**M E M O R A N D U M**

**Date:** September 9, 2016

**To:** Paul Vogel

**From:** Angie Bersaw, Senior Transportation Planner
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**Subject:** Existing Conditions
Riverfront Drive Corridor Study, Mankato, MN

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## Introduction

The Mankato/North Mankato Area Planning Organization (MAPO) and the City of Mankato, in partnership with Blue Earth County and the Minnesota Department of Transportation (MnDOT), are working together to identify multimodal transportation improvements on Riverfront Drive between Woodland Avenue and Highway 14 (see study area map in Appendix A). Riverfront Drive serves an important role in providing access and connectivity to downtown Mankato and providing primary connections to other parts of Mankato and North Mankato, including US Highways 14 and 169. Riverfront Drive serves multiple transportation users including automobiles, freight, transit, pedestrians and bicyclists.

The City of Mankato desires to define a comprehensive vision for Riverfront Drive to continue their momentum in City Center reinvestment while also serving continued growth and local/regional mobility needs over the next 25 years. The study will include:

- Defining the issues and potential opportunities along the corridor
- Establishing the corridor vision and goals
- Developing and evaluating potential multimodal infrastructure improvement alternatives
- Developing a long-term implementation plan that identifies potential projects, cost estimates and funding opportunities

The purpose of this memorandum is to document existing conditions on Riverfront Drive as it relates to land use and previous studies, traffic operations, safety, access, pedestrian/bicycle accommodations and environmental resources. This information will serve as the framework to develop improvement goals for Riverfront Drive into the future.

## Previous Studies Overview

Several short- and long-range documents have been comple3ted which provide planning direction for future transportation system needs within and near the Riverfront Drive corridor. The key points in each study relevant to Riverfront Drive are summarized below by plan title.

*MAPO 2045 Long Range Transportation Plan (2015)*

- Riverfront Drive is a minor arterial roadway
- Identifies the following congested roadway segments by 2045:

    - Cherry Street: Riverfront Drive to 5th Street – Level of Service (LOS) E and volume-to-capacity (V/C) ratio of .98.
    - S. Riverfront Drive: Highway 169 to Lamm Street – LOS E with V/C ratio of .89.
- Interchange deficiencies at Riverfront Drive and Highway 14 related to intersection geometry and traffic control. Notes previous studies recommend multi-lane roundabouts or traffic signals as solutions.
- Gap in paved trail system between the western terminus of the Sakatah Signing Hills State Trail at the Highway 14 interchange and Dukes Street.

*Old Town Master Plan (2016)*

- A master plan for the Old Town area that serves as an update to the City Center Renaissance Plan's implementation tactics in light of several identified changes and challenges within the area.
- Provides Implementation Tactics for developing a plan to reuse the Coughlan Quarry area for future development. Redevelopment of this area will create a trip generator for vehicular and pedestrian traffic alike with a variety of potential uses. Future study recommended to determine use.
- Need to facilitate connections and linkages by examining Riverfront Drive and Second Street to reduce traffic speeds and address pedestrian safety concerns. The following suggestions were noted to accomplish this:
    - Convert Riverfront Drive to a three-lane section with a center turn lane
    - Install additional pedestrian crossing control signals
    - Facilitate truck turning movements
    - Accommodate bicycle lanes on Second Street
    - Develop additional on-street parking options with adjusted lanes
- Encourage a walkable environment on Riverfront Drive and Second Street by providing safe pedestrian connections between neighborhoods. Suggestions to accomplish this included:
    - Streetscaping that creates friction to slow traffic such as implementation of sidewalk bumpouts that reduce the street width and provide space for benches, art, landscaping, and lighting
    - Accentuated crosswalks to focus attention on pedestrian connections
    - Bike lanes along Second Street to assist with traffic calming and connectivity
    - Wider sidewalks (12ft min.) to encourage pedestrian movement and sidewalk cafes
    - Incorporation of art and other streetscaping to enhance character
    - Pedestrian scaled period lighting for safety and character
    - Improvements to pedestrian crossings, particularly at the Riverfront Drive/Rock Street gateway to Riverfront Park
    - Mid-block pedestrian crossings with center refuge and signals with accentuated patterns, materials, and colors to bring attention to pedestrians
    - Enhanced connections to Washington Park from Riverfront Drive including bumpouts, patterned crosswalks and pedestrian signals
    - Enhancements to the crossing elements at the intersections of Plum Street, Mulberry Street (at Second Street), and Main Street
    - Integration of a multi-modal transportation network as redevelopment occurs
    - Public transportation alternatives for connectivity and accessibility
    - Other items such as permeable pavement, accentuated alley surfaces, and buried powerlines to improve the pedestrian environment

*Preliminary ICE Traffic Analysis Report: Highway 14 at Riverfront Drive (2015)*

- Recommended single-lane roundabouts at both ramp intersections to alleviate delays caused by limited gaps in traffic during peak hours.

