	10/8/2018 1:16 PM
37	None, we don't need it we can't afford it.	9/28/2018 9:03 PM
38	Sidewalk improvements, could use crosswalks near Our Redeemer area. Industrial Park area could use trees, landscaping, etc. It's an eye sore.	9/28/2018 4:34 PM
39	It's really hard to bike along 12th Avenue. I'd make that my top priority. Also, I don't know why that road is so steeply sloped in my neighborhood (i.e. near the intersection of 3rd St and 12th Ave S).	9/25/2018 8:24 PM
40	Mentioned in point 8 "20th st and main is covered in dirt rocks along with being at a steep grade that is not safe for my elementary age children to travel." However, outside of this study area I have another concern with 12th ave s at 34th st s. At that intersection, there is not a pedestrian crossing from west to east on the north side of the crossing and there's no pedestrian crossing from the south to north on the east side of the intersection making it not possible to reach Casey's from the west side of 34th st.	9/24/2018 10:27 PM
41	Continuous off-road pedestrian path/sidewalk.	9/21/2018 8:15 AM
42	Better signs to figure out where the different colleges are would be helpful.	9/20/2018 8:21 PM
43	Bike and pedestrian safety is sorely lacking.	9/20/2018 4:42 PM
44	crossing by Concordia for event parking	9/20/2018 4:27 PM
45	Crossing the railroad tracks at 20th. Rough, small distance between 20th and the railroad tracks, etc.	9/20/2018 11:13 AM
46	the road quality is very inconsistent. In some spots it is fine, in others, it is uneven, potholed, etc.	9/20/2018 8:21 AM
47	bike rider access and safety, and beautification. Moorhead can do a much better job of landscaping and beautifying our public spaces!	9/20/2018 5:36 AM
48	1. 12th Avenue should be a preferred East-West bicycle corridor with dedicated bicycle lanes. 2. There should be a MAT Bus route connecting Concordia to Moorhead Adult Basic Education along 12th Avenue to 34th Street and south. This would help volunteers (like me) and students in the ABE program.	9/19/2018 8:33 PM
49	Smoother crossing of the tracks at 20th st and off street bike lane(s)	9/19/2018 7:48 PM
50	Limited neighborhood impact. Encourage mass transit. Emphasis on improvements closest to 8th street and Conc. College.	9/19/2018 5:28 PM
51	bus traffic / school age child safety	9/19/2018 4:22 PM
52	Appropriate bike and pedestrian paths so they can safely commute and not clog the sidewalks if it isn't necessary.	9/19/2018 3:09 PM
53	Policing the Edison area--lots of activity in the lot.	9/19/2018 9:47 AM
54	Bicycle and pedestrian use.	9/18/2018 6:58 PM
55	Pedestrian safety and accessibility.	9/18/2018 4:38 PM

56	Keeping traffic moving at safe speeds.	9/18/2018 7:40 AM
57	If this project involves special assessment, it should be assessed only on properties along 12th Street, especially if the City is resorting to specials to pay for the 20th Street underpass.	9/17/2018 5:04 PM
58	Stoplights or stop signs.	9/17/2018 3:03 PM
59	The corridor from Main to 34th St. S. on 132th Ave S. At least there are no residential home west of Main, only the Industrial Park, Less chance speeders will hurt or cause a crash. There is an extensive residential area from Main to 34th St S, on 12th Ave S. and lots of pedestrian and bike traffic, many children, along with the speeders. it is a crash or hit and hurt someone situation. Thankful it has not happened yet. I just do not understand why you are ignoring this part of the 12th Ave S corridor.	9/17/2018 2:52 PM
60	pedestrian friendliness	9/17/2018 1:41 PM
61	Bike and pedestrian safety!	9/17/2018 12:52 PM
62	I would hate to see quicker travel through the corridor as I live and walk in this neighborhood. The speed limit is plenty high at 30MPH. The intersections are served well with the stop signs.	9/17/2018 11:22 AM
63	Improve the sidewalks for walking	9/17/2018 10:45 AM
64	Safety for cyclists and pedestrians. Many areas currently without sidewalks and any existing bike lanes are narrow and often covered in sand from the street sweepers or filled with snow from plows. I commute year round.	9/17/2018 9:46 AM
65	Safety of college students crossing the street.	9/17/2018 8:30 AM
66	Improved amenities and beautification. I'm sick of Moorhead being labeled as the cheap and dumpy city. I invest a lot in my home to improve the aesthetics, I don't see why the city can't do the same. Forget the check book theory. "If there's no money in the check book account, then don't spend money you don't have." We invest in education (the key word "invest"), why shouldn't we invest in our quality of life too?	9/17/2018 8:06 AM
67	It's a major corridor but too much stop and go for vehicles. That needs to be improved and still make it safe for bicycles and walkers. There should not be on-street parking on 12th.	9/16/2018 6:50 PM
68	Paving	9/16/2018 11:27 AM
69	safety	9/16/2018 7:52 AM
70	12th Ave S redevelopment must allow the roadway to serve as a high volume arterial as the City continues to grow. Please consider emergency vehicles and the ability of traffic to pull to the side. Center medians and single traffic lanes create bottlenecks and are difficult to maintain in the winter.	9/15/2018 10:44 PM
71	Keeping the cost low or nothing. Why is the city looking at this when there are so many other areas that need wayyyyyy more improvement for safety, quality and benefit? Honestly, this area is a waste of the city's time. You (city) can do a LOT better.	9/15/2018 4:56 PM
72	Improved Traffic safety for pedestrians and vehicles.	9/15/2018 1:37 PM
73	Improving traffic flow	9/15/2018 1:10 PM
74	12th Avenue west of 4th street is not a high traffic, high use avenue; nor should it be. This is a residential area. All "development" west of 4th resulting in more traffic, more cars, and more nonsense will be opposed by neighborhood groups, residents, and business owners.	9/15/2018 11:32 AM
75	During commuting hours it is too narrow to safely accommodate the traffic it receives. Where it is residential, I feel it would be better to reroute car traffic and use 12th for bikes, pedestrians, buses.	9/15/2018 10:49 AM
76	1. Preserving the residential character of 12th Avenue and the surrounding neighborhood from 20th street to the river. 2. Preventing 12th Avenue from becoming a major commercial thoroughfare with folks speeding through 3. Avoiding special assessments of neighborhood homes to finance expensive upgrades	9/14/2018 9:51 PM
77	Keep the residential feel to 20th Street	9/14/2018 9:37 PM
78	Road surface.	9/14/2018 9:18 PM
79	Street narrows with cars parked in residential section of 12th Avenue. Either eliminate on street parking (not popular with those that live on 12th I suspect) or widen street.	9/14/2018 9:13 PM

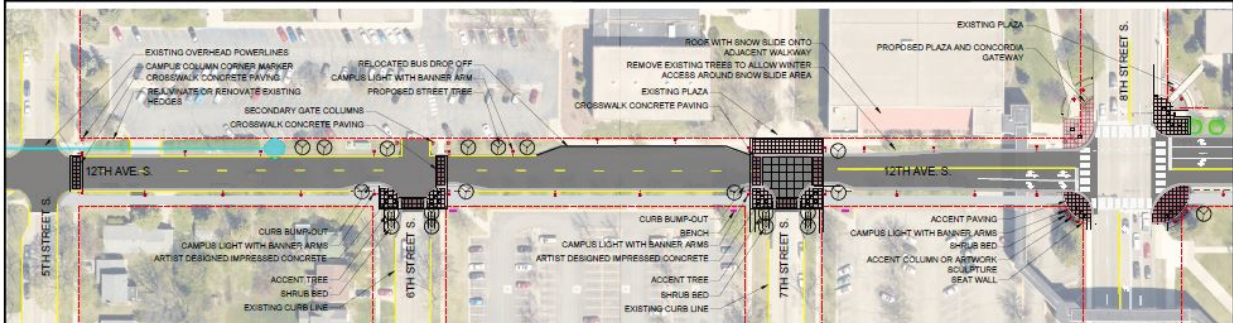
80	Speed	9/14/2018 9:02 PM
81	Because my backyard is on 12th, I would much prefer less/slower/quieter traffic.	9/14/2018 7:45 PM
82	Pedestrian safety	9/14/2018 6:41 PM
83	Providing a safe bike/ pedestrian path would be helpful.	9/14/2018 5:00 PM
84	Flattening out the intersections.	9/14/2018 4:53 PM
85	Parking. Too many people use the street as a parking lot.	9/14/2018 4:48 PM
86	Connect 12th ave in Moorhead to 13th Ave in Fargo via a bridge	9/14/2018 4:39 PM
87	We have an existing skywalk that almost is never used, while turning onto other streets is virtually impossible.	9/14/2018 4:24 PM
88	There are severe visibility issues at the intersection with 7th Street where student parking on the streets is too close to the intersection to see traffic coming from the west. At best there would be no parking allowed on 12th from 7th to 6th Street. There may be a similar visibility issue at 6th Street as well but I don't use that street often.	9/14/2018 3:52 PM
89	Road conditions ie potholes	9/14/2018 3:30 PM
90	Twelfth Ave S is largely a residential area that doesn't need a faster corridor to or over the river because there is a nearby major freeway going east and west that crosses the Red River. There are other bridges crossing the river between Moorhead and Fargo. What 12th Ave S needs is streets without pot holes and water main breaks but because of the winters here that is a difficult task. Adding a continuous path for bicycling, running and walking without major disruption of property, streets and traffic sounds fine providing there is enough space and money to spend. Improving existing parks and adding a nice park closer to the eastern end of the corridor. How about an art park with paths that don't use the entire length of the corridor. Bike lanes in the street would be a good thing where there the streets are wide enough. Speeding bicyclers who don't use bells that come up behind unsuspecting pedestrians are not appreciated.	9/14/2018 2:33 PM
91	Continuous bike lane for bikes and walkers	9/14/2018 2:21 PM
92	Large amounts of traffic and high speeds that people travel on this mostly residential route.	9/14/2018 2:07 PM
93	widening	9/14/2018 1:34 PM
94	Slow traffic down between 8th St and 20th St!	9/14/2018 1:20 PM
95	Please don't do any construction on 12th Ave until after the train project is done!!!!	9/14/2018 9:52 AM
96	Leave it alone. Where I live is a nice and quiet neighbor hood. I fear any "improvements " will ultimately destroy it.	9/14/2018 9:43 AM
97	Safety for pedestrians and smooth travel for vehicles. A well lit wide path for walking/biking is a higher priority than decorating the area. Safety of our local residents and students should be a priority.	9/14/2018 8:08 AM
98	Improving bicycle and pedestrian safety while maintaining efficient traffic flow	9/13/2018 11:39 PM
99	Safety. But, practically speaking, there is nothing anyone can do if people will not obey the law, read and follow the traffic signals and pay attention.	9/13/2018 6:32 PM
100	Improve pedestrian mobility and reduce the speed of vehicular traffic through traffic calming, such as reduced lane widths and curb bump-outs.	9/13/2018 4:55 PM
101	Sidewalks through the industrial park	9/13/2018 1:53 PM
102	Having bus shelters	9/13/2018 1:42 PM
103	biggest issue i see is the need for better/more street lights through there (and even farther east to 34th st, but thats not in the study area). it's a very dark road at night and with pedestrians and bikes it makes it dangerous	9/13/2018 1:30 PM
104	Cut down traffic through our neighborhood. Use 8th and 20th as the major routes and eliminate as much traffic as possible so it can be more quiet and less exhaust in our back yards.	9/13/2018 12:33 PM
105	I think it should be treated as a main corridor. It should have wider lanes, concrete surface with great lighting. Currently it looks/feels like a residential street that everyone happens to drive on.	9/13/2018 8:30 AM
106	Safety and aesthetics	9/11/2018 8:31 AM

107	RR crossing and sidewalks between 20th and Old 52.	9/7/2018 2:48 PM
108	Making the entire corridor safer and more inviting to use. Keeping paths and bike lanes clear of debris and well maintained. But honestly, better planning city-wide.	8/24/2018 6:26 PM
109	Road pavement improvement. More space for cars, less car parking on the street. Larger sidewalks for both bikes and pedestrians.	8/22/2018 3:38 PM
110	n/a	8/22/2018 2:58 PM
111	Train crossing!	8/21/2018 3:56 PM
112	Lack of rail road underpass at 20th st and Main Ave locations	8/3/2018 11:00 AM
113	Quicker travel	7/29/2018 11:11 PM
114	Somehow improving the railroad crossing at 20th	7/25/2018 11:18 PM
115	Clean bike and walking paths. Sweep the street, please.	7/10/2018 8:15 AM

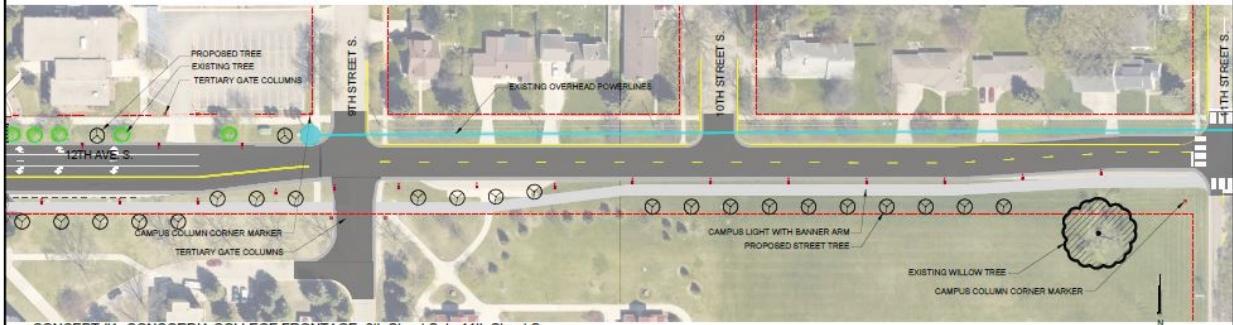






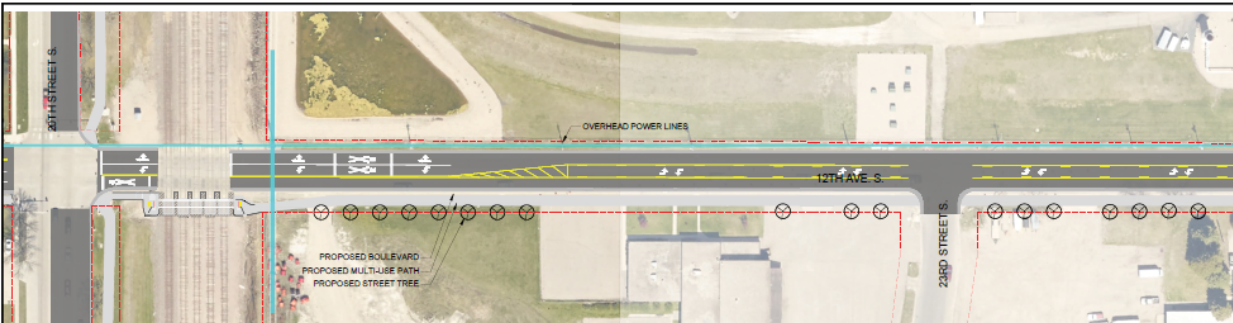


CONCEPT #1- CONCORDIA COLLEGE FRONTAGE- 5th Street S. to 8th Street S.

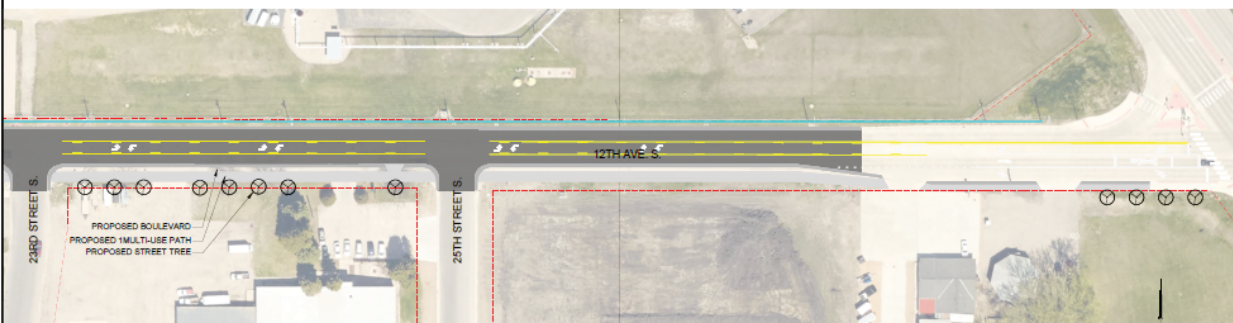


CONCEPT #1- CONCORDIA COLLEGE FRONTAGE- 8th Street S. to 11th Street S.

<table border="1"> <tr><td>No.</td><td>Revision</td><td>Date</td><td>By</td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>	No.	Revision	Date	By						Drawn by: JH Checked by: JH Date: 3-19-19 Scale: AS SHOWN	Moorhead 12th Avenue South MOORHEAD, MINNESOTA	CONCORDIA COLLEGE 5th St. S to 11th St. S. PROJECT NO.	SHEET 1 of -
No.	Revision	Date	By										



CONCEPT #1- INDUSTRIAL AREA- 20th Street S. to 23rd Street S.



CONCEPT #1- INDUSTRIAL AREA- 23rd Street S. to Main Ave SE

<table border="1"> <tr><td>No.</td><td>Revision</td><td>Date</td><td>By</td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>	No.	Revision	Date	By						Drawn by: JH Checked by: JH Date: 3-19-19 Scale: AS SHOWN	Moorhead 12th Avenue South MOORHEAD, MINNESOTA	INDUSTRIAL AREA 20th St. S to SE Main Ave PROJECT NO.	SHEET 1 of -
No.	Revision	Date	By										

### Q1 1A2: Replace existing south sidewalk with an 8' shared-use path from 5th Street to 8th Street and install shared-lane bike markings from River Drive to 5th Street.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	20.83% 5	8.33% 2	33.33% 8	16.67% 4	20.83% 5	24	3.08

### Q2 1B: Install 5' sidewalk on north side between 2nd street and 6th Street.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	29.17% 7	4.17% 1	25.00% 6	8.33% 2	33.33% 8	24	3.13

### Q3 1C: Close parking lot access points near 5th Street and 8th Street, and shift parking area near 7th Street.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	16.67% 4	8.33% 2	16.67% 4	8.33% 2	50.00% 12	24	3.67

### Q4 1D: Install curb bump-outs at 6th Street and 7th Street.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	16.67% 4	12.50% 3	25.00% 6	4.17% 1	41.67% 10	24	3.42

### Q5 1E1: Reassign eastbound lanes at 8th Street intersection with a shared left/thru and a designated right turn by shifting curbline.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	29.17% 7	4.17% 1	12.50% 3	16.67% 4	37.50% 9	24	3.29

## Q6 1D2: Widen 12th Avenue to install designated eastbound right turn lane at 8th Street.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	41.67%	4.17%	12.50%	16.67%	25.00%	24	2.79
	10	1	3	4	6		

## Q7 Additional Comments on Segment 1.

Answered: 11 Skipped: 15

#	RESPONSES	DATE
1	Turn lanes always impeded by college foot traffic. Sidewalk north side 12th Ave would keep peds off street. Bicyclists would ignore bike lanes.	4/17/2019 8:32 PM
2	Bump outs are not effective. Sidewalks are vital! DON'T remove sidewalk from 5th to 8th! Bikes go where they want and never obey traffic signs; DON'T give them a special lane. Remove parking from 12th Ave. so there is room to drive! I've driven on 12th Ave. for more than 30 years. The biggest problem has always been that the parking allowed on 12th squeezes the driving lanes down so half the year you can't go both directions (east and west) at the same time. You CAN'T remove the sidewalks that are already there. People need to be able to walk around the block! Pedestrian traffic is huge in our neighborhood. Don't mess that up!	4/10/2019 5:42 PM
3	I would oppose removal of trees from the river to Fifth St. S. on the north side of 12th Ave., particularly the Canadian Cherry Trees.	4/2/2019 7:47 PM
4	We need to keep street parking on at least one side of 12th. Ave. from Third Street to the river. Currently there is parking only on one side of Third St. If we lose parking on 12th. Ave., we will own a home that has zero Street parking.	3/29/2019 5:30 PM
5	I absolutely hate the idea of 1D2 and most of the ideas that would impact trees.	3/25/2019 9:54 AM
6	Leave pier as is	3/24/2019 2:09 PM
7	Eastbound traffic turning right at 8th St is always limited, mostly to certain times of day. Such traffic bound for I-94 can always continue S on 6th to 24th Av S, as an alternative. A small short turn lane is a good compromise. Curb bump-outs only intrude as an obstacle, especially for those making right turns, and they choke a lane used by both cars and bikes. Hitting one unexpectedly could be disastrous to either. Lastly, for all pedestrians at 8th & 12th Av, "No Right Turn On Red" should be STRONGLY enforced!	3/24/2019 1:54 PM
8	Less autocratic and more pedestrian friendly planning and engineering.	3/22/2019 10:12 PM
9	bad idea, need a dedicated left turn lane more since there's no right on red light, they can't turn on red anyway so more important to have dedicated left turn lane and right turns can share lane with straight ahead traffic	3/22/2019 3:55 PM
10	I applaud the interest in putting in bike lanes, but mixing them with pedestrians confuses bikes' status as having a right to use the road and is a hazard to the pedestrians. I'd rather see a bike lane on the road. I am satisfied with the current turn/ through lane configuration. My primary interest is in things that will improve pedestrian and bicycle safety, since vehicle congestion is not a major problem in that area.	3/22/2019 11:18 AM
11	I think widening 12th Ave to install a right-turn lane would be a bad idea even if the skyway pier was not there. By widening the street, you would make it less pedestrian friendly, and I don't think there's enough of a traffic problem to warrant it.	3/20/2019 3:48 PM

### Q8 2A: Install 8' shared-use path on south side from 9th Street to 11th Street, staying north of the "Crazy Tree."

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	20.83% 5	4.17% 1	16.67% 4	4.17% 1	54.17% 13	24	3.67

### Q9 2D: Remove parking area on south side near 9th Street, remove driveway for north side parking lot, realign access.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	4.17% 1	16.67% 4	12.50% 3	20.83% 5	45.83% 11	24	3.88

### Q10 2E: Realign 11th Street intersection to improve horizontal alignment.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	33.33% 8	8.33% 2	0.00% 0	20.83% 5	37.50% 9	24	3.21

### Q11 2B2: Add 6' designated on-street bike lanes on each side of 12th Avenue from 11th Street to 19th Street.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	20.83% 5	0.00% 0	20.83% 5	0.00% 0	58.33% 14	24	3.75

### Q12 2B3: Replace existing south sidewalk with an 8' shared-use path from 11th Street to 20th Street.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	41.67% 10	12.50% 3	12.50% 3	4.17% 1	29.17% 7	24	2.67

### Q13 2C: Install crosswalk at 19 1/2 Street.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	12.50% 3	0.00% 0	41.67% 10	8.33% 2	37.50% 9	24	3.58

### Q14 2F: Construct grade raise of 20th Street intersection to improve vertical profile with BNSF Railroad Tracks.

Answered: 24 Skipped: 2

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	20.83% 5	4.17% 1	8.33% 2	8.33% 2	58.33% 14	24	3.79

### Q15 Additional Comments on Segment 2.

Answered: 11 Skipped: 15

#	RESPONSES	DATE
1	On street bike lanes are a hazard. Shared use path parallel to street is safer. Do we need a crosswalk at 19 1/2 St? Raising 20th St intersection too costly.	4/17/2019 8:32 PM
2	DON'T add on street bike lanes! The road is big enough for east/west traffic now. Continue to allow parking on this section of 12th Ave. It has never caused problems. Bikers do NOT follow traffic laws; DO NOT give them their own special lane.	4/10/2019 5:42 PM
3	Please do not take our trees. The reason I live in the this area is that it is well-established with grown trees. The idea of destroying our greenery to cater to cars makes me ill.	3/25/2019 9:54 AM
4	Protect "crazy tree" and other trees.	3/24/2019 2:09 PM
5	I prefer on-street bike lanes between 11th St and 19St. For those reluctant to bike in traffic, more curb cuts and approaches could be added along 20th St, making it easier to enter/exit parallel shared use bike/pedestrian path that already exists! That bike traffic could then find a more quiet, safer E/W route alternative. Hopping a curb is dangerous for those unaccustomed to such a tactic. Put these curb cuts at logical intersections with 20th St. Currently there's only one a full half mile N of 12th Av., and the 1st one to the South is at 20th Av (I think). The result could be less bike traffic on a busy stretch of 12th S, but a good, logical alternative HAS to be provided!	3/24/2019 1:54 PM
6	This corridor should be more pedestrian friendly and be turned into a multi-modal corridor emphasizing modes of travel other than the automobile with designated bike lanes.	3/22/2019 10:12 PM
7	"2F" is excellent idea, plus need to realign lanes across railroad tracks, the eastbound lane shifts to the right when you cross tracks (the street is wider on the east side of tracks than to the west)	3/22/2019 3:55 PM
8	the 19 1/2 crosswalk would only give pedestrians a false sense of security--drivers are probably already looking at the 20th street lights and won't comply with crosswalk markings. The value of realigning 11th street seems very low. It's not hard to navigate as is.	3/22/2019 11:18 AM
9	These improvements at best leave me with a yawn. How about black cast iron street lights? Bronze statue on boulevard of terminating vista? Install plastic poles along bike lanes to make them more comfortable? If we're going to do this thing let's do it right and get rid of the tight wad image of Moorhead. Let's make Moorhead exciting for once and do something really cool. For example a pilot project of a solar multi use path that melts snow in the winter to save on snow removal costs.	3/22/2019 11:13 AM
10	What's the possibility of making available parking to replace those spaces lost on 12th Avenue in the parking area of the school formerly located on the north side between 14th & 16th	3/21/2019 1:29 PM

11 I've long thought we needed a shared-use path by Concordia (between 8th and 11th). Any reason why it can't be ten feet wide, the recommended width? I think the on-street bike lanes are a great idea. I like that they are 6 feet instead of 5 feet. I've ridden on many of the 5-foot lanes that I feel are too narrow. I was at the public input meeting and heard the complaints from the guy worried about the loss of parking. It's a valid concern, but I'd like to see an analysis of how many cars are typically parked along 12th ave and what the capacity is on adjacent streets to take those cars. My suspicion is that not that many will be impacted, and that there are enough parking places in the neighborhood, even if you'll have to walk a bit. Sure, some people will be inconvenienced, but we need to stop prioritizing cars over everything else. Bicyclists, pedestrians, and transit users have long been inconvenienced by the way we have been designing cities. We need to design a multi-modal city that gives people the freedom to travel how they choose. This is the right move.

3/20/2019 3:48 PM

### Q16 3A: Construct pedestrian/bicycle crossing on east side of 20th Street South at BNSF Railroad tracks.

Answered: 26 Skipped: 0

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	23.08% 6	0.00% 0	7.69% 2	7.69% 2	61.54% 16	26	3.85

### Q17 3B: Add new 10' shared-use path on south side (remove existing on-street bike lanes, shift south curb line 10' north to accommodate off-street path), install curb ramp and concrete waiting area at 25th Street South bus stop.

Answered: 26 Skipped: 0

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	7.69% 2	3.85% 1	19.23% 5	11.54% 3	57.69% 15	26	4.08

### Q18 3D: Shift private business driveway east of the BNSF Railroad tracks, close driveways.

Answered: 26 Skipped: 0

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	11.54% 3	7.69% 2	19.23% 5	7.69% 2	53.85% 14	26	3.85

### Q19 Additional Comments on Segment 3.

Answered: 10 Skipped: 16

#	RESPONSES	DATE
1	Leave private drives alone.	4/17/2019 8:32 PM

2	The major problem with this section of the road is the intersection of 12th ave. and 20th St. The east side has no room because of the railroad tracks. There is no room for vehicles on the west side of the tracks. I don't know of any way to fix this.	4/10/2019 5:42 PM
3	I think this road needs to be reconstructed so it doesn't fall apart all the time from the truck traffic.	4/1/2019 11:28 AM
4	Protect trees.	3/24/2019 2:09 PM
5	20th St S reconstruction squandered opportunities to improve grade changes in regard to railroad tracks at 12th Av S intersection. What were you thinking! 20th St could have been raised to minimize grade change, OR..... it could be LOWERED to intersect with the NEW (are you sitting down?) UNDERPASS, or grade separation in regards to those pesky RR tracks! If one new underpass is good, then even more would be better! Just dreaming. This last segment needs street lighting. What's there now is totally inadequate, especially for pedestrians and bike traffic. I believe this is considered an alternate route for such traffic during the ongoing SE Main/21St S grade separation project. What a joke! Broken pavement near the curbs, always littered with gravel debris, and dark to boot! This stretch of 12th Av S could have/should have had a mill and overlay 10 years ago! AND, some better lighting.	3/24/2019 1:54 PM
6	Keep bike lanes on the road. Drivers in Fargo-Moorhead don't understand and are not the friendliest when it comes to bikes. Removing bike lanes from the road to a shared use path emphasizes cars and space for cars are more important than bikes and pedestrians. It also gives more staunch critics another reason to say bikes have no right to be on the road.	3/22/2019 10:12 PM
7	glad to see sidewalk in this stretch since now there's one west of 20th and east of se main ave but nothing between. i've seen lots of people walking in the street there, it's not safe	3/22/2019 3:55 PM
8	This is a dangerous segment from 20th Street to Main Ave SE. current traffic has little regard for bikes and pedestrians. To add to the danger are the fuel trucks using this segment to go to/from the terminal.	3/22/2019 12:18 PM
9	I'm okay with a shared-use path from 20th St. to Main because it gets significant bike use and less pedestrian use. It would be seen as a continuation of the paths running on the east side of 20th St. and the south side of 12th Ave. from Main to Horizon. The purported bike line on this stretch is impassable and hazardously narrow; a wise cyclist would avoid it entirely and use the regular traffic lane. Anything would be an improvement.	3/22/2019 11:18 AM
10	All should be completed as they would greatly increase pedestrian and bicycle safety!!	3/20/2019 8:53 PM

### Q20 4: Corridor-wide streetscaping improvements

Answered: 25 Skipped: 1

	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
☆	12.00%	8.00%	20.00%	24.00%	36.00%	25	3.64
	3	2	5	6	9		

### Q21 Additional Comments on Corridor-wide Considerations.

Answered: 6 Skipped: 20

#	RESPONSES	DATE
1	Winter wrecks most of this. Why spend the money?	4/17/2019 8:32 PM
2	Bump outs are totally ineffective. They narrow down the turning room for vehicles and make it more difficult to make turns without moving into opposing traffic. DON'T install bump outs!	4/10/2019 5:42 PM

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3	Do NOT make summer drainage and winter drifting any worse between 20th St S & SE Main than it already is. Lastly, I sometimes think consultants and traffic engineers have never been on foot or on a bike for any reason other than a leisurely walk around their own respective neighborhoods. Have you EVER commuted to your job on a bike? Do you walk along and cross busy streets after dark on a regular basis. Have you ever tried to get around in a wheelchair, for the rest of your life? Sometimes small inexpensive changes can result in huge benefits for.....the little people. Would YOU want YOUR elderly grandmother navigating these mean streets, sidewalks, and intersections, with "Walk" lights that abruptly switch to "Don't Walk" when you've only made it to the MIDDLE of the intersection?!? Little things like that. If you can't do it right, then you're only pandering.	3/24/2019 1:54 PM
4	Why aren't there any improvements proposed between 11th and 20th Streets? Don't use that red stamped concrete; it's not durable and looks terrible after just a couple of years.	3/22/2019 11:18 AM
5	I have a problem with the city paying for landscaping on the land owned by Concordia as well as creating new entrances to the campus by elaborate paving work placed in the street	3/21/2019 1:29 PM
6	Lots of great ideas!	3/20/2019 3:48 PM

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Appendix D  
Traffic Analysis Supporting Data



Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound			Int. Total			
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left		Thru	Right	Peds
03:00 AM	0	2	0	1	0	0	0	0	0	0	0	0	1	0	0	7
03:15 AM	0	1	1	0	3	0	0	0	0	0	0	0	1	0	1	10
03:30 AM	0	2	0	0	1	0	2	0	1	0	0	0	1	0	0	12
03:45 AM	0	1	1	0	0	0	2	0	2	0	0	0	3	2	0	12
Total	0	6	2	1	4	0	2	3	3	2	0	0	6	4	2	41
04:00 AM	0	1	2	0	0	0	0	1	4	2	0	0	2	1	1	16
04:15 AM	0	1	0	0	0	0	1	0	2	0	0	0	2	1	0	7
04:30 AM	0	2	1	0	0	0	0	1	1	0	0	0	1	2	0	13
04:45 AM	0	2	1	0	0	0	3	3	3	0	0	0	0	0	0	15
Total	0	6	4	0	0	0	4	10	10	2	0	0	5	4	1	51
05:00 AM	0	2	2	0	0	0	3	1	4	0	0	0	1	2	0	19
05:15 AM	0	0	5	0	0	0	4	1	1	0	0	0	1	0	2	20
05:30 AM	0	0	2	0	1	0	1	1	2	0	0	1	2	0	1	13
05:45 AM	0	0	1	0	0	1	2	3	3	0	0	0	1	2	0	17
Total	0	2	9	1	1	1	10	6	9	2	0	2	8	4	3	69
06:00 AM	0	0	2	0	0	0	1	0	0	0	0	2	1	1	2	11
06:15 AM	0	0	0	0	0	0	2	0	5	0	0	0	0	1	0	15
06:30 AM	0	0	1	1	2	0	3	3	1	1	0	0	1	1	0	14
06:45 AM	0	1	1	0	2	0	0	0	3	2	0	0	1	1	0	13
Total	0	1	4	1	4	0	6	4	9	3	0	2	4	4	2	53
07:00 AM	0	1	0	0	0	0	0	1	1	0	0	1	1	0	0	6
07:15 AM	0	4	0	0	0	0	1	1	2	0	0	0	1	0	1	11
07:30 AM	0	3	2	0	1	0	0	0	1	1	0	1	2	1	0	13
07:45 AM	0	0	0	0	1	0	0	4	2	0	0	0	1	3	0	12
Total	0	8	2	0	2	0	1	6	6	1	0	2	4	4	1	42
08:00 AM	0	2	1	0	0	0	0	1	1	0	0	2	0	0	0	13
08:15 AM	0	2	1	0	1	0	2	1	0	0	0	0	0	0	0	8
08:30 AM	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	4
08:45 AM	0	0	0	0	1	0	1	0	1	1	0	1	1	2	0	11
Total	0	5	3	0	2	0	4	2	2	1	0	3	1	2	0	36
09:00 AM	0	2	1	0	2	0	0	0	1	0	0	0	0	0	0	6
09:15 AM	0	0	0	0	0	0	1	2	2	0	0	0	2	0	0	9
09:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	3
09:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	3
Total	0	3	1	0	2	0	1	3	3	0	0	0	3	1	0	21

Groups Printed- Cars + - Trucks

Start Time	Southbound						Westbound						Northbound						Eastbound								
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total	
10:00 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
10:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
10:30 AM	0	1	2	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	3	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	10	
11:00 AM	0	1	2	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	1	8
11:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	
11:30 AM	0	1	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	7	
11:45 AM	0	1	0	0	0	0	0	1	2	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	8
Total	0	5	3	0	0	0	0	2	3	0	0	1	3	0	3	0	0	1	4	0	0	0	1	4	2	27	
12:00 PM	0	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5
12:15 PM	0	0	1	0	1	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
12:30 PM	0	3	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6
12:45 PM	0	2	1	0	0	0	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	7
Total	0	5	2	0	1	0	4	2	3	4	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	24	
01:00 PM	0	2	1	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	10
01:15 PM	0	1	1	0	0	0	1	4	0	1	0	0	1	0	0	0	0	2	1	0	0	0	2	1	0	0	12
01:30 PM	0	1	2	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	8
01:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	4
Total	0	4	4	0	0	0	3	7	4	1	0	1	2	0	0	0	0	3	4	1	0	0	3	4	1	0	34
02:00 PM	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3
02:15 PM	0	1	3	0	0	0	2	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10
02:30 PM	0	0	1	1	0	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	4	1	0	0	3	1	4	0	0	2	2	0	0	0	0	1	0	0	0	0	1	0	0	0	19
Grand Total	0	47	41	4	16	1	38	41	60	16	0	19	31	22	9	0	6	31	33	12	0	6	31	33	12	427	
Approch %	0	43.5	38	3.7	14.8	0.6	24.4	26.3	38.5	10.3	0	23.5	38.3	27.2	11.1	0	7.3	37.8	40.2	14.6	0	7.3	37.8	40.2	14.6	427	
Total %	0	11	9.6	0.9	3.7	0.2	8.9	9.6	14.1	3.7	0	4.4	7.3	5.2	2.1	0	1.4	7.3	7.7	2.8	0	1.4	7.3	7.7	2.8	427	
Cars +	0	45	40	4	14	1	38	41	60	14	0	19	31	21	6	0	4	31	33	9	0	4	31	33	9	411	
% Cars +	0	95.7	97.6	100	87.5	100	100	100	100	87.5	0	100	100	95.5	66.7	0	66.7	100	100	75	0	66.7	100	100	75	96.3	
Trucks	0	2	1	0	2	0	0	0	0	2	0	0	0	1	3	0	2	0	0	3	0	2	0	0	3	16	
% Trucks	0	4.3	2.4	0	12.5	0	0	0	0	12.5	0	0	0	4.5	33.3	0	33.3	0	0	25	0	33.3	0	0	25	3.7	

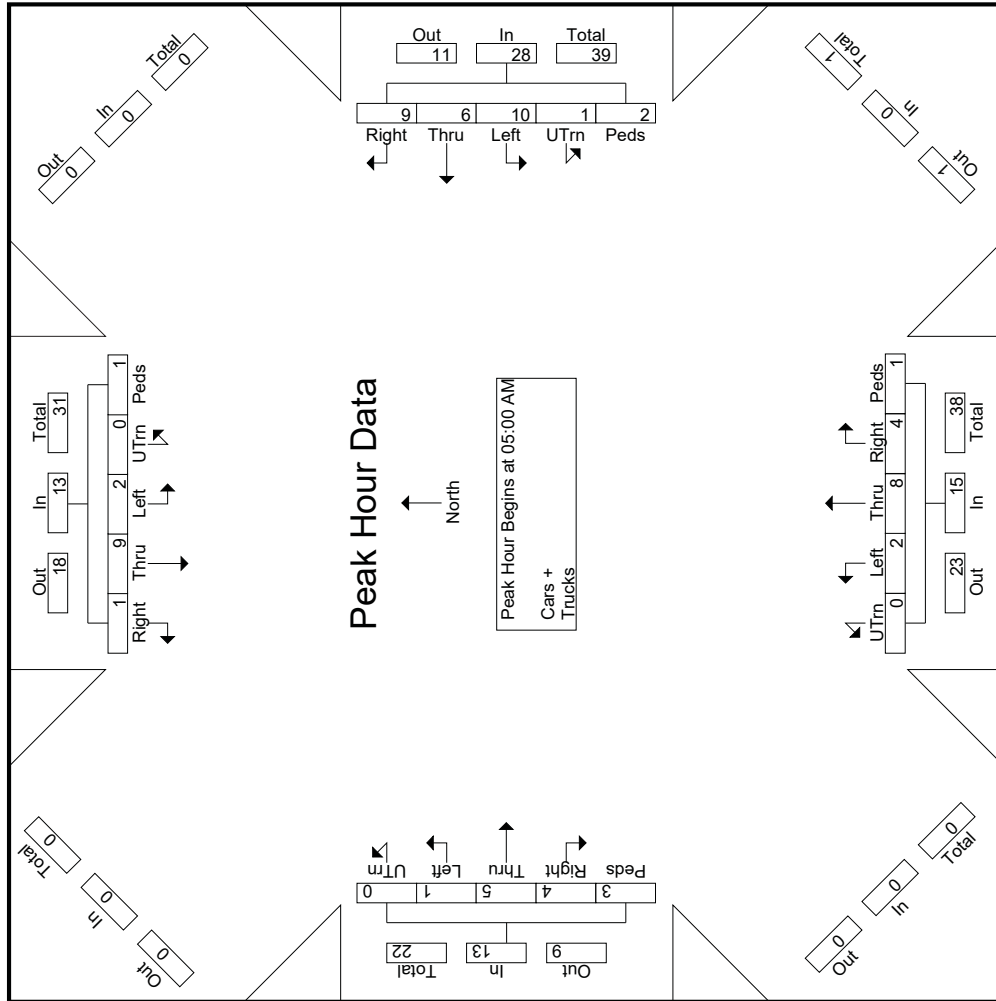


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

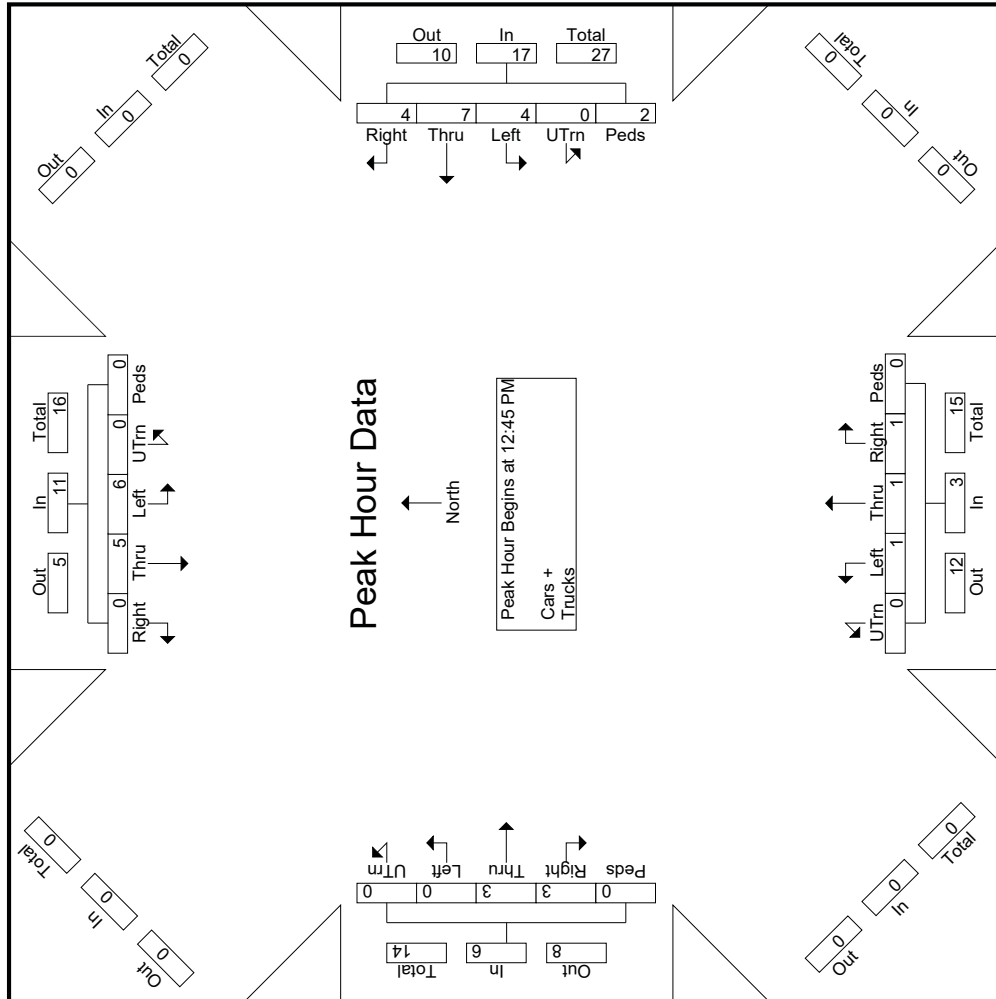
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Start Date : 5/1/2018  
Page No : 4

Start Time	Southbound					Westbound					Northbound					Eastbound										
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 03:00 AM to 11:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 05:00 AM																										
05:00 AM	0	2	2	0	0	4	0	3	1	4	0	8	0	0	1	3	0	4	0	0	1	2	0	3	0	19
05:15 AM	0	0	5	0	0	5	0	4	1	1	0	6	0	1	4	1	0	6	0	0	1	0	2	3	20	
05:30 AM	0	0	2	0	1	3	0	1	1	1	2	5	0	0	1	0	0	1	0	1	2	0	1	4	13	
05:45 AM	0	0	0	1	0	1	1	2	3	3	0	9	1	2	2	0	1	4	0	0	1	2	0	3	17	
Total Volume	0	2	9	1	1	13	1	10	6	9	2	28	0	2	8	4	1	15	0	1	5	4	3	13	69	
% App. Total	0	15.4	69.2	7.7	7.7	3.6	35.7	21.4	32.1	7.1	3.6	77.8	0	13.3	53.3	26.7	6.7	0	7.7	38.5	30.8	23.1	8.13	86.3		
PHF	.000	.250	.450	.250	.250	.650	.250	.625	.500	.563	.250	.778	.000	.500	.500	.333	.250	.625	.000	.250	.625	.500	.375	.813	.863	



Start Time	Southbound					Westbound					Northbound					Eastbound										
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 12:00 PM to 02:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 12:45 PM																										
12:45 PM	0	2	1	0	0	3	0	2	0	0	1	3	0	0	0	1	0	0	0	0	0	0	0	0	0	7
01:00 PM	0	2	1	0	0	3	0	1	2	3	0	6	0	0	0	0	0	0	0	0	0	1	0	0	1	10
01:15 PM	0	1	1	0	0	2	0	1	4	0	1	6	0	0	1	0	0	0	0	0	0	2	1	0	3	12
01:30 PM	0	1	2	0	0	3	0	0	1	1	0	2	0	1	0	0	0	0	0	0	0	0	2	0	2	8
Total Volume	0	6	5	0	0	11	0	4	7	4	2	17	0	1	1	1	1	0	3	0	0	3	3	0	6	37
% App. Total	0	54.5	45.5	0	0	0	0	23.5	41.2	23.5	11.8	0	0	33.3	33.3	33.3	0	0	0	0	50	50	0	0	6	37
PHF	.000	.750	.625	.000	.000	.917	.000	.500	.438	.333	.500	.708	.000	.250	.250	.250	.000	.000	.000	.000	.375	.375	.000	.500	.771	



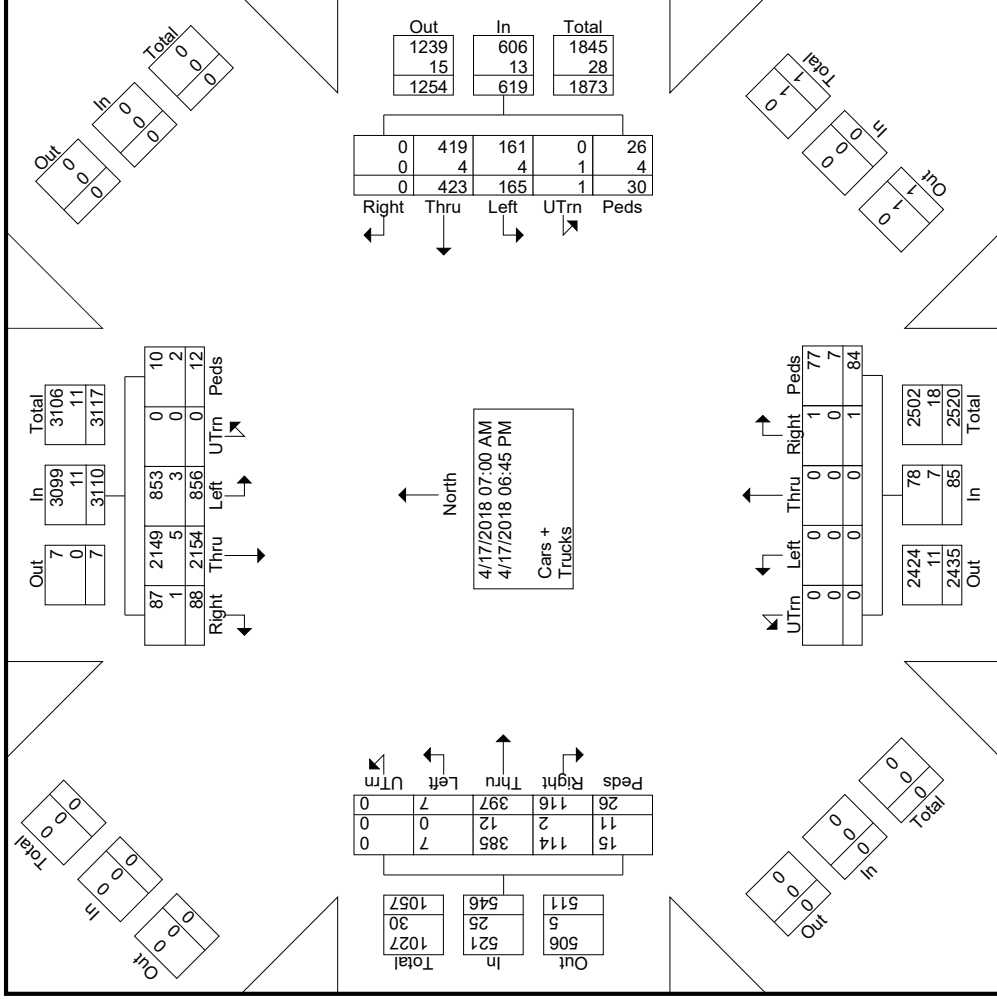


Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound												
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total	
07:00 AM	0	16	57	5	1	0	3	4	0	3	0	0	0	0	0	0	0	4	0	0	2	95
07:15 AM	0	15	44	4	0	0	3	11	0	1	0	0	0	0	4	0	0	4	1	2	2	89
07:30 AM	0	11	72	0	0	0	2	12	0	2	0	0	0	0	5	0	0	14	3	1	1	122
07:45 AM	0	12	68	4	0	0	8	17	0	3	0	0	0	0	2	0	0	9	2	0	0	125
Total	0	54	241	13	1	0	16	44	0	9	0	0	0	0	11	0	0	31	6	5	0	431
08:00 AM	0	27	61	5	1	0	9	15	0	7	0	0	0	0	2	0	0	7	1	0	0	135
08:15 AM	0	35	61	1	0	1	3	14	0	7	0	0	0	0	4	0	2	7	1	2	0	138
08:30 AM	0	29	113	2	0	0	7	15	0	0	0	0	0	0	1	0	0	9	4	1	0	181
08:45 AM	0	47	96	4	0	0	9	23	0	0	0	0	0	0	1	0	1	16	4	2	0	203
Total	0	138	331	12	1	1	28	67	0	14	0	0	0	0	8	0	3	39	10	5	0	657
09:00 AM	0	44	114	2	0	0	3	25	0	1	0	0	0	0	1	0	0	18	2	0	0	210
09:15 AM	0	27	129	3	0	0	6	22	0	0	0	0	0	0	1	0	0	18	2	1	0	209
09:30 AM	0	20	63	4	0	0	7	18	0	0	0	0	0	0	0	0	0	7	3	0	0	122
09:45 AM	0	25	64	5	0	0	2	12	0	0	0	0	0	0	1	0	0	7	4	0	0	120
Total	0	116	370	14	0	0	18	77	0	1	0	0	0	0	3	0	0	50	11	1	0	661
10:00 AM	0	17	55	4	1	0	7	16	0	0	0	0	0	0	0	0	0	7	2	0	0	109
10:15 AM	0	24	53	0	0	0	9	9	0	0	0	0	0	0	2	0	0	11	1	2	0	111
10:30 AM	0	22	46	3	0	0	3	5	0	0	0	0	0	0	1	0	0	3	0	0	0	83
10:45 AM	0	15	33	3	0	0	5	9	0	0	0	0	0	0	0	0	0	8	3	2	0	78
Total	0	78	187	10	1	0	24	39	0	0	0	0	0	0	3	0	0	29	6	4	0	381
11:00 AM	0	4	23	0	0	0	0	2	0	0	0	0	0	0	0	0	0	8	7	0	0	44
11:15 AM	0	16	40	0	0	0	3	7	0	0	0	0	0	0	1	0	0	12	10	0	0	89
11:30 AM	0	18	35	2	0	0	4	3	0	0	0	0	0	0	0	0	0	16	9	0	0	87
11:45 AM	0	16	39	0	0	0	7	8	0	0	0	0	0	0	3	0	0	19	0	0	0	92
Total	0	54	137	2	0	0	14	20	0	0	0	0	0	0	4	0	0	55	26	0	0	312
12:00 PM	0	16	34	0	0	0	3	5	0	0	0	0	0	0	2	0	0	10	6	0	0	76
12:15 PM	0	15	29	2	0	0	3	4	0	0	0	0	0	0	1	0	0	11	5	0	0	70
12:30 PM	0	20	29	0	0	0	4	6	0	0	0	0	0	0	1	0	0	6	5	1	0	72
12:45 PM	0	14	36	0	0	0	5	8	0	0	0	0	0	0	2	0	1	10	3	0	0	79
Total	0	65	128	2	0	0	15	23	0	0	0	0	0	0	6	0	1	37	19	1	0	297
01:00 PM	0	10	16	0	0	0	5	4	0	0	0	0	0	0	2	0	0	7	3	0	0	47
01:15 PM	0	17	21	2	0	0	1	6	0	0	0	0	0	0	4	0	0	11	0	1	0	63
01:30 PM	0	12	26	1	0	0	3	4	0	1	0	0	0	0	0	0	0	8	0	0	0	55
01:45 PM	0	14	24	1	0	0	2	4	0	0	0	0	0	0	0	0	0	6	2	0	0	53
Total	0	53	87	4	0	0	11	18	0	1	0	0	0	0	6	0	0	32	5	1	0	218

Groups Printed- Cars + - Trucks

Start Time	Southbound				Westbound				Northbound				Eastbound									
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total	
02:00 PM	0	17	26	1	0	0	0	5	0	0	0	0	0	0	4	0	0	10	3	0	0	66
02:15 PM	0	20	14	0	2	0	1	7	0	0	0	0	0	0	1	0	0	4	1	0	0	50
02:30 PM	0	13	32	1	0	0	1	6	0	0	0	0	0	0	0	0	0	7	1	4	0	65
02:45 PM	0	13	33	2	0	0	3	2	0	0	0	0	0	0	1	0	0	4	1	0	0	59
Total	0	63	105	4	2	0	5	20	0	0	0	0	0	0	6	0	0	25	6	4	0	240
03:00 PM	0	8	32	1	0	0	0	9	0	0	0	0	0	0	1	0	0	5	2	0	0	59
03:15 PM	0	9	37	1	0	0	1	4	0	0	0	0	0	0	4	0	0	5	3	0	0	64
03:30 PM	0	12	38	2	0	0	2	8	0	0	0	0	0	0	0	0	0	3	2	0	0	67
03:45 PM	0	24	32	2	2	0	5	10	0	0	0	0	0	1	5	0	0	9	2	0	0	92
Total	0	53	139	6	2	0	8	31	0	1	0	0	0	1	10	0	0	22	9	0	0	282
04:00 PM	0	24	49	0	1	0	2	10	0	0	0	0	0	0	2	0	0	7	3	0	0	98
04:15 PM	0	16	38	2	1	0	2	4	0	1	0	0	0	0	4	0	0	9	2	2	0	81
04:30 PM	0	21	36	4	0	0	1	10	0	0	0	0	0	0	3	0	0	9	0	0	0	84
04:45 PM	0	23	31	1	1	0	1	6	0	0	0	0	0	0	1	0	0	8	2	0	0	74
Total	0	84	154	7	3	0	6	30	0	1	0	0	0	0	10	0	0	33	7	2	0	337
05:00 PM	0	14	42	2	0	0	3	7	0	0	0	0	0	0	2	0	0	9	1	1	0	81
05:15 PM	0	11	37	4	0	0	2	4	0	1	0	0	0	0	4	0	0	5	1	0	0	69
05:30 PM	0	12	29	0	0	0	3	8	0	1	0	0	0	0	0	0	0	9	3	0	0	65
05:45 PM	0	12	40	1	1	0	5	10	0	0	0	0	0	0	0	0	0	9	4	0	0	82
Total	0	49	148	7	1	0	13	29	0	2	0	0	0	0	6	0	0	32	9	1	0	297
06:00 PM	0	15	45	0	0	0	3	4	0	0	0	0	0	0	1	0	0	2	1	0	0	71
06:15 PM	0	15	39	4	1	0	1	9	0	1	0	0	0	0	3	0	3	5	0	1	0	82
06:30 PM	0	19	43	3	0	0	3	12	0	0	0	0	0	0	7	0	0	5	1	1	0	94
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	49	127	7	1	0	7	25	0	1	0	0	0	0	11	0	3	12	2	2	0	247
Grand Total	0	856	2154	88	12	1	165	423	0	30	0	0	0	1	84	0	7	397	116	26	0	4360
Approch %	0	27.5	69.3	2.8	0.4	0.2	26.7	68.3	0	4.8	0	0	0	1.2	98.8	0	1.3	72.7	21.2	4.8	0	
Total %	0	19.6	49.4	2	0.3	0	3.8	9.7	0	0.7	0	0	0	0	1.9	0	0.2	9.1	2.7	0.6	0	
Cars +	0	853	2149	87	10	0	161	419	0	26	0	0	0	1	77	0	7	385	114	15	0	4304
% Cars +	0	99.6	99.8	98.9	83.3	0	97.6	99.1	0	86.7	0	0	0	100	91.7	0	100	97	98.3	57.7	0	98.7
Trucks	0	3	5	1	2	1	4	4	0	4	0	0	0	0	7	0	0	12	2	11	0	56
% Trucks	0	0.4	0.2	1.1	16.7	100	2.4	0.9	0	13.3	0	0	0	0	8.3	0	0	3	1.7	42.3	0	1.3

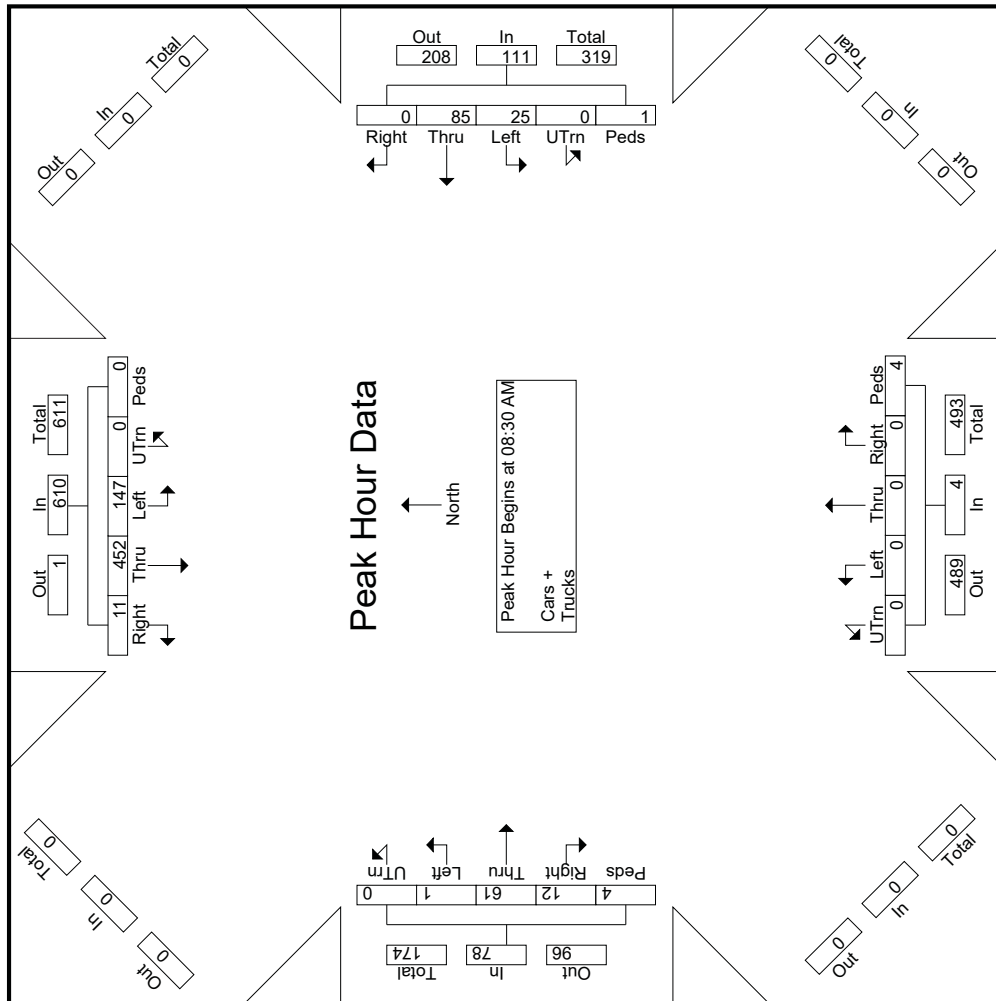


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 2  
Site Code :  
Start Date : 4/17/2018  
Page No : 4

Start Time	Southbound					Westbound					Northbound					Eastbound											
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total		
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																											
Peak Hour for Entire Intersection Begins at 08:30 AM																											
08:30 AM	0	29	113	2	0	144	0	7	15	0	0	22	0	0	0	0	0	0	0	0	0	0	9	4	1	14	181
08:45 AM	0	47	96	4	0	147	0	9	23	0	0	32	0	0	0	0	0	0	0	0	0	1	16	4	2	23	203
09:00 AM	0	44	114	2	0	160	0	3	25	0	1	29	0	0	0	0	0	0	0	0	0	0	18	2	0	20	210
09:15 AM	0	27	129	3	0	159	0	6	22	0	0	28	0	0	0	0	0	0	0	0	0	0	18	2	1	21	209
Total Volume	0	147	452	11	0	610	0	25	85	0	1	111	0	0	0	0	4	0	1	61	12	4	78	4	78	803	
% App. Total	0	24.1	74.1	1.8	0	100	0	22.5	76.6	0	0.9	100	0	0	0	0	100	0	1.3	78.2	15.4	5.1	78	5.1	78	803	
PHF	.000	.782	.876	.688	.000	.953	.000	.694	.850	.000	.250	.867	.000	.000	.000	.000	1.00	.000	.250	.847	.750	.500	.848	.500	.848	.956	

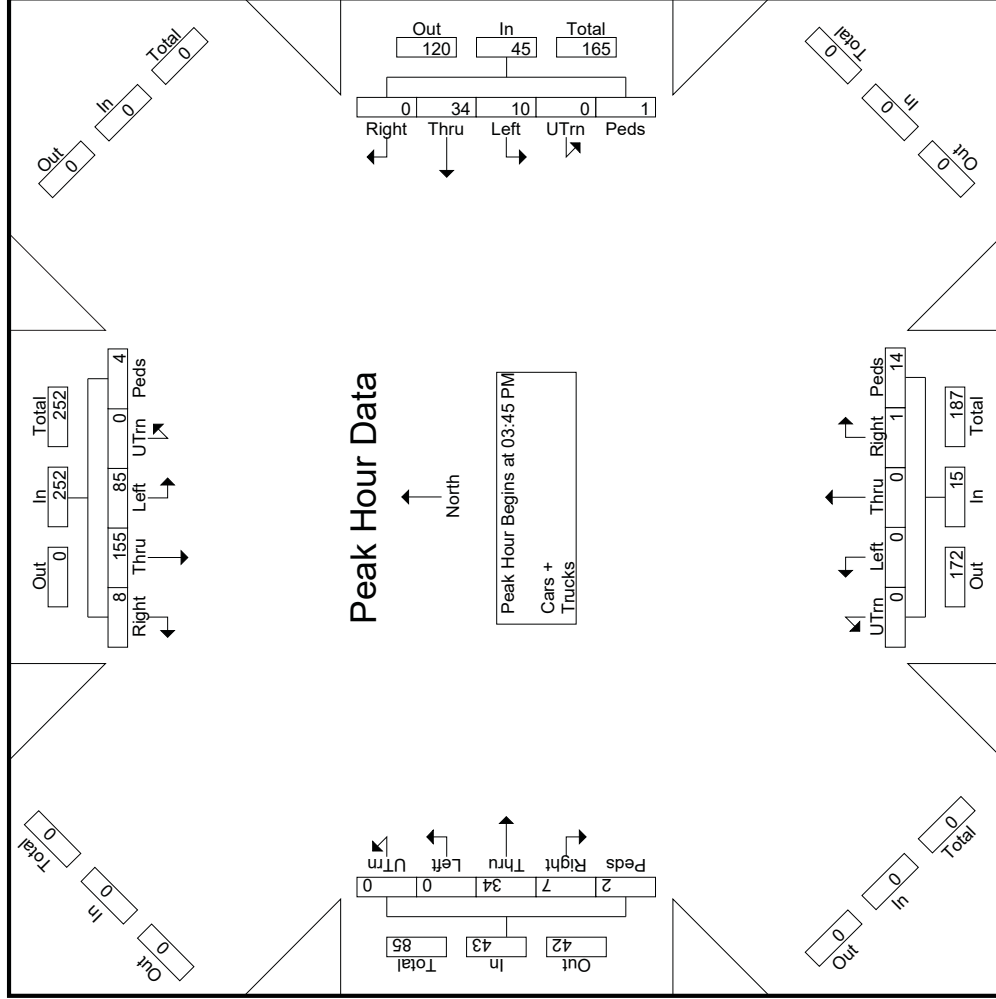


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 2  
Site Code :  
Start Date : 4/17/2018  
Page No : 6

