TH 23 & CSAH 75 Corridor Study

March 2007

Prepared for:

Mn/DOT District 3, St. Cloud, and Stearns County

Partnered with:

St. Cloud Area Planning Organization,
St. Augusta, Town of St. Joseph, and Waite Park,

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SI. Introduction & Background

A. Study Overview

The Trunk Highway 23 and Stearns County State Aid Highway 75 (TH23/CSAH 75) Corridor Study was undertaken by Mn/DOT District 3 in partnership with Stearns County, the St. Cloud Area Planning Organization (APO) and the communities of St. Joseph Township, St. Augusta, St. Cloud, and Waite Park. The study focuses on building a vision for TH 23/CSAH 75 that can provide a framework for decision making on land use and transportation investments in the corridors. A vision for these corridors will help Mn/DOT, Stearns County and adjacent Cities know where to preserve right-of-way for future expansion and consolidate and/or remove access points to improve mobility throughout the corridors. The vision for these corridors will minimize future impacts on the area's social, economic, cultural, and natural environments. The findings and recommendations discussed in this report will be the basis for future preliminary engineering and environmental studies in the corridors. The schedule for future studies is not determined at this time.

Study Purpose

The primary objective of the TH 23/CSAH 75 Corridor Study is to determine what improvements may be needed to handle traffic demand through 2030 and beyond, and identify an implementation plan that would allow improvements to be made over time.

Study Limits

The segment of TH 23 under study begins at its interchange with I-94 and heads northeasterly to its intersection with TH 15. This segment of the TH 23 corridor lies within the Town of St. Joseph and City of Waite Park in Stearns County. The segment of CSAH 75 under study begins at its southern intersection with TH 15 (across from TH 23) and heads southeasterly to its interchange with I-94. The segment of CSAH 75 under study lies within the Cities of St. Cloud and St. Augusta in Stearns County.

Relationship to TH 15 Study

A similar study is being conducted for TH 15 from Stearns CSAH 47/136 to TH 10. Because improvements on TH 23/CSAH 75 will have an impact on TH 15 and improvements on TH 15 will have an impact on TH 23/CSAH 75, these two studies are being conducted jointly to coordinate the decision making for the two roadways.

Study Organization

A Technical Advisory Committee (TAC) and a Policy Advisory Committee (PAC) were established to provide direction and oversight for the study. The TAC is made up of staff from the Cities, Counties, APO, and Mn/DOT. Their role is to provide technical review of the analysis and findings from the study and communicate those findings with elected representatives. The PAC is made up of elected representatives from the affected agencies, and their role is to provide policy direction and input for the study.

SII. Project Purpose and Need

A. Project Goal & Objectives

Goal

The goal for the TH 23 & CSAH 75 corridors is to preserve their integrity as principal arterials moving the longer trips efficiently, safely, and reliably within and through the St. Cloud Metropolitan Area. Specific objectives for the corridor include:

Objectives

- Meet Mn/DOT's and/or St. Cloud APO access spacing guidelines while maintaining reasonable land access along the corridor.
- Strive for crash and severity rates that are at or below the statewide rates for similar facilities.
- Maintain or improve average travel speeds (average speed includes control delay) in the corridor.
- Provide LOS D on all segments of the corridor with isolated at-grade intersections at the LOS D threshold or better.
- Proposed improvements in the corridor should have a benefit to cost greater than one (1).
- Minimize social, environmental, and economic impacts.

B. Summary of Deficiencies

The following summarize the existing and No Build conditions for TH 23 and CSAH 75 and whether the stated objectives are met. Only the first four objectives, access spacing, safety, travel speeds, and LOS are summarized since the benefit/cost and SEE impacts are not influenced by the exiting and No Build conditions.

Segment 1: TH 23 – I-94 to 10th Avenue

Access: The current and future access does not meet Mn/DOT's access spacing guidelines.

Safety: Crash rates on this segment are above the statewide and District 3 rates for similar facilities. Since access on this segment is mostly unchanged in the future, it is expected that the crash rates will not change. Therefore, existing and future crash rates are above the statewide and District 3 averages.

Travel Speeds and LOS: The addition of traffic control and increase in traffic volumes along this segment of the corridor are anticipated to have a negative affect on travel speeds. The existing PM peak hour travel speeds are 59 and 58 mph in the eastbound and westbound directions respectively. The modeling indicates that with the future traffic projections, the travel speeds will decrease 38 mph in the westbound and eastbound directions. The average travel speeds will result in segment LOS E for the future

condition on TH 23. The No Build condition also results in one intersection at LOS E which does not meet the objective of LOS D or better at all intersections.

Segment 2: TH 23 – 10th Ave. to TH 15

Access: The spacing of signals and full access points do not meet Mn/DOT's access spacing guidelines on TH 23, from 10th Avenue to 2nd Avenue.

Safety: This segment has a high crash rate of 6.76 which is higher than both the statewide and District 3 averages of 4.8 and 5.8 respectively. Since access remains unchanged in the future No Build condition, it is anticipated that the crash rates along this segment would remain the same.

Travel Speeds & LOS: Currently the average travel speeds in the PM peak hour along this segment are 36 mph in the eastbound direction and 26 mph in the westbound direction. In the future with no improvements, the travel speeds along the corridor are anticipated to decrease significantly up to 26 mph. This results in LOS F along the segment and three intersections operating at LOS E and F.

Segment 3: CSAH 75 – TH 15 to Cooper Ave.

Access: The segment of CSAH 75 from TH 15 to 25th Avenue, does not meet the APO's recommended guidelines for signal spacing, full intersections, and partial and private access.

Safety: This segment of CSAH 75 has a very high crash rate of 10.26, which is two times higher than the statewide average for similar facilities. Again, if the access remains unchanged in the future, the crash rates are not anticipated to change either.

LOS & Travel Speeds: The PM peak hour travel speeds along this segment are the lowest of the entire corridor at 29 and 14 mph (eastbound and westbound respectively). These are expected to decrease to 15 mph and 8 mph (eastbound and westbound respectively) by 2030 with no improvements. Four of the signalized intersections are anticipated to operate poorly in the future providing LOS F.

Segment 4: CSAH 75 – Cooper Ave. to I-94

Access: The signal spacing along this segment of roadway meets the APO guidelines and even though the signal spacing (or intersections requiring traffic control) decreases in the future due to newly developed corridors accessing CSAH 75 they are still within the APO guidelines. However, the spacing of full and partial access points along the corridor do not meet the APO guidelines. The many private accesses along CSAH 75 do not meet the APO guideline which states it is highly restricted.

Travel Speeds & LOS: The existing PM peak hour travel speeds are 40 and 42 mph in the eastbound and westbound directions respectively. In the future, corridor travel speeds are anticipated to decrease significantly by as much as 26 mph. Four intersections are anticipated to have poor operations of LOS E and F.

SIII. Alternatives & Evaluation of Alternatives

The access recommendations are provided below as well as a summary of the evaluation completed for the corridor wide alternatives. For all of the segments, the appropriate

traffic control (such as a traffic signal or roundabout) was not determined, but will be evaluated in future studies.

Segment 1: TH 23 – I-94 to 10th Avenue

The build alternatives for this segment include:

1A - 4-lane divided roadway

1B - 6-lane divided roadway

Both scenarios would consolidate access points at six full intersections, and provide other right-in/right-out intersections. These intersections would connect into the local roadway network (with the exception of I-94 ramps), which would provide access to properties along TH 23. Access to property fronting on TH 23 would be provided via frontage or backage roads which would be implemented as the area is developed.

The six full access points on TH 23 would include:

1. TH 23 @ I -94 Eastbound Ramps
2. TH 23 @ I-94 Westbound Ramps
3. TH 23 @ B el Clare Road (with Bel Clare Road being extended to the east)
4. TH 23 @ J ulip Road (with Julip Road being extended to the south)
5. TH 23 @ 28th Avenue (existing signal)
6. TH 23 @ 10th Avenue (existing signal)

Segment 2: TH 23 – 10th Avenue to TH 15

The build alternatives include:

2A - 4-lane divided roadway (existing geometry)

2B – Full-width (150' R/W) 6-lane divided roadway with dual left turn lanes (traffic lanes would be 12 feet wide)

2C - Modified 6-lane divided roadway with single left turn lanes (traffic lanes would be 11 feet wide – 133' R/W).