*Preliminary ICE Traffic Analysis Report: Highway 169/60/60 at Riverfront Drive (2015)*

- Recommended change in signal timing as a short-term solution to alleviate backups on the Highway 169/60/60 SB ramp intersection with S. Riverfront Drive.
- Recommended development of alternative intersection designs to meet future demands including the addition of turn lanes at Poplar Street, a potential multi-lane roundabout at the Riverfront Drive/Stoltzman Road intersection, modifications to the Highway 169/60 entrance ramp, increases to turn lane lengths at several locations, and other modifications.

*Front Street Connectivity Plan (2014)*

- Plan's focus is on improving accessibility of Front Street from Main Street to Liberty Street.
- Recommended maximizing or maintain parking levels in study area.
- Recommended improving pedestrian connectivity to entertainment, retail, lodging and recreational areas – wayfinding signage at E. Cherry Street and S. Riverfront Dr. and Main Street and S. Riverfront Drive.

*Wayfinding Signage Plan (2015)*

- Recommends addition of wayfinding signage to announce arrival to and assist with navigation through the City Center. Signage may include informational kiosks, pedestrian signage on sidewalks, and vehicular signage directing to public parking and other points of interest.
- Signage staged in two phases. Phase 1 (2015) included the intersections of Riverfront Drive and Sibley Parkway, Warren Street, Main Street, and Rock Street. Phase 2 (2016) includes the intersections of Riverfront Drive and Cherry Street, Plum Street, Spring Street, and Civic Center Plaza

*Complete Streets Plan (2015)*

- Outlines the Broad Street Project which is a 3-mile bicycle link from the north side of the City, through the City Center and eventually Stoltzman Road.
- Outlines the West Pleasant Street Project that will utilize West Pleasant Street to connect the Broad Street Project to the Red Jacket Trail.
- There is one bicycle facility planned along Riverfront Drive completing the connection of the Sakatah Singing Hills State Trail under the Highway 14 overpass and across Riverfront to Good Counsel Drive. For the rest of the corridor, emphasis is on Broad Street to accommodate bicycles with lane construction projects slated for 2016, 2017 and 2018 along this parallel route.
- Identifies a future bicycle route (year unidentified) will cross Riverfront Drive at Elm Street for access to Riverfront Park.
- Identifies a future bicycle route along Woodland accessing Sibley Park.

*Mankato Area Public School's Safe Routes to School Plan (2013)*

- Franklin Elementary School recommendations include converting N. Riverfront Drive from a four-lane road to a three-lane road from Madison Avenue to Highway 14 to calm traffic and promote multi-modal use.

- Roosevelt Elementary School recommendations include the installation of pedestrian crossing signs at the intersection of Sibley Street and S. Riverfront Drive and at the crosswalk of the Minneopa Bike Trail and S. Riverfront Drive to encourage pedestrian awareness.
- Roosevelt Elementary School recommendations also include Sibley Street (CSAH 8) and S. Riverfront Drive improvement with pedestrian bump-outs, pedestrian refuge medians and lane configuration changes such as a four-lane to three-lane section. (See also project listed below)

Safe Routes to School Project (2017)

- Utilizes a $229,000 Safe Routes to School Grant for traffic calming and crosswalk improvements at the intersection of Riverfront Drive and Sibley Street. Project proposes to reduce Riverfront Drive to one lane in each direction and southbound left-turn lane at Sibley Street with a rectangular rapid flash beacon at the crosswalk.