Start Time	Southbound					Westbound					Northbound					Eastbound										
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total	
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 03:45 PM																										
03:45 PM	0	24	32	2	2	60	0	5	10	0	0	15	0	0	0	0	1	5	6	0	0	9	2	0	11	92
04:00 PM	0	24	49	0	1	74	0	2	10	0	0	12	0	0	0	0	0	2	2	0	0	7	3	0	10	98
04:15 PM	0	16	38	2	1	57	0	2	4	0	1	7	0	0	0	0	0	4	4	0	0	9	2	2	13	81
04:30 PM	0	21	36	4	0	61	0	1	10	0	0	11	0	0	0	0	0	3	3	0	0	9	0	0	9	84
Total Volume	0	85	155	8	4	252	0	10	34	0	1	45	0	0	0	0	1	14	15	0	0	34	7	2	43	355
% App. Total	0	33.7	61.5	3.2	1.6		0	22.2	75.6	0	2.2		0	0	0	0	6.7	93.3		0	0	79.1	16.3	4.7		
PHF	.000	.885	.791	.500	.500	.851	.000	.500	.850	.000	.250	.750	.000	.000	.000	.250	.700	.625	.000	.000	.944	.583	.250	.827	.906	



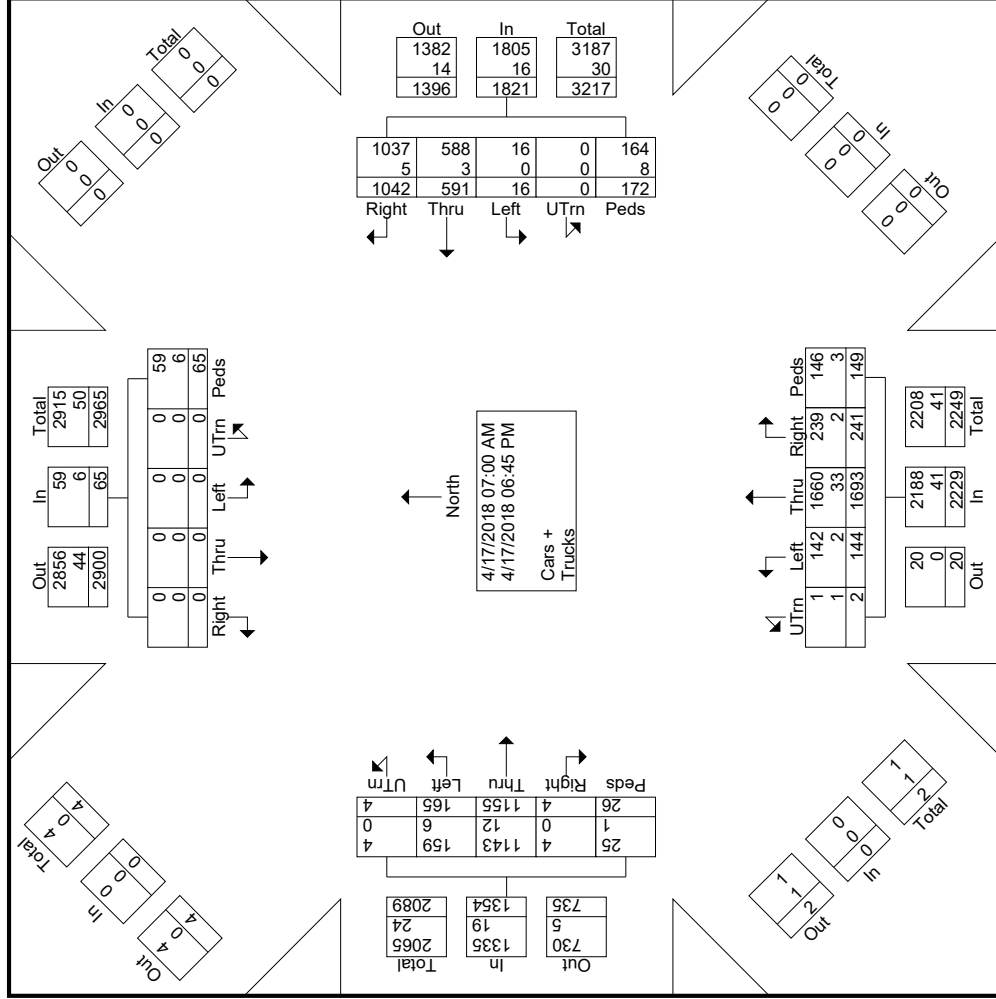


Groups Printed- Cars + - Trucks

Start Time	Southbound				Westbound				Northbound				Eastbound								
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	1	0	0	5	13	0	0	1	37	5	0	0	2	14	0	0	78
07:15 AM	0	0	0	0	1	0	1	7	20	1	0	1	64	4	0	0	4	27	0	1	131
07:30 AM	0	0	0	0	0	0	0	9	35	4	0	2	93	7	2	0	7	37	0	0	196
07:45 AM	0	0	0	0	0	0	6	16	34	6	0	2	106	7	7	0	3	29	0	0	216
Total	0	0	0	0	2	0	7	37	102	11	0	6	300	23	9	0	16	107	0	1	621
08:00 AM	0	0	0	0	1	0	0	10	14	1	0	1	61	11	2	0	5	30	0	1	137
08:15 AM	0	0	0	0	0	0	0	11	16	1	0	0	31	3	1	2	18	8	0	1	92
08:30 AM	0	0	0	0	0	0	0	13	12	0	0	0	48	3	2	0	7	23	0	0	108
08:45 AM	0	0	0	0	1	0	2	10	5	1	0	0	24	3	2	0	3	17	0	0	68
Total	0	0	0	0	2	0	2	44	47	3	0	1	164	20	7	2	33	78	0	2	405
09:00 AM	0	0	0	0	2	0	0	6	15	2	0	3	19	0	2	2	2	11	0	0	64
09:15 AM	0	0	0	0	1	0	0	8	16	2	0	0	16	4	7	0	4	23	0	1	82
09:30 AM	0	0	0	0	0	0	0	2	25	2	0	1	20	10	2	0	5	17	0	0	84
09:45 AM	0	0	0	0	2	0	1	13	17	1	0	1	22	3	2	0	3	17	0	0	82
Total	0	0	0	0	5	0	1	29	73	7	0	5	77	17	13	2	14	68	0	1	312
10:00 AM	0	0	0	0	2	0	0	2	15	6	0	1	32	2	3	0	5	20	0	1	89
10:15 AM	0	0	0	0	1	0	0	7	20	10	0	1	30	9	6	0	5	23	0	0	112
10:30 AM	0	0	0	0	1	0	0	8	18	1	0	0	32	2	1	0	4	21	0	1	89
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	4	0	0	17	53	17	0	2	94	13	10	0	14	64	0	2	290
11:00 AM	0	0	0	0	1	0	0	5	22	1	0	3	20	4	0	0	1	15	0	0	72
11:15 AM	0	0	0	0	0	0	0	9	19	4	0	1	24	2	4	0	0	13	0	0	76
11:30 AM	0	0	0	0	2	0	0	10	19	2	0	0	28	1	1	0	2	22	0	0	87
11:45 AM	0	0	0	0	3	0	0	6	40	3	1	2	31	8	3	0	1	26	0	0	124
Total	0	0	0	0	6	0	0	30	100	10	1	6	103	15	8	0	4	76	0	0	359
12:00 PM	0	0	0	0	5	0	0	10	28	11	0	0	31	7	7	0	3	37	1	1	141
12:15 PM	0	0	0	0	1	0	0	9	32	6	0	2	34	9	1	0	0	22	0	0	116
12:30 PM	0	0	0	0	0	0	0	13	27	6	0	2	38	7	7	0	5	28	0	2	135
12:45 PM	0	0	0	0	1	0	0	13	36	7	0	3	35	7	5	0	10	29	0	2	148
Total	0	0	0	0	7	0	0	45	123	30	0	7	138	30	20	0	18	116	1	5	540
01:00 PM	0	0	0	0	0	0	0	6	14	5	0	1	33	5	4	0	3	26	0	1	98
01:15 PM	0	0	0	0	0	0	0	7	20	3	0	1	28	2	2	0	2	19	0	0	84
01:30 PM	0	0	0	0	1	0	0	11	22	3	0	6	27	5	2	0	2	22	0	0	101
01:45 PM	0	0	0	0	1	0	0	8	28	4	0	5	33	4	3	0	2	22	0	1	111
Total	0	0	0	0	2	0	0	32	84	15	0	13	121	16	11	0	9	89	0	2	394

Groups Printed- Cars + - Trucks

Start Time	Southbound				Westbound				Northbound				Eastbound									
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total	
02:00 PM	0	0	0	0	2	0	2	16	18	1	0	4	31	1	2	0	2	20	0	0	0	99
02:15 PM	0	0	0	0	2	0	0	12	25	6	0	7	33	2	3	0	2	30	0	0	0	122
02:30 PM	0	0	0	0	1	0	0	24	27	4	0	3	39	8	11	0	2	32	0	0	0	151
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	5	0	2	52	70	11	0	14	103	11	16	0	6	82	0	0	0	372
03:00 PM	0	0	0	0	1	0	0	8	18	3	0	2	36	7	3	0	0	18	0	0	0	96
03:15 PM	0	0	0	0	1	0	0	13	22	3	0	6	27	3	5	0	1	20	0	2	0	103
03:30 PM	0	0	0	0	2	0	1	16	26	4	0	6	43	4	3	0	6	24	0	2	0	137
03:45 PM	0	0	0	0	0	0	0	28	21	3	0	2	42	8	1	0	3	24	0	0	0	132
Total	0	0	0	0	4	0	1	65	87	13	0	16	148	22	12	0	10	86	0	4	0	468
04:00 PM	0	0	0	0	3	0	0	19	23	4	0	13	45	7	3	0	5	33	2	2	0	159
04:15 PM	0	0	0	0	7	0	1	29	43	4	1	9	31	7	10	0	2	36	0	1	0	181
04:30 PM	0	0	0	0	2	0	0	25	24	8	0	3	38	6	7	0	2	33	1	1	0	150
04:45 PM	0	0	0	0	1	0	0	30	35	6	0	10	39	6	4	0	6	56	0	0	0	193
Total	0	0	0	0	13	0	1	103	125	22	1	35	153	26	24	0	15	158	3	4	0	683
05:00 PM	0	0	0	0	1	0	0	23	33	9	0	9	50	6	8	0	4	50	0	1	0	194
05:15 PM	0	0	0	0	5	0	0	24	28	5	0	10	42	5	1	0	2	35	0	1	0	158
05:30 PM	0	0	0	0	0	0	0	19	28	3	0	6	38	6	1	0	2	23	0	1	0	127
05:45 PM	0	0	0	0	2	0	0	18	19	2	0	3	34	4	3	0	3	22	0	0	0	110
Total	0	0	0	0	8	0	0	84	108	19	0	28	164	21	13	0	11	130	0	3	0	589
06:00 PM	0	0	0	0	5	0	0	20	24	2	0	5	43	8	1	0	5	24	0	1	0	138
06:15 PM	0	0	0	0	1	0	0	10	14	2	0	4	38	8	0	0	6	31	0	0	0	114
06:30 PM	0	0	0	0	0	0	0	9	14	9	0	1	27	5	4	0	1	26	0	0	0	96
06:45 PM	0	0	0	0	1	0	2	14	18	1	0	1	20	6	1	0	3	20	0	1	0	88
Total	0	0	0	0	7	0	2	53	70	14	0	11	128	27	6	0	15	101	0	2	0	436
Grand Total	0	0	0	0	65	0	16	591	1042	172	2	144	1693	241	149	4	165	1155	4	26	0	5469
Approch %	0	0	0	0	100	0	0.9	32.5	57.2	9.4	0.1	6.5	76	10.8	6.7	0.3	12.2	85.3	0.3	1.9	0	
Total %	0	0	0	0	1.2	0	0.3	10.8	19.1	3.1	0	2.6	31	4.4	2.7	0.1	3	21.1	0.1	0.5	0	
Cars +	0	0	0	0	59	0	16	588	1037	164	1	142	1660	239	146	4	159	1143	4	25	0	5387
Cars +	0	0	0	0	90.8	0	100	99.5	99.5	95.3	50	98.6	98.1	99.2	98	100	96.4	99	100	96.2	0	98.5
Trucks	0	0	0	0	6	0	0	3	5	8	1	2	33	2	3	0	6	12	0	1	0	82
% Trucks	0	0	0	0	9.2	0	0	0.5	0.5	4.7	50	1.4	1.9	0.8	2	0	3.6	1	0	3.8	0	1.5

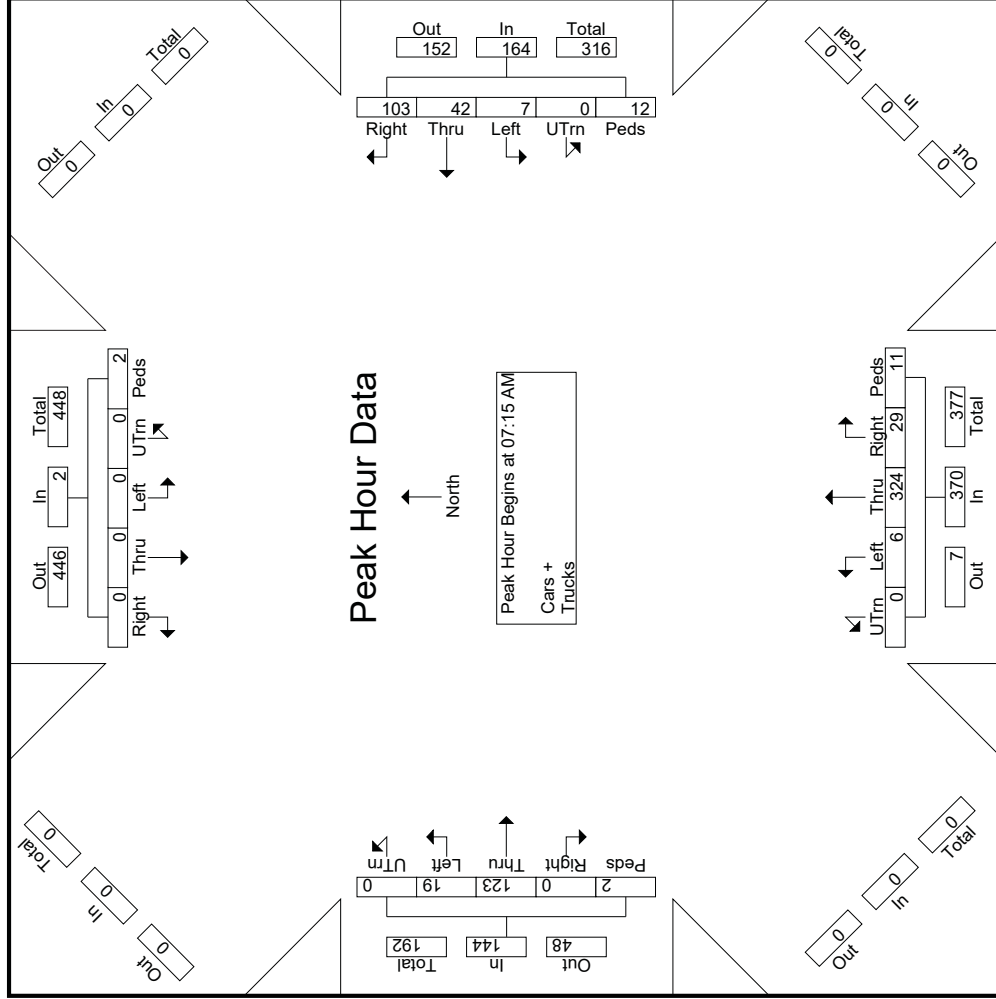


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 3  
Site Code :  
Start Date : 4/17/2018  
Page No : 4

Start Time	Southbound					Westbound					Northbound					Eastbound																						
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total						
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																																						
Peak Hour for Entire Intersection Begins at 07:15 AM																																						
07:15 AM	0	0	0	0	1	0	1	7	20	1	29	0	1	64	4	0	69	0	4	27	0	1	32	0	4	27	0	1	32	0	69	0	4	27	0	1	131	
07:30 AM	0	0	0	0	0	0	0	9	35	4	48	0	2	93	7	2	104	0	7	37	0	0	44	0	7	37	0	0	44	0	7	37	0	104	0	7	37	196
07:45 AM	0	0	0	0	0	0	6	16	34	6	62	0	2	106	7	7	122	0	3	29	0	0	32	0	3	29	0	0	32	0	3	29	0	122	0	3	29	216
08:00 AM	0	0	0	0	1	0	0	10	14	1	25	0	1	61	11	2	75	0	5	30	0	1	36	0	5	30	0	1	36	0	5	30	0	75	0	5	30	137
Total Volume	0	0	0	0	2	0	7	42	103	12	164	0	6	324	29	11	370	0	19	123	0	2	144	0	19	123	0	2	144	0	19	123	0	370	0	19	123	680
% App. Total	0	0	0	0	100	0	4.3	25.6	62.8	7.3	66.1	0	1.6	87.6	7.8	3	75.8	0	13.2	85.4	0	1.4	81.8	0	13.2	85.4	0	1.4	81.8	0	13.2	85.4	0	75.8	0	13.2	85.4	787
PHF	.000	.000	.000	.000	.500	.000	.292	.656	.736	.500	.661	.000	.750	.764	.659	.393	.758	.000	.679	.831	.000	.500	.818	.000	.679	.831	.000	.500	.818	.000	.679	.831	.000	.758	.000	.679	.831	.787

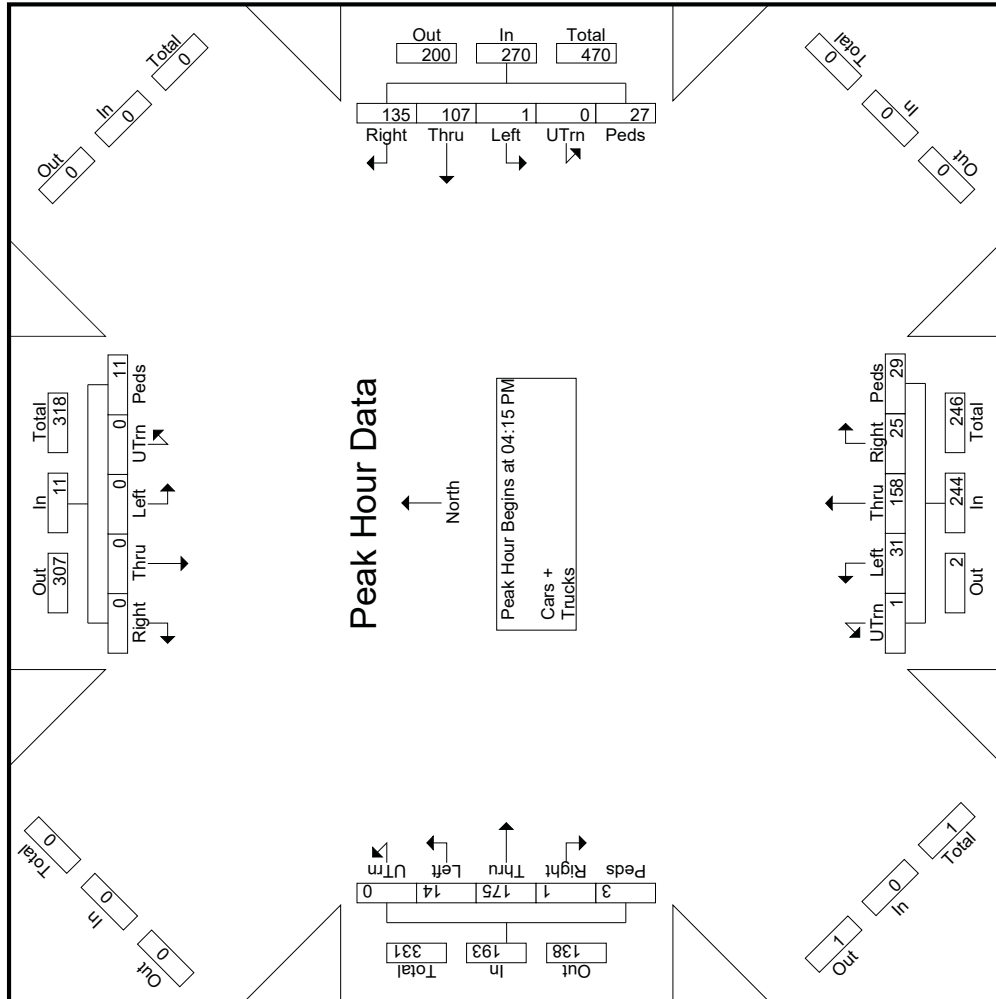


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 3  
Site Code :  
Start Date : 4/17/2018  
Page No : 6

Start Time	Southbound					Westbound					Northbound					Eastbound									
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:15 PM																									
04:15 PM	0	0	0	0	7	7	0	1	29	43	4	77	1	9	31	7	10	58	0	2	36	0	1	39	181
04:30 PM	0	0	0	0	2	2	0	0	25	24	8	57	0	3	38	6	7	54	0	2	33	1	1	37	150
04:45 PM	0	0	0	0	1	1	0	0	30	35	6	71	0	10	39	6	4	59	0	6	56	0	0	62	193
05:00 PM	0	0	0	0	1	1	0	0	23	33	9	65	0	9	50	6	8	73	0	4	50	0	1	55	194
Total Volume	0	0	0	0	11	11	0	1	107	135	27	270	1	31	158	25	29	244	0	14	175	1	3	193	718
% App. Total	0	0	0	0	100	100	0	0.4	39.6	50	10	10	0.4	12.7	64.8	10.2	11.9	836	0	7.3	90.7	0.5	1.6	193	718
PHF	.000	.000	.000	.000	.393	.393	.000	.250	.892	.785	.750	.877	.250	.775	.790	.893	.725	.836	.000	.583	.781	.250	.750	.778	.925

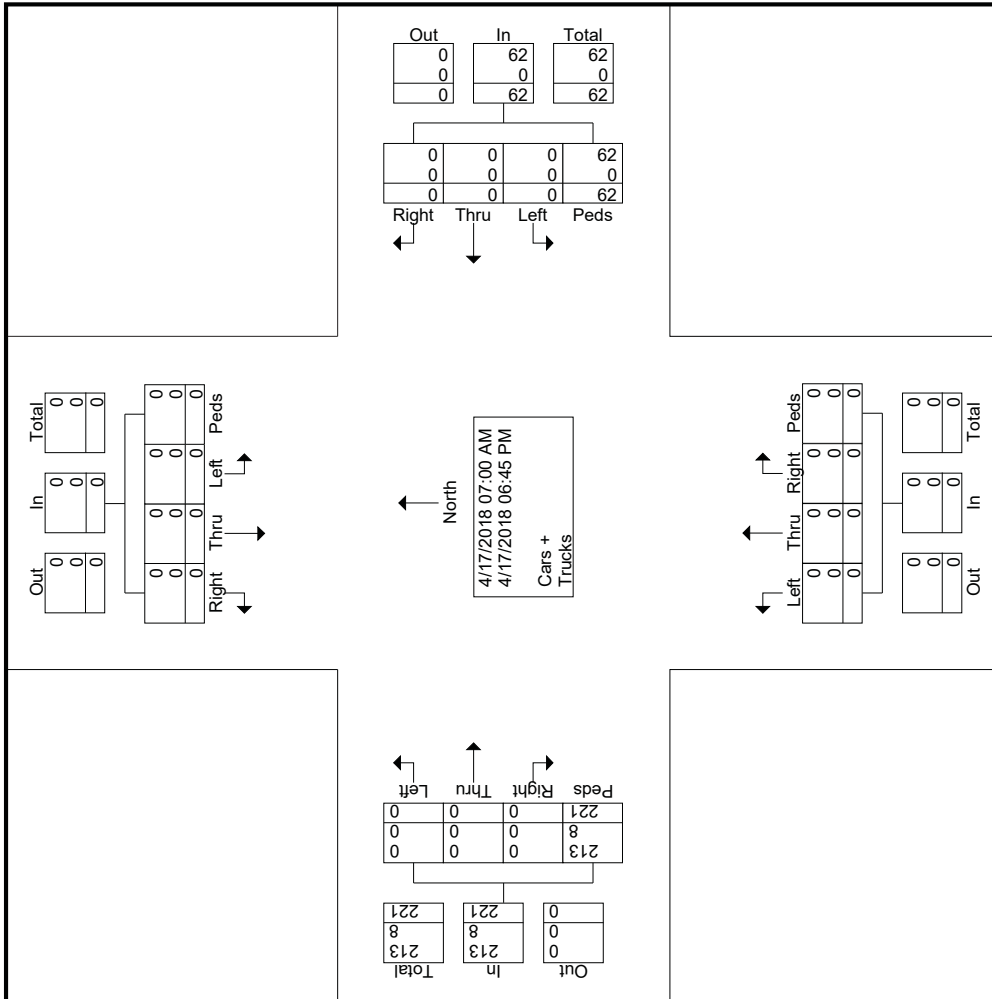






Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound			Int. Total		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Peds	
02:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	3	4
02:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	4	5
02:30 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	5	8
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	5	0	0	0	0	0	0	12	17
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
03:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	13	15
03:30 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	4	8
03:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	5	7
Total	0	0	0	0	0	0	8	0	0	0	0	0	0	24	32
04:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	5	7
04:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	17	19
04:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	16	18
04:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	6	7
Total	0	0	0	0	0	0	7	0	0	0	0	0	0	44	51
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6
05:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	4	6
05:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	9	11
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	0	0	0	0	0	0	4	0	0	0	0	0	0	21	25
06:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	8	9
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10
06:30 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	9	13
06:45 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	5	8
Total	0	0	0	0	0	0	8	0	0	0	0	0	0	32	40
Grand Total	0	0	0	0	0	0	62	0	0	0	0	0	0	221	283
Approch %	0	0	0	0	0	0	100	0	0	0	0	0	0	100	
Total %	0	0	0	0	0	0	21.9	0	0	0	0	0	0	78.1	
Cars +	0	0	0	0	0	0	62	0	0	0	0	0	0	213	275
% Cars +	0	0	0	0	0	0	100	0	0	0	0	0	0	96.4	97.2
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	3.6	2.8

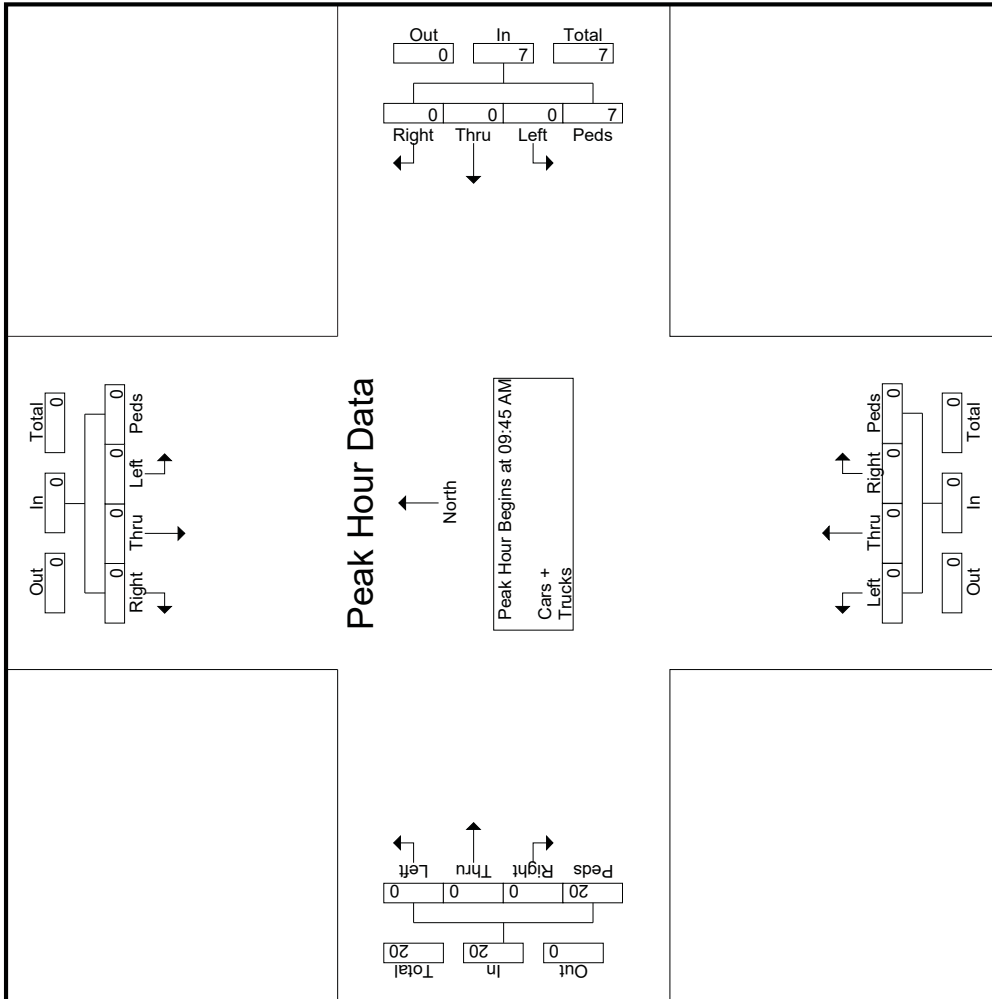


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 2  
Site Code :  
Start Date : 4/17/2018  
Page No : 4

Start Time	Southbound				Westbound				Northbound				Eastbound										
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total		
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																							
Peak Hour for Entire Intersection Begins at 09:45 AM																							
09:45 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	10
10:00 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	4	7
10:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	5	6
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
Total Volume	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	20	27
% App. Total	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	100	27
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.583	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.714	.675	