2D - Modified 6-lane divided roadway with single left turn lanes (traffic lanes would be 11 feet wide – 133' R/W). ¾ access is provided at mid-block locations.

All Build alternatives would close private access over time and provide consolidated partial access at mid-block. The completion of a backage road system would provide alternative access and circulation for adjacent businesses. Full access (with traffic control such as a signal or roundabout) for all four alternatives (2A, 2B, 2C, and 2D) would be provided at five intersections. These include:

1. TH 23 @ 10th Avenue (existing signal)
2. TH 23 @ 6th Avenue (existing signal)
3. TH 23 @ 2nd Avenue (existing signal)
4. TH 23 @ Waite A venue (existing signal)
5. TH 23 @ TH 15 (existing signal)

Segment 3: CSAH 75 – TH 15 to Cooper Avenue

As described in the alternatives section the build alternatives include:

3A - 4-lane divided roadway (existing geometry)

3B – Full-width (150' R/W) 6-lane divided roadway with dual left turn lanes (traffic lanes would be 12 feet wide)

3C - Modified 6-lane divided roadway with single left turn lanes (traffic lanes would be 11 feet wide – 133' R/W

3D - Modified 6-lane divided roadway with single left turn lanes (traffic lanes would be 11 feet wide – 133' R/W). ¾ access points provided at mid-block locations.

All alternatives would close private access over time and provide consolidated partial access at mid-block. The completion of a backage road system would provide alternative access and circulation for adjacent businesses. Full access for all four cross-section scenarios (3A, 3B, 3C, and 3D) would be provided at five intersections. These include:

1.CS AH 75 @ TH 15 (existing signal)
2.CS AH 75 @ 33rd Avenue (existing signal)
3.CS AH 75 @ 29th Avenue (existing signal)
4.CS AH 75 @ 25th Avenue (existing signal)
5.CS AH 75 @ Cooper Avenue (existing signal)

Segment 4: CSAH 75 – Cooper Avenue to I-94

The build alternatives for Segment 4 include:

4A - 4-lane divided roadway

4B – 4/6-lane divided roadway

Both scenarios would consolidate access points at eight full intersections requiring traffic control, plus one three quarter access intersection, and complete the partial frontage road located on the east side of CSAH 75 between Halliday Road and 43rd Street. All but one private access would be closed over time.

Of the eight proposed full access intersections, only three currently exist, with the remaining being new, or relocated intersections. The eight full intersections would include:

1.CS AH 75 @ Cooper Avenue (existing signal).
2.CS AH 75 @ Halliday Road (with Halliday Road connecting to the future extension of 24th Street; 22nd would be converted to right-in, right-out)
3.CS AH 75 @ Cheryl Drive (existing signal)
4.CS AH 75 @ 33rd Street (existing signal)
5.CS AH 75 @ 36th Street (approximate location, 36th Street would be constructed to intersect with CSAH 75 from the west)
6.CS AH 75 @ 40th Street (intersection at 43rd Street would be converted to right-in, right-out as the analysis for 2030 conditions concluded it would not function at an acceptable level, particularly given it's proximity to the I-94 on/off ramps.)
7.CS AH 75 @ I-94 Westbound Ramps

8.CS AH 75 @ I-94 Eastbound Ramps

Evaluation Summary and Conclusion

The evaluation indicates that adding capacity on TH 23 and CSAH 75 in the core area (Segment 2 and 3) is needed and cost effective. Using narrower (11 feet) traffic lanes reduces the impacts on parking and circulation of adjacent properties and will maximize the benefits from adding an additional lane on TH 23 and CSAH 75. With a wider cross-section, the parking and circulation impacts quickly increase the costs and offset the benefits of improved travel time and traffic operations. Access management is also necessary and cost effective along the entire length of the corridor if it is performed over time as the adjacent properties develop and/or redevelop. The following summarizes the recommended improvements throughout the corridor.

- **Segment 1: Access Management and Improve Intersection Capacity**
- **Segment 2 & 3: Access Management and Widen to 6-lanes (Narrowed Typical Section)**
- **Segment 4: Access Management, Improve Intersection Capacity, and Widen to 6-lanes from 40th Street to I-94.**

The recommended plan is also illustrated in Figure S1 through Figure S4.

SIV. Public Involvement

The public involvement plan for this study was comprised of monthly study update meetings with the Technical Advisory Committee, periodic study update meetings with the Policy Advisory Committee, and two public information meetings. Two public meetings were held to gather public input on the needs in the TH 23 and CSAH 75 corridors and potential solutions. In addition, information was mailed to interested property owners and citizens. The draft report and recommendations will be posted on Mn/DOT's website and all adjacent property owners will be notified of the availability of the draft recommendations and report.

SV. Implementation

A. Staging

The following is a staging plan for improvements on TH 23 and CSAH 75. While specific construction improvements are not in the near future, the preservation of right-of-way and consolidation of access as development or redevelopment occurs along the corridor could happen as the opportunities present themselves.

Short Term (0 to 10 Years)

- Improve the intersection capacity at TH 23 and 28th Avenue with the extension of 28th Avenue project.
- As development/redevelopment occurs on TH 23, between 28th Avenue and 10th Avenue remove access to local roadways system per this reports Recommended Plan.

- As development/redevelopment occurs at CSAH 75 and 43rd Street, relocate the full access at 43rd Street to 40th Street

Long Term (10 plus Years)

- Upgrade Segments 2 and 3 (TH 23 from 10th Avenue to TH 15 and CSAH 75 from TH 15 to Cooper Avenue) to 6-lanes.

B. Next Steps

The following actions are recommended by the agencies responsible for implementation of elements of the TH 23 and CSAH 75 Plan:

Approval of Study through Local Resolutions

- The St. Cloud Area Planning Organization approves study through Resolution from APO Board.
- Cities of St. Cloud, St. Augusta, and Waite Park approve the study through City Council Resolutions.
- Stearns County approve study through Resolution from County Board

Planning Updates

- Mn/DOT incorporates study into District 3 Plan Update.
- Stearns County incorporates study into County Transportation Plan.
- St. Cloud APO incorporates study into Metropolitan Transportation Plan.
- Cities of St. Cloud, St. Augusta, and Waite Park incorporate study in Transportation Elements of Comprehensive Plans.

Environmental Documentation

Mn/DOT completes the environmental review for the TH 23 corridor.

Stearns County complete the environmental review for the CSAH 75 corridor.

Staff Approved Layout and Official Map

Mn/DOT should work with the local agencies to create a staff approved layout for TH 23 for municipal consent. The layout will provide the footprint for an official map that would be adopted after the environmental review is complete.

Stearns County should work with the local agencies to create a layout for CSAH 75 which provides a footprint for an official map that would be adopted after the environmental review is complete.

Pursue Funding

Mn/DOT, Stearns County, and the St. Cloud APO should pursue funding for the TH 23 and CSAH 75 improvements.