*Railroad Corridor Mitigation Plan (2009)*

- Calls for pedestrian railroad underpass to be located on Sibley Street to provide connections to school sidewalks. The pedestrian underpass would also serve as access for emergency vehicles.
- Proposes to close rail crossings at Hubbell Avenue and Owatonna Street.
- Proposes addition of a vehicle turn around on Owatonna Street north of the tracks.
- Proposes a pedestrian plaza at the Minnesota River's edge that would be elevated over railroad tracks adjacent to the intersection of Riverfront Drive and Hickory Street. A skyway connection would extend to the City's second level skyway system, the downtown mall, the parking garages, and the Civic Center.

Calls for Main Street at-grade crossing of the tracks to be closed and a security gate installed at the flood wall. This would prevent pedestrians/bicyclists from accessing the N. Minnesota River Trail at this location along Riverfront Drive.

## Demographics and Trends

Located in south central Minnesota, the Mankato/North Mankato metropolitan planning area is 75 miles south of Minneapolis-St. Paul at the junction of Highway 14 and Highway 169/60. The area has experienced widespread growth across the metropolitan area and serves southern Minnesota as a hub for health care, education, retail, agriculture, and industry. The area is comprised of Mankato, North Mankato, Eagle Lake and Skyline; Blue Earth and Nicollet counties; and Belgrade, Lime, South Bend, LeRay and Mankato townships.

*Population*

The Mankato/North Mankato area has seen rapid growth. In 2010, the metropolitan statistical area (MSA) population was 96,740 with an urbanized population of 58,265. The 2010 population estimate represents a 12.9% change from the year 2000 for the MSA. Table 1 illustrates historic population figures referenced

| | 1980 CENSUS | 1990 CENSUS | 2000 CENSUS | % CHANGE 2000-2010 | 2010 CENSUS | % CHANGE 2000-2010 | 2015 ESTIMATE |
|---|---|---|---|---|---|---|---|
| **Mankato** | 28,651 | 31,477 | 32,427 | 3.0% | 39,309 | 21.2% | 41,044 |
| **MSA** | 79,243 | 82,120 | 85,712 | 4.4% | 96,740 | 12.9% | 99,134 |

**Table 1. 1980 – 2010 Historic Population (Source: US Census Bureau; Minnesota State Demographer (Mankato Area Housing Study Update, 2013; MAPO 2040 Long Range Transportation Plan.)**

from the Mankato/North Mankato Metropolitan Planning Organization's (MAPO) 2040 Long Range Transportation Plan.

A large portion of the rapid growth occurred in Mankato alone, exhibiting 21.2% change within the decade. Much of the growth probably occurred in the first half of the decade as indicators show decline after 2007. More recent estimates indicate that growth has slowed to a more moderate rate. Trends implied the MAPO area added 450 to 535 people annually at the time the 2045 plan was developed.

| | MSA | | |
|---|---|---|---|
| AGE | 2000 | 2010 | CHANGE |
| 0-9 | 9,869 | 11,466 | 1,597 |
| 10-17 | 9,447 | 8,298 | (1,149) |
| 18-20 | 17,249 | 19,606 | 2,357 |
| 25-34 | 10,460 | 13,342 | 2,882 |
| 35-44 | 11,879 | 10,009 | (1,870) |
| 45-54 | 10,640 | 12,129 | 1,489 |
| 55-64 | 6,161 | 10,411 | 4,250 |
| 65-74 | 4,785 | 5,627 | 842 |
| 75-84 | 3,649 | 3,867 | 218 |
| 85+ | 1,573 | 1,985 | 412 |
| Total | 85,712 | 96,740 | 11,028 |

**Table 2. Population by Age (Source: US Census Bureau; MAPO 2040 Long Range Transportation Plan).**

*Age*

The population's age distribution is important as it effects transportation usage. Within the period from 2000 to 2010, 18-34 year olds as well as those of retirement age saw the highest increases in populations indicating increased commuters and dial-a-ride transit users. Retirees exhibited the greatest increase in population while 18-20 year olds represented the largest demographic group. With a large 18-20 year old group, the area may see a higher demand for pedestrian and bicycle amenities.

*Employment*

Most household trips include travel to and from places of employment. Mankato and North Mankato are the major employment centers for the region with a labor shed spanning 16 counties. There is a net inflow of primary jobs in the MAPO market area meaning there are more jobs in the market than people living in the market area. Almost 72 percent of labor force living in the market area also work there.

## Transportation System Characteristics

The transportation network characteristics identify major qualities of the physical roadway system of Riverfront Drive and its connections. The following section provides details on existing roadway conditions including descriptions of functional classification and connections, speed limits, number of lanes and parking accommodations.