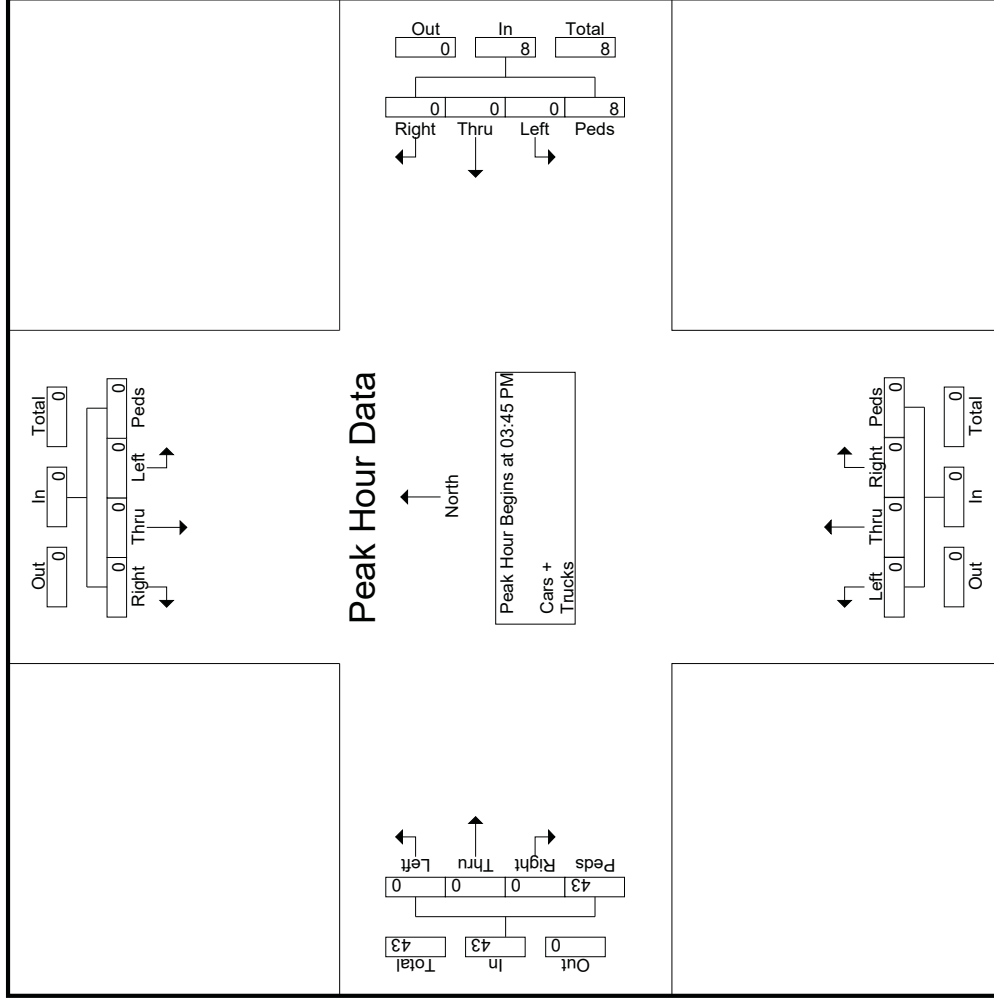


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 2  
Site Code :  
Start Date : 4/17/2018  
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Start Time	Southbound			Westbound			Northbound			Eastbound											
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Peds	Int. Total						
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	5	5	7
04:00 PM	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	5	5	7
04:15 PM	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	17	17	19
04:30 PM	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	16	16	18
Total Volume	0	0	0	0	0	0	8	8	8	0	0	0	0	0	0	0	0	0	43	43	51
% App. Total	0	0	0	0	0	0	100	100	100	0	0	0	0	0	0	0	0	0	100	100	100
PHF	.000	.000	.000	.000	.000	.000	1.00	1.00	1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.632	.632	.671



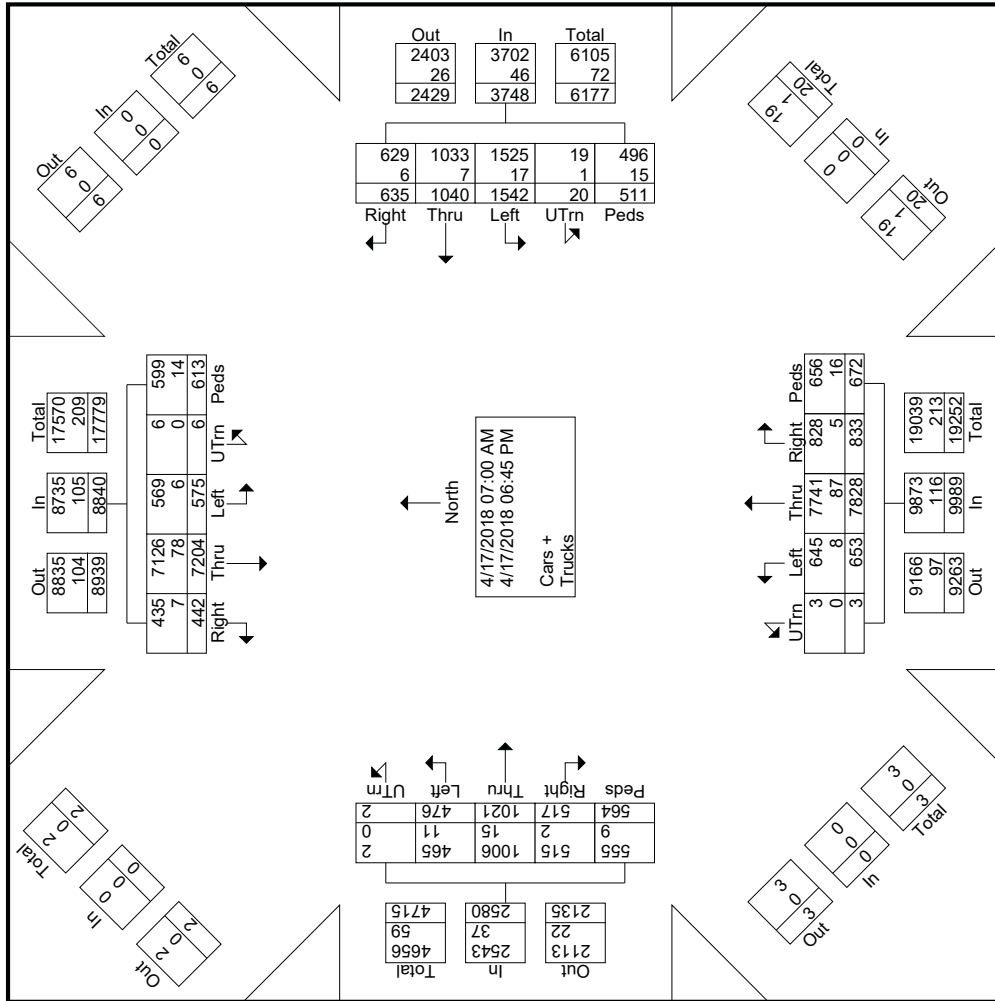
Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound											
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	6	56	2	0	0	26	15	11	1	0	4	113	9	3	0	2	7	7	3	265
07:15 AM	0	4	92	5	1	0	33	17	7	2	0	7	149	17	1	0	1	19	5	3	363
07:30 AM	0	3	99	4	4	0	38	30	13	4	0	9	221	15	9	0	11	15	4	12	491
07:45 AM	0	8	130	10	17	0	31	65	17	13	1	20	294	24	25	0	8	19	6	21	709
Total	0	21	377	21	22	0	128	127	48	20	1	40	777	65	38	0	22	60	22	39	1828
08:00 AM	0	6	125	9	3	0	19	23	10	2	0	11	229	27	4	0	8	21	6	1	504
08:15 AM	0	7	110	8	3	0	16	21	17	1	0	9	174	13	5	0	5	23	7	4	423
08:30 AM	1	6	110	9	7	0	16	18	8	2	0	13	120	10	0	0	1	19	8	2	350
08:45 AM	0	11	91	4	4	0	18	14	11	1	0	10	138	12	6	0	5	13	10	5	353
Total	1	30	436	30	17	0	69	76	46	6	0	43	661	62	15	0	19	76	31	12	1630
09:00 AM	0	7	98	5	9	0	15	16	9	5	0	9	146	16	9	0	7	14	4	11	380
09:15 AM	0	7	108	2	8	0	13	14	15	8	0	12	151	12	9	0	12	23	7	10	411
09:30 AM	0	8	143	14	17	0	13	14	17	14	0	15	147	25	14	0	7	8	6	5	467
09:45 AM	1	16	126	3	10	0	26	21	14	4	0	20	144	20	11	0	7	7	2	18	450
Total	1	38	475	24	44	0	67	65	55	31	0	56	588	73	43	0	33	52	19	44	1708
10:00 AM	1	11	112	3	15	0	24	21	11	10	0	11	143	9	17	0	6	16	11	11	432
10:15 AM	0	12	159	13	13	1	24	18	4	38	0	10	186	25	40	0	7	18	9	15	592
10:30 AM	0	10	104	8	10	0	22	20	8	5	0	10	102	12	6	0	7	15	2	9	350
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	33	375	24	38	1	70	59	23	53	0	31	431	46	63	0	20	49	22	35	1374
11:00 AM	0	6	107	1	7	0	22	15	10	3	0	4	117	12	4	0	10	4	9	5	336
11:15 AM	0	8	117	4	3	0	28	13	13	1	0	9	119	15	7	0	8	15	6	3	369
11:30 AM	0	6	126	3	13	0	19	17	7	6	0	7	179	13	9	0	10	11	10	5	441
11:45 AM	1	19	161	5	16	0	23	24	6	13	0	10	160	23	28	0	13	20	10	16	548
Total	1	39	511	13	39	0	92	69	36	23	0	30	575	63	48	0	41	50	35	29	1694
12:00 PM	0	11	157	11	24	0	24	19	18	18	0	11	167	14	29	0	20	28	14	19	584
12:15 PM	0	9	124	5	10	0	27	17	12	8	0	11	146	27	11	0	11	24	14	9	465
12:30 PM	0	13	169	5	37	0	31	26	9	29	0	16	166	13	21	0	12	20	8	23	598
12:45 PM	1	11	133	6	25	0	25	17	11	19	0	13	196	18	13	0	7	22	16	18	551
Total	1	44	583	27	96	0	107	79	50	74	0	51	675	72	74	0	50	94	52	69	2198
01:00 PM	0	9	135	5	8	0	36	16	18	6	0	8	161	20	15	0	9	13	19	12	490
01:15 PM	0	14	156	6	6	0	31	17	12	3	0	12	173	11	6	2	10	11	6	6	482
01:30 PM	0	12	158	8	8	0	36	24	5	5	0	11	146	17	8	0	8	17	8	6	477
01:45 PM	0	13	165	5	13	0	30	20	17	14	0	14	174	11	6	0	9	23	13	12	539
Total	0	48	614	24	35	0	133	77	52	28	0	45	654	59	35	2	36	64	46	36	1988

Groups Printed- Cars + - Trucks

Start Time	Southbound					Westbound					Northbound					Eastbound										
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
02:00 PM	0	10	128	5	12	0	35	14	14	7	1	17	134	20	10	0	8	16	5	6	0	8	16	5	6	442
02:15 PM	0	20	163	8	20	0	33	17	7	14	1	19	139	10	28	0	6	18	11	23	0	6	18	11	23	537
02:30 PM	0	20	260	21	36	0	49	24	16	25	0	8	245	15	36	0	22	29	15	32	0	22	29	15	32	853
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	50	551	34	68	0	117	55	37	46	2	44	518	45	74	0	36	63	31	61	0	36	63	31	61	1832
03:00 PM	0	17	154	3	6	0	41	18	15	12	0	10	153	16	8	0	9	21	10	8	0	9	21	10	8	501
03:15 PM	0	13	206	6	11	0	49	21	14	17	0	11	161	23	31	0	9	28	7	18	0	9	28	7	18	625
03:30 PM	0	18	252	11	17	0	46	25	15	10	0	10	223	16	11	0	9	20	8	7	0	9	20	8	7	698
03:45 PM	0	17	254	24	20	0	49	29	19	19	0	20	202	23	24	0	15	39	16	12	0	15	39	16	12	782
Total	0	65	866	44	54	0	185	93	63	58	0	51	739	78	74	0	42	108	41	45	0	42	108	41	45	2606
04:00 PM	0	22	246	25	6	0	46	41	25	5	0	21	227	19	17	0	14	33	6	45	0	14	33	6	45	798
04:15 PM	0	33	273	57	42	8	56	59	18	54	0	47	275	29	81	0	16	70	27	34	0	16	70	27	34	1179
04:30 PM	1	20	336	22	29	11	71	35	23	16	0	20	278	27	15	0	20	30	24	19	0	20	30	24	19	997
04:45 PM	0	15	228	21	11	0	66	32	18	9	0	31	194	27	9	0	13	43	21	11	0	13	43	21	11	749
Total	1	90	1083	125	88	19	239	167	84	84	0	119	974	102	122	0	63	176	78	109	0	63	176	78	109	3723
05:00 PM	0	15	237	15	19	0	49	24	26	11	0	21	189	19	4	0	9	44	19	4	0	9	44	19	4	705
05:15 PM	0	20	180	13	14	0	34	36	15	12	0	28	177	26	3	0	12	38	25	2	0	12	38	25	2	635
05:30 PM	0	13	196	11	25	0	42	34	21	23	0	16	187	30	21	0	14	20	7	15	0	14	20	7	15	675
05:45 PM	0	16	159	7	13	0	52	17	25	10	0	20	146	19	7	0	16	26	14	11	0	16	26	14	11	558
Total	0	64	772	46	71	0	177	111	87	56	0	85	699	94	35	0	51	128	65	32	0	51	128	65	32	2573
06:00 PM	0	9	161	14	12	0	41	24	18	9	0	12	139	15	17	0	22	32	15	16	0	22	32	15	16	556
06:15 PM	0	20	145	6	14	0	31	15	13	11	0	20	147	21	11	0	14	22	27	9	0	14	22	27	9	526
06:30 PM	0	14	129	8	5	0	40	6	10	4	0	12	117	16	16	0	10	23	18	21	0	10	23	18	21	449
06:45 PM	0	10	126	2	10	0	46	17	13	8	0	14	134	22	7	0	17	24	15	7	0	17	24	15	7	472
Total	0	53	561	30	41	0	158	62	54	32	0	58	537	74	51	0	63	101	75	53	0	63	101	75	53	2003
Grand Total	6	575	7204	442	613	20	1542	1040	635	511	3	653	7828	833	672	2	476	1021	517	564	2	476	1021	517	564	25157
Approch %	0.1	6.5	81.5	5	6.9	0.5	41.1	27.7	16.9	13.6	0	6.5	78.4	8.3	6.7	0.1	18.4	39.6	20	21.9	0.1	18.4	39.6	20	21.9	
Total %	0	2.3	28.6	1.8	2.4	0.1	6.1	4.1	2.5	2	0	2.6	31.1	3.3	2.7	0	1.9	4.1	2.1	2.2	0	1.9	4.1	2.1	2.2	
Cars +	6	569	7126	435	599	19	1525	1033	629	496	3	645	7741	828	656	2	465	1006	515	555	2	465	1006	515	555	24853
% Cars +	100	99	98.9	98.4	97.7	95	98.9	99.3	99.1	97.1	100	98.8	98.9	99.4	97.6	100	97.7	98.5	99.6	98.4	100	97.7	98.5	99.6	98.4	98.8
Trucks	0	6	78	7	14	1	17	7	6	15	0	8	87	5	16	0	11	15	2	9	0	11	15	2	9	304
% Trucks	0	1	1.1	1.6	2.3	5	1.1	0.7	0.9	2.9	0	1.2	1.1	0.6	2.4	0	2.3	1.5	0.4	1.6	0	2.3	1.5	0.4	1.6	1.2



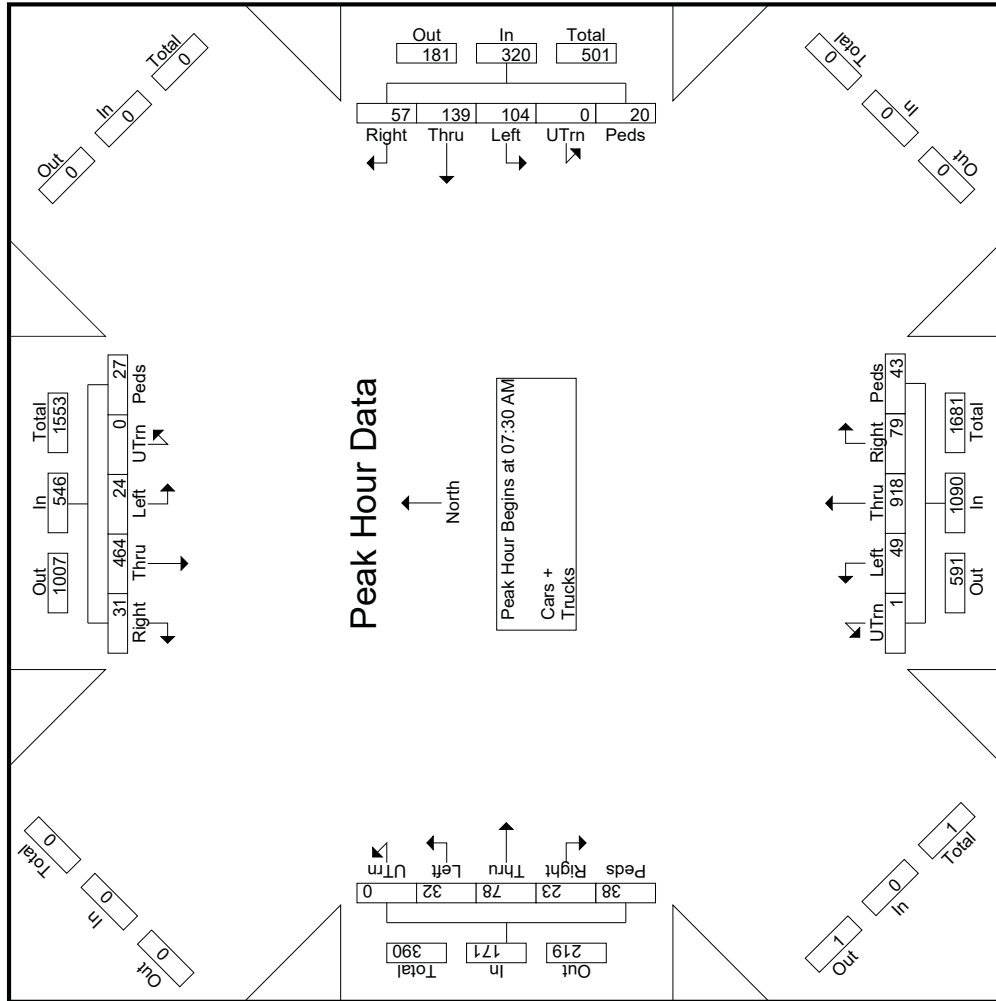


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 2  
Site Code :  
Start Date : 4/17/2018  
Page No : 4

Start Time	Southbound					Westbound					Northbound					Eastbound									
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:30 AM																									
07:30 AM	0	3	99	4	4	110	0	38	30	13	4	85	0	9	221	15	9	254	0	11	15	4	12	42	491
07:45 AM	0	8	130	10	17	165	0	31	65	17	13	126	1	20	294	24	25	364	0	8	19	6	21	54	709
08:00 AM	0	6	125	9	3	143	0	19	23	10	2	54	0	11	229	27	4	271	0	8	21	6	1	36	504
08:15 AM	0	7	110	8	3	128	0	16	21	17	1	55	0	9	174	13	5	201	0	5	23	7	4	39	423
Total Volume	0	24	464	31	27	546	0	104	139	57	20	320	1	49	918	79	43	1090	0	32	78	23	38	171	2127
% App. Total	0	4.4	85	5.7	4.9	82.7	0	32.5	43.4	17.8	6.2	63.5	0.1	4.5	84.2	7.2	3.9	74.9	0	18.7	45.6	13.5	22.2	7.92	750
PHF	.000	.750	.892	.775	.397	.827	.000	.684	.535	.838	.385	.635	.250	.613	.781	.731	.430	.749	.000	.727	.848	.821	.452	.792	.750

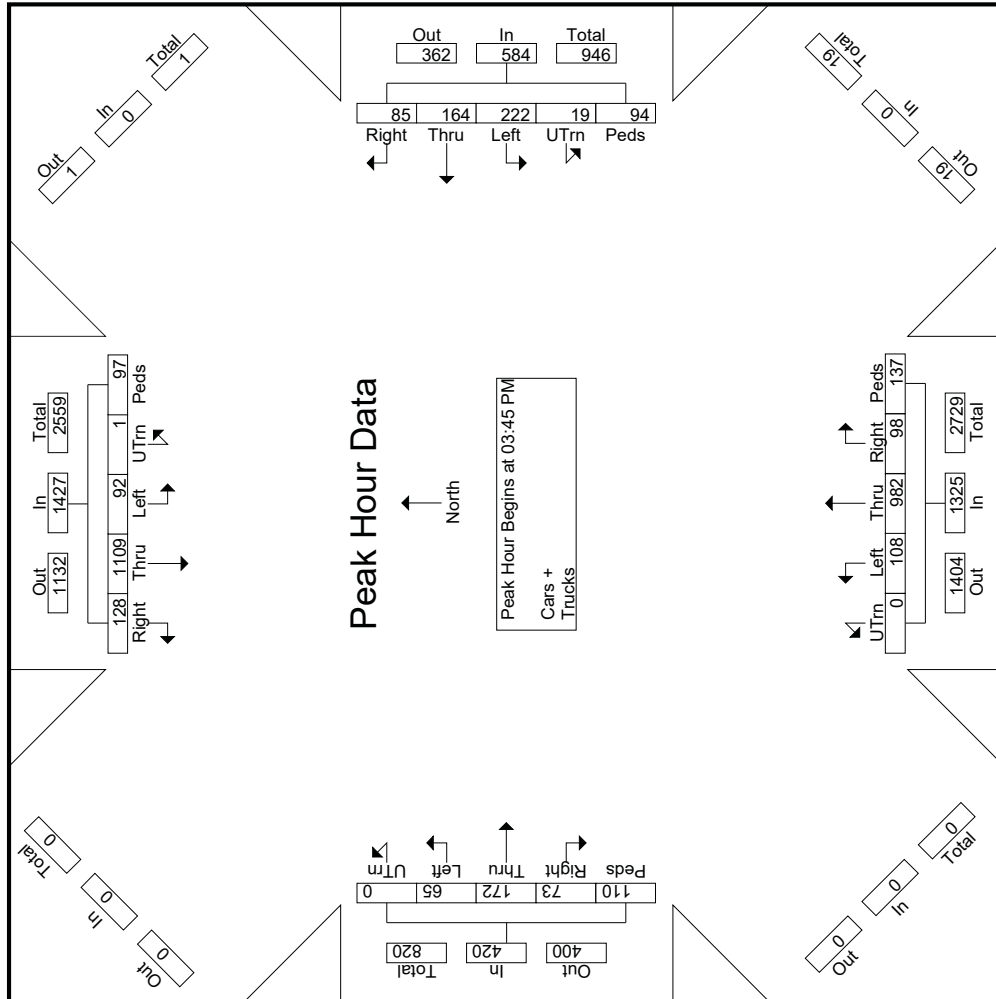


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 2  
Site Code :  
Start Date : 4/17/2018  
Page No : 6

Start Time	Southbound					Westbound					Northbound					Eastbound									
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 03:45 PM																									
03:45 PM	0	17	254	24	20	315	0	49	29	19	19	116	0	20	202	23	24	269	0	15	39	16	12	82	782
04:00 PM	0	22	246	25	6	299	0	46	41	25	5	117	0	21	227	19	17	284	0	14	33	6	45	98	798
04:15 PM	0	33	273	57	42	405	8	56	59	18	54	195	0	47	275	29	81	432	0	16	70	27	34	147	1179
04:30 PM	1	20	336	22	29	408	11	71	35	23	16	156	0	20	278	27	15	340	0	20	30	24	19	93	997
Total Volume	1	92	1109	128	97	1427	19	222	164	85	94	584	0	108	982	98	137	1325	0	65	172	73	110	420	3756
% App. Total	0.1	6.4	77.7	9	6.8		3.3	38	28.1	14.6	16.1		0	8.2	74.1	7.4	10.3		0	15.5	41	17.4	26.2		
PHF	.250	.697	.825	.561	.577	.874	.432	.782	.695	.850	.435	.749	.000	.574	.883	.845	.423	.767	.000	.813	.614	.676	.611	.714	.796

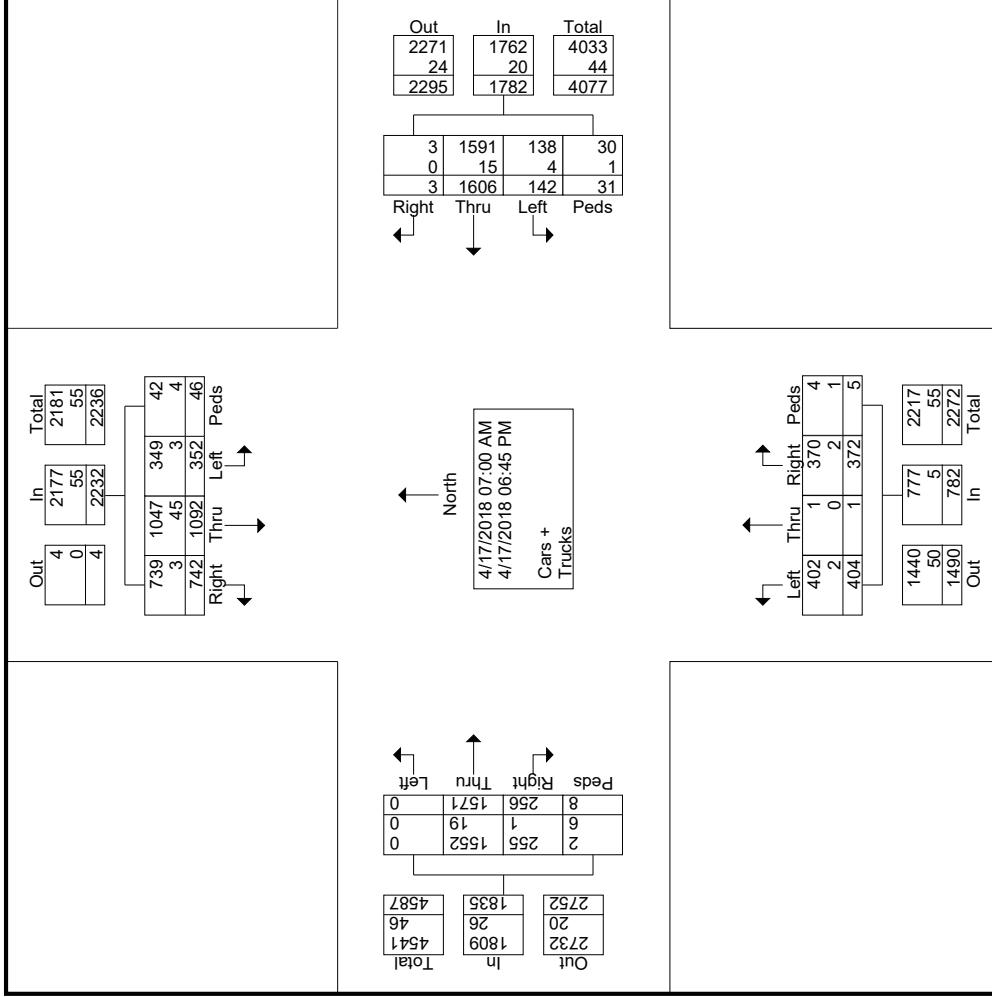


Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound			Int. Total					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Peds				
07:00 AM	7	23	20	0	33	0	0	0	0	6	0	5	0	0	30	8	0	132
07:15 AM	7	25	25	0	38	0	0	0	0	6	0	5	0	0	37	7	0	157
07:30 AM	13	31	23	3	52	1	0	0	0	12	0	11	0	0	50	7	2	209
07:45 AM	8	35	18	5	58	0	0	0	0	12	0	14	0	0	53	8	0	212
Total	35	114	86	8	181	0	1	0	0	36	0	35	0	0	170	30	2	710
08:00 AM	17	32	19	0	58	0	1	0	0	8	0	9	0	0	39	8	1	193
08:15 AM	5	41	22	5	57	0	6	0	0	16	0	15	0	0	51	8	0	234
08:30 AM	20	55	25	2	73	1	0	0	0	13	0	16	0	0	47	12	0	267
08:45 AM	14	60	35	3	51	1	1	0	0	17	0	14	0	0	69	8	0	285
Total	56	188	101	10	239	2	8	0	0	54	0	54	0	0	206	36	1	979
09:00 AM	14	41	21	2	41	0	0	0	0	13	0	11	0	0	53	10	0	209
09:15 AM	13	22	15	2	50	0	0	0	0	5	0	7	0	0	60	16	1	198
09:30 AM	12	31	25	3	46	0	0	0	0	11	0	17	0	0	51	9	1	211
09:45 AM	9	21	25	0	26	0	1	0	0	11	0	9	1	0	54	8	0	171
Total	48	115	86	7	163	0	1	0	0	40	0	44	1	0	218	43	2	789
10:00 AM	10	24	21	2	40	0	0	0	0	9	0	9	0	0	40	7	0	168
10:15 AM	12	19	17	1	29	0	0	0	0	10	0	6	0	0	40	5	0	140
10:30 AM	5	30	18	0	22	0	0	0	0	6	0	8	0	0	31	9	0	129
10:45 AM	5	28	27	0	30	0	1	0	0	7	0	9	0	0	37	6	0	154
Total	32	101	83	3	121	0	1	0	0	32	0	32	0	0	148	27	0	591
11:00 AM	5	9	7	0	28	0	0	0	0	8	0	0	0	0	13	1	0	71
11:15 AM	3	22	13	0	34	0	1	0	0	12	0	6	0	0	26	1	0	123
11:30 AM	4	17	10	0	53	0	0	0	0	14	0	11	0	0	22	7	0	141
11:45 AM	6	23	15	1	74	0	2	0	0	23	0	13	1	0	21	4	0	186
Total	18	71	45	1	189	0	3	0	0	57	0	30	1	0	82	13	0	521
12:00 PM	3	25	10	0	35	0	2	0	0	4	0	7	0	0	35	4	0	125
12:15 PM	8	12	9	0	31	0	1	0	0	6	0	3	0	0	22	9	0	102
12:30 PM	7	16	7	0	25	0	0	0	0	5	0	4	0	0	29	1	0	96
12:45 PM	4	15	11	1	19	0	1	0	0	12	0	4	0	0	25	2	0	98
Total	22	68	37	1	110	0	4	0	0	27	0	18	0	0	111	16	0	421
01:00 PM	6	16	10	1	18	0	2	0	0	10	0	11	0	0	23	2	0	103
01:15 PM	8	14	6	0	19	0	1	0	0	1	0	5	0	0	29	4	0	90
01:30 PM	6	16	7	1	20	0	0	0	0	13	0	7	0	0	18	5	1	96
01:45 PM	3	18	11	0	35	0	0	0	0	5	0	3	0	0	28	3	0	111
Total	23	64	34	2	92	0	3	0	0	29	0	26	0	0	98	14	1	400

Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	3	16	15	1	15	0	0	0	6	0	18	4	0
02:15 PM	5	16	12	0	26	0	0	0	11	0	25	4	0
02:30 PM	5	26	17	0	30	0	0	0	8	0	24	2	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	13	58	44	1	71	0	0	0	25	0	67	10	0
03:00 PM	7	25	8	0	25	0	0	0	6	2	18	1	0
03:15 PM	4	15	16	4	23	0	0	2	2	0	29	3	2
03:30 PM	8	15	9	3	22	0	3	7	0	0	26	1	0
03:45 PM	13	22	14	4	22	0	0	6	0	0	36	7	0
Total	32	77	47	11	92	0	3	21	2	0	109	12	2
04:00 PM	4	18	11	2	31	0	0	0	6	0	34	8	0
04:15 PM	7	20	9	2	24	0	1	5	0	0	39	7	0
04:30 PM	8	23	16	1	35	0	1	13	0	0	33	6	0
04:45 PM	5	16	17	2	27	0	0	12	0	0	34	8	0
Total	24	77	53	7	117	0	2	36	0	0	140	29	0
05:00 PM	4	18	12	5	39	0	0	9	1	0	42	2	0
05:15 PM	2	25	20	4	33	0	3	8	0	0	24	5	0
05:30 PM	4	20	15	2	33	0	1	4	0	0	24	3	0
05:45 PM	7	18	14	5	39	0	0	7	0	0	34	4	0
Total	17	81	61	16	144	0	4	28	1	0	124	14	0
06:00 PM	9	21	19	1	28	0	0	6	0	0	34	2	0
06:15 PM	11	30	17	4	24	0	0	9	0	0	31	5	0
06:30 PM	12	27	29	2	35	1	1	8	0	0	33	5	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	78	65	7	87	1	1	23	0	0	98	12	0
Grand Total	352	1092	742	142	1606	3	31	372	5	0	1571	256	8
Approach %	15.8	48.9	33.2	8	90.1	0.2	1.7	47.6	0.6	0	85.6	14	0.4
Total %	5.3	16.5	11.2	2.1	24.2	0	0.5	5.6	0.1	0	23.7	3.9	0.1
Cars +	349	1047	739	138	1591	3	30	370	4	0	1552	255	2
% Cars +	99.1	95.9	99.6	97.2	99.1	100	96.8	99.5	80	0	98.8	99.6	25
Trucks	3	45	3	4	15	0	1	2	1	0	19	1	6
% Trucks	0.9	4.1	0.4	2.8	0.9	0	3.2	0.5	20	0	1.2	0.4	75