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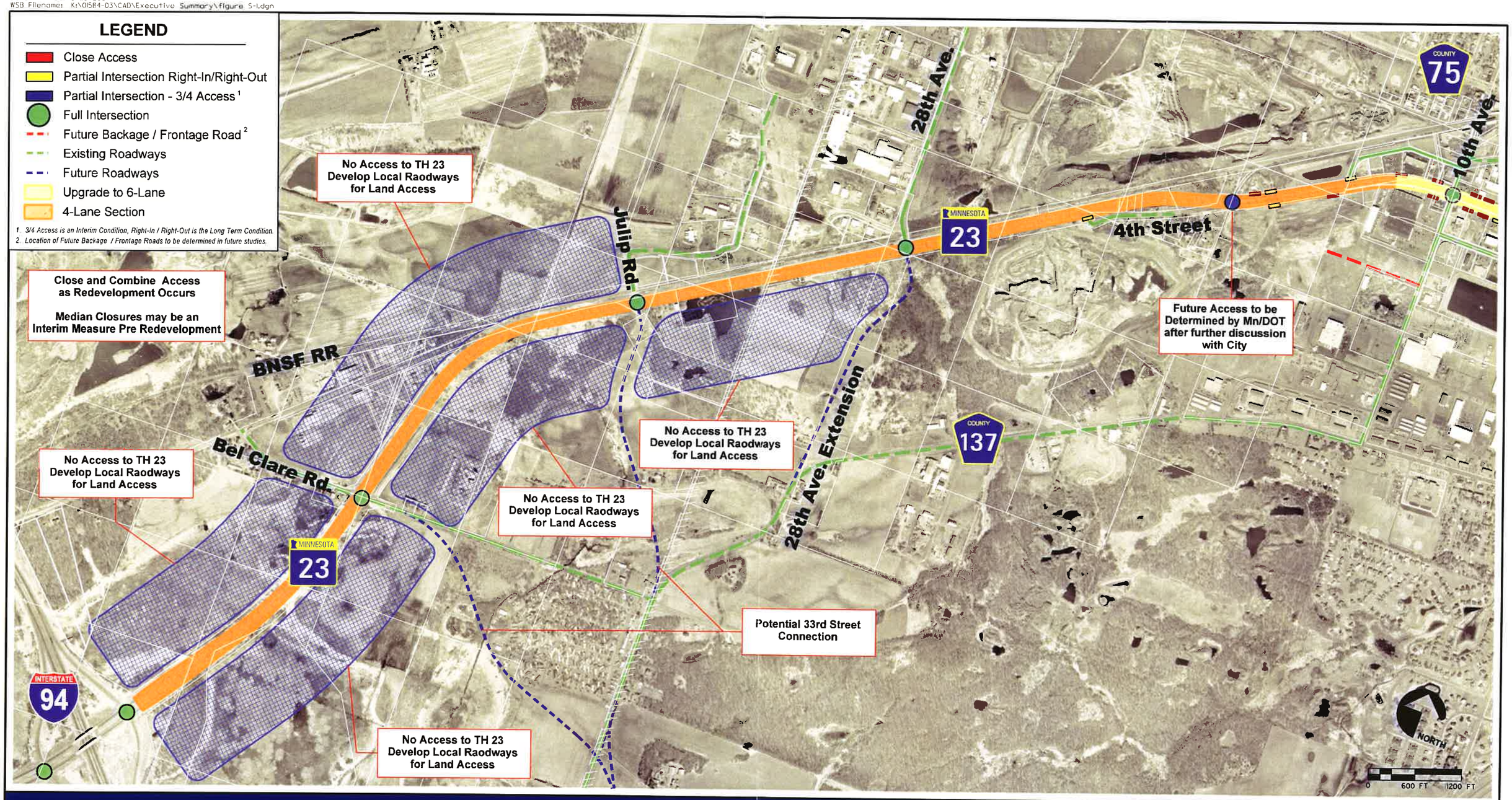
LEGEND

- Close Access
- Partial Intersection Right-In/Right-Out
- Partial Intersection - 3/4 Access [1]
- Full Intersection
- Future Backage / Frontage Road [2]
- Existing Roadways
- Future Roadways
- Upgrade to 6-Lane
- 4-Lane Section

1. 3/4 Access is an Interim Condition, Right-In / Right-Out is the Long Term Condition.
2. Location of Future Backage / Frontage Roads to be determined in future studies.



TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 1

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Figure S1

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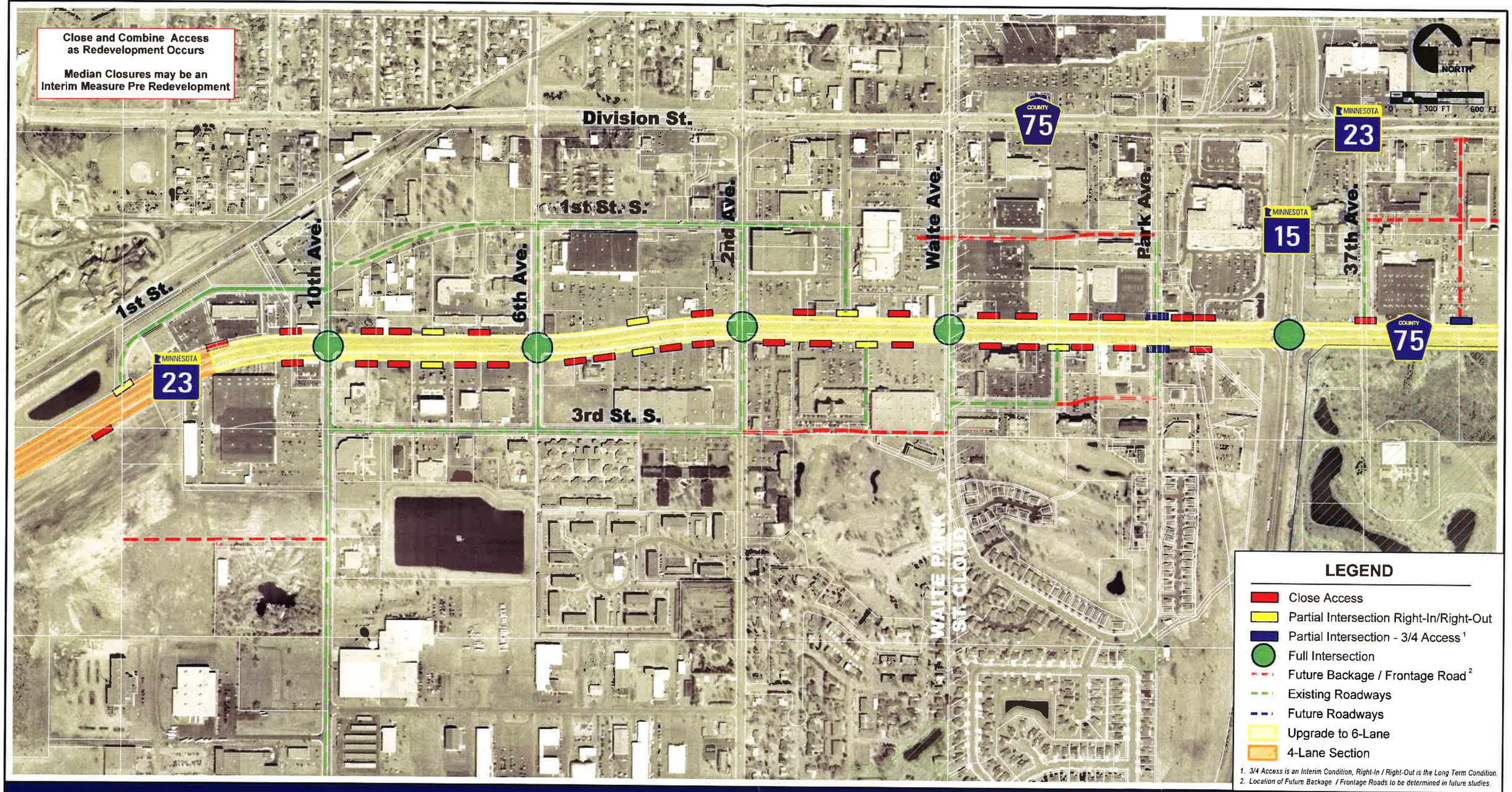

TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 2

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Figure S2

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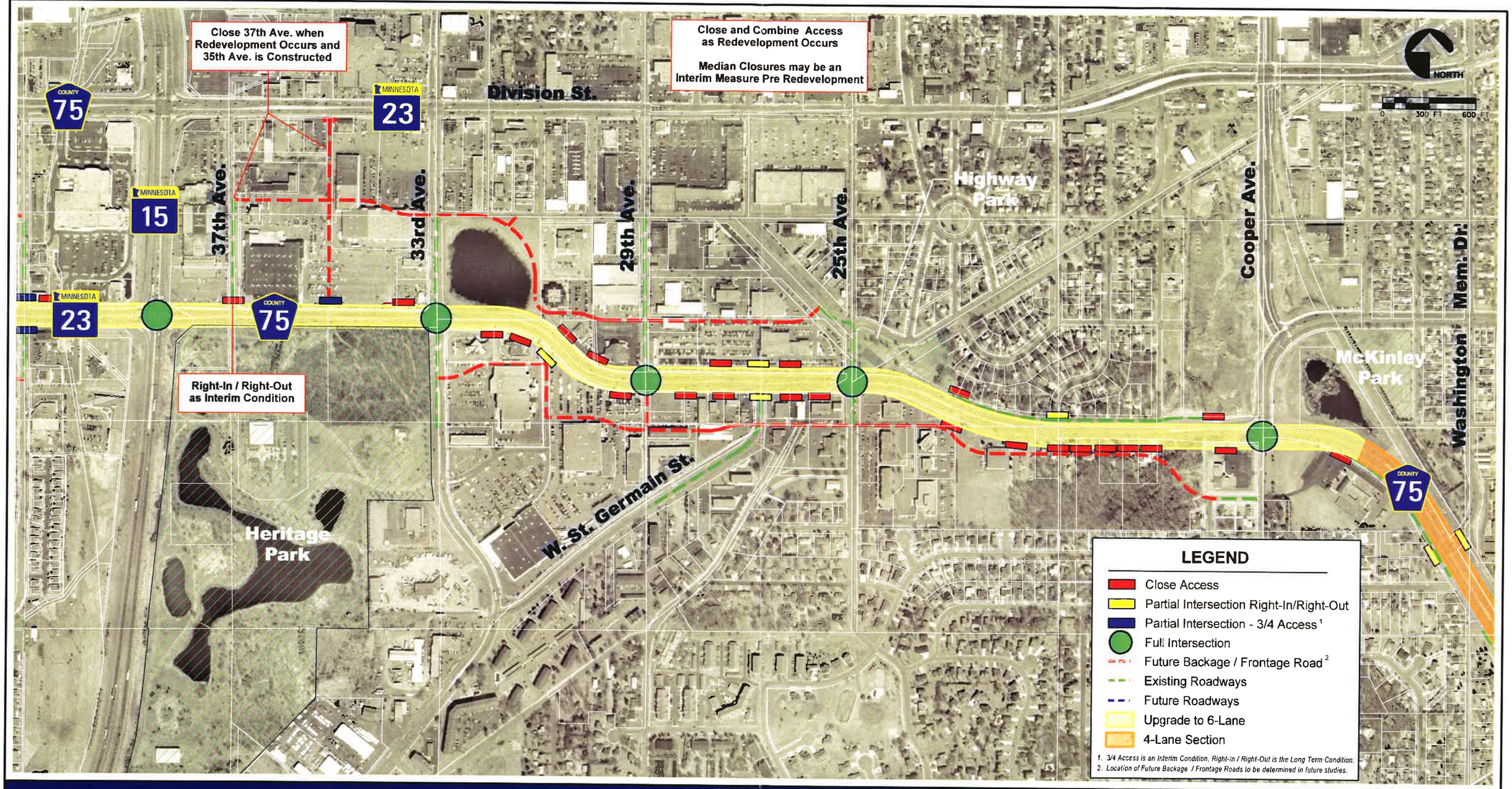

TH 23 / CSAH 75 Corridor Study

Recommened Plan - Segment 3

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Figure S3

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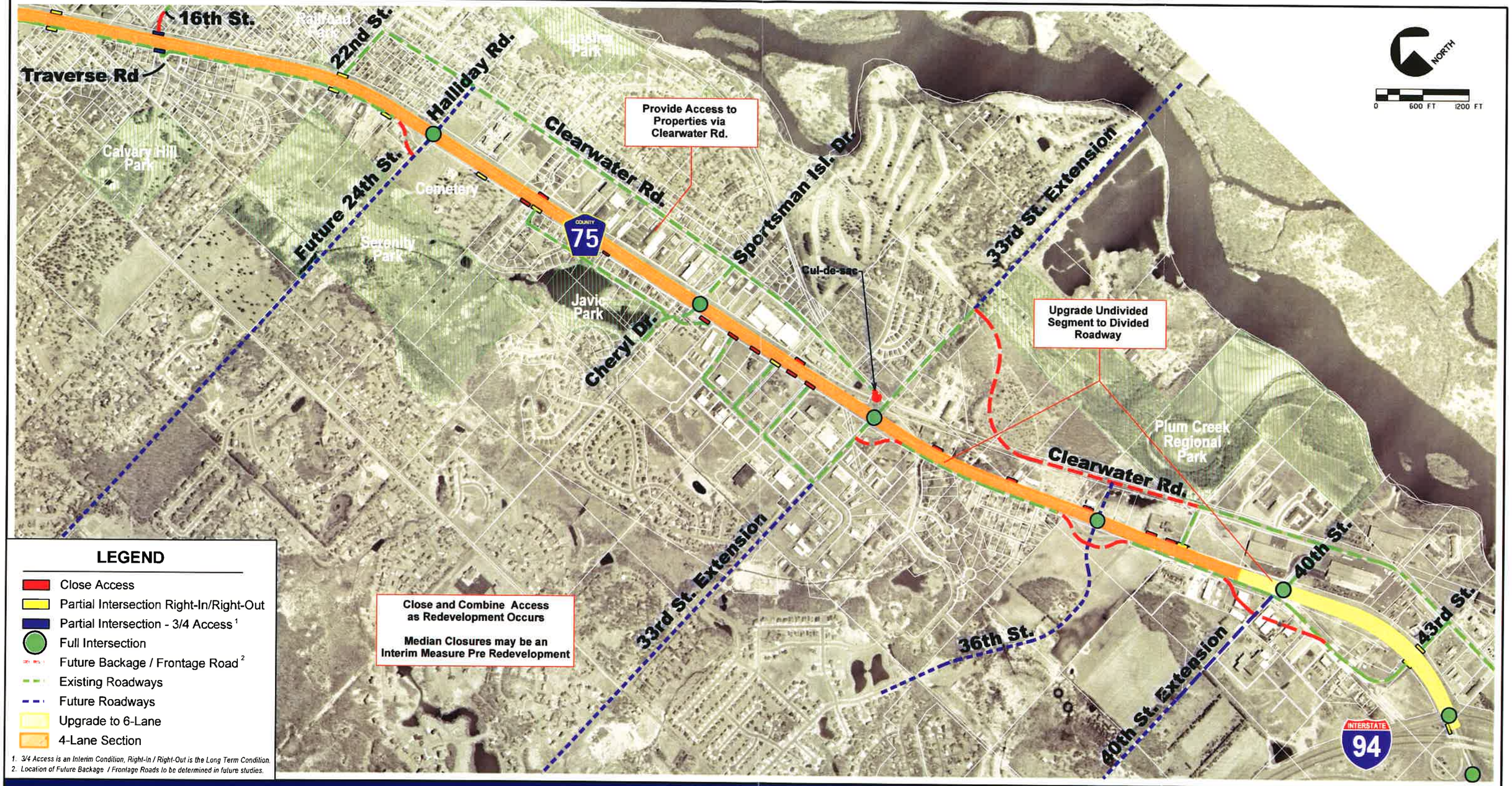

LEGEND

- Close Access
- Partial Intersection Right-In/Right-Out
- Partial Intersection - 3/4 Access [1]
- Full Intersection
- Future Backage / Frontage Road [2]
- Existing Roadways
- Future Roadways
- Upgrade to 6-Lane
- 4-Lane Section

1. 3/4 Access is an Interim Condition, Right-In / Right-Out is the Long Term Condition.
2. Location of Future Backage / Frontage Roads to be determined in future studies.

TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 4

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Figure S4

I. Introduction & Background

A. Study Overview

The Trunk Highway 23 and Stearns County State Aid Highway 75 (TH 23/CSAH 75) Corridor Study was undertaken by Mn/DOT District 3 in partnership with Stearns County, the St. Cloud Area Planning Organization (APO) and the communities of St. Joseph Township, St. Augusta, St. Cloud, and Waite Park. The study focuses on building a vision for TH 23/CSAH 75 that can provide a framework for decision-making on land use and transportation investments in the corridors. A vision for these corridors will help Mn/DOT, Stearns County and adjacent Cities know where to preserve right-of-way for future expansion and consolidate and/or remove access points to improve mobility throughout the corridors. The vision for these corridors will minimize future impacts on the area's social, economic, cultural, and natural environments. The findings and recommendations discussed in this report will be the basis for future preliminary engineering and environmental studies in the corridors. The schedule for future studies is not determined at this time.

Study Purpose

The primary objective of the TH 23/CSAH 75 Corridor Study is to determine what improvements may be needed to handle traffic demand through 2030 and beyond, and identify an implementation plan that would allow improvements to be made over time.