*Functional Classification*

The functional classification system is used to create a roadway network that efficiently collects and distributes traffic from neighborhoods to the state highway system. A successful system coordinates and manages mobility, roadway design, and route alignment as well as seeks to match current and future access and land use with the adjacent roadway's purpose, speeds, and spacing. The functional classification system is comprised of principal arterials, minor arterials, major and minor collectors, and local roadways.

Riverfront Drive serves as a minor arterial roadway running the entire length of Mankato. It serves a diverse mix of personal vehicle, freight, transit, bicycle, and pedestrian traffic. From a regional perspective, mobility on Riverfront Drive is important, with vital interchange connections to Highways 14 and 169/60, the two principal arterial highways running through Mankato. Riverfront Drive provides connections to the following minor arterial roadways: Sibley Street (MN Highway 66), Stoltzman Road (CSAH 16), Warren Street, Cherry Street, Main Street, Veteran's Memorial Bridge, Madison Avenue, 3rd Avenue (CSAH 5) and North Riverfront Drive (CSAH 57). Riverfront Drive also provides a cross

community function for local and regional trips. All of this creates a challenge in balancing mobility and access along the roadway. See MAPO's Functional Classification Map in **Appendix B**.

*Existing Traffic Speeds*

The posted speed limit is 30 miles per hour (mph) from Woodland Avenue to Ann Street. Traffic speeds transition from 30 to 35 mph north of Ann Street and from 35 to 40 mph at Dukes Street/Good Counsel Drive. From this point, speeds increase to 45 mph north of the Highway 14 interchange.

The following existing traffic speeds were collected during the May 2016 traffic data collection counts:

- Woodland Avenue to Sibley Parkway: Traffic has been documented as traveling five to nine MPH above the posted speed limit north of the Highway 169/60 interchange. South of the interchange, southbound traffic continues with this trend while northbound traffic exhibits speeds of one to four MPH above the limit.
- Sibley Parkway to Veteran's Memorial Bridge: The majority of north and southbound movements exhibit vehicles traveling five to nine mph above the speed limit while the section of roadway between Cherry/Minnesota Streets and Plum Street exhibits vehicles traveling at 10+ mph above the posted speed limit.
- Veteran's Memorial Bridge to Madison Avenue: Most of this segment exhibited traffic traveling at five to nine mph above the posted speed limit. Traffic between the bridge and Plum Street traveling southbound is documented as traveling 10+ MPH over the posted limit.
- Madison Avenue to Highway 14: Traffic from Madison Ave to Adams St was observed traveling five to nine mph above the posted speed limit of 30 mph. Traffic traveling northbound between Adams and Good Counsel Drive exhibit speeds in excess of 10 mph over the posted speed limit of 30/35 mph. The same situation is exhibited in the southbound lanes between May Street and Adams Street.

*Existing Number of Lanes and Parking Accommodations*

Riverfront Drive is a two-lane undivided roadway between Woodland Avenue and Sibley Street. On-street parking is permitted on the west side of the corridor in this segment. From Sibley St to Highway 169/60 southbound ramp/Owatonna Street, Riverfront Drive is a four-lane undivided roadway and north of this area it transitions to a four-lane divided roadway. The intersections of Highway 169/60 southbound ramps/Owatonna Street, Poplar Street/Mankato West High School, Stoltzman Road and Marshall Street are signalized with dedicated left turn lanes along Riverfront Drive. There are also dedicated right turn lanes on Riverfront Drive at Marshall Street and Stotlzman Road.

Riverfront Drive is a four lane divided roadway from Sibley Parkway to the Veteran's Memorial Bridge. All intersections with Riverfront Drive in this segment are signalized with dedicated left turn lanes along the corridor. Dedicated right turn lanes exist for northbound traffic at Main Street, southbound traffic at Minnesota Street/Cherry Street, and southbound traffic at Sibley Parkway.

Between Madison Ave and Plum St, Riverfront Drive is a four lane undivided roadway. Traffic signals exist at Plum Street, Elm Street, and Madison Avenue. The lack of turn lanes in this segment are a concern from both a traffic operations and safety perspective. Observed traffic behaviors in this segment include weaving to avoid turning traffic and/or parallel parking traffic (on northbound side of Riverfront Drive between Washington Street and Vine Street).