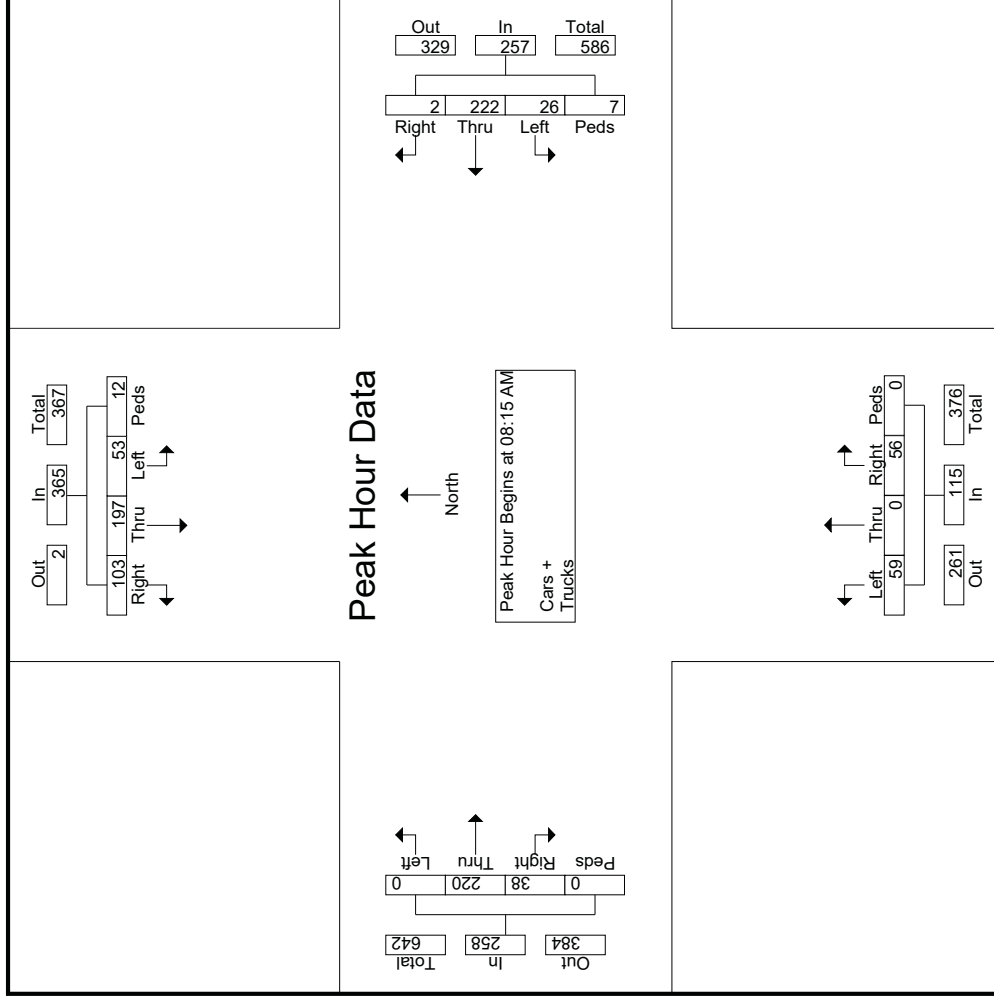


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : 041718 - 12 Ave S & 11 St S  
Site Code :  
Start Date : 4/17/2018  
Page No : 4

Start Time	Southbound					Westbound					Northbound					Eastbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	5	41	22	5	73	8	57	0	6	71	16	0	15	0	31	0	51	8	0	59	234
08:30 AM	20	55	25	2	102	3	73	1	0	77	13	0	16	0	29	0	47	12	0	59	267
08:45 AM	14	60	35	3	112	12	51	1	1	65	17	0	14	0	31	0	69	8	0	77	285
09:00 AM	14	41	21	2	78	3	41	0	0	44	13	0	11	0	24	0	53	10	0	63	209
Total Volume	53	197	103	12	365	26	222	2	7	257	59	0	56	0	115	0	220	38	0	258	995
% App. Total	14.5	54	28.2	3.3	81.5	10.1	86.4	0.8	2.7	83.4	51.3	0	48.7	0	92.7	0	85.3	14.7	0	83.8	873
PHF	.663	.821	.736	.600	.815	.542	.760	.500	.292	.834	.868	.000	.875	.000	.927	.000	.797	.792	.000	.838	.873

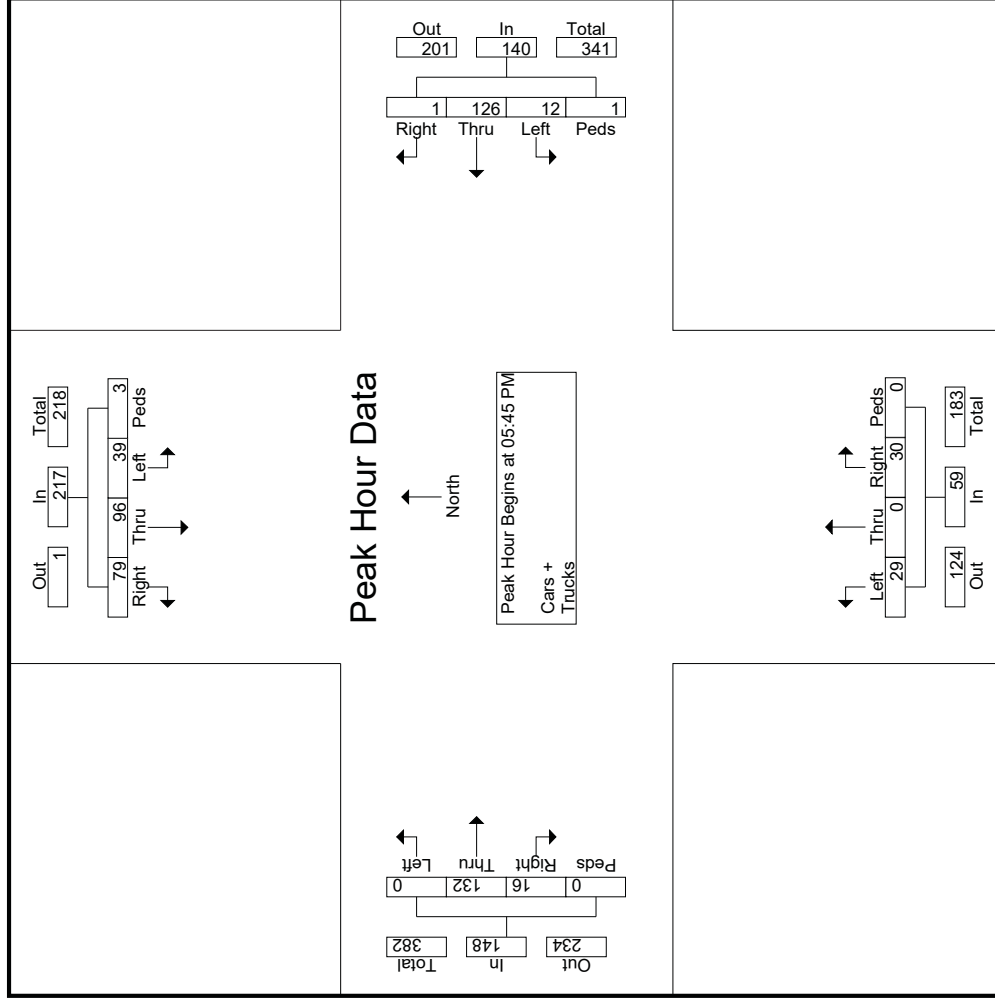


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : 041718 - 12 Ave S & 11 St S  
Site Code :  
Start Date : 4/17/2018  
Page No : 6

Start Time	Southbound					Westbound					Northbound					Eastbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:45 PM																					
05:45 PM	7	18	14	0	39	5	39	0	0	44	7	0	7	0	14	0	34	4	0	38	135
06:00 PM	9	21	19	2	51	1	28	0	0	29	5	0	6	0	11	0	34	2	0	36	127
06:15 PM	11	30	17	1	59	4	24	0	0	28	12	0	9	0	21	0	31	5	0	36	144
06:30 PM	12	27	29	0	68	2	35	1	1	39	5	0	8	0	13	0	33	5	0	38	158
Total Volume	39	96	79	3	217	12	126	1	1	140	29	0	30	0	59	0	132	16	0	148	564
% App. Total	18	44.2	36.4	1.4	798	8.6	90	0.7	0.7	795	49.2	0	50.8	0	702	0	89.2	10.8	0	974	892
PHF	.813	.800	.681	.375	.798	.600	.808	.250	.250	.795	.604	.000	.833	.000	.702	.000	.971	.800	.000	.974	.892



		Groups Printed- Cars + - Trucks																			
		Southbound				Westbound				Northbound				Eastbound							
Start Time	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	3	0	2	22	7	0	0	4	24	14	0	0	7	31	5	1	120
07:15 AM	0	0	0	0	0	0	9	42	4	0	0	2	12	7	0	0	6	36	3	0	121
07:30 AM	0	1	0	0	0	0	10	46	9	0	0	4	14	8	0	0	12	40	2	0	146
07:45 AM	0	0	0	0	2	0	10	38	3	1	0	0	20	4	0	0	13	38	9	0	138
Total	0	1	0	0	5	0	31	148	23	1	0	10	70	33	0	0	38	145	19	1	525
08:00 AM	0	0	0	0	2	0	4	44	10	1	0	1	13	10	0	0	11	33	10	0	139
08:15 AM	0	0	0	0	5	0	2	42	11	1	0	5	15	9	0	0	17	31	3	1	142
08:30 AM	0	0	0	0	5	0	6	52	5	0	0	4	27	10	1	0	9	51	4	3	177
08:45 AM	0	0	0	0	5	0	7	43	4	0	0	1	15	4	1	0	5	60	7	1	153
Total	0	0	0	0	17	0	19	181	30	2	0	11	70	33	2	0	42	175	24	5	611
09:00 AM	0	0	0	0	3	0	6	49	3	1	0	2	21	18	1	0	7	57	4	0	172
09:15 AM	0	0	0	0	2	0	7	53	2	0	1	1	25	7	0	0	10	60	3	0	171
09:30 AM	0	0	0	0	0	0	4	43	3	0	0	3	15	11	1	0	14	39	2	0	135
09:45 AM	0	0	0	0	1	0	5	26	6	0	0	0	16	5	0	0	5	55	3	0	122
Total	0	0	0	0	6	0	22	171	14	1	1	6	77	41	2	0	36	211	12	0	600
10:00 AM	0	0	0	0	4	0	3	38	10	0	0	3	16	4	0	0	13	38	4	0	133
10:15 AM	0	0	0	0	2	0	6	30	6	0	0	1	19	5	0	0	14	32	4	2	121
10:30 AM	0	0	0	0	1	1	18	12	0	0	0	1	11	6	1	0	8	23	3	1	86
10:45 AM	0	0	0	0	0	0	8	25	9	0	0	1	14	6	1	0	9	31	4	0	108
Total	0	0	0	0	7	1	35	105	25	0	0	6	60	21	2	0	44	124	15	3	448

Stonebrooke Engineering  
 12279 Nicollet Avenue  
 Burnsville, MN 55337

12 Ave & 14 St S  
 Moorhead, MN  
 Tuesday, April 17, 2018

File Name : 041718 - 12 Ave S & 14 St S  
 Site Code : 041718  
 Start Date : 4/17/2018  
 Page No : 2

		Groups Printed- Cars + - Trucks																			
		Southbound				Westbound				Northbound				Eastbound							
Start Time	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
11:00 AM	0	0	0	0	0	0	3	19	0	1	0	2	13	6	0	0	3	17	0	2	66
11:15 AM	0	0	0	0	0	0	8	25	7	2	0	6	18	9	0	1	7	23	2	1	109
11:30 AM	0	0	0	0	0	0	7	41	12	0	0	6	16	17	0	0	4	27	1	2	133
11:45 AM	0	0	0	0	0	0	5	64	11	1	0	6	23	20	1	0	4	27	1	0	163
Total	0	0	0	0	0	0	23	149	30	4	0	20	70	52	1	1	18	94	4	5	471
12:00 PM	0	0	0	0	0	0	6	24	9	2	0	5	17	17	1	0	10	31	0	0	122
12:15 PM	0	0	0	0	0	0	4	28	6	0	0	3	9	8	0	0	5	27	1	0	91
12:30 PM	0	0	0	0	0	0	5	25	8	0	0	1	14	8	1	0	5	34	3	0	104
12:45 PM	0	0	0	0	0	0	4	24	9	0	0	1	16	1	0	0	3	25	1	0	84
Total	0	0	0	0	0	0	19	101	32	2	0	10	56	34	2	0	23	117	5	0	401
01:00 PM	0	0	0	0	0	0	2	19	12	1	0	3	13	1	0	0	9	22	2	0	84
01:15 PM	0	0	0	0	0	0	1	22	6	0	0	3	12	2	0	0	6	26	1	0	79
01:30 PM	0	0	0	0	0	0	2	22	6	0	0	3	13	5	0	0	4	17	1	0	73
01:45 PM	0	0	0	0	0	0	1	28	9	0	0	5	13	1	0	0	6	20	1	0	84
Total	0	0	0	0	0	0	6	91	33	1	0	14	51	9	0	0	25	85	5	0	320
02:00 PM	0	0	0	0	0	0	1	13	4	0	0	1	6	4	0	0	7	18	4	0	58
02:15 PM	0	0	0	0	0	0	3	21	13	0	0	4	11	4	0	0	7	28	1	0	92
02:30 PM	0	0	0	0	0	0	2	29	11	0	0	4	8	3	1	0	8	25	3	0	94
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	6	63	28	0	0	9	25	11	1	0	22	71	8	0	244
03:00 PM	0	0	0	0	1	0	2	18	4	0	0	0	15	6	0	0	5	23	3	0	77

Stonebrooke Engineering  
 12279 Nicollet Avenue  
 Burnsville, MN 55337

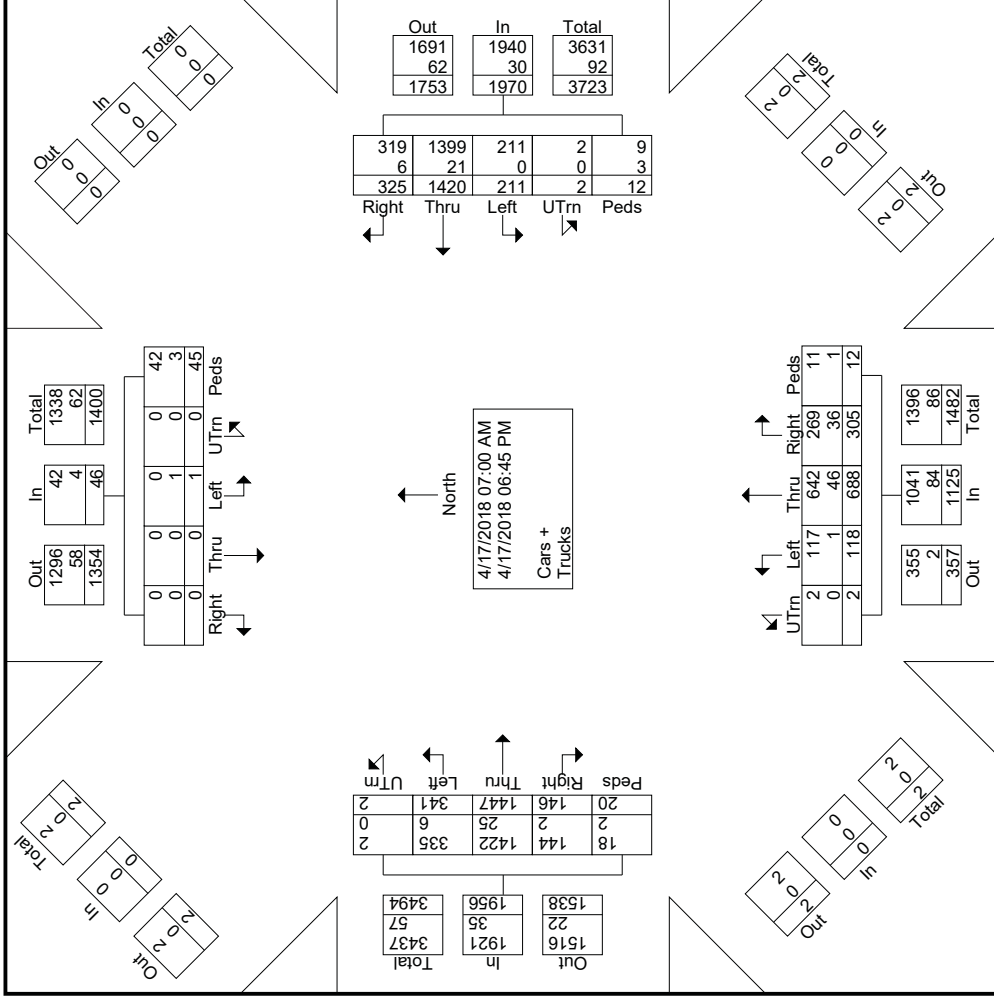
12 Ave & 14 St S  
 Moorhead, MN  
 Tuesday, April 17, 2018

File Name : 041718 - 12 Ave S & 14 St S  
 Site Code : 041718  
 Start Date : 4/17/2018  
 Page No : 3

Groups Printed- Cars + - Trucks

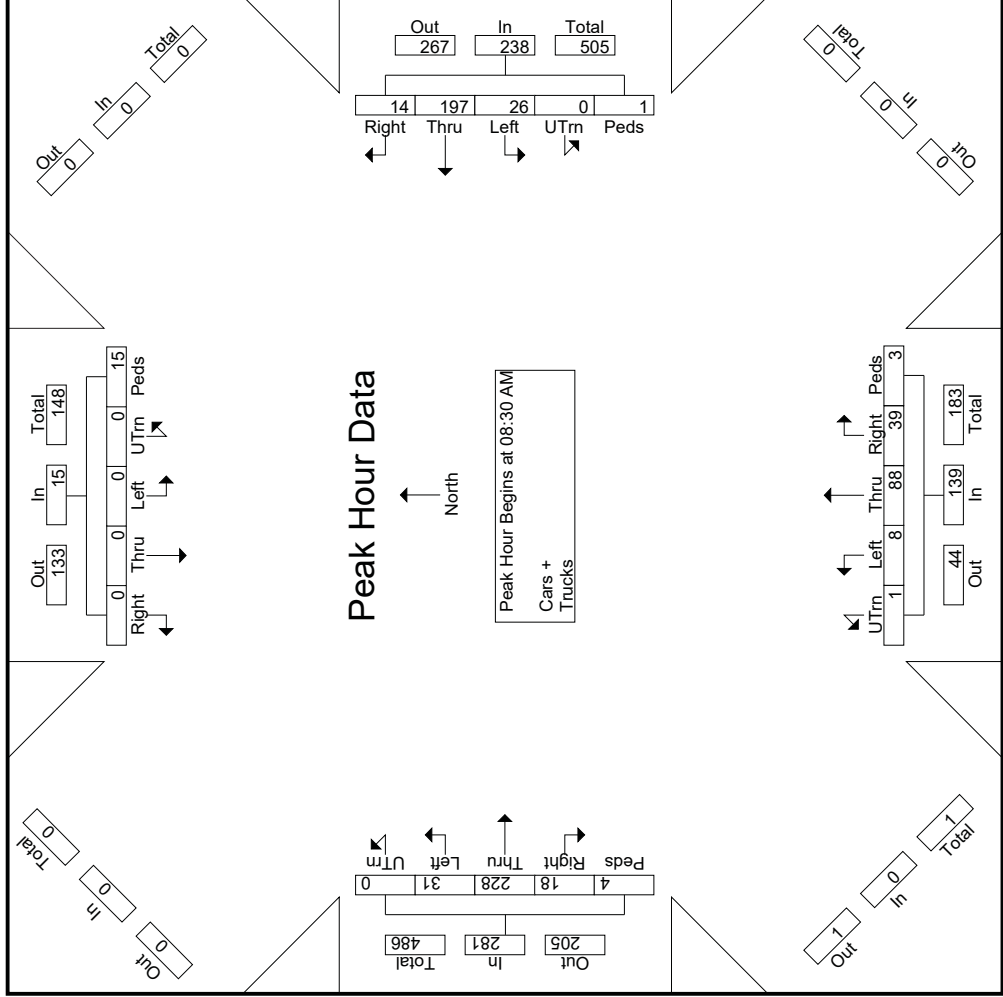
Start Time	Southbound			Westbound			Northbound			Eastbound			Int. Total								
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left		Thru	Right	Peds					
03:15 PM	0	0	0	0	1	0	4	28	6	0	0	2	11	2	0	0	6	26	1	1	88
03:30 PM	0	0	0	0	1	0	4	22	9	1	0	1	13	5	0	1	5	23	1	0	86
03:45 PM	0	0	0	0	0	0	5	23	4	0	0	2	13	5	0	0	8	33	4	0	97
Total	0	0	0	0	3	0	15	91	23	1	0	5	52	18	0	1	24	105	9	1	348
04:00 PM	0	0	0	0	0	0	1	32	4	0	0	2	13	7	0	0	4	31	4	2	100
04:15 PM	0	0	0	0	0	0	4	24	11	0	0	3	12	2	0	0	14	29	3	0	102
04:30 PM	0	0	0	0	0	0	3	28	11	0	0	5	10	4	1	0	3	37	2	0	104
04:45 PM	0	0	0	0	0	0	2	24	13	0	1	1	17	4	0	0	7	37	2	0	108
Total	0	0	0	0	0	0	10	108	39	0	1	11	52	17	1	0	28	134	11	2	414
05:00 PM	0	0	0	0	2	0	2	40	7	0	0	3	16	6	0	0	9	27	8	0	120
05:15 PM	0	0	0	0	1	1	8	27	7	0	0	0	12	8	0	0	4	19	0	0	87
05:30 PM	0	0	0	0	0	0	3	29	12	0	0	1	20	6	0	0	3	23	3	0	100
05:45 PM	0	0	0	0	0	0	1	43	3	0	0	3	17	4	0	0	5	32	6	1	115
Total	0	0	0	0	3	1	14	139	29	0	0	7	65	24	0	0	21	101	17	1	422
06:00 PM	0	0	0	0	2	0	2	16	12	0	0	3	14	6	0	0	3	33	6	1	98
06:15 PM	0	0	0	0	0	0	4	30	3	0	0	2	8	4	1	0	7	25	7	0	91
06:30 PM	0	0	0	0	2	0	5	27	4	0	0	4	18	2	0	0	10	27	4	1	104
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	4	0	11	73	19	0	0	9	40	12	1	0	20	85	17	2	293
Grand Total	0	1	0	0	45	2	211	1420	325	12	2	118	688	305	12	2	341	1447	146	20	5097
Approch %	0	2.2	0	0	97.8	0.1	10.7	72.1	16.5	0.6	0.2	10.5	61.2	27.1	1.1	0.1	17.4	74	7.5	1	
Total %	0	0	0	0	0.9	0	4.1	27.9	6.4	0.2	0	2.3	13.5	6	0.2	0	6.7	28.4	2.9	0.4	
Cars +	0	0	0	0	42	2	211	1399	319	9	2	117	642	269	11	2	335	1422	144	18	4944
% Cars +	0	0	0	0	93.3	100	100	98.5	98.2	75	100	99.2	93.3	88.2	91.7	100	98.2	98.3	98.6	90	97
Trucks	0	1	0	0	3	0	0	21	6	3	0	1	46	36	1	0	6	25	2	2	153
% Trucks	0	100	0	0	6.7	0	0	1.5	1.8	25	0	0.8	6.7	11.8	8.3	0	1.8	1.7	1.4	10	3

Stonebrooke Engineering  
 12279 Nicollet Avenue  
 Burnsville, MN 55337





Start Time	Southbound					Westbound					Northbound					Eastbound									
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 01:00 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 08:30 AM																									
08:30 AM	0	0	0	0	5	5	0	6	52	5	0	63	0	4	27	10	1	42	0	9	51	4	3	67	177
08:45 AM	0	0	0	0	5	5	0	7	43	4	0	54	0	1	15	4	1	21	0	5	60	7	1	73	153
09:00 AM	0	0	0	0	3	3	0	6	49	3	1	59	0	2	21	18	1	42	0	7	57	4	0	68	172
09:15 AM	0	0	0	0	2	2	0	7	53	2	0	62	1	1	25	7	0	34	0	10	60	3	0	73	171
Total Volume	0	0	0	0	15	15	0	26	197	14	1	238	1	8	88	39	3	139	0	31	228	18	4	281	673
% App. Total	0	0	0	0	100	100	0	10.9	82.8	5.9	0.4	100	0.7	5.8	63.3	28.1	2.2	82.7	0	11	81.1	6.4	1.4	96.2	95.1
PHF	.000	.000	.000	.000	.750	.750	.000	.929	.929	.700	.250	.944	.250	.500	.815	.542	.750	.827	.000	.775	.950	.643	.333	.962	.951



Start Time	Southbound					Westbound					Northbound					Eastbound									
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:15 PM to 06:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:15 PM																									
04:15 PM	0	0	0	0	0	0	0	4	24	11	0	39	0	3	12	2	0	17	0	14	29	3	0	46	102
04:30 PM	0	0	0	0	0	0	3	28	11	0	42	0	5	10	4	1	20	0	3	37	2	0	42	104	
04:45 PM	0	0	0	0	0	0	2	24	13	0	39	1	1	17	4	0	23	0	7	37	2	0	46	108	
05:00 PM	0	0	0	0	2	2	2	40	7	0	49	0	3	16	6	0	25	0	9	27	8	0	44	120	
Total Volume	0	0	0	0	2	2	11	116	42	0	169	1	12	55	16	1	85	0	33	130	15	0	178	434	
% App. Total	0	0	0	0	100	0	6.5	68.6	24.9	0	0	1.2	14.1	64.7	18.8	1.2	0	18.5	73	8.4	0	0	0	904	
PHF	.000	.000	.000	.000	.250	.250	.688	.725	.808	.000	.862	.250	.600	.809	.667	.250	.850	.000	.589	.878	.469	.000	.967	.904	

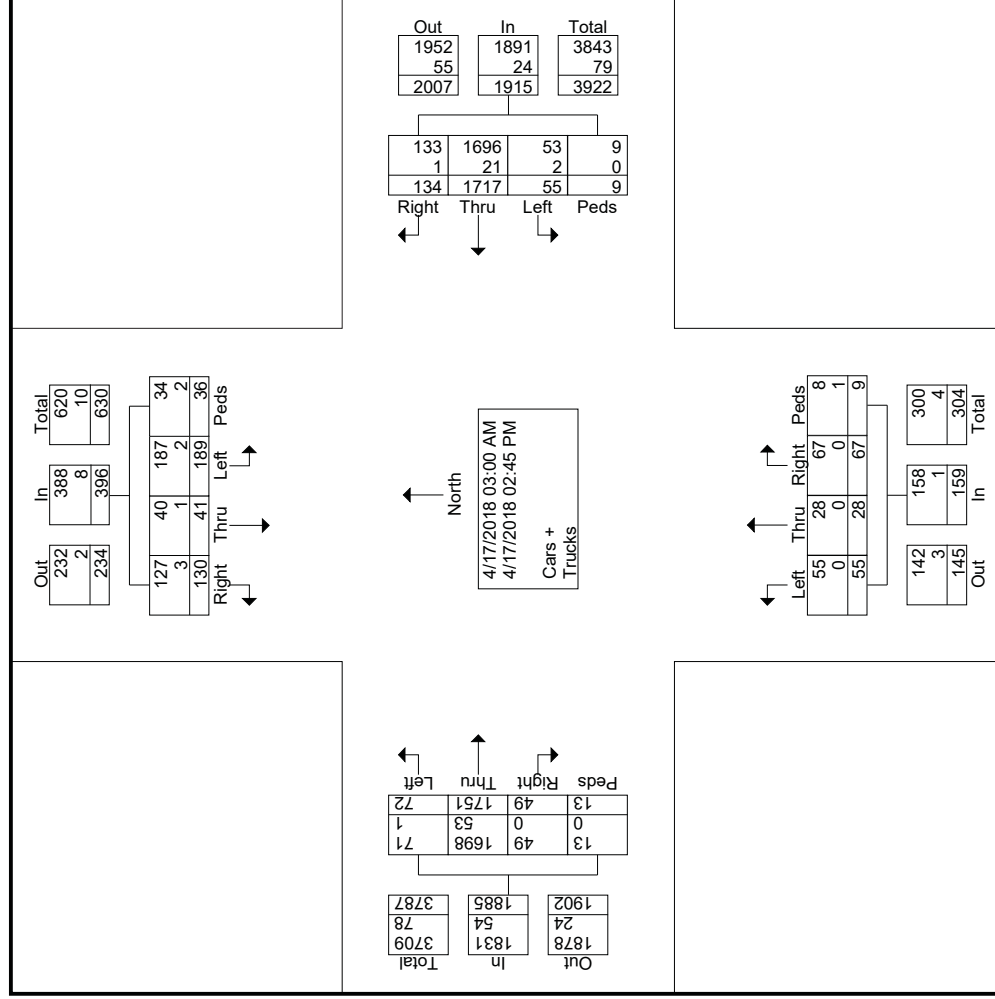


Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
	Peds			Peds			Peds			Peds			
03:00 AM	5	0	2	0	31	1	0	1	1	2	4	1	0
03:15 AM	5	2	8	2	37	6	0	0	0	1	3	41	0
03:30 AM	12	2	5	1	60	4	0	1	0	0	3	42	2
03:45 AM	5	3	1	4	50	5	2	0	2	3	1	43	0
Total	27	7	16	7	178	16	2	2	3	6	11	166	5
04:00 AM	1	0	4	2	55	4	0	1	0	0	4	45	0
04:15 AM	7	2	2	0	54	1	0	1	0	0	1	42	0
04:30 AM	12	1	6	1	47	4	1	0	0	1	1	71	3
04:45 AM	7	2	2	0	54	5	1	0	0	3	1	65	3
Total	27	5	14	3	210	14	2	2	0	4	7	223	6
05:00 AM	12	1	5	2	51	5	0	1	1	1	2	78	3
05:15 AM	5	3	4	2	57	4	0	0	1	2	2	63	5
05:30 AM	3	2	3	1	43	2	0	0	1	3	3	50	5
05:45 AM	8	2	7	1	36	2	0	1	3	2	2	50	1
Total	28	8	19	6	187	13	0	2	6	8	9	241	14
06:00 AM	10	1	2	1	38	4	0	1	1	2	4	32	2
06:15 AM	3	2	4	1	44	3	0	3	1	1	3	39	2
06:30 AM	5	1	1	1	30	0	0	1	3	1	6	25	0
06:45 AM	2	1	6	2	27	1	0	1	4	1	1	41	0
Total	20	5	13	5	139	8	0	6	9	5	14	137	4
07:00 AM	0	0	2	0	20	3	0	0	0	1	0	29	0
07:15 AM	0	0	1	2	29	0	0	3	1	2	1	34	1
07:30 AM	4	0	3	4	45	1	0	5	0	2	0	51	0
07:45 AM	0	1	1	1	68	4	0	4	0	7	0	48	1
Total	4	1	7	7	162	8	0	12	1	12	1	162	2
08:00 AM	1	0	0	0	44	3	1	0	0	3	0	57	0
08:15 AM	2	1	2	0	37	3	0	3	1	3	0	43	1
08:30 AM	8	0	3	0	34	10	0	0	0	2	2	47	1
08:45 AM	3	1	1	0	36	2	1	1	0	2	0	31	0
Total	14	2	6	0	151	18	2	4	1	10	2	178	2
09:00 AM	1	0	2	1	39	6	0	0	0	1	1	24	0
09:15 AM	3	0	0	0	28	5	0	2	1	0	2	21	1
09:30 AM	1	0	2	0	22	2	0	0	0	0	0	26	0
09:45 AM	4	0	3	0	37	5	1	0	0	1	0	19	2
Total	9	0	7	3	126	18	1	2	1	2	3	90	3