Study Limits

The segment of TH 23 under study begins at its interchange with I-94 and heads northeasterly to its intersection with TH 15. The east-west segment of TH 23 from 10th Avenue to TH 15 is also known as 2nd Street South. This segment of the TH 23 corridor lies within the Town of St. Joseph and Waite Park in Stearns County. The segment of CSAH 75 under study begins at its southern intersection with TH 15 (across from TH 23) and heads southeasterly to its interchange with I-94. The east-west segment of CSAH 75 from TH 15 to 25th Avenue is also known as 2nd Street South. From 25th Avenue to south of 22nd Street, CSAH 75 is also referred to as Roosevelt Road. The segment of CSAH 75 under study lies within St. Cloud and St. Augusta in Stearns County.

Relationship to TH 15 Study

A similar study is being conducted for TH 15 from Stearns CSAH 47/136 to TH 10. Because improvements on TH 23/CSAH 75 will have an impact on TH 15 and improvements on TH 15 will have an impact on TH 23/CSAH 75, these two studies are being conducted jointly to coordinate the decision making for the two roadways.

Figure I-1 illustrates the issues identified early in the study process for both TH 23/CSAH 75 and TH 15. Signal and access spacing were common issues identified on TH 23/CSAH 75. Access to the core business area was also identified as a key issue early in the study process.

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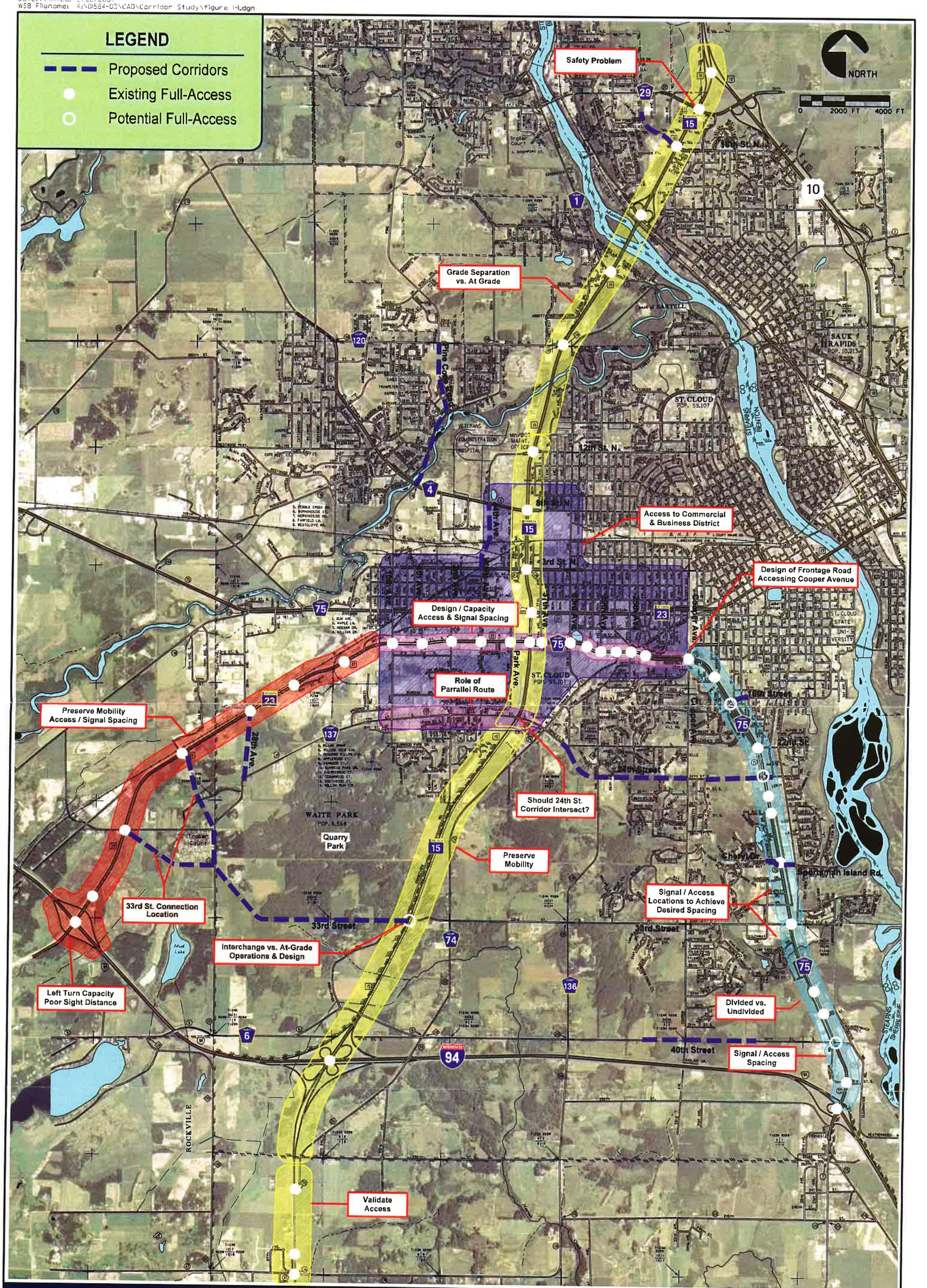

TH 23 / CSAH 75 Corridor Study

System Issues Map

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Figure I-1

Study Organization

A Technical Advisory Committee (TAC) and a Policy Advisory Committee (PAC) were established to provide direction and oversight for the study. The TAC is made up of staff from the Cities, Counties, APO, and Mn/DOT. Their role is to provide technical review of the analysis and findings from the study and communicate those findings with elected representatives. The PAC is made up of elected representatives from the affected agencies, and their role is to provide policy direction and input for the study. The representatives for each of these committees are identified in the section on public involvement.

B. Role of TH 23/CSAH 75 in the St. Cloud Area Transportation System

TH 23

State Trunk Highway (TH) 23 is a Medium Priority Interregional Corridor (IRC) that extends northeasterly from Interstate 90 in southwest Minnesota to Interstate 35 in northeast Minnesota. The IRC system is a network of interstates and highways designed to provide efficient connections between the major Regional Trade Centers around the state. TH 23 connects St. Cloud, a Primary Regional Trade Center, to Secondary Regional Trade Centers such as Marshall and Willmar. It is one of three National Highway System routes within the St. Cloud Metropolitan area and is functionally classified as a principal arterial. The role of a principal arterial is to move longer trips at higher speeds.

CSAH 75

Stearns County State Aid Highway (CSAH) 75 is also functionally classified as a principal arterial from the western Waite Park city limits to its eastern interchange with I-94. CSAH 75 begins at its western interchange with I-94 northwest of St. Joseph and continues southeasterly through the St. Cloud Metropolitan Area to the Stearns County border with Wright County in Clearwater.

Mn/DOT's District 3 2008-2030 Transportation Plan

Mn/DOT's fiscally constrained 2030 Transportation Plan focuses investment dollars on maintenance/preservation and improving safety deficiencies. The plan states "The District's ability to address congestion-related concerns in its regional trade centers is limited to low-cost improvements to manage the operation efficiency of these corridors." The fiscally constrained plan currently has no funds dedicated to improve mobility on the segment of TH 23 under study. Nor does the plan have funding for congested corridors in the regional trade centers. A preventative safety expansion project is planned for TH 23 outside the study area from east of St. Cloud to TH 25.

Although major improvements on TH 23 are not in the District's 2030 plans, a future vision for the TH 23 Corridor will allow communities to plan future development in a way that will preserve the right-of-way that may be needed for future improvements needed by 2030 and beyond.