Riverfront Drive is a four lane undivided roadway from Madison Avenue to Good Counsel Drive and four lane divided from Good Counsel Drive to Highway 14. There is a two way left turn lane along Riverfront Drive from Lafayette Street to Ruth Street. All intersections in this area are side-street stop controlled with Riverfront Drive having the right of way.

## Study Area Characteristics

The study area was divided into four segments for better identification of existing conditions related to land use, traffic operations, crash history, roadway access, and pedestrian and bicycle connections. This section also contains a review of known social, economic, and environmental (SEE) resources within the study area. Working south to north, the study segments described in this section are as follows:

- Segment 1 – Woodland Avenue to Sibley Parkway
- Segment 2 – Sibley Parkway to the Veteran's Memorial Bridge
- Segment 3 – Veteran's Memorial Bridge to Madison Avenue
- Segment 4 – Madison Avenue to the Highway 14 Interchange

Several Figures are appended to this document relating to the existing characteristics described within each segment of the study area in the text below. Refer to the **Appendix A** for the following graphics:

- Existing Land Use
- Existing Traffic Operations
- Crash History (2010-2014)
- Existing Traffic Speeds
- Access Inventory
- Pedestrian and Bicycle Connections

A detailed Existing Traffic Conditions Technical Memorandum is attached in **Appendix C** which documents the traffic data collection, methodology and additional details on existing conditions analysis summarized in the sections below.

### *Segment 1 – Woodland Avenue to Sibley Parkway*

#### *Land Use and Major Traffic Generators*

Land uses adjacent to this segment consist of mostly commercial with some institutional mixed in. Industrial uses are located on the west side, south of Woodland Avenue and north of the Highway 169/60 interchange. Residential neighborhoods are located on both sides of Riverfront Drive between Woodland Drive and the interchange. Major traffic generators in this segment include CHS Oilseed Processing, Roosevelt Elementary School, the YMCA, Mankato West High School, and the Cub Food retail complex.

#### *Traffic Operations*

This segment carries 8,300 vehicles per day south of the Highway 169/60 interchange, 20,700 vehicles per day between the interchange and Stoltzman Road, and 15,500 vehicles per day from Stoltzman Road to Sibley Parkway.

The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches. Intersections and each intersection approach are given a ranking from Level of Service (LOS) A through LOS F. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS A through D is generally perceived to be acceptable to drivers. LOS E indicates that an intersection is operating at, or very near, its capacity and that drivers experience considerable delays. LOS F indicates an intersection where demand exceeds capacity and drivers experience substantial delays.

Almost all intersections in this segment are operating at generally acceptable levels of service, however, the Poplar Street/Riverfront Drive intersection operates at a LOS D in the AM peak hours which is approaching an unacceptable LOS. Traffic backups were identified for northbound and southbound movements on Riverfront Drive for both AM and PM peak hour periods as well as the westbound leg entering from Mankato West High School in the AM peak hour period.

All other intersections within this segment operate acceptably under existing conditions. Although the overall intersection operations are acceptable, there are a few areas where traffic back-ups are common during the peak periods, indicating a potential problem. These areas include the following signalized intersections:

- North and southbound Highway 169/60 ramps for traffic entering Riverfront Drive
- All four legs of the Stoltzman/Riverfront intersection experience backups during peak hours.
- North and southbound Riverfront Drive movements at the Marshall Street intersection

*Crash History (2010 – 2014)*

A crash review was completed using the Minnesota Crash Mapping Analysis Tool (MnCMAT) which identified 90 crashes in this segment within a five-year period from 2010 to 2014. MnDOT uses a comparison of the crash rate and the critical rate when determining whether or not safety issues exist at an intersection. The 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 of the expected, normal range. The critical index reports the magnitude of this difference and a critical index of less than one shows that the intersection is operating within the normal range.

Most intersections in this segment exhibit crash counts within a normal range during the five-year period. However, the Stoltzman/Riverfront intersection exhibited 56 crashes (Critical Index: 1.14) which is outside of the normal range. These crashes included nine left turn crashes, nine right angle crashes, and 23 rear end crashes. There were four pedestrian/bicycle crashes at this intersection within the five-year period and one in 2006 which resulted in a fatality. An Intersection Control Evaluation Study was completed that considered lane configurations and traffic controls at this intersection suggesting that the left and shared through-left turn lanes at the northbound approach may be causing driver confusion leading to increased crashes as the signal currently operates with protected and permissive left turn phases. The study recommended changing the northbound and southbound traffic to split phase operations could potentially reduce the number of crashes observed at this intersection. Another intersection of note is the Sibley/Riverfront intersection where all six crashes were right angle.