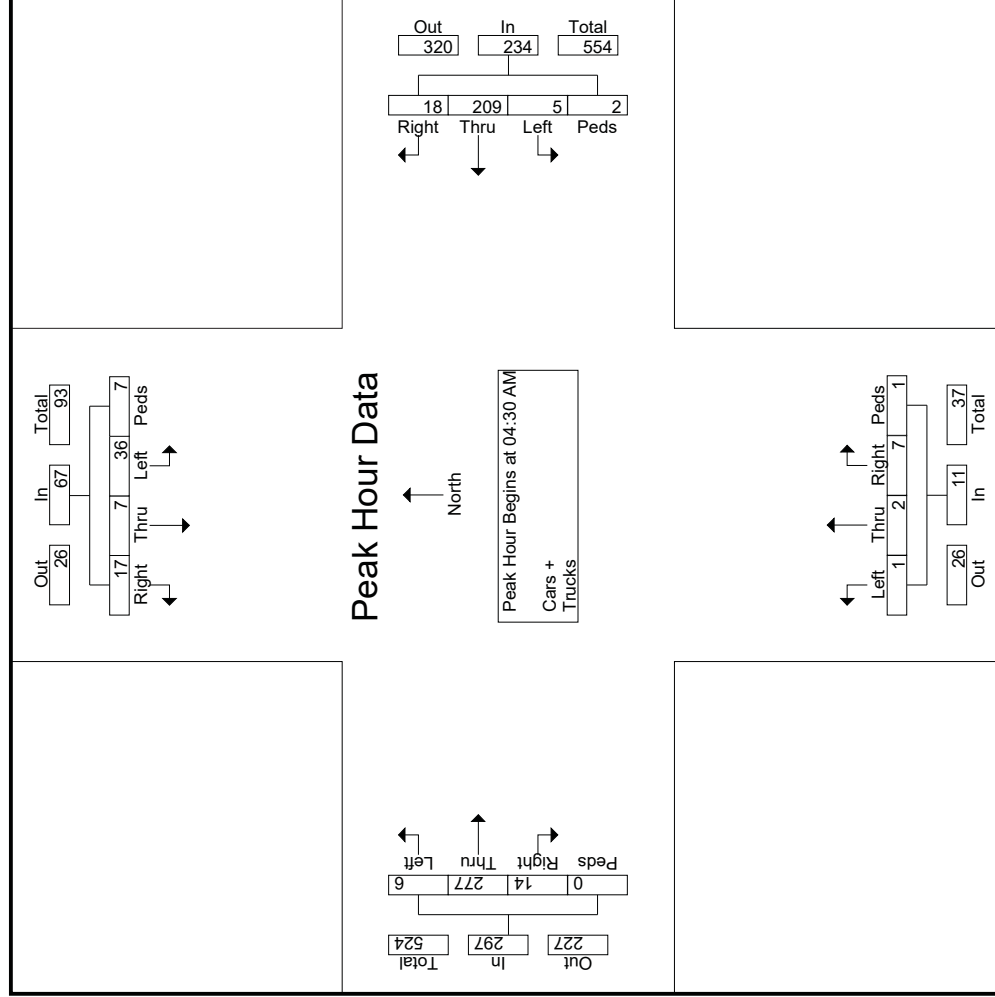
Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound							
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total	
10:00 AM	1	0	1	1	19	2	1	1	0	0	0	0	1	18	1	0	46
10:15 AM	1	0	3	1	29	3	0	0	1	0	0	0	3	29	1	0	73
10:30 AM	3	2	1	2	27	0	1	1	0	1	1	0	3	26	1	0	70
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	2	5	4	75	5	1	2	1	1	1	1	7	73	3	0	189
11:00 AM	5	1	1	0	19	2	0	1	4	0	0	0	0	32	0	0	68
11:15 AM	3	1	4	4	28	2	0	0	1	0	0	0	2	32	1	0	80
11:30 AM	5	1	2	2	30	3	0	0	3	0	0	0	1	34	1	0	85
11:45 AM	4	0	6	2	27	3	0	1	3	0	0	0	0	39	1	0	87
Total	17	3	13	6	104	10	0	2	11	0	0	0	3	137	3	0	320
12:00 PM	3	0	2	2	30	3	0	1	1	1	1	1	1	37	0	1	84
12:15 PM	4	1	1	4	36	3	0	0	0	0	0	0	4	21	3	0	78
12:30 PM	2	2	1	2	31	2	0	0	4	0	0	0	3	37	2	1	90
12:45 PM	0	0	1	0	33	2	0	1	2	0	0	0	1	36	1	0	80
Total	9	3	5	8	130	10	0	2	7	1	1	1	9	131	6	2	332
01:00 PM	3	0	3	2	39	0	0	0	0	0	0	0	2	30	1	0	84
01:15 PM	5	1	5	0	40	2	0	0	0	0	0	0	0	28	0	0	82
01:30 PM	6	1	3	1	34	4	0	1	0	0	0	0	1	33	0	0	84
01:45 PM	3	1	5	0	40	2	1	2	0	0	0	0	1	32	0	1	89
Total	17	3	16	3	153	8	1	6	0	0	0	0	4	123	1	1	339
02:00 PM	2	0	2	1	29	1	0	0	1	0	0	0	1	36	0	0	73
02:15 PM	3	1	4	1	36	2	0	0	0	0	0	0	1	24	0	0	74
02:30 PM	7	1	3	1	37	3	0	1	1	0	0	0	0	30	0	0	85
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	12	2	9	3	102	6	0	1	1	1	1	0	2	90	0	0	232
Grand Total	189	41	130	55	1717	134	9	55	28	67	9	72	72	1751	49	13	4355
Approch %	47.7	10.4	32.8	2.9	89.7	7	0.5	34.6	17.6	42.1	5.7	3.8	3.8	92.9	2.6	0.7	
Total %	4.3	0.9	3	1.3	39.4	3.1	0.2	1.3	0.6	1.5	0.2	1.7	1.7	40.2	1.1	0.3	
Cars +	187	40	127	53	1696	133	9	55	28	67	8	71	71	1698	49	13	4268
% Cars +	98.9	97.6	97.7	94.4	98.8	99.3	100	100	100	100	88.9	98.6	98.6	97	100	100	98
Trucks	2	1	3	2	21	1	0	0	0	0	1	1	1	53	0	0	87
% Trucks	1.1	2.4	2.3	3.6	1.2	0.7	0	0	0	0	11.1	1.4	1.4	3	0	0	2

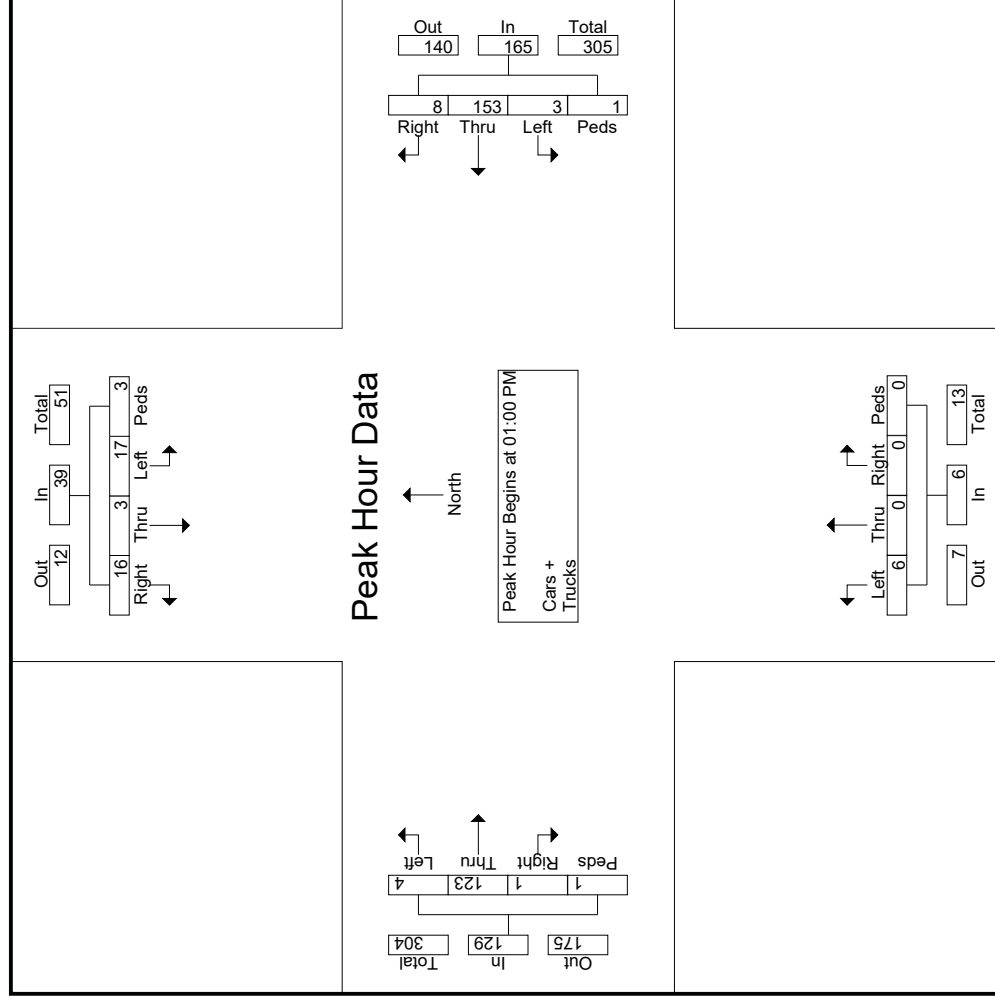


Start Time	Southbound				Westbound				Northbound				Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 AM																					
04:30 AM	12	1	6	1	20	1	47	4	1	53	0	0	1	0	1	1	71	3	0	75	149
04:45 AM	7	2	2	4	15	0	54	5	1	60	0	0	3	1	4	1	65	3	0	69	148
05:00 AM	12	1	5	1	19	2	51	5	0	58	1	1	1	0	3	2	78	3	0	83	163
05:15 AM	5	3	4	1	13	2	57	4	0	63	0	1	2	0	3	2	63	5	0	70	149
Total Volume	36	7	17	7	67	5	209	18	2	234	1	2	7	1	11	6	277	14	0	297	609
% App. Total	53.7	10.4	25.4	10.4	10.4	2.1	89.3	7.7	0.9	9.1	9.1	18.2	63.6	9.1	688	2	93.3	4.7	0	895	934
PHF	.750	.583	.708	.438	.838	.625	.917	.900	.500	.929	.250	.500	.583	.250	.688	.750	.888	.700	.000	.895	.934





Start Time	Southbound				Westbound				Northbound				Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	3	0	3	1	7	2	39	0	0	41	3	0	0	0	3	2	30	1	0	33	84
01:15 PM	5	1	5	1	12	0	40	2	0	42	0	0	0	0	0	0	28	0	0	28	82
01:30 PM	6	1	3	0	10	1	34	4	0	39	1	0	0	0	1	1	33	0	0	34	84
01:45 PM	3	1	5	1	10	0	40	2	1	43	2	0	0	0	2	1	32	0	1	34	89
Total Volume	17	3	16	3	39	3	153	8	1	165	6	0	0	0	6	4	123	1	1	129	339
% App. Total	43.6	7.7	41	7.7	81.3	1.8	92.7	4.8	0.6	95.9	100	0	0	0	500	3.1	95.3	0.8	0.8	949	952
PHF	.708	.750	.800	.750	.813	.375	.956	.500	.250	.959	.500	.000	.000	.000	.500	.500	.932	.250	.250	.949	.952

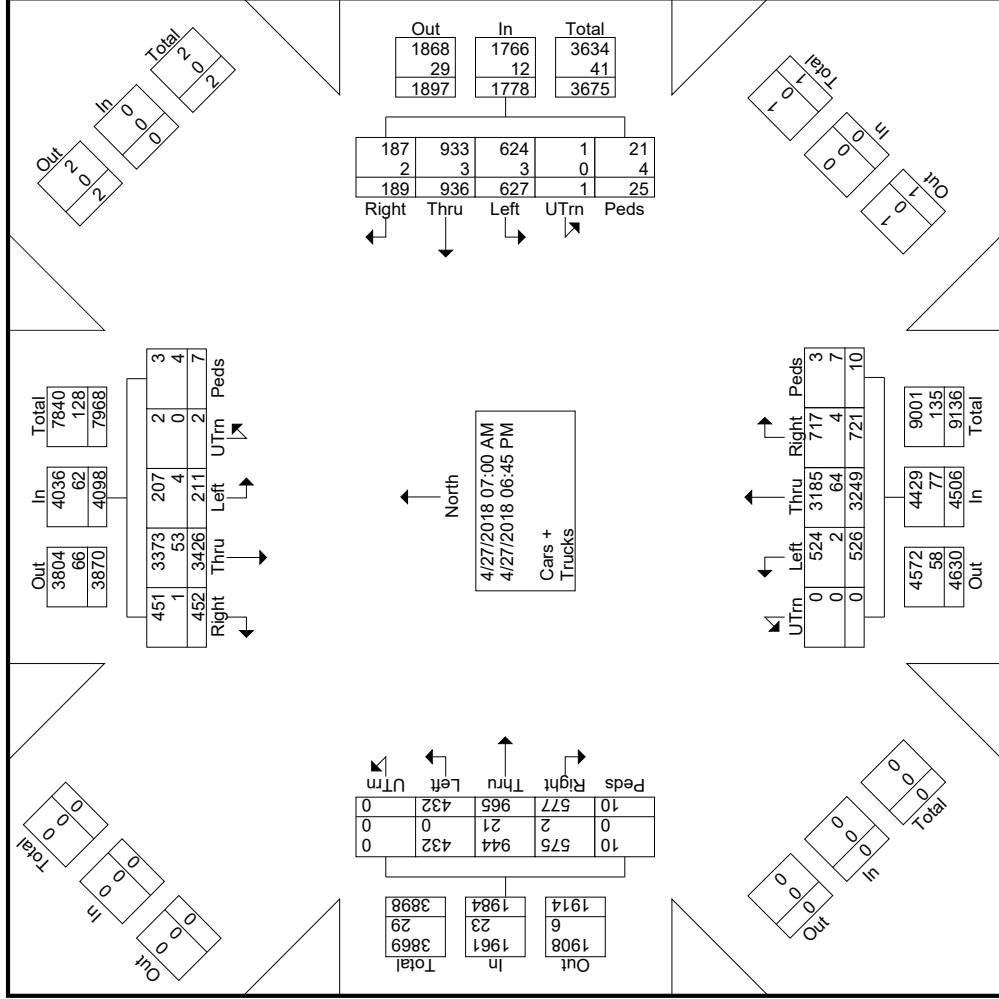


Groups Printed- Cars + - Trucks

Start Time	Southbound				Westbound				Northbound				Eastbound								
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	4	45	0	0	0	11	16	3	0	0	8	29	10	0	0	7	22	10	0	165
07:15 AM	0	4	61	7	0	0	12	16	1	0	0	7	57	5	0	0	8	23	11	0	212
07:30 AM	0	3	94	10	0	0	19	28	7	0	0	16	109	16	0	0	18	38	20	0	378
07:45 AM	0	3	94	17	0	0	22	33	8	1	0	20	111	22	2	0	16	30	7	0	386
Total	0	14	294	34	0	0	64	93	19	1	0	51	306	53	2	0	49	113	48	0	1141
08:00 AM	0	5	59	10	0	0	10	20	3	0	0	11	39	10	0	0	6	24	8	0	205
08:15 AM	0	6	45	10	0	0	13	10	3	0	0	6	34	10	0	0	4	11	7	0	159
08:30 AM	0	4	50	3	0	0	14	15	0	0	0	8	54	12	0	0	11	15	9	0	195
08:45 AM	0	4	56	7	0	0	18	16	2	1	0	17	68	14	1	0	5	14	9	0	232
Total	0	19	210	30	0	0	55	61	8	1	0	42	195	46	1	0	26	64	33	0	791
09:00 AM	0	1	54	2	0	0	9	12	5	2	0	4	49	9	0	0	3	14	5	0	169
09:15 AM	0	5	45	2	0	0	10	23	2	0	0	10	51	15	0	0	4	9	2	0	178
09:30 AM	0	2	66	8	0	0	12	24	5	0	0	9	64	10	0	0	7	16	7	0	230
09:45 AM	0	2	57	5	0	0	16	23	6	0	0	14	57	19	0	0	5	15	9	0	228
Total	0	10	222	17	0	0	47	82	18	2	0	37	221	53	0	0	19	54	23	0	805
10:00 AM	0	4	37	6	0	0	8	23	4	0	0	15	45	13	0	0	6	18	8	0	187
10:15 AM	0	2	58	6	0	0	11	15	1	1	0	14	48	19	0	0	3	18	10	0	206
10:30 AM	0	2	43	8	0	0	11	21	7	0	0	9	51	16	1	0	6	25	9	0	209
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	8	138	20	0	0	30	59	12	1	0	38	144	48	1	0	15	61	27	0	602
11:00 AM	0	4	67	5	0	0	6	28	6	0	0	7	61	13	0	0	10	25	11	0	243
11:15 AM	0	4	64	10	0	0	21	20	2	1	0	10	58	15	0	0	12	18	5	0	241
11:30 AM	0	3	98	2	0	0	22	29	6	0	0	5	78	19	0	0	4	26	15	0	307
11:45 AM	0	7	91	5	0	0	28	28	1	0	0	9	87	16	1	0	8	26	17	0	324
Total	0	18	320	22	0	0	77	105	15	1	0	31	284	63	1	0	34	95	48	0	1115
12:00 PM	0	4	82	8	0	0	19	29	6	0	0	8	80	13	1	0	8	21	11	1	291
12:15 PM	0	5	72	11	0	0	8	18	7	0	0	10	82	13	1	0	11	17	20	0	275
12:30 PM	0	6	81	11	1	0	14	20	7	0	0	11	72	24	0	0	13	22	14	0	296
12:45 PM	0	8	82	17	0	0	4	17	4	0	0	13	85	20	0	0	9	15	8	0	282
Total	0	23	317	47	1	0	45	84	24	0	0	42	319	70	2	0	41	75	53	1	1144
01:00 PM	0	8	89	12	0	0	22	16	4	0	0	11	72	15	0	0	8	20	18	0	295
01:15 PM	0	5	84	5	0	0	11	23	7	0	0	10	66	21	0	0	6	30	12	1	281
01:30 PM	0	4	81	11	0	0	14	19	4	1	0	9	78	10	0	0	5	26	18	0	280
01:45 PM	0	3	84	15	0	0	9	12	6	0	0	11	83	16	0	0	12	26	16	0	293
Total	0	20	338	43	0	0	56	70	21	1	0	41	299	62	0	0	31	102	64	1	1149

Groups Printed- Cars + - Trucks

Start Time	Southbound						Westbound						Northbound						Eastbound							
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
02:00 PM	0	2	69	7	0	0	17	25	3	0	0	4	74	25	0	0	11	22	17	0	0	11	22	17	0	276
02:15 PM	0	9	78	8	0	0	21	22	2	0	0	22	75	19	0	0	5	20	9	0	0	5	20	9	0	290
02:30 PM	0	4	88	12	0	0	16	17	4	0	0	10	80	16	0	0	5	23	17	0	0	5	23	17	0	292
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	15	235	27	0	0	54	64	9	0	0	36	229	60	0	0	21	65	43	0	0	21	65	43	0	858
03:00 PM	1	10	86	13	2	0	14	26	2	0	0	8	69	21	0	0	11	22	13	2	0	11	22	13	2	300
03:15 PM	0	0	105	12	0	0	0	0	2	0	0	17	73	3	0	0	23	2	24	0	0	23	2	24	0	261
03:30 PM	0	1	85	7	0	0	13	36	2	1	0	12	72	16	0	0	14	24	17	0	0	14	24	17	0	300
03:45 PM	0	7	92	16	1	0	11	23	1	0	0	16	91	14	0	0	15	20	16	0	0	15	20	16	0	323
Total	1	18	368	48	3	0	38	85	7	1	0	53	305	54	0	0	63	68	70	2	0	63	68	70	2	1184
04:00 PM	0	4	88	11	1	0	15	19	4	0	0	11	91	21	1	0	17	24	19	3	0	17	24	19	3	329
04:15 PM	0	4	89	9	0	0	15	16	13	16	0	8	71	8	0	0	14	31	21	0	0	14	31	21	0	315
04:30 PM	1	4	79	19	0	0	17	24	3	0	0	8	80	13	0	0	6	24	20	0	0	6	24	20	0	298
04:45 PM	0	6	92	15	1	0	18	28	3	1	0	24	92	18	0	0	17	30	16	2	0	17	30	16	2	363
Total	1	18	348	54	2	0	65	87	23	17	0	51	334	60	1	0	54	109	76	5	0	54	109	76	5	1305
05:00 PM	0	3	94	13	0	0	15	30	5	0	0	16	83	19	2	0	10	38	21	0	0	10	38	21	0	349
05:15 PM	0	11	69	14	1	0	13	24	3	0	0	29	92	17	0	0	10	32	17	0	0	10	32	17	0	332
05:30 PM	0	9	74	14	0	0	17	18	6	0	0	9	77	32	0	0	10	21	8	0	0	10	21	8	0	295
05:45 PM	0	3	87	14	0	0	13	22	4	0	0	6	95	23	0	0	8	18	8	0	0	8	18	8	0	301
Total	0	26	324	55	1	0	58	94	18	0	0	60	347	91	2	0	38	109	54	0	0	38	109	54	0	1277
06:00 PM	0	5	81	14	0	0	14	20	9	0	0	16	66	25	0	0	13	13	10	1	0	13	13	10	1	287
06:15 PM	0	0	93	25	0	0	4	3	0	0	0	10	69	7	0	0	8	2	12	0	0	8	2	12	0	233
06:30 PM	0	8	81	9	0	0	14	22	5	0	0	8	58	16	0	0	11	23	8	0	0	11	23	8	0	263
06:45 PM	0	9	57	7	0	0	6	7	1	0	0	10	73	13	0	0	9	12	8	0	0	9	12	8	0	212
Total	0	22	312	55	0	0	38	52	15	0	0	44	266	61	0	0	41	50	38	1	0	41	50	38	1	995
Grand Total	2	211	3426	452	7	1	627	936	189	25	0	526	3249	721	10	0	432	965	577	10	0	432	965	577	10	12366
Approch %	0	5.1	83.6	11	0.2	0.1	35.3	52.6	10.6	1.4	0	11.7	72.1	16	0.2	0	21.8	48.6	29.1	0.5	0	21.8	48.6	29.1	0.5	
Total %	0	1.7	27.7	3.7	0.1	0	5.1	7.6	1.5	0.2	0	4.3	26.3	5.8	0.1	0	3.5	7.8	4.7	0.1	0	3.5	7.8	4.7	0.1	
Cars +	2	207	3373	451	3	1	624	933	187	21	0	524	3185	717	3	0	432	944	575	10	0	432	944	575	10	12192
% Cars +	100	98.1	98.5	99.8	42.9	100	99.5	99.7	98.9	84	0	99.6	98	99.4	30	0	100	97.8	99.7	100	0	100	97.8	99.7	100	98.6
Trucks	0	4	53	1	4	0	3	3	2	4	0	2	64	4	7	0	0	21	2	0	0	0	21	2	0	174
% Trucks	0	1.9	1.5	0.2	57.1	0	0.5	0.3	1.1	16	0	0.4	2	0.6	70	0	0	2.2	0.3	0	0	0	2.2	0.3	0	1.4

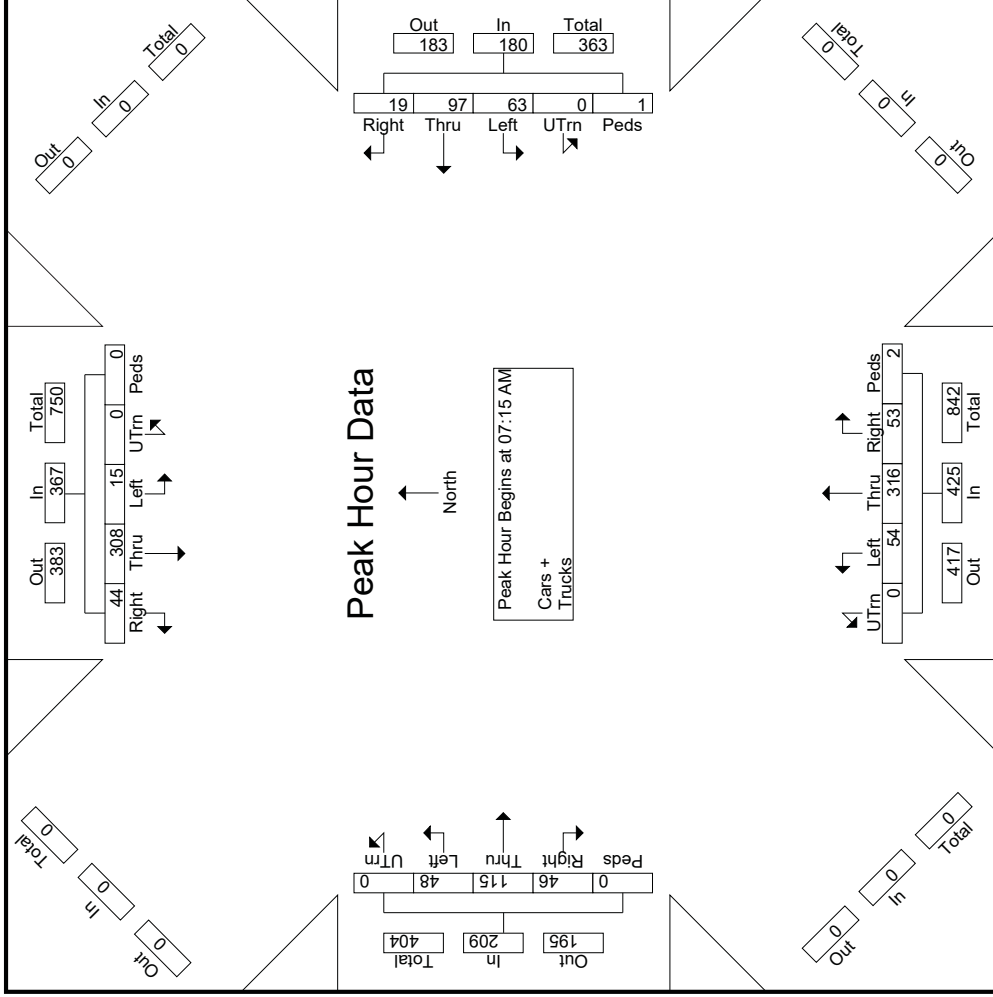


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 2  
Site Code :  
Start Date : 4/27/2018  
Page No : 4

Start Time	Southbound					Westbound					Northbound					Eastbound									
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:15 AM																									
07:15 AM	0	4	61	7	0	72	0	12	16	1	0	29	0	7	57	5	0	69	0	8	23	11	0	42	212
07:30 AM	0	3	94	10	0	107	0	19	28	7	0	54	0	16	109	16	0	141	0	18	38	20	0	76	378
07:45 AM	0	3	94	17	0	114	0	22	33	8	1	64	0	20	111	22	2	155	0	16	30	7	0	53	386
08:00 AM	0	5	59	10	0	74	0	10	20	3	0	33	0	11	39	10	0	60	0	6	24	8	0	38	205
Total Volume	0	15	308	44	0	367	0	63	97	19	1	180	0	54	316	53	2	425	0	48	115	46	0	209	1181
% App. Total	0	4.1	83.9	12	0		0	35	53.9	10.6	0.6		0	12.7	74.4	12.5	0.5		0	23	55	22	0		
PHF	.000	.750	.819	.647	.000	.805	.000	.716	.735	.594	.250	.703	.000	.675	.712	.602	.250	.685	.000	.667	.757	.575	.000	.688	.765



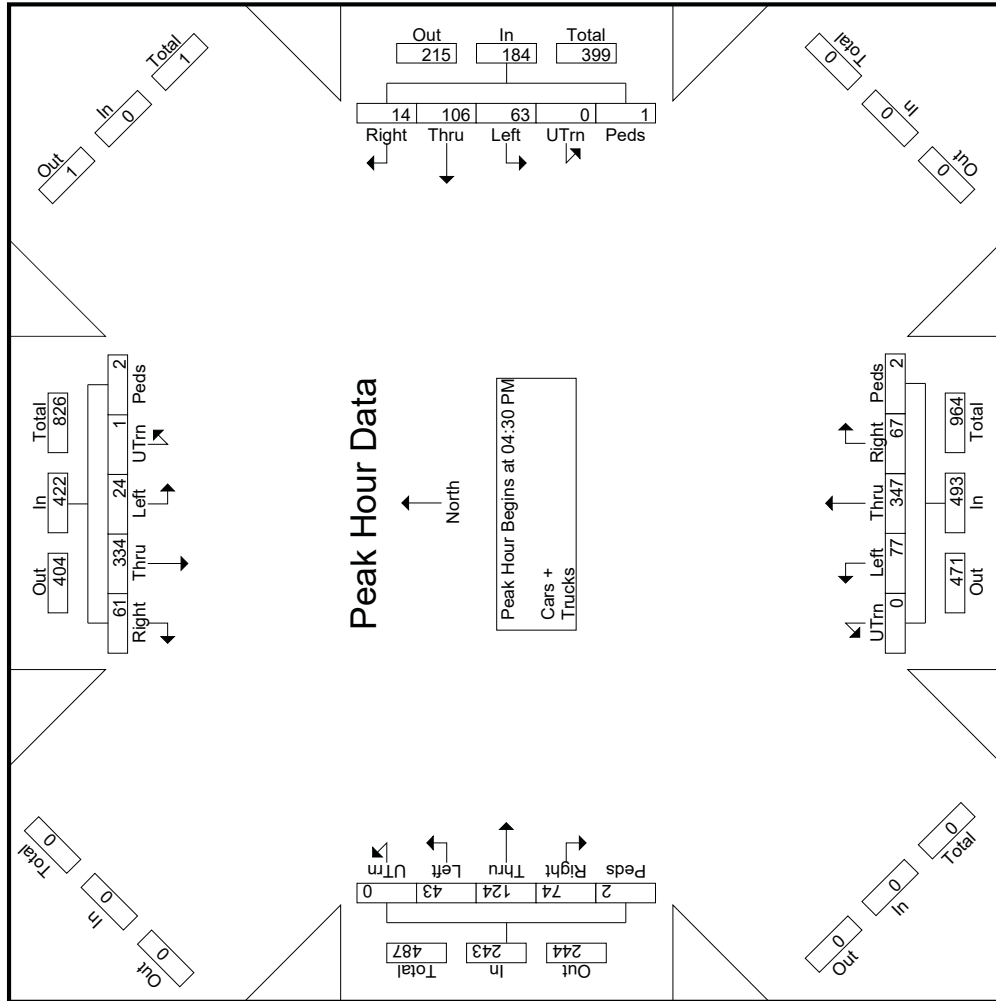


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

File Name : Not Named 2  
Site Code :  
Start Date : 4/27/2018  
Page No : 6

Start Time	Southbound					Westbound					Northbound					Eastbound									
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:30 PM																									
04:30 PM	1	4	79	19	0	103	0	17	24	3	0	44	0	8	80	13	0	101	0	6	24	20	0	50	298
04:45 PM	0	6	92	15	1	114	0	18	28	3	1	50	0	24	92	18	0	134	0	17	30	16	2	65	363
05:00 PM	0	3	94	13	0	110	0	15	30	5	0	50	0	16	83	19	2	120	0	10	38	21	0	69	349
05:15 PM	0	11	69	14	1	95	0	13	24	3	0	40	0	29	92	17	0	138	0	10	32	17	0	59	332
Total Volume	1	24	334	61	2	422	0	63	106	14	1	184	0	77	347	67	2	493	0	43	124	74	2	243	1342
% App. Total	0.2	5.7	79.1	14.5	0.5		0	34.2	57.6	7.6	0.5		0	15.6	70.4	13.6	0.4		0	17.7	51	30.5	0.8		
PHF	.250	.545	.888	.803	.500	.925	.000	.875	.883	.700	.250	.920	.000	.664	.943	.882	.250	.893	.000	.632	.816	.881	.250	.880	.924