APO's 2030 Transportation Plan

The St. Cloud Area Planning Organization 2030 Transportation Plan includes several improvements that will impact TH 23/CSAH 75. The plan lists projects in two scenarios, Financially Constrained and Illustrative. The Financially Constrained plan contains projects that can be funded through 2030 based on current funding scenarios. The Illustrative Plan is financially unconstrained and shows projects that are desirable but funding is not available. Unfunded projects in the Illustrative Plan are eligible for High Priority Project funding. The following table lists the improvements in each plan that may impact TH 23/CSAH 75:

Table I-1: APO Project's that Impact TH 23/CSAH 75

Projects that Directly Impact TH 23/CSAH 75		
Financially Constrained Plan		
Roadway	**Location**	**Description**
TH 23	10th Ave. to TH 15	*6-lane divided
CSAH 75	TH 15 to 25th Ave.	6-lane divided
28th Avenue	CR 137 to TH 23	4-lane new alignment
Illustrative Plan		
Roadway	**Location**	**Description**
CSAH 75	33rd St. S. to CSAH 7	4-lane Divided
10th Avenue	CSAH 6 to 3rd St. N.	4-lane new alignment & lane addition
TH 15	2nd Street to CSAH 29	6-lane expressway
33rd Street South	TH 15 Access	Construct Interchange
33rd Street South Bridge	33rd St. S. to TH 10	New Mississippi River Crossing
40th Street	Cooper Ave. to CSAH 75	2-lane new alignment
Clearwater Road	CSAH 75 to Industrial Park	2-lane new alignment
Southwest Beltway	TH 23 to CR 133	4-lane new alignment
Parallel Projects with Traffic Demand Impacts on TH 23/CSAH 75		
Financially Constrained Plan		
Roadway	**Location**	**Description**
33rd Street South	TH 23 to CSAH 75	4-lane new alignment
Stearns CR 137	10th Ave. to Quarry Park	4-lane
CSAH 4	CR 120 to TH 15	Widen roadway to 6-lane divided
Illustrative Plan		
Roadway	**Location**	**Description**
Sportsman Island Road	TH 15 Access	Construct Interchange
Sportsman Island Road	CR 136 to TH 15	2-lane new alignment
24th Street South	Clearwater to CR 74	2-lane new alignment
Clearwater Road	Division to Sportsman Isl. Rd.	4-lane Divided
TH 23	TH 15 to 10th Ave.	6-lane divided
CSAH 75	10th Ave. to TH 15	6-lane divided

*Programmed as to study capacity improvements.

Source: Exhibit 5L and 5I - St. Cloud APO 2030 Transportation Plan

II. Project Purpose and Need

A. Project Goal & Objectives

As stated in the study purpose, the main objective for this study is to determine what improvements may be needed on TH 23 and CSAH 75 in order to handle traffic demand through 2030 and beyond. To assist in determining what improvements are necessary, the study team identified goals and objectives for the TH 23 and CSAH 75 corridors. These goals and objectives are used to establish measures for evaluating improvement alternatives for the corridor.

Goal

The goal for the TH 23 & CSAH 75 corridors is to preserve their integrity as principal arterials moving the longer trips efficiently, safely, and reliably within and through the St. Cloud Metropolitan Area. Specific objectives for the corridor include:

Objectives

- Meet Mn/DOT's and/or St. Cloud APO access spacing guidelines while maintaining reasonable land access along the corridor.
- Strive for crash and severity rates that are at or below the statewide rates for similar facilities.
- Maintain or improve average travel speeds (average speed includes control delay) in the corridor.
- Provide level of service (LOS) D on all segments of the corridor with isolated at-grade intersections at the LOS D threshold or better.
- Proposed improvements in the corridor should have a benefit to cost greater than one (1).
- Minimize social, environmental, and economic impacts.

B. Analysis of Existing Conditions

In setting the objectives for the corridors, the desire is to, at a minimum, maintain the level of service and safety that currently exists in these corridors. This section discusses the existing conditions relative to each of the corridor transportation performance objectives.

The characteristics of the TH 23 and CSAH 75 corridors vary substantially throughout. Therefore, the corridor was divided into four segments for the purpose of analysis. The analysis segments are:

1. TH 23: I-94 to 10th Avenue
2. TH 23: 10th Avenue to TH 15
3. CSAH 75: TH 15 to Cooper Avenue
4. CSAH 75: Cooper Avenue to I-94

Access

Table II-1 details Mn/DOT's and the St. Cloud APO's access spacing guidelines for roadways classified as Principal Arterials and Medium Priority IRC's. TH 23 is classified as a Medium

Priority IRC and both corridors, TH 23 and CSAH 75, are classified as principal arterials. The APO guidelines refer to Mn/DOT's access spacing guidelines for state highways, which is why only Mn/DOT guidelines are emphasized for TH 23.

Signals are strongly discouraged on Medium Priority IRCs in rural and urbanizing areas. However, on a principal arterial in an urban/urbanizing area, signals are permitted at half-mile spacing. The guidelines recommend that full public accesses be limited to one access every mile on rural IRCs and every half mile on urban/urbanizing IRCs and principal arterials. Mn/DOT's recommended spacing for partial access (right-in/right-out or ¾ access) is one half mile spacing on rural IRCs and every quarter mile on urban/urbanizing IRCs and principal arterials. Private access is strongly discouraged for all facility types unless they are within the urban core area. The APO recommends that on principal arterials access points are limited to other arterials with signals or interchanges and that local street and private access be highly restricted. The recommended signal spacing is between 2,310 and 4,400 feet which is similar to Mn/DOT signal spacing guidelines outside the urban core, but is more restrictive than Mn/DOT within the urban core.

Table II-1: Mn/DOT's & APO Access Spacing Guidelines

Mn/DOT Category	Segment	Facility Type and Area	Signal Spacing (mile)	Non Sign. Full Access Spacing (mile)	Public Partial Access Spacing (mile)	Private Access
2A	**TH 23** I-94 to W. Lim. Waite Park	**Mn/DOT - Medium Priority IRC Rural**	Mn/DOT - strongly discouraged	Mn/DOT - 1.0	Mn/DOT - 0.5	Mn/DOT / By Exception or Deviation Only
2B	**TH 23** W. Lim. Waite Park to 2nd Ave.	**Mn/DOT - Medium Priority IRC Urban/Urbanizing**	Mn/DOT - strongly discouraged	Mn/DOT - 0.5	Mn/DOT - 0.25	Mn/DOT / By Exception or Deviation Only
2C	**TH 23** 2nd Ave. to TH 15	**Mn/DOT - Medium Priority IRC Urban Core**	Mn/DOT - 0.25	Mn/DOT - 300'-660'		Mn/DOT / Permitted Subject to Conditions
3C	**CSAH 75** TH 15 to 25th Ave.	**Mn/DOT - Principal Arterial Urban Core / (APO - *Urbanized*)**	Mn/DOT - 0.25 / *(APO - 2310-4400')*	Mn/DOT - 300'-660' / *(APO - 2310'-4400')*		Mn/DOT - Permitted Subject to Conditions / *(APO - Highly Restricted)*
3B	**CSAH 75** 25th Ave. to I-94	**Mn/DOT - Principal Arterial Urban/Urbanizing (APO - *Urbanized*)**	Mn/DOT - 0.5 *(APO 2310-4400')*	0.5 / *(APO-2310'-4400')*	0.25 / *(APO-2310'-4400')*	Mn/DOT - By Exception or Deviation Only / *(APO - Highly Restricted)*

Table II-2 details the existing access spacing along TH 23 and CSAH 75. Although TH 23 is a Medium Priority IRC, this segment of TH 23 is within the regional trade center (St. Cloud Metropolitan Area) that this highway serves.

Table II-2: TH 23/CSAH 75 Existing Access Spacing

Seg-ment	Access Cate-gory	Location	Length (miles)	Signal Spacing (mile)	Access Spacing (mile)	Access Spacing (mile)	Private Access #
1	2A	TH 23 - I-94 to W. Limits Waite Park	2.2	---	**0.63**	0.63	**1**
	2B	TH 23 - W. Limits Waite Park to 10th Ave.	1.7	**1.13**	**0.48**	0.42	**9**
2	2B	TH 23 - 10th Ave. to 2nd Ave.	0.5	**0.25**	**0.25**	0.25	**15**
	2C	TH 23 -2nd Ave. to TH 15	0.7	0.33	0.22	0.15	**16**
3	3C	CSAH 75 - TH 15 to 25th Ave.	0.9	**0.29**	**0.14**	**0.14**	**14**
	3B	CSAH 75 - 25th Ave. to Cooper Avenue	0.5	0.50	**0.25**	**0.20**	**7**
4	3B	CSAH 75 - Cooper Ave. to I-94	4.4	0.76	**0.38**	**0.29**	**9**

Note: Bold Numbers do not meet Guideline
Source: WSB & Associates, Inc.

TH 23, from I-94 to west of the western limits of Waite Park, is a four-lane divided expressway with a posted speed limit of 65 mph. The existing access does not meet the access spacing guidelines of one mile spacing between full intersections for an IRC in a rural area. With one private access, it conflicts with Mn/DOT's guidelines which indicate that private access is allowed by exception or deviation only on rural IRCs. Access control has been obtained by Mn/DOT on this segment of TH 23.