*Access*

There are 28 access points in this segment including five primary accesses (5 per mile), eight secondary accesses (9 per mile), and 15 private accesses (16 per mile). Both primary and secondary access counts fall

within or below MAPO's recommendations for 9 to 19 accesses per mile along minor arterial roadways. However, the spacing of signalized intersections within this segment is problematic as shown by the traffic back-ups occurring at multiple intersections in this segment today.

*Pedestrian and Bicycle Connections*

Sidewalks are present along both sides of the corridor within most of the southern area and north of the Highway 169/60 interchange. There is no sidewalk on the east side of the corridor between Sibley Street and Woodland Ave. There are no bicycle facilities along Riverfront Drive in this segment of roadway, however, two trails intersect Riverfront including the West Mankato trail, located at Poplar Ave, as well as the Minneopa Trail which begins across Riverfront from Woodland Ave and continues west along Highway 169/60, outside of the study area.

There are a few high demand pedestrian crossing locations along this segment of Riverfront Drive. The Sibley Street intersection accommodates children accessing Roosevelt Elementary School to the east. Improvements to this intersection were included in the Mankato Safe Routes to School Plan described in the previous plans section of this document. The crossing located at Poplar Street carries bicycles and pedestrians as the West Mankato Trail intersects Riverfront Drive at this location. Students also use this crossing to access Burger King and the Cub Foods retail complex during lunch hours. The Cub Foods retail complex also generates pedestrian trips from the Marshall Street and Stoltzman Road intersections with Riverfront Drive. A signaled crossing location exists on Stoltzman Road just north of the Mankato West High School's main parking lot access for those accessing the school from east of Stoltzman Road.

***Segment 2 – Sibley Parkway to Veteran's Memorial Bridge***

*Land Use and Major Traffic Generators*

This segment is surrounded by commercial and industrial land uses and traverses alongside an area designated as Central Business District (CBD) that includes the Front Street Connectivity District on the east side of the roadway. Reconciliation Park is located adjacent to the Veteran's Memorial Bridge on Riverfront Dr. The Riverfront Court Apartments are located near the intersection of Riverfront Drive/Main Street between the City Center Hotel and the Verizon Wireless Center and represents the only residential use within this segment. Major traffic generators within this segment include: new office complex and parking ramp at the Warren Ave/Riverfront Drive intersection, Hy-Vee, Civic Center, hotels, Mankato Intergovernmental Center and parking ramp, and Blue Earth County Library.

*Traffic Operations*

Riverfront Drive carries 16,400 vehicles per day in this segment. All intersections in this segment are identified as operating at acceptable LOS grades. Traffic backups have been identified at the southbound approach to the Minnesota St/Cherry St and Warren St intersections during PM peak hour traffic. Northbound backups have been identified at Minnesota St/Cherry St and Main St for AM/PM and PM peak hours respectively.

*Crash History (2010 – 2014)*

While elevated crash counts exist at the signalized intersections of Warren Street (35 crashes) and Minnesota Street/Cherry Street (22 crashes), neither of the intersections exhibit crashes outside of the normal range. However, Warren St does exhibit higher occurrences of rear end crashes with 16 occurring

in the five-year period. There was one pedestrian crash at Warren St and two at Cherry St within the five-year period as well.

*Access*

There are a total of 19 accesses within this segment including 3 primary accesses (4 per mile), 3 secondary accesses (4 per mile), and 13 private accesses (18.9 per mile). Both primary and secondary access counts fall below MAPO's recommendations for 9 to 19 accesses per mile along minor arterial roadways.

*Pedestrian and Bicycle Connections*

Sidewalks are present along both sides of the corridor between Sibley Parkway and Cherry Street. A gap exists on the eastern side of the roadway from Cherry Street to Hickory Street. There are no bicycle facilities along Riverfront Drive in this segment of roadway, however, a dedicated on-street bike lane exists on Cherry Street extending across Riverfront Drive to Minnesota Street.