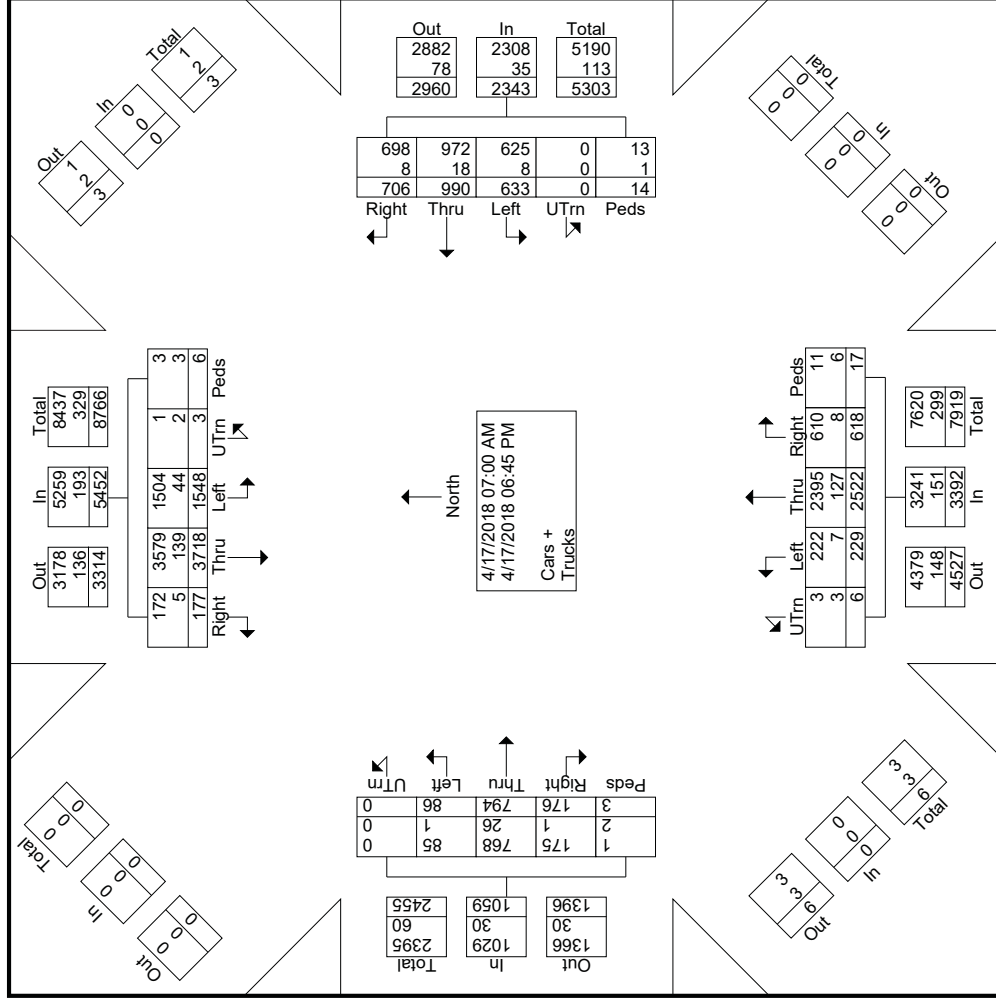


Groups Printed- Cars + - Trucks

Start Time	Southbound			Westbound			Northbound			Eastbound											
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	8	59	1	1	0	41	38	13	1	0	3	60	7	0	0	2	41	19	0	294
07:15 AM	0	22	89	1	0	0	28	23	17	0	0	7	80	4	0	0	2	39	7	0	319
07:30 AM	0	28	88	6	0	0	48	41	45	0	0	10	131	4	0	0	2	29	3	0	435
07:45 AM	0	49	88	2	1	0	27	40	50	1	0	5	138	8	0	0	7	41	8	0	465
Total	0	107	324	10	2	0	144	142	125	2	0	25	409	23	0	0	13	150	37	0	1513
08:00 AM	2	32	58	4	3	0	17	26	27	0	0	8	112	17	0	0	3	34	6	0	349
08:15 AM	1	35	64	3	0	0	12	28	13	0	0	4	54	8	0	0	7	30	1	0	260
08:30 AM	0	48	49	5	0	0	13	23	23	0	0	3	40	11	0	0	1	33	0	0	249
08:45 AM	0	31	74	3	0	0	12	38	15	0	0	7	48	11	0	0	1	26	5	0	271
Total	3	146	245	15	3	0	54	115	78	0	0	22	254	47	0	0	12	123	12	0	1129
09:00 AM	0	16	47	1	0	0	11	25	9	0	0	10	41	7	0	0	3	18	3	0	191
09:15 AM	0	19	50	5	0	0	5	22	15	4	0	5	33	5	0	0	0	13	7	0	183
09:30 AM	0	18	60	1	0	0	8	13	10	0	0	2	34	6	0	0	1	23	5	0	181
09:45 AM	0	18	50	3	0	0	11	15	10	0	0	9	43	1	0	0	3	26	5	0	194
Total	0	71	207	10	0	0	35	75	44	4	0	26	151	19	0	0	7	80	20	0	749
10:00 AM	0	15	82	0	0	0	2	13	13	0	0	3	28	9	0	0	3	18	2	0	188
10:15 AM	0	15	43	3	0	0	9	15	5	0	0	2	44	4	0	0	2	23	4	0	171
10:30 AM	0	20	64	3	0	0	7	10	7	0	0	1	49	4	3	0	3	18	5	0	194
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	50	189	6	0	0	18	38	25	0	2	6	121	17	3	0	8	59	11	0	553
11:00 AM	0	13	54	2	0	0	13	8	18	0	0	3	39	12	1	0	2	26	5	0	196
11:15 AM	0	25	70	3	0	0	7	12	4	0	0	9	40	10	0	0	1	19	5	0	205
11:30 AM	0	33	58	6	1	0	8	25	10	1	0	6	51	12	0	0	3	33	5	0	252
11:45 AM	0	24	76	4	0	0	14	9	14	0	0	8	44	10	0	0	1	27	7	0	238
Total	0	95	258	15	1	0	42	54	46	1	0	26	174	44	1	0	7	105	22	0	891
12:00 PM	0	43	82	5	0	0	7	21	9	0	0	4	57	10	1	0	1	29	3	0	272
12:15 PM	0	34	82	2	0	0	5	22	23	0	0	4	48	12	0	0	3	19	2	0	256
12:30 PM	0	33	79	6	0	0	14	17	19	0	0	2	44	2	0	0	2	22	7	0	247
12:45 PM	0	28	84	3	0	0	14	14	15	0	0	7	35	10	0	0	4	25	9	0	248
Total	0	138	327	16	0	0	40	74	66	0	0	17	184	34	1	0	10	95	21	0	1023
01:00 PM	0	25	99	6	0	0	12	24	9	0	0	3	48	12	0	0	3	33	8	2	284
01:15 PM	0	36	82	1	0	0	6	12	9	0	0	5	46	11	0	0	4	20	4	0	236
01:30 PM	0	19	69	2	0	0	11	16	16	0	1	2	58	12	0	0	4	25	3	0	238
01:45 PM	0	26	83	6	0	0	11	16	10	0	0	4	44	9	0	0	4	31	9	0	253
Total	0	106	333	15	0	0	40	68	44	0	1	14	196	44	0	0	15	109	24	2	1011

Groups Printed- Cars + - Trucks

Start Time	Southbound						Westbound						Northbound						Eastbound							
	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	UTrn	Left	Thru	Right	Peds	Int. Total
02:00 PM	0	13	59	1	0	0	8	15	11	0	0	7	35	13	0	0	6	16	8	0	0	6	16	8	0	192
02:15 PM	0	27	103	5	0	0	5	14	10	0	0	1	43	15	0	0	5	27	14	0	0	5	27	14	0	269
02:30 PM	0	26	72	5	0	0	15	16	10	0	0	2	48	10	0	0	3	30	7	0	0	3	30	7	0	244
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	66	234	11	0	0	28	45	31	0	0	10	126	38	0	0	14	73	29	0	0	14	73	29	0	705
03:00 PM	0	19	59	6	0	0	13	21	11	1	0	4	75	15	0	0	0	0	0	0	0	0	0	0	0	224
03:15 PM	0	39	102	5	0	0	20	21	13	0	0	6	57	13	0	0	0	0	0	0	0	0	0	0	0	276
03:30 PM	0	63	141	6	0	0	18	33	11	0	1	7	47	13	0	0	0	0	0	0	0	0	0	0	0	340
03:45 PM	0	72	91	6	0	0	17	40	18	0	2	5	41	26	0	0	0	0	0	0	0	0	0	0	0	318
Total	0	193	393	23	0	0	68	115	53	1	3	22	220	67	0	0	0	0	0	0	0	0	0	0	0	1158
04:00 PM	0	41	106	6	0	0	14	48	24	0	0	14	67	13	2	0	0	0	0	0	0	0	0	0	0	335
04:15 PM	0	60	118	4	0	0	12	35	17	0	0	5	73	22	0	0	0	0	0	0	0	0	0	0	0	346
04:30 PM	0	52	106	4	0	0	16	30	20	0	0	5	50	54	0	0	0	0	0	0	0	0	0	0	0	337
04:45 PM	0	65	141	3	0	0	18	23	11	0	0	6	70	28	3	0	0	0	0	0	0	0	0	0	0	368
Total	0	218	471	17	0	0	60	136	72	0	0	30	260	117	5	0	0	0	0	0	0	0	0	0	0	1386
05:00 PM	0	67	139	6	0	0	10	19	22	1	0	1	78	17	1	0	0	0	0	0	0	0	0	0	0	361
05:15 PM	0	76	94	6	0	0	15	23	21	0	0	8	66	42	0	0	0	0	0	0	0	0	0	0	0	351
05:30 PM	0	48	103	4	0	0	17	27	25	0	0	4	61	27	1	0	0	0	0	0	0	0	0	0	0	317
05:45 PM	0	35	89	11	0	0	15	17	19	1	0	1	53	24	0	0	0	0	0	0	0	0	0	0	0	265
Total	0	226	425	27	0	0	57	86	87	2	0	14	258	110	2	0	0	0	0	0	0	0	0	0	0	1294
06:00 PM	0	39	97	6	0	0	10	12	12	0	0	9	53	20	1	0	0	0	0	0	0	0	0	0	1	260
06:15 PM	0	35	84	1	0	0	14	12	10	2	0	4	34	13	0	0	0	0	0	0	0	0	0	0	0	209
06:30 PM	0	26	70	4	0	0	15	8	10	2	0	2	36	10	4	0	0	0	0	0	0	0	0	0	0	187
06:45 PM	0	32	61	1	0	0	8	10	3	0	0	2	46	15	0	0	0	0	0	0	0	0	0	0	0	178
Total	0	132	312	12	0	0	47	42	35	4	0	17	169	58	5	0	0	0	0	0	0	0	0	0	1	834
Grand Total	3	1548	3718	177	6	0	633	990	706	14	6	229	2522	618	17	0	86	794	176	3	0	86	794	176	3	12246
Approch %	0.1	28.4	68.2	3.2	0.1	0	27	42.3	30.1	0.6	0.2	6.8	74.4	18.2	0.5	0	8.1	75	16.6	0.3	0	8.1	75	16.6	0.3	
Total %	0	12.6	30.4	1.4	0	0	5.2	8.1	5.8	0.1	0	1.9	20.6	5	0.1	0	0.7	6.5	1.4	0	0	0.7	6.5	1.4	0	
Cars +	1	1504	3579	172	3	0	625	972	698	13	3	222	2395	610	11	0	85	768	175	1	0	85	768	175	1	11837
% Cars +	33.3	97.2	96.3	97.2	50	0	98.7	98.2	98.9	92.9	50	96.9	95	98.7	64.7	0	98.8	96.7	99.4	33.3	0	98.8	96.7	99.4	33.3	96.7
Trucks	2	44	139	5	3	0	8	18	8	1	3	7	127	8	6	0	1	26	1	2	0	1	26	1	2	409
% Trucks	66.7	2.8	3.7	2.8	50	0	1.3	1.8	1.1	7.1	50	3.1	5	1.3	35.3	0	1.2	3.3	0.6	66.7	0	1.2	3.3	0.6	66.7	3.3

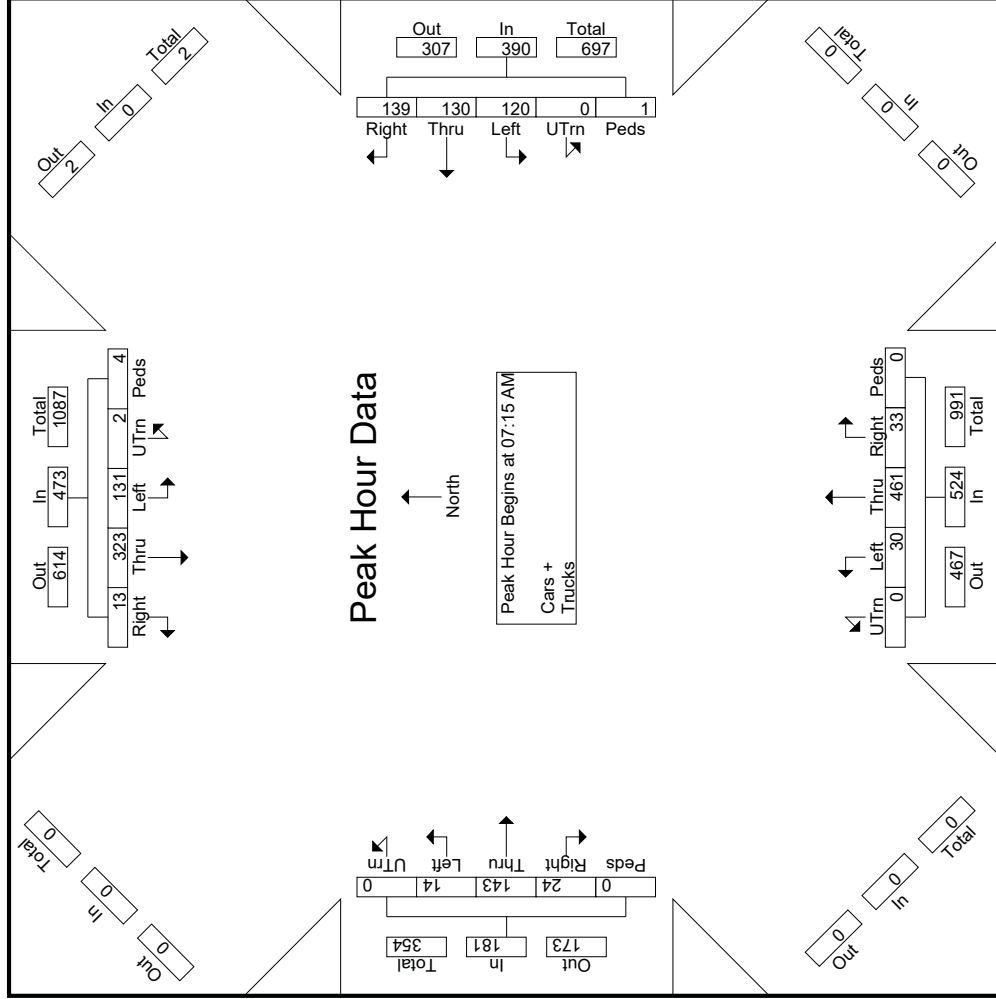


Stonebrooke Engineering

12279 Nicollet Avenue  
Burnsville, MN 55337

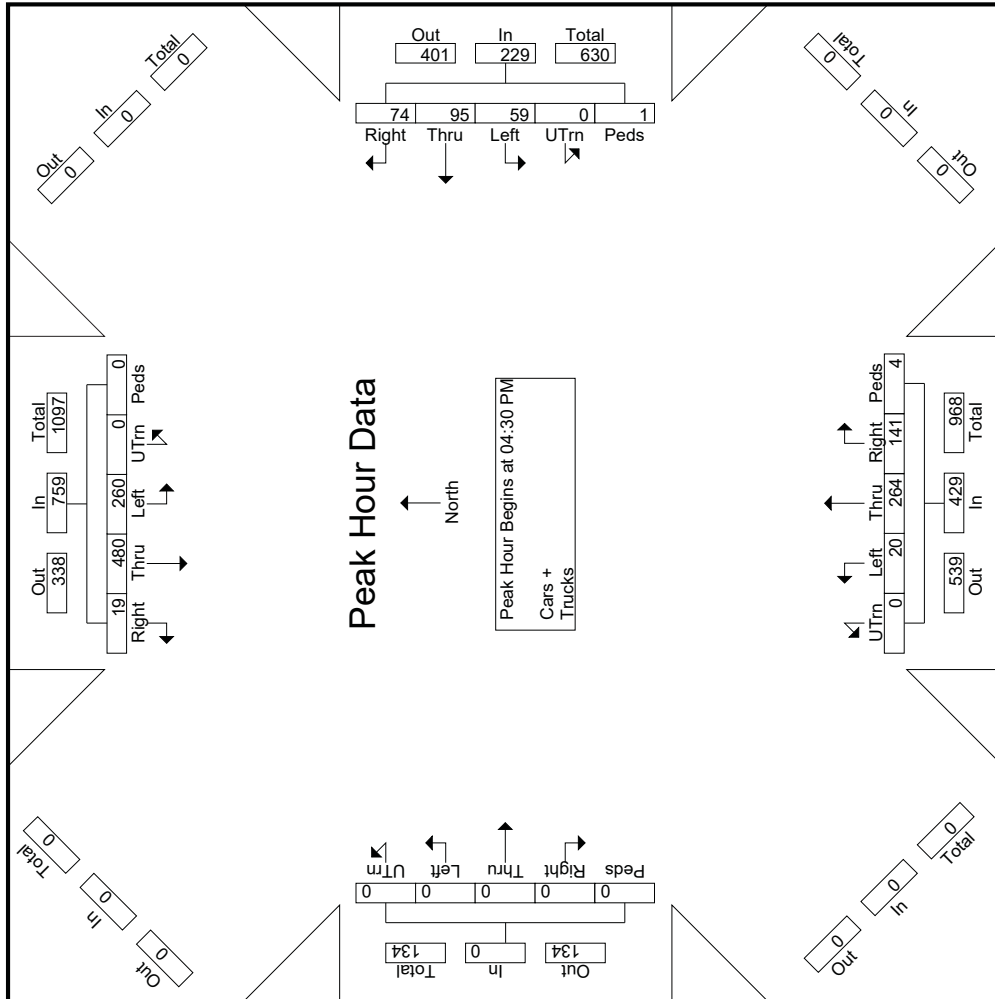
File Name : Not Named 2  
Site Code :  
Start Date : 4/17/2018  
Page No : 4

Start Time	Southbound					Westbound					Northbound					Eastbound									
	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:15 AM																									
07:15 AM	0	22	89	1	0	112	0	28	23	17	0	68	0	7	80	4	0	91	0	2	39	7	0	48	319
07:30 AM	0	28	88	6	0	122	0	48	41	45	0	134	0	10	131	4	0	145	0	2	29	3	0	34	435
07:45 AM	0	49	88	2	1	140	0	27	40	50	1	118	0	5	138	8	0	151	0	7	41	8	0	56	465
08:00 AM	2	32	58	4	3	99	0	17	26	27	0	70	0	8	112	17	0	137	0	3	34	6	0	43	349
Total Volume	2	131	323	13	4	473	0	120	130	139	1	390	0	30	461	33	0	524	0	14	143	24	0	181	1568
% App. Total	0.4	27.7	68.3	2.7	0.8		0	30.8	33.3	35.6	0.3		0	5.7	88	6.3	0		0	7.7	79	13.3	0		
PHF	.250	.668	.907	.542	.333	.845	.000	.625	.793	.695	.250	.728	.000	.750	.835	.485	.000	.868	.000	.500	.872	.750	.000	.808	.843









# Intersection Safety Screening

Intersection: 12th Ave & 4th Street S



Crash Data, 2011-2015.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	0
Property Damage	1
<b>Total Crashes</b>	<b>1</b>

Intersection Characteristics	
Entering Volume	7,850
Traffic Control	All stop
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$1,520

## Statewide Comparison

All Way Stop

Total Crash Rate	
Observed	0.07
Statewide Average	0.35
Critical Rate	0.79
<b>Critical Index</b>	<b>0.09</b>

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.57
Critical Rate	6.62
<b>Critical Index</b>	<b>0.00</b>

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.07 per MEV; this is 91% below the critical rate. Based on similar statewide intersections, an additional 11 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

# Intersection Safety Screening

Intersection: 12th Ave & 5th Street S



Crash Data, 2011-2015.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	0
Property Damage	1
<b>Total Crashes</b>	<b>1</b>

Intersection Characteristics	
Entering Volume	6,500
Traffic Control	All stop
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$1,520

## Statewide Comparison

All Way Stop

Total Crash Rate	
Observed	0.08
Statewide Average	0.35
Critical Rate	0.84
<b>Critical Index</b>	<b>0.10</b>

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.57
Critical Rate	7.60
<b>Critical Index</b>	<b>0.00</b>

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.08 per MEV; this is 90% below the critical rate. Based on similar statewide intersections, an additional 9 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

# Intersection Safety Screening

Intersection: 12th Ave & 8th Street S



Crash Data, 2011-2015.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	2
Possible Injury	7
Property Damage	25
<b>Total Crashes</b>	<b>34</b>

Intersection Characteristics	
Entering Volume	24,550
Traffic Control	Signals
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$222,200

## Statewide Comparison

Signals: high volume, low speed

Total Crash Rate	
Observed	0.76
Statewide Average	0.70
Critical Rate	1.03
<b>Critical Index</b>	<b>0.74</b>

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.76
Critical Rate	3.55
<b>Critical Index</b>	<b>0.00</b>

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.76 per MEV; this is 26% below the critical rate. Based on similar statewide intersections, an additional 13 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

# Intersection Safety Screening

Intersection: 12th Ave & 11th Street S



Crash Data, 2011-2015.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	1
Property Damage	1
<b>Total Crashes</b>	<b>2</b>

Intersection Characteristics	
Entering Volume	8,050
Traffic Control	All stop
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$18,120

## Statewide Comparison

All Way Stop

Total Crash Rate	
Observed	0.14
Statewide Average	0.35
Critical Rate	0.78
<b>Critical Index</b>	<b>0.18</b>

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.57
Critical Rate	6.50
<b>Critical Index</b>	<b>0.00</b>

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.14 per MEV; this is 82% below the critical rate. Based on similar statewide intersections, an additional 10 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

# Intersection Safety Screening

Intersection: 12th Ave & 14th Street S



Crash Data, 2011-2015.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	0
Property Damage	4
<b>Total Crashes</b>	<b>4</b>

Intersection Characteristics	
Entering Volume	5,675
Traffic Control	All stop
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$6,080

## Statewide Comparison

All Way Stop

Total Crash Rate	
Observed	0.39
Statewide Average	0.35
Critical Rate	0.87
<b>Critical Index</b>	<b>0.45</b>

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.57
Critical Rate	8.41
<b>Critical Index</b>	<b>0.00</b>

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.39 per MEV; this is 55% below the critical rate. Based on similar statewide intersections, an additional 6 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

# Intersection Safety Screening

Intersection: 12th Ave & 17th Street S



Crash Data, 2011-2015.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	1
Property Damage	0
<b>Total Crashes</b>	<b>1</b>

Intersection Characteristics	
Entering Volume	5,350
Traffic Control	Thru / stop
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$16,600

## Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.10
Statewide Average	0.18
Critical Rate	0.59
<b>Critical Index</b>	<b>0.17</b>

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.33
Critical Rate	7.79
<b>Critical Index</b>	<b>0.00</b>

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.10 per MEV; this is 83% below the critical rate. Based on similar statewide intersections, an additional 5 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

# Intersection Safety Screening

Intersection: 12th Ave & 20th Street S



Crash Data, 2011-2015.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	6
Property Damage	12
<b>Total Crashes</b>	<b>19</b>

Intersection Characteristics	
Entering Volume	17,475
Traffic Control	Signals
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$151,840

## Statewide Comparison

Signals: low volume, low speed

Total Crash Rate	
Observed	0.60
Statewide Average	0.52
Critical Rate	0.86
<b>Critical Index</b>	<b>0.70</b>

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.42
Critical Rate	3.47
<b>Critical Index</b>	<b>0.00</b>

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.60 per MEV; this is 30% below the critical rate. Based on similar statewide intersections, an additional 9 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.



# Intersection Safety Screening

Intersection: 12th Ave & Main SE



Crash Data, 2011-2015.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	4
Property Damage	5
<b>Total Crashes</b>	<b>10</b>

Intersection Characteristics	
Entering Volume	14,650
Traffic Control	Signals
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$108,000

## Statewide Comparison

Signals: low volume, low speed

Total Crash Rate	
Observed	0.37
Statewide Average	0.52
Critical Rate	0.89
<b>Critical Index</b>	<b>0.42</b>

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.42
Critical Rate	3.91
<b>Critical Index</b>	<b>0.00</b>

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.37 per MEV; this is 58% below the critical rate. Based on similar statewide intersections, an additional 14 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

3: 8th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.2	0.2
Total Del/Veh (s)	21.1	16.4	15.6	11.4	15.0

6: 4th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.1	0.1	0.2	0.1
Total Del/Veh (s)	6.1	6.6	6.6	6.6

9: 5th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1
Total Del/Veh (s)	6.7	4.3	6.2	5.7

12: 11th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.2	0.1
Total Del/Veh (s)	8.2	9.3	4.2	6.6	7.6

15: 14th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	6.4	7.0	5.4	6.5

19: 17th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)	2.1	1.7	4.1	5.7	2.3

22: 20th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.4	1.0	0.8
Total Del/Veh (s)	14.3	18.8	10.2	11.5	12.6

25: SE Main & 12th Avenue S Performance by approach

Approach	EB	WB	SE	NW	All
Denied Del/Veh (s)	0.0	2.2	1.2	0.5	1.1
Total Del/Veh (s)	23.8	15.5	11.2	16.3	15.4

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28: Elm Street & 12th Avenue S Performance by approach

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Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1	0.0
Total Del/Veh (s)	0.1	2.0	2.7	4.4	2.1

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Total Network Performance

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Denied Del/Veh (s)	0.6
Total Del/Veh (s)	18.7

3: 8th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.2	0.3	3.0	0.1	0.2
Total Del/Veh (s)	24.0	20.0	19.5	23.2	12.8	16.8	21.4	15.2	16.2	23.9	10.8	11.5

3: 8th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	15.0

6: 4th Street S & 12th Avenue S Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1	0.3	0.1	0.1	0.1
Total Del/Veh (s)	6.2	3.5	5.7	7.0	5.9	7.0	2.8	6.6

9: 5th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1
Total Del/Veh (s)	5.7	7.0	3.7	5.2	5.3	6.5	3.2	5.7

12: 11th Street S & 12th Avenue S Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
Total Del/Veh (s)	8.7	5.8	8.0	9.4	5.4	3.2	5.3	8.1	4.7	7.6

15: 14th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0
Total Del/Veh (s)	7.3	6.3	5.4	6.7	7.5	5.0	5.2	6.6	3.4	6.5

19: 17th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1
Total Del/Veh (s)	4.6	2.0	1.9	4.2	1.6	1.9	3.8	7.3	3.0	6.4	7.4	3.2

19: 17th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	2.3

22: 20th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.6	3.5	3.7	0.4	3.6
Total Del/Veh (s)	19.9	15.4	4.6	21.4	19.2	9.6	11.3	11.4	3.1	12.9	12.7	3.8

22: 20th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	12.6

25: SE Main & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Denied Del/Veh (s)	0.0	0.0	0.0	3.1	0.7	2.9	3.4	0.2	3.4	3.3	0.1	3.1
Total Del/Veh (s)	29.8	25.1	6.1	23.5	19.6	5.2	14.7	10.0	2.9	14.7	17.4	3.4

25: SE Main & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	1.1
Total Del/Veh (s)	15.4

28: Elm Street & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1
Total Del/Veh (s)	1.1	0.0	0.1	3.6	1.9	2.1	3.3	3.0	2.5	4.5	5.3	2.3

28: Elm Street & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	2.1

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	18.7

Queuing and Blocking Report  
AM Existing

12/21/2018

Intersection: 3: 8th Street S & 12th Avenue S

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	61	106	105	138	95	154	278	250	70	146	139
Average Queue (ft)	24	50	52	56	28	40	160	143	16	81	51
95th Queue (ft)	56	91	92	105	70	107	244	223	55	130	104
Link Distance (ft)		1032		1229			904	904		1004	1004
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	130		160		160	130		120			
Storage Blk Time (%)		0		0	0		11			1	
Queuing Penalty (veh)		0		0	0		5			0	

Intersection: 6: 4th Street S & 12th Avenue S

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	TR
Maximum Queue (ft)	56	56	88	53
Average Queue (ft)	27	31	50	29
95th Queue (ft)	51	49	75	49
Link Distance (ft)	1381	250	290	290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: 5th Street S & 12th Avenue S

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	TR
Maximum Queue (ft)	70	76	84	58
Average Queue (ft)	37	40	45	31
95th Queue (ft)	57	64	71	52
Link Distance (ft)	250	1032	202	202
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
AM Existing

12/21/2018

Intersection: 12: 11th Street S & 12th Avenue S

Movement	EB	WB	NB	NB	SB	SB
Directions Served	TR	LT	L	R	L	TR
Maximum Queue (ft)	100	87	47	68	53	96
Average Queue (ft)	54	49	22	27	26	50
95th Queue (ft)	82	76	47	52	49	80
Link Distance (ft)	1229	1255	459	459	456	456
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: 14th Street S & 12th Avenue S

Movement	EB	WB	NB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	74	116	61
Average Queue (ft)	42	54	34
95th Queue (ft)	65	90	55
Link Distance (ft)	1255	1029	400
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 19: 17th Street S & 12th Avenue S

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	39	31	54
Average Queue (ft)	2	2	8	25
95th Queue (ft)	16	19	30	50
Link Distance (ft)	1029	1275	315	415
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
AM Existing

12/21/2018

Intersection: 22: 20th Street S & 12th Avenue S

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	T	R	L	TR	L	T	R	L	T	R	
Maximum Queue (ft)	66	99	42	82	100	74	160	44	39	179	56	
Average Queue (ft)	26	41	14	31	38	25	77	14	13	89	19	
95th Queue (ft)	56	82	33	66	80	55	140	34	38	154	48	
Link Distance (ft)	1275			2074			567			789		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	170		170	180		200		200	220		175	
Storage Blk Time (%)							0				0	
Queuing Penalty (veh)							0				0	

Intersection: 25: SE Main & 12th Avenue S

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	R	L	T	R	L	T	T	L	T	T
Maximum Queue (ft)	45	144	49	134	128	80	119	115	85	30	170	142
Average Queue (ft)	11	60	6	50	49	24	42	51	27	9	97	47
95th Queue (ft)	34	115	28	97	99	54	86	96	63	26	153	104
Link Distance (ft)	2074			1166			561			561		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130		130	200		200	240			180		
Storage Blk Time (%)			1	0							0	
Queuing Penalty (veh)			0	0							0	

Intersection: 28: Elm Street & 12th Avenue S

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	31	36
Average Queue (ft)	6	10
95th Queue (ft)	26	34
Link Distance (ft)	205	297
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 7



**3: 8th Street S & 12th Avenue S Performance by approach**

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	1.5	0.5	0.4	0.6
Total Del/Veh (s)	37.6	24.0	25.1	24.2	25.9

**6: 4th Street S & 12th Avenue S Performance by approach**

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1
Total Del/Veh (s)	5.8	3.2	5.9	5.0

**9: 5th Street S & 12th Avenue S Performance by approach**

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1
Total Del/Veh (s)	6.5	5.2	5.7	5.7

**12: 11th Street S & 12th Avenue S Performance by approach**

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.1
Total Del/Veh (s)	5.0	8.3	4.0	5.7	5.7

**15: 14th Street S & 12th Avenue S Performance by approach**

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	6.8	6.1	5.7	6.4

**19: 17th Street S & 12th Avenue S Performance by approach**

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.4	1.7	4.4	4.7	2.2

**22: 20th Street S & 12th Avenue S Performance by approach**

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.0	0.3	1.4	1.0	1.0
Total Del/Veh (s)	14.5	20.6	10.4	13.3	13.6

**25: SE Main & 12th Avenue S Performance by approach**

Approach	EB	WB	SE	NW	All
Denied Del/Veh (s)	0.1	1.9	1.1	1.2	1.1
Total Del/Veh (s)	22.6	14.7	10.3	13.4	13.4

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28: Elm Street & 12th Avenue S Performance by approach

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Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.2	0.1	0.0
Total Del/Veh (s)	0.2	1.8	4.2	4.0	2.3

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Total Network Performance

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Denied Del/Veh (s)	0.9
Total Del/Veh (s)	23.6

3: 8th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.2	0.1	0.1	1.9	0.4	1.9	2.8	0.2	0.3	2.4	0.2	0.3
Total Del/Veh (s)	32.8	36.9	41.9	28.9	17.6	20.7	35.2	22.7	30.2	33.0	23.4	25.3