Figure II-1 illustrates the signalized and full access points along TH 23.

TH 23, from the western Waite Park limits to 2nd Avenue, is a four-lane divided roadway transitioning from rural to urban. This segment has several signals which are strongly discouraged in an urban/urbanizing area. The distance between full access points is also less than the Mn/DOT's guidelines of one-half mile spacing. Several private accesses exist along this segment which the guidelines strongly discourage. The access category designation on this segment of the corridor was determined by Mn/DOT's Office of Investment Management. However, from 10th Avenue to 2nd Avenue, the roadway's characteristics are similar to an urban core. As an Urban Core IRC, Access Category 2C, the signal spacing and non-signalized access spacing are consistent with Mn/DOT's access spacing guidelines.

TH 23, from west of 2nd Avenue to TH 15, is a four-lane divided urban roadway through the urban core area. The posted speed limit is 40 mph. This segment is also located in the identified core business area. The access on this segment is consistent with Mn/DOT's access spacing guidelines with signals spacing greater than every quarter mile. Partial and full access also meets Mn/DOT's access spacing guidelines within an urban core area. Several (16) private accesses exist along this segment which are allowed but subject to conditions.

CSAH 75, from TH 15 to 25th Avenue, is a four-lane divided principal arterial through the urban core. This segment is also located in the core business area. The posted speed limit along this segment is 40 mph. The access on this segment is consistent with Mn/DOT's access spacing guidelines with signals located approximately every one-third mile. It is not consistent with APO guidelines of signal spacing from 2,310 to 4,400 feet. The spacing of partial and full access also meets Mn/DOT's access spacing guidelines within an urban core area. However, the APO guidelines indicate access should be highly restricted.

Figure II-2 illustrates the signalized and full access intersections along CSAH 75. Several (14) private accesses exist along this segment which according to APO guidelines should be highly restricted.

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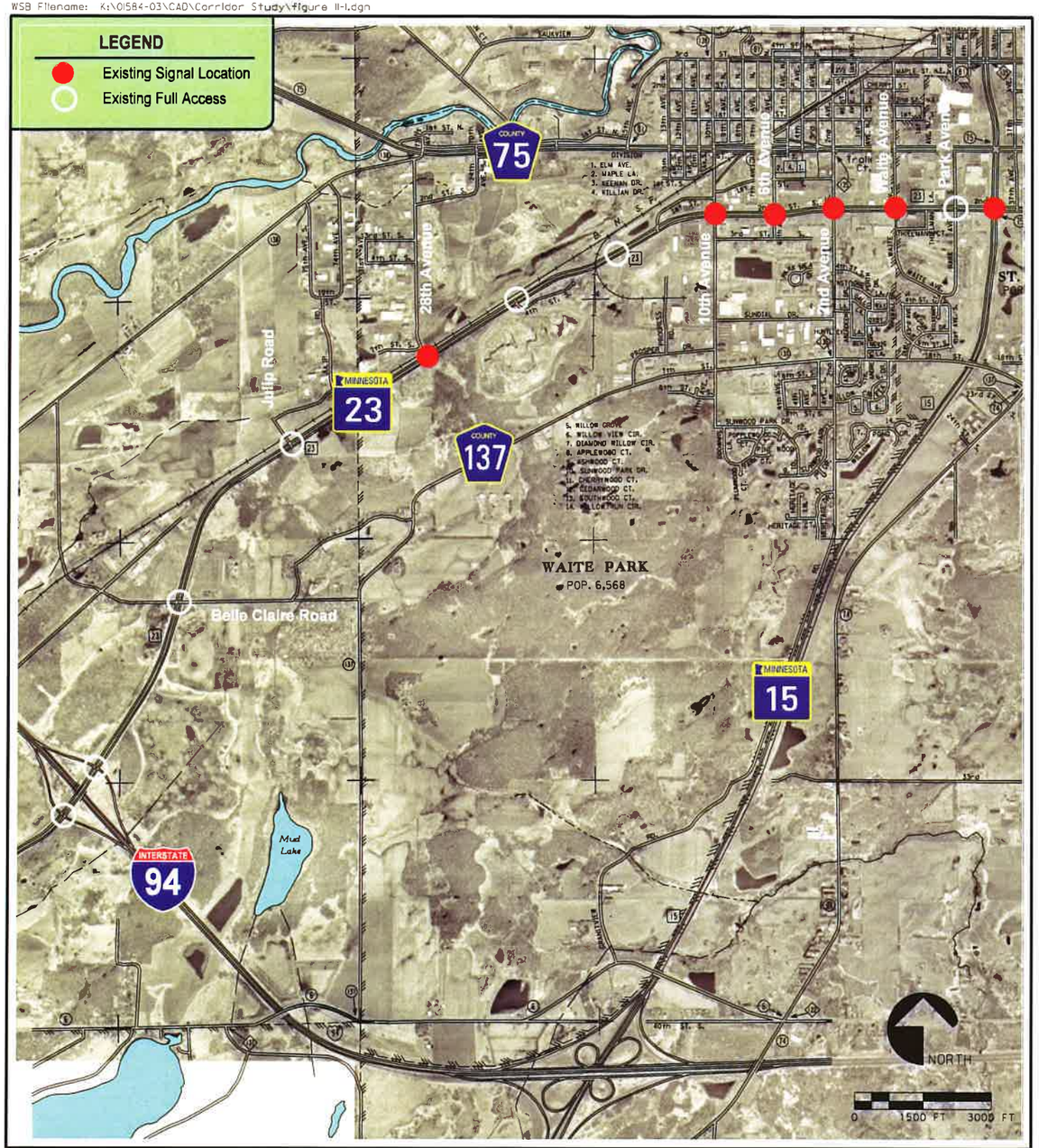

TH 23 / CSAH 75 Corridor Study

Public Full Access Map: TH 23, I-94 to TH 15

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure II-1

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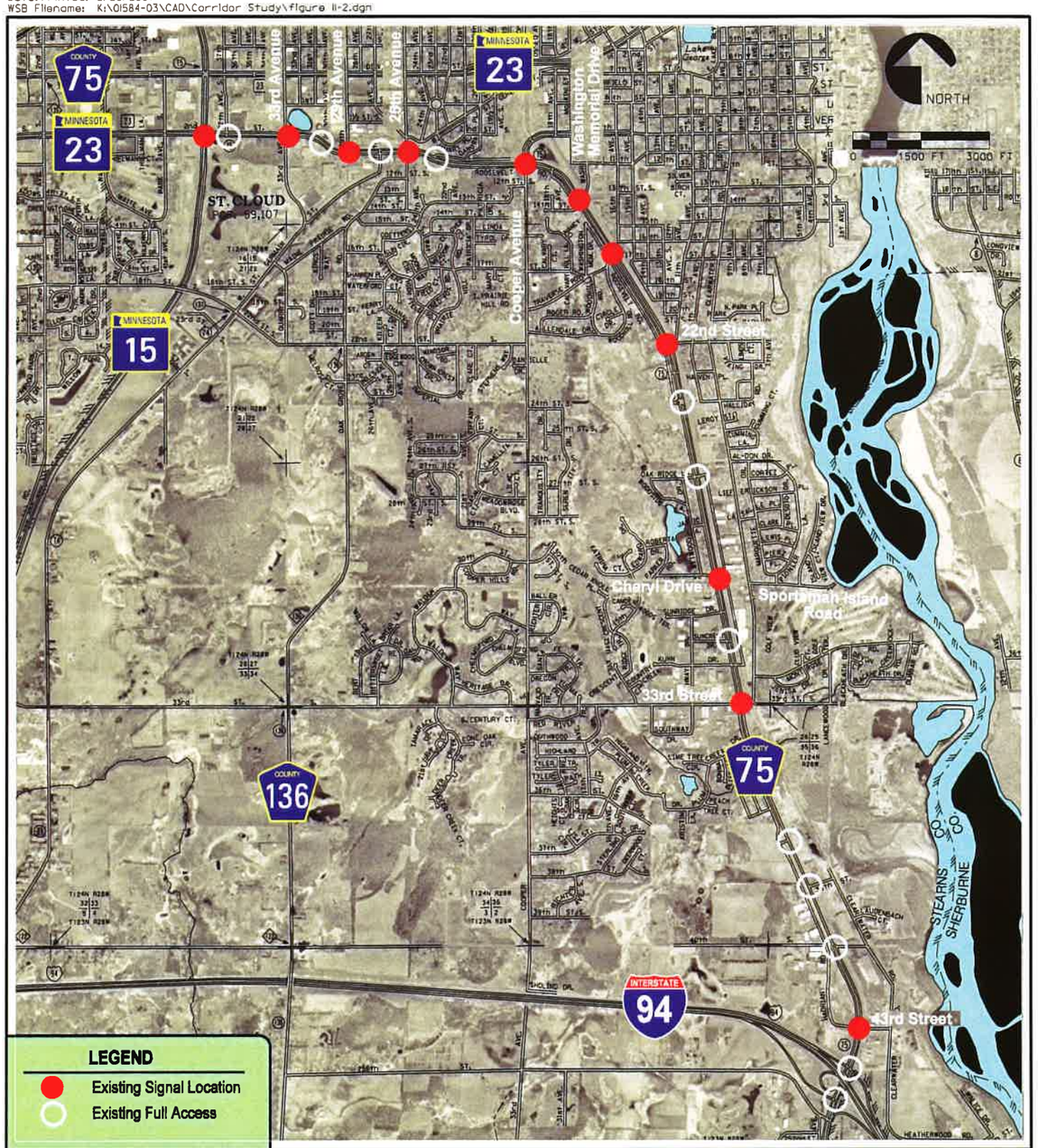