High demand pedestrian crossings exist along this segment at various locations. The intersection of Poplar Street-Warren Street is frequented by those accessing dining retail options on the west side of Riverfront Drive. The Hy-Vee grocery store draws pedestrians to cross at the Cherry Street-Minnesota Street intersection. Pedestrians accessing the Minnesota River Trail and the historic Depot parking lot use the Main Street intersection. The Civic Center Arena draws foot traffic crossing Riverfront Drive during events.

***Segment 3 – Veteran's Memorial Bridge to Madison Avenue***

*Land Use and Major Traffic Generators*

This segment of Riverfront Drive primarily serves commercial uses while traversing a segment of CBD existing between the Veteran's Memorial Bridge and Spring St. This segment passes through the Old Town Master Plan planning area bound by Main St, North Second Street, Madison Ave, and the riverfront. This planning effort outlines strategies for area improvements and potential redevelopment that will influence roadway infrastructure as well as vehicular and pedestrian/bicycle movements. This segment provides access to Riverfront Park which is a major draw for vehicles and pedestrians accessing events. Planned developments in the area including the Coughlan Mine and the Bridge Plaza redevelopments, will create increased vehicle and pedestrian traffic in this segment in the future. There is also access to heavy industrial uses that draw heavy truck traffic and rail for distribution. Major traffic generators within this segment include:

1. Retail within the Old Town Historic District
2. Many industrial entities such as Dotson Iron Castings, Mankato Iron & Metal, and Ardent Mills among others.
3. The Coughlan Mine Redevelopment Area
4. The Bridge Plaza Redevelopment Area
5. Super America Gas Station
6. Gerring's Mankato Car Wash
7. Riverfront Park

*Traffic Operations*

Between Madison Ave and Plum Street, Riverfront Drive carries approximately 17,400 vehicles per day. All intersections within this segment operate at acceptable LOS grades. The northbound approach to Madison Ave intersection exhibits backups in the AM and PM peak traffic hours.

*Crash History (2010 – 2014)*

All intersections exhibit crash counts within the normal range, however, Madison Ave had an elevated count of 33 crashes over the five-year period. There were 22 left turning crashes among which 20 were caused by traffic along Riverfront Drive.

*Access*

There are a total of 34 access locations within this segment including 1 primary access (1.8 per mile), 6 secondary accesses (10.9 per mile), and 27 private accesses (49.3 per mile). Primary access counts fall below, and secondary access counts fall within, MAPO's recommendations for 9 to 19 accesses per mile along minor arterial roadways. However, there are multiple access locations within this segment that are closely spaced and exhibit conflicting left-turn movements which is a safety concern.

*Pedestrian and Bicycle Connections*

Sidewalks are present along both sides of the corridor the entire length of this segment. There are no bicycle facilities along Riverfront Dr in this segment, however, a dedicated on-street bike lane exists on Broad St running parallel to the corridor two blocks to the east. No trails currently intersect Riverfront within this segment.

Pedestrian traffic is high in this area and will only increase with more frequent events at Riverfront Park and redevelopments at Coughlan Mine and the Bridge Plaza redevelopment areas. A future trail connection is proposed at the signalized intersection at Elm Street that will enhance access to Riverfront Park and the Minnesota River Trail. The area is also in high demand for pedestrian crossings due to public parking lots and the Old Town District. Signals are located at Plum Street, Elm Street, and Madison Avenue. There is a three block separation between each signal creating an environment where existing signals do not align with all pedestrian crossing demand locations. For example, Rock Street provides a gateway to Riverfront Park and serves heavy traffic during events. Pedestrian crossing at this location during events is heavily controlled by law enforcement which shows the demand for enhanced intersection controls.

***Segment 4 – Madison Avenue to the Highway 14 Interchange***

*Land Use and Major Traffic Generators*

Uses along this segment include commercial and light industrial with some residential, institutional, and park uses easily accessed. Lime Street, Adams Street, and Lafayette Street provide access to Franklin Elementary School on the east and Chestnut Street and Maxfield Street provide access to light industrial uses such as Crown Cork & Seal Co. to the west.

Two schools serve as major traffic generators for parents and school buses access during peak traffic hours in this segment. These include Franklin Elementary School at Lafayette Street and Adams Street as well as Loyola School via Good Counsel Drive. There is a large presence of warehouse and distribution uses along this segment including businesses like Ferguson Plumbing Supplies, SPS Plumbing Supply, Graybar, and

Rooms and Rest Distribution Center among others. This area also provides access to the industrial uses along 3rd Avenue as well as major rail connections for distribution services. A key traffic generator in this segment is the Highway 14 interchange which filters regional traffic through the area creating access opportunities to the previously mentioned uses.