3: 8th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	25.9

6: 4th Street S & 12th Avenue S Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1
Total Del/Veh (s)	6.1	2.8	6.0	3.0	5.2	6.4	2.7	5.0

9: 5th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1
Total Del/Veh (s)	5.1	6.7	3.5	7.4	5.0	5.6	5.0	6.2	3.1	5.7

12: 11th Street S & 12th Avenue S Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.1
Total Del/Veh (s)	5.0	5.3	6.9	8.5	5.1	3.0	5.0	6.9	3.7	5.7

15: 14th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0
Total Del/Veh (s)	6.9	6.9	5.0	5.2	7.0	4.0	5.1	6.5	3.3	6.4

19: 17th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Total Del/Veh (s)	4.2	2.3	2.2	3.0	1.6	1.8	5.8	3.6	2.9	5.6	6.1	3.1

19: 17th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	2.2

22: 20th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.8	0.2	1.7	0.9	0.1	0.1	3.5	0.7	3.3	3.6	0.5	3.5
Total Del/Veh (s)	19.6	17.9	5.9	21.2	21.7	15.0	13.1	11.1	3.5	12.3	15.0	4.0

22: 20th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	1.0
Total Del/Veh (s)	13.6

25: SE Main & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Denied Del/Veh (s)	0.6	0.0	0.5	3.1	0.4	3.0	3.0	0.2	2.8	3.5	0.1	3.4
Total Del/Veh (s)	26.1	25.8	7.2	21.2	18.5	3.4	13.1	9.3	3.0	13.0	17.8	3.2

25: SE Main & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	1.1
Total Del/Veh (s)	13.4

28: Elm Street & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0		0.1	0.1	0.1	0.1	0.2
Total Del/Veh (s)	1.0	0.0	0.0	3.8	1.6	1.5		4.0	3.7	3.9	5.2	2.2

28: Elm Street & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	2.3

Total Network Performance

Denied Del/Veh (s)	0.9
Total Del/Veh (s)	23.6

Intersection: 3: 8th Street S & 12th Avenue S

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	154	312	182	253	126	154	319	301	144	327	301
Average Queue (ft)	43	126	104	63	49	86	168	154	55	172	157
95th Queue (ft)	119	253	164	148	98	169	264	250	129	264	250
Link Distance (ft)		1032		1229			904	904		1004	1004
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	130		160		160	130			120		
Storage Blk Time (%)	0	11	2		0	1	15		0	18	
Queuing Penalty (veh)	0	6	5		0	5	17		0	12	

Intersection: 6: 4th Street S & 12th Avenue S

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	TR
Maximum Queue (ft)	60	31	77	57
Average Queue (ft)	26	21	40	19
95th Queue (ft)	52	44	62	47
Link Distance (ft)	1381	236	290	290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: 5th Street S & 12th Avenue S

Movement	EB	WB	NB	NB
Directions Served	LTR	LTR	LT	TR
Maximum Queue (ft)	91	88	63	57
Average Queue (ft)	42	51	39	23
95th Queue (ft)	70	75	58	50
Link Distance (ft)	236	1032	202	202
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 12: 11th Street S & 12th Avenue S

Movement	EB	WB	NB	NB	SB	SB
Directions Served	TR	LT	L	R	L	TR
Maximum Queue (ft)	81	85	50	52	31	72
Average Queue (ft)	44	41	24	24	17	37
95th Queue (ft)	67	65	49	48	42	59
Link Distance (ft)	1229	1255	459	459	456	456
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: 14th Street S & 12th Avenue S

Movement	EB	WB	NB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	62	78	63
Average Queue (ft)	38	45	31
95th Queue (ft)	57	68	52
Link Distance (ft)	1255	1029	400
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 19: 17th Street S & 12th Avenue S

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	36	17	31	44
Average Queue (ft)	2	1	14	15
95th Queue (ft)	16	10	39	42
Link Distance (ft)	1029	1275	315	415
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 22: 20th Street S & 12th Avenue S

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	T	R	L	TR	L	T	R	L	T	R	
Maximum Queue (ft)	84	107	55	81	141	64	206	100	56	254	87	
Average Queue (ft)	29	50	22	31	50	27	86	18	12	115	23	
95th Queue (ft)	65	91	46	63	103	54	160	56	41	197	67	
Link Distance (ft)	1275			2074			567			789		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	170	170		180	200			200	220	175		
Storage Blk Time (%)						0	0			1		0
Queuing Penalty (veh)						0	0			1		0

Intersection: 25: SE Main & 12th Avenue S

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW				
Directions Served	L	T	R	L	T	R	L	T	T	L	T	T				
Maximum Queue (ft)	40	152	89	89	110	37	125	145	102	25	132	107				
Average Queue (ft)	8	71	11	33	40	13	58	64	45	7	71	23				
95th Queue (ft)	28	128	43	70	84	30	104	115	87	20	121	66				
Link Distance (ft)	2074			1166			561			561	575		575			
Upstream Blk Time (%)																
Queuing Penalty (veh)																
Storage Bay Dist (ft)	130	130		200	200			240	180							
Storage Blk Time (%)	1		0													
Queuing Penalty (veh)	1		0													

Intersection: 28: Elm Street & 12th Avenue S

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	31	36
Average Queue (ft)	3	10
95th Queue (ft)	18	34
Link Distance (ft)	205	297
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 46

3: 8th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.4	0.3	0.2
Total Del/Veh (s)	20.1	18.1	18.9	12.3	17.4

6: 4th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.1	0.1	0.2	0.1
Total Del/Veh (s)	6.0	6.4	6.9	6.7

9: 5th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1
Total Del/Veh (s)	7.3	4.1	6.6	6.0

12: 11th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.1
Total Del/Veh (s)	9.4	12.2	5.1	8.5	9.5

15: 14th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	8.2	7.5	6.1	7.6

19: 17th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.2
Total Del/Veh (s)	2.4	2.3	7.9	9.1	2.7

22: 20th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	0.0	1.4	1.0	0.8
Total Del/Veh (s)	19.0	24.7	14.5	19.3	18.9

25: SE Main & 12th Avenue S Performance by approach

Approach	EB	WB	SE	NW	All
Denied Del/Veh (s)	0.0	2.2	1.2	0.5	1.2
Total Del/Veh (s)	30.5	22.7	17.0	24.1	22.6



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28: Elm Street & 12th Avenue S Performance by approach

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Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1	0.0
Total Del/Veh (s)	0.1	2.1	3.7	4.5	2.0

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Total Network Performance

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Denied Del/Veh (s)	0.7
Total Del/Veh (s)	24.4

3: 8th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.2	0.3	2.8	0.1	0.2
Total Del/Veh (s)	31.1	16.7	24.3	26.5	13.4	22.4	24.1	18.5	19.8	33.1	11.3	11.2

3: 8th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	17.4

6: 4th Street S & 12th Avenue S Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.1
Total Del/Veh (s)	6.5	3.1	5.4	6.8	6.5	7.2	2.6	6.7

9: 5th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.4	0.1	0.2	0.1
Total Del/Veh (s)	6.6	7.5	3.4	5.4	6.3	6.9	3.3	6.0

12: 11th Street S & 12th Avenue S Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.1
Total Del/Veh (s)	9.9	6.8	11.3	12.2	6.4	4.1	5.8	10.1	7.0	9.5

15: 14th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Total Del/Veh (s)	8.6	8.3	6.6	8.5	7.5	7.2	6.3	7.2	3.6	7.6

19: 17th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.1	0.0	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Total Del/Veh (s)	5.5	2.2	1.8	4.6	2.2	1.8	10.3	10.7	2.7	9.9	10.1	7.1

19: 17th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	2.7

22: 20th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.9	0.1	0.7	0.0	0.0	0.0	3.4	0.7	3.3	3.5	0.5	3.4
Total Del/Veh (s)	23.4	22.0	7.0	30.7	23.0	17.7	17.8	15.8	4.3	18.1	21.5	5.3

22: 20th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	18.9

25: SE Main & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Denied Del/Veh (s)	0.0	0.0	0.1	2.8	1.3	2.7	3.1	0.2	3.3	3.1	0.2	3.0
Total Del/Veh (s)	33.2	32.8	10.0	36.7	26.1	8.6	22.2	15.3	3.5	21.2	26.0	3.9

25: SE Main & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	22.6

28: Elm Street & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)		0.1	0.1	0.0	0.0	0.0		0.1	0.1	0.1	0.1	0.1
Total Del/Veh (s)		0.0	0.0	3.7	2.0	1.9		5.3	2.9	4.0	6.5	2.1

28: Elm Street & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	2.0

Total Network Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	24.4

Intersection: 3: 8th Street S & 12th Avenue S

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	70	137	140	164	126	154	437	390	81	170	138
Average Queue (ft)	23	55	67	76	45	50	215	189	20	85	50
95th Queue (ft)	58	104	115	133	92	130	355	330	56	146	113
Link Distance (ft)		1032		1229			904	904		1004	1004
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	130		160		160	130			120		
Storage Blk Time (%)		0	0	0	0	0	20			2	
Queuing Penalty (veh)		0	0	0	0	0	12			1	

Intersection: 6: 4th Street S & 12th Avenue S

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	TR
Maximum Queue (ft)	59	88	90	59
Average Queue (ft)	29	37	55	31
95th Queue (ft)	52	62	80	50
Link Distance (ft)	1381	250	290	290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: 5th Street S & 12th Avenue S

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	TR
Maximum Queue (ft)	93	81	89	76
Average Queue (ft)	44	42	53	38
95th Queue (ft)	73	70	78	65
Link Distance (ft)	250	1032	202	202
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 12: 11th Street S & 12th Avenue S

Movement	EB	WB	NB	NB	SB	SB
Directions Served	TR	LT	L	R	L	TR
Maximum Queue (ft)	118	138	61	55	56	120
Average Queue (ft)	62	72	29	32	27	64
95th Queue (ft)	97	114	53	50	49	100
Link Distance (ft)	1229	1255	459	459	456	456
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: 14th Street S & 12th Avenue S

Movement	EB	WB	NB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	83	123	64
Average Queue (ft)	52	72	37
95th Queue (ft)	75	109	56
Link Distance (ft)	1255	1029	400
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 19: 17th Street S & 12th Avenue S

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	53	46	31	58
Average Queue (ft)	8	5	8	28
95th Queue (ft)	36	26	30	54
Link Distance (ft)	1029	1275	315	415
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 22: 20th Street S & 12th Avenue S

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	T	R	L	TR	L	T	R	L	T	R	
Maximum Queue (ft)	143	220	143	160	185	86	258	92	168	301	197	
Average Queue (ft)	51	91	28	59	86	35	119	18	22	155	30	
95th Queue (ft)	108	169	80	114	158	69	207	54	96	250	92	
Link Distance (ft)	1275			2074			567			789		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	170		170		180		200		200		220	
Storage Blk Time (%)			1		0				1		5	
Queuing Penalty (veh)			2		0				2		4	

Intersection: 25: SE Main & 12th Avenue S

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	R	L	T	R	L	T	T	L	T	T
Maximum Queue (ft)	131	266	155	214	301	204	145	166	142	84	278	241
Average Queue (ft)	21	120	21	111	120	62	67	84	52	15	155	102
95th Queue (ft)	71	217	90	200	223	140	121	147	108	48	232	199
Link Distance (ft)	2074			1166			561			561		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130		130		200		200		240		180	
Storage Blk Time (%)			9		0		2		1		0	
Queuing Penalty (veh)			5		0		13		4		0	

Intersection: 28: Elm Street & 12th Avenue S

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	31	36
Average Queue (ft)	4	10
95th Queue (ft)	22	34
Link Distance (ft)	205	297
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 46

3: 8th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.5	0.5	0.3	0.6
Total Del/Veh (s)	125.7	39.0	32.1	30.6	42.2

6: 4th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1
Total Del/Veh (s)	5.8	3.7	6.2	5.4

9: 5th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	1.1	0.0	0.1	0.3
Total Del/Veh (s)	8.9	4.9	6.8	6.6

12: 11th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.1
Total Del/Veh (s)	6.6	9.6	4.5	6.1	7.0

15: 14th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.0
Total Del/Veh (s)	8.4	7.6	5.8	7.8

19: 17th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.5	3.0	5.4	5.9	3.0

22: 20th Street S & 12th Avenue S Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.3	0.3	1.4	1.1	1.1
Total Del/Veh (s)	21.5	30.3	16.1	22.4	21.6

25: SE Main & 12th Avenue S Performance by approach

Approach	EB	WB	SE	NW	All
Denied Del/Veh (s)	0.0	1.9	1.2	1.2	1.1
Total Del/Veh (s)	31.9	20.5	19.8	19.8	21.7

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28: Elm Street & 12th Avenue S Performance by approach

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Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.2	0.1	0.0
Total Del/Veh (s)	0.1	2.1	5.9	4.0	2.4

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Total Network Performance

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Denied Del/Veh (s)	1.0
Total Del/Veh (s)	36.0



3: 8th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	1.9	0.5	1.8	2.6	0.2	0.3	2.4	0.2	0.2
Total Del/Veh (s)	109.6	124.7	137.5	46.7	28.2	32.6	46.7	29.5	33.0	42.2	29.7	31.2

3: 8th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	42.2

6: 4th Street S & 12th Avenue S Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1
Total Del/Veh (s)	5.9	3.0	6.2	3.5	5.8	6.7	2.7	5.4

9: 5th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.1	1.1		0.0	0.0	0.2	0.1	0.1	0.3
Total Del/Veh (s)	5.6	9.1		4.4	5.9	5.7	6.9	7.4	6.6

12: 11th Street S & 12th Avenue S Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1
Total Del/Veh (s)	6.7	6.0	8.0	9.8	5.4	3.4	5.0	7.6	4.4	7.0

15: 14th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0
Total Del/Veh (s)	8.0	8.8	5.9	7.8	8.0	6.1	5.0	6.7	3.4	7.8

19: 17th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1
Total Del/Veh (s)	4.9	2.4	2.3	5.1	2.9	2.2	6.4	6.0	3.6	7.3	7.3	3.6

19: 17th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	3.0

22: 20th Street S & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	2.1	0.5	2.2	0.7	0.1	0.1	3.3	0.8	3.3	3.1	0.6	3.4
Total Del/Veh (s)	29.6	25.7	10.3	33.8	30.5	19.8	18.7	17.6	5.2	20.4	24.7	7.5

22: 20th Street S & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	1.1
Total Del/Veh (s)	21.6

25: SE Main & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Denied Del/Veh (s)	0.1	0.0	0.1	2.9	0.7	2.9	2.7	0.4	2.8	3.0	0.2	3.2
Total Del/Veh (s)	33.7	35.1	13.6	30.0	25.6	5.1	32.0	14.8	3.4	20.2	26.4	4.1

25: SE Main & 12th Avenue S Performance by movement

Movement	All
Denied Del/Veh (s)	1.1
Total Del/Veh (s)	21.7

28: Elm Street & 12th Avenue S Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)		0.1	0.1	0.0	0.0	0.0		0.1	0.1	0.1	0.1	0.0
Total Del/Veh (s)		0.0	0.0	3.5	1.8	1.8		3.7	4.0	5.9	2.1	2.4

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	36.0

Intersection: 3: 8th Street S & 12th Avenue S

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	154	593	185	524	167	154	436	401	144	370	351
Average Queue (ft)	73	318	150	185	63	119	241	226	69	215	198
95th Queue (ft)	176	749	212	455	133	189	378	352	155	325	303
Link Distance (ft)		1032		1229			904	904		1004	1004
Upstream Blk Time (%)		2									
Queuing Penalty (veh)		6									
Storage Bay Dist (ft)	130		160		160	130			120		
Storage Blk Time (%)	0	48	20	0	1	3	27		0	29	
Queuing Penalty (veh)	0	25	56	2	3	15	38		1	19	

Intersection: 6: 4th Street S & 12th Avenue S

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	TR
Maximum Queue (ft)	53	51	83	40
Average Queue (ft)	28	26	49	22
95th Queue (ft)	50	48	74	46
Link Distance (ft)	1381	236	290	290
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: 5th Street S & 12th Avenue S

Movement	EB	WB	NB	NB
Directions Served	LT	LTR	LT	TR
Maximum Queue (ft)	129	102	82	68
Average Queue (ft)	59	56	46	30
95th Queue (ft)	104	86	70	57
Link Distance (ft)	236	1032	202	202
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 12: 11th Street S & 12th Avenue S

Movement	EB	WB	NB	NB	SB	SB
Directions Served	TR	LT	L	R	L	TR
Maximum Queue (ft)	116	88	67	60	45	78
Average Queue (ft)	54	50	29	28	21	43
95th Queue (ft)	87	74	53	51	46	68
Link Distance (ft)	1229	1255	459	459	456	456
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: 14th Street S & 12th Avenue S

Movement	EB	WB	NB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	88	120	56
Average Queue (ft)	46	63	33
95th Queue (ft)	71	96	51
Link Distance (ft)	1255	1029	400
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 19: 17th Street S & 12th Avenue S

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	53	69	36	44
Average Queue (ft)	5	7	11	17
95th Queue (ft)	26	38	36	44
Link Distance (ft)	1029	1275	315	415
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 22: 20th Street S & 12th Avenue S

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	140	249	158	156	216	131	306	155	52	373	200
Average Queue (ft)	55	117	54	63	101	39	144	24	16	193	48
95th Queue (ft)	109	221	134	122	188	98	256	89	44	330	146
Link Distance (ft)	1275		2074			567			789		
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	170	170		180	200		200		220	175	
Storage Blk Time (%)	2		0	1		3		0	11		0
Queuing Penalty (veh)	6		0	2		4		0	10		0

Intersection: 25: SE Main & 12th Avenue S

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	R	L	T	R	L	T	T	L	T	T
Maximum Queue (ft)	111	288	155	154	186	91	248	352	312	37	193	160
Average Queue (ft)	19	148	38	56	93	26	132	126	104	7	119	65
95th Queue (ft)	71	250	125	110	158	62	233	274	220	24	183	142
Link Distance (ft)	2074			1166			561		561	575		575
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	130	130		200	200		240	180				
Storage Blk Time (%)	14		0	0		3		0	0	1		
Queuing Penalty (veh)	11		0	1		10		0	0	0		

Intersection: 25: SE Main & 12th Avenue S

Movement	NW
Directions Served	R
Maximum Queue (ft)	40
Average Queue (ft)	2
95th Queue (ft)	36
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	230
Storage Blk Time (%)	
Queuing Penalty (veh)	

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Intersection: 28: Elm Street & 12th Avenue S

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Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	25	31
Average Queue (ft)	2	10
95th Queue (ft)	14	33
Link Distance (ft)	205	297
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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Network wide Queuing Penalty: 209

Appendix E  
Cost Estimates





## Alternative Development Preliminary Cost Estimate

Fargo Moorhead Metro COG and City of Moorhead

12<sup>th</sup> Avenue Corridor – River Dr to Main Avenue

Moorhead, MN

Updated May 6, 2019

*Note: Quantities and costs are preliminary estimates and are subject to change.*

*All costs are 2019 dollars.*

1A1: Install Shared Lane Markings (Sharrows) from River Dr to 8th St				
Item	Unit	Quantity	Unit Cost	Cost
Sharrows	EA	24	\$ 250.00	\$ 6,000.00
SUBTOTAL				\$ 6,000.00
Contingencies (20%)				\$ 1,200.00
<b>Construction Cost</b>				<b>\$ 7,200.00</b>
<b>TOTAL</b>				<b>\$ 7,200.00</b>
<b>Estimated Cost: \$7,500</b>				

1A2: Install Sharrows from River Dr to 5th St and Replace South Sidewalk with 8' Path				
Item	Unit	Quantity	Unit Cost	Cost
Removal	SY	667	\$ 5.00	\$ 3,335.00
Sidewalk	SY	889	\$ 60.00	\$ 53,340.00
ADA Ramps	EA	6	\$ 2,000.00	\$ 12,000.00
Sharrows	EA	16	\$ 250.00	\$ 4,000.00
SUBTOTAL				\$ 72,675.00
Contingencies (20%)				\$ 14,535.00
<b>Construction Cost</b>				<b>\$ 87,210.00</b>
<b>TOTAL</b>				<b>\$ 87,210.00</b>
<b>Estimated Cost: \$90,000</b>				

**1B: Install 5' Sidewalk on North Side Between 2nd St and 6th St**

Item	Unit	Quantity	Unit Cost	Cost
Removal	SY	745	\$ 5.00	\$ 3,725.00
Sidewalk	SY	995	\$ 60.00	\$ 59,700.00
ADA Ramps	EA	12	\$ 2,000.00	\$ 24,000.00
SUBTOTAL				\$ 87,425.00
Contingencies (20%)				\$ 17,485.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 104,910.00</b>

**Estimated Cost: \$110,000**

**1C: Close Parking Lot Access**

Item	Unit	Quantity	Unit Cost	Cost
Removal	SY	380	\$ 10.00	\$ 3,800.00
Sidewalk	SY	23	\$ 60.00	\$ 1,380.00
Curb & Gutter	LF	408	\$ 45.00	\$ 18,360.00
Bus Parking Area	TONS	132	\$ 130.00	\$ 17,160.00
SUBTOTAL				\$ 40,700.00
Contingencies (20%)				\$ 8,140.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 48,840.00</b>

**Estimated Cost: \$50,000**

1D: Install Curb Bump-Outs at 6th St and 7th St Intersections				
Item	Unit	Quantity	Unit Cost	Cost
Removal	SY	445	\$ 10.00	\$ 4,450.00
Sidewalk	SY	290	\$ 60.00	\$ 17,400.00
Curb & Gutter	LF	440	\$ 45.00	\$ 19,800.00
ADA Ramps	EA	8	\$ 2,000.00	\$ 16,000.00
SUBTOTAL				\$ 57,650.00
Contingencies (20%)				\$ 11,530.00
<b>Construction Cost</b>				<b>\$ 69,180.00</b>
<b>TOTAL</b>				<b>\$ 69,180.00</b>
				<b>Estimated Cost: \$75,000</b>

1E1: Revise Eastbound Lanes to Shared Thru-Left and Designated Right-Turn Lane				
Item	Unit	Quantity	Unit Cost	Cost
<b>Short-Term Costs (C &amp; G and Pole Modification in SE corner 8th St):</b>				
Pavement	TON	100	\$ 130.00	\$ 13,000.00
Traffic Signal Pole Relocation	EA	1	\$ 50,000.00	\$ 50,000.00
Curb & Gutter	LF	400	\$ 45.00	\$ 18,000.00
Drainage/Dirtwork	LUMP SUM	1	\$ 10,000.00	\$ 10,000.00
SUBTOTAL				\$ 91,000.00
Contingencies (20%)				\$ 18,200.00
<b>Construction Cost (Short-Term)</b>				<b>\$ 109,200.00</b>
<b>TOTAL</b>				<b>\$ 109,200.00</b>
				<b>Estimated Short-Term Cost:</b>
				<b>\$110,000</b>
<b>Long-Range Costs (Re-Striping and Signal Head/Wiring Changes for Lane Reassignment):</b>				
Striping	LF	5000	\$ 2.00	\$ 10,000.00
Traffic Signal Head Switchouts, and Cabinet/Wiring	EA	1	\$ 50,000.00	\$ 50,000.00
SUBTOTAL				\$ 60,000.00
Contingencies (20%)				\$ 12,000.00
<b>Construction Cost</b>				<b>\$ 72,000.00</b>
<b>TOTAL</b>				<b>\$ 72,000.00</b>
				<b>Estimated Long-Range Cost:</b>
				<b>\$75,000</b>

**2A: Install 8' or 10' Shared-Use Path on South Side from 8th to 11th St**

Item	Unit	Quantity	Unit Cost	Cost
Removal	SY	1357	\$ 5.00	\$ 6,785.00
Sidewalk	SY	1300	\$ 60.00	\$ 78,000.00
ADA Ramps	EA	3	\$ 2,000.00	\$ 6,000.00
SUBTOTAL				\$ 90,785.00
Contingencies (20%)				\$ 18,157.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 108,942.00</b>

**Estimated Cost: \$110,000**

**2B1: Install Shared Lane Markings (Sharrows) from 11th St to 20th St**

Item	Unit	Quantity	Unit Cost	Cost
Sharrows	EA	30	\$ 250.00	\$ 7,500.00
SUBTOTAL				\$ 7,500.00
Contingencies (20%)				\$ 1,500.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 9,000.00</b>

**Estimated Cost: \$10,000**

**2B2: 6' Designated On-Street Bike Lanes on Each Side of 12th Ave from 11th St to 20th St**

Item	Unit	Quantity	Unit Cost	Cost
Removal	LF	3700	\$ 0.10	\$ 370.00
Bike Lane Symbol	EA	36	\$ 250.00	\$ 9,000.00
Lanes Lines	LF	11100	\$ 1.00	\$ 11,100.00
Bike Lane Signs	EA	36	\$ 100.00	\$ 3,600.00
SUBTOTAL				\$ 24,070.00
Contingencies (20%)				\$ 4,814.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 28,884.00</b>

**Estimated Cost: \$30,000**

**2B3: Replace Existing South Sidewalk with 8' Shared-Use Path from 11th St to 20th St**

Item	Unit	Quantity	Unit Cost	Cost
Removal	SY	1750	\$ 5.00	\$ 8,750.00
Sidewalk	SY	3111	\$ 60.00	\$ 186,660.00
Trees	EA	25	\$ 750.00	\$ 18,750.00
ADA Ramps	EA	20	\$ 2,000.00	\$ 40,000.00
SUBTOTAL				\$ 254,160.00
Contingencies (20%)				\$ 50,832.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 304,992.00</b>

**Estimated Cost: \$305,000**

**2C: Install Crosswalk at 19 1/2 St**

Item	Unit	Quantity	Unit Cost	Cost
ADA Ramps	EA	1	\$ 2,000.00	\$ 2,000.00
Crosswalk Markngs	EA	1	\$ 1,500.00	\$ 1,500.00
SUBTOTAL				\$ 3,500.00
Contingencies (20%)				\$ 700.00
<b>Construction Cost</b>				<b>\$ 4,200.00</b>
<b>TOTAL</b>				

**Estimated Cost: \$5,000**

**2D: Remove Parking Area on South Side near 9th St Realign Approach into Campus Lots**

Item	Unit	Quantity	Unit Cost	Cost
Removal	LF	247	\$ 10.00	\$ 2,470.00
Pavement	TON	164	\$ 130.00	\$ 21,320.00
Curb & Gutter	LF	268	\$ 45.00	\$ 12,060.00
SUBTOTAL				\$ 35,850.00
Contingencies (20%)				\$ 7,170.00
<b>Construction Cost</b>				<b>\$ 43,020.00</b>
<b>TOTAL</b>				

**Estimated Cost: \$45,000**

## 2E: Realign 11th St Intersection to Improve Horizontal Alignment

Item	Unit	Quantity	Unit Cost	Cost
Removal	SY	1027	\$ 10.00	\$ 10,270.00
Pavement	TON	700	\$ 130.00	\$ 91,000.00
Curb & Gutter	LF	550	\$ 45.00	\$ 24,750.00
SUBTOTAL				\$ 126,020.00
Contingencies (20%)				\$ 25,204.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 151,224.00</b>

**Estimated Cost: \$150,000**

## 2F: Construct Grade Raise of 20th St Intersection to Improve Profile with BNSF RR Tracks

Item	Unit	Quantity	Unit Cost	Cost
Removal	SY	3222	\$ 10.00	\$ 32,220.00
Remove/Replace Trees	EA	40	\$ 1,000.00	\$ 40,000.00
ADA Ramps	EA	8	\$ 2,000.00	\$ 16,000.00
Striping	LF	7400	\$ 1.50	\$ 11,100.00
Traffic Signals	EA	4	\$ 62,500.00	\$ 250,000.00
Drainage/Dirtwork	LUMP SUM	1	\$ 250,000.00	\$ 250,000.00
Pavement	TON	2240	\$ 130.00	\$ 291,200.00
Curb & Gutter	LF	900	\$ 45.00	\$ 40,500.00
SUBTOTAL				\$ 931,020.00
Contingencies (20%)				\$ 186,204.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 1,117,224.00</b>

**Estimated Cost: \$1,250,000**

**3A: Construct PED Bicycle Crossing on East Side of 20th St South a BNSF Railroad**

Item	Unit	Quantity	Unit Cost	Cost
Sidewalk and Crossing Plates	Lump SUM	1	\$ 135,560.00	\$ 135,560.00
Drainage/Dirtwork	Lump SUM	1	\$ 25,000.00	\$ 25,000.00
Quad Gates for Quiet Zone	EA	4	\$ 50,000.00	\$ 200,000.00
Insurance	EA	1	\$ 5,000.00	\$ 5,000.00
SUBTOTAL				\$ 365,560.00
Contingencies (20%)				\$ 73,112.00
<b>Construction Cost TOTAL</b>				<b>\$ 438,672.00</b>

**Estimated Cost: \$450,000**

**3B: Add New 10' Shared-Use Path on South Side**

Item	Unit	Quantity	Unit Cost	Cost
Sidewalk	SY	2085	\$ 60.00	\$ 125,100.00
Drainage	Lump SUM	1	\$ 5,000.00	\$ 5,000.00
Curb & Gutter	LF	1800	\$ 45.00	\$ 81,000.00
SUBTOTAL				\$ 211,100.00
Contingencies (20%)				\$ 42,220.00
<b>Construction Cost TOTAL</b>				<b>\$ 253,320.00</b>

**Estimated Cost: \$250,000**



### 3C: Install Curb Ramp and Concrete Waiting Area at 25th Street South Bus Stop

Item	Unit	Quantity	Unit Cost	Cost
ADA Ramps	EA	1	\$ 2,000.00	\$ 2,000.00
Drainage	Lump SUM	1	\$ 1,000.00	\$ 1,000.00
Curb & Gutter	LF	25	\$ 45.00	\$ 1,125.00
SUBTOTAL				\$ 4,125.00
Contingencies (20%)				\$ 825.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 4,950.00</b>
			<b>Estimated Cost: \$5,000</b>	

### 3D: Shift Private Business Driveway East of the BNSF Railroad Tracks

Item	Unit	Quantity	Unit Cost	Cost
Removals	SY	517	\$ 5.00	\$ 2,585.00
Drainage	Lump SUM	1	\$ 4,000.00	\$ 4,000.00
Concrete Driveway	SY	89	\$ 60.00	\$ 5,340.00
SUBTOTAL				\$ 11,925.00
Contingencies (20%)				\$ 2,385.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 14,310.00</b>
			<b>Estimated Cost: \$15,000</b>	

#### 4A: Upgrade Existing Sidewalks to Current ADA Standards

Item	Unit	Quantity	Unit Cost	Cost
Removals	EA	80	\$ 50.00	\$ 4,000.00
ADA Ramps	EA	80	\$ 2,000.00	\$ 160,000.00
SUBTOTAL				\$ 164,000.00
Contingencies (20%)				\$ 32,800.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 196,800.00</b>

**Estimated Cost: \$200,000**

#### 4B: Review and Enforce Parking Policies, Paint Curb to Restrict Parking Near Access

Item	Unit	Quantity	Unit Cost	Cost
Paint	EA	10500	\$ 1.00	\$ 10,500.00
Removals	LF	10500	\$ 0.10	\$ 1,050.00
SUBTOTAL				\$ 11,550.00
Contingencies (20%)				\$ 2,310.00
<b>Construction Cost</b>				
<b>TOTAL</b>				<b>\$ 13,860.00</b>

**Estimated Cost: \$15,000**

### 4D: Bury Overhead Electric Lines

Item	Unit	Quantity	Unit Cost	Cost
Underground Lines	LF	10500	\$ 35.00	\$ 367,500.00
Remove/Replace Trees	EA	73	\$ 1,000.00	\$ 73,000.00
Remove OH Lines	LF	10500	\$ 20.00	\$ 210,000.00
Dirtwork	LUMP SUM	1	\$ 275,000.00	\$ 275,000.00
Remove OH Poles	EA	63	\$ 3,000.00	\$ 189,000.00
SUBTOTAL				\$ 1,114,500.00
Contingencies (20%)				\$ 222,900.00
<b>Construction Cost</b>				<b>\$ 1,337,400.00</b>
<b>TOTAL</b>				<b>\$ 1,337,400.00</b>
			<b>Estimated Cost: \$1,350,000</b>	







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