*Traffic Operations*

This segment carries approximately 13,500 vehicles per day and provides access to the Highway 14 interchange.

All intersections operate at an acceptable LOS grade. However, traffic backups have been observed traveling southbound at the Madison Ave traffic signal for AM and PM peak hour traffic. Traffic backups have also been observed on the Highway 14 southbound ramp for traffic entering Riverfront Drive in the PM peak hours. These back-ups occasionally extend to the Highway 14 mainline which is a safety concern. Drivers have also been observed making illegal U-turns around the median to the north of the ramp intersection on Riverfront Drive to avoid the westbound ramp to southbound Riverfront Drive delays.

*Crash History (2010 – 2014)*

There were 31 crashes within this segment not including those 33 that occurred at the Madison Ave intersection (noted in Segment 3). There were 15 crashes at Lafayette Street/3rd Avenue giving this intersection a critical index of 1.04 and showing that this intersection is experiencing a higher than usual number of crashes compared to similar intersections statewide. Crashes include 5 right angle, 4 ran off road, and 4 rear end crashes among other types. Sight distance and proximity to the Madison Avenue signalized intersection have been noted as potential issues at this intersection. There was one pedestrian/bicycle crash at Lime St in 2008 which resulted in a fatality. Other intersections exhibit crash counts with the normal range.

*Access*

There are currently 70 access locations along this segment of the corridor including five primary accesses (4.1 per mile), 11 secondary accesses (9.1 per mile), and 54 private accesses (44.6 per mile). Primary access counts fall below, and secondary access counts fall within, MAPO's recommendations for 9 to 19 accesses per mile along minor arterial roadways. There are over 20 locations identified within this segment where accesses are closely spaced resulting in overlapping turning movements which is a safety concern. There were several properties along this segment that have side street access and may be candidates for access closure along Riverfront.

*Pedestrian and Bicycle Connections*

Sidewalks are present along both sides of the entire extent of this segment. There are no bicycle facilities or trails traversing the segment or intersecting the segment. However, the Minnesota River Trail and the Sakatah Singing Hills Trail can be accessed north of the Highway 14 interchange. A parallel, dedicated on-street bicycle lane exists on Broad St, two blocks to the east of Riverfront between Madison Ave and Thompson St.

A trail addition is proposed to close a gap existing near the TH 14 interchange. The trail will travel south along the west side of Riverfront crossing at Good Counsel Drive and continuing into the residential neighborhoods to the east of the corridor, eventually connecting to dedicated on-street bike lanes on Broad Street. This will enhance bicycle traffic along that short segment of Riverfront.

***All Segments - Social, Economic, and Environmental (SEE) Concerns***

An environmental screening was completed for the entire study area. This screening included a high-level review of previously identified social, economic and environmental (SEE) resources. The following key findings are summarized from the environmental screening attached in **Appendix D:**

1. The study area falls within the Mankato Watershed of the Minnesota River Basin.
2. A small segment of Riverfront Drive near Stoltzman Road/Riverfront Drive intersection and most of the area west of the Highway 169/60 interchange fall within the 500-year floodplain of the Minnesota River Basin.
3. Minnesota Department of Natural Resources Natural Heritage Information Systems data suggests threatened, endangered, and rare species do not exist within the study area.
4. The study area is dominated by developed residential, industrial and commercial uses with altered vegetation.
5. Several areas were identified along the corridor that have a known history of contamination based on the Minnesota Pollution Control Agency's "What's in My Neighborhood?" data. More detailed investigations may need to take place as roadway alternatives are implemented along the corridor.
6. There are three parks, one school, and four trails that are adjacent to the corridor that represent Section 4f and Section 6f properties. Impacts to these properties will need to be taken into consideration in a future environmental review.
7. The entire east side of the block between Washington Street and Spring Street is designated as a historic district. The Stahl House at the junction of Washington St and Riverfront Drive is on the National Register of Historic Places.

# APPENDIX A

## Figures

# APPENDIX B

## MAPO Functional Classification

# APPENDIX C

## Existing Traffic Conditions Analysis Memo

# APPENDIX D

## Environmental Screening