TH 23 / CSAH 75 Corridor Study

CSAH 75; Public Full Access Map: Cooper Ave - I-94

Figure II-2

CSAH 75, from 25th Avenue to Cooper Avenue, is a four-lane divided principal arterial going through an urban/urbanizing area. The signal spacing along this segment is improved at 0.5 mile spacing meeting APO. However, access is provided at local streets and at private driveways which according to APO guidelines should be highly restricted.

CSAH 75, from Cooper Avenue to I-94, is four-lane divided with a short segment from 33rd Street to 40th Street, which tapers down to a four-lane undivided roadway with one signal at 33rd Street. The speed limit is 40 mph from Cooper Avenue to 22nd Street and changes to 50 mph from 22nd through the I-94 interchange. Access spacing does not meet APO guidelines because access is provided at local streets. The signal spacing along this segment is irregular with some signals less than ¼ mile apart and other signals greater than a mile apart (see Figure II-2). Private access is prevalent along this segment which is strongly discouraged for a principal arterial.

Safety

Intersection Crashes: Table II-3 provides a summary of intersection crash data for TH 23 and CSAH 75 for a three-year period from 2002 to 2004. The district and statewide average crash and severity rates for similar intersections are provided at the bottom of the table. Intersections that have crash rates or severity rates that are above the average are shown in bold. Intersection crashes are also illustrated on Figure II-3.

There are six intersections with crash rates and severity rates above the statewide average for similar intersections. The first four intersections are located in the core business area where there are numerous public and private access points. These are discussed below:

- TH 23/Park Avenue Intersection: Many of the crashes (48%) are rear-end crashes at this intersection. The next highest crash type are right angle crashes which comprise 24% of all the intersection crashes. This intersection is unsignalized and is located approximately 700 feet from the TH 23/TH 15 intersection. This intersection serves a high traffic generating retail area, and Mn/DOT has received numerous requests for a signal at this location. However, this intersection is too close to TH 15 to signalize.
- TH 23 and CSAH 75/TH 15 Intersection: This intersection has the most crashes and it also has the highest entering volumes. The crash rate at this intersection is almost three times greater than the statewide crash rate for signalized intersections. Most of the crashes at this intersection are rear-end crashes, making up 73% of the total crashes at this location.
- CSAH 75/37th Avenue South: This is also a full access unsignalized intersection. It is located approximately 400 feet east of the CSAH 75/TH 15 intersection. Rear-end crashes comprise 47% of all crashes at this intersection. Right-angle crashes account for 25% of the crashes at this intersection.

Table II-3: TH 23/CSAH 75 Intersection Crashes (2002 to 2004)

Intersection	Entering Vehicles	Signalized (Y or N?)	Total Number of Crashes	Crash Rate*	Severity Rate	Crash Type (Number and Percent) of Total Crashes at Intersections: 1 Rear End	2+9 Sd Swp	3 Left Turn	4+7 ROR Left+Right	5 Right Angle	6 Right Turn	8 Head On	0/90/98/99 Unknown
TH 23/Bel Clare Dr.[1]							1			4			1
	15800	N	6	0.35	0.81		17%			67%			17%
TH 23/28th Ave. S.								1	2	5	1	1	5
	19730	Y	15	0.69	1.02			7%	13%	33%	7%	7%	33%
TH 23/10th Ave. S.						6	4			8	1	1	2
	28450	Y	22	0.71	1.03	27%	18%			36%	5%	5%	9%
TH 23/6th Ave. S.						4	1			1			2
	21920	Y	8	0.33	0.46	50%	13%			13%			25%
TH 23/2nd Ave. S.						7	1	1		7		1	2
	27350	Y	19	0.63	0.80	37%	5%	5%		37%		5%	11%
TH 23/Waite Ave. S.						11	2	3	1	6		1	3
	34300	Y	27	0.72	1.04	41%	7%	11%	4%	22%		4%	11%
TH 23/Park Ave. S.						24	3	1	1	12	1	1	7
	30130	N	50	**1.52**	**1.88**	48%	6%	2%	2%	24%	2%	2%	14%
TH 23&CSAH 75/TH 15						111	8	2		16			16
	46,950	Y	153	**2.98**	**3.77**	73%	5%	1%		10%			10%
CSAH 75/37th Ave. S.[2]						15	2	5		8			2
	26600	N	32	**1.10**	**1.51**	47%	6%	16%		25%			6%
CSAH 75/33rd Ave. S.						32	3	5	1	20	1	2	
	38750	Y	64	**1.51**	**2.36**	50%	5%	8%	2%	31%	2%	3%	0%
CSAH 75/29th Ave. S.						7	2	1		8			1
	21600	Y	19	0.80	0.97	37%	11%	5%		42%			5%
CSAH 75/27th Ave. S.												1	2
	21925	N	6	0.25	0.25							17%	33%
CSAH 75/25th Ave. S.						20	3	7	1	13	1	2	7
	33550	Y	54	**1.47**	**1.99**	37%	6%	13%	2%	24%	2%	4%	13%
CSAH 75/Cooper Ave. S.						27	4	8		16			5
	38900	Y	60	**1.41**	**1.76**	45%	7%	13%		27%			8%
CSAH 75/Washington Memorial Dr.						4	1	4		5		1	5
	26750	Y	20	0.68	1.06	20%	5%	20%		25%		5%	25%
CSAH 75/22nd St. S.						7	4	9		7			9
	20650	Y	36	**1.59**	**2.79**	19%	11%	25%		19%			25%
CSAH 75/33rd St. S.						9	2	2	1	3			2
	25700	Y	19	0.68	0.99	47%	11%	11%	5%	16%			11%
CSAH 75/41st St. S.[3]							1						
	20100	N	1	0.05	0.05	0%	100%						
CSAH 75/Hadrian Rd.						5				1			
	26300	Y	6	0.21	0.31	83%				17%			

**Statewide Average - Unsignalized, Urban or Suburban Thru/Stop	0.3	0.4
**District 3 Average - Unsignalized, Urban or Suburban Thru/Stop	0.4	0.7
**Statewide Average - Signalized, Low Speed and High Volume (<45mph, >15k ADT)	0.9	1.3
**District 3 Average - Signalized, Low Speed and High Volume (<45mph, >15k ADT)	0.9	1.3
**Statewide Average - Signalized, High Speed and High Volume (≥45mph, >15k ADT)	0.8	1.2
**District 3 Average - Signalized, High Speed and High Volume (≥45mph, >15k ADT)	1.0	1.6

* Crashes/Million Entering Vehicles

** Source Mn/DOT 2000-2002

1. Estimated Entering Vehicles on Belle Claire at 400 veh/day
2. Estimated Entering Vehicles on 37th Avenue at 700 veh/day
3. Estimated Entering Vehicles on 41st Street at 900 veh/day

Note: Numbers in bold exceed Statewide and/or District 3 averages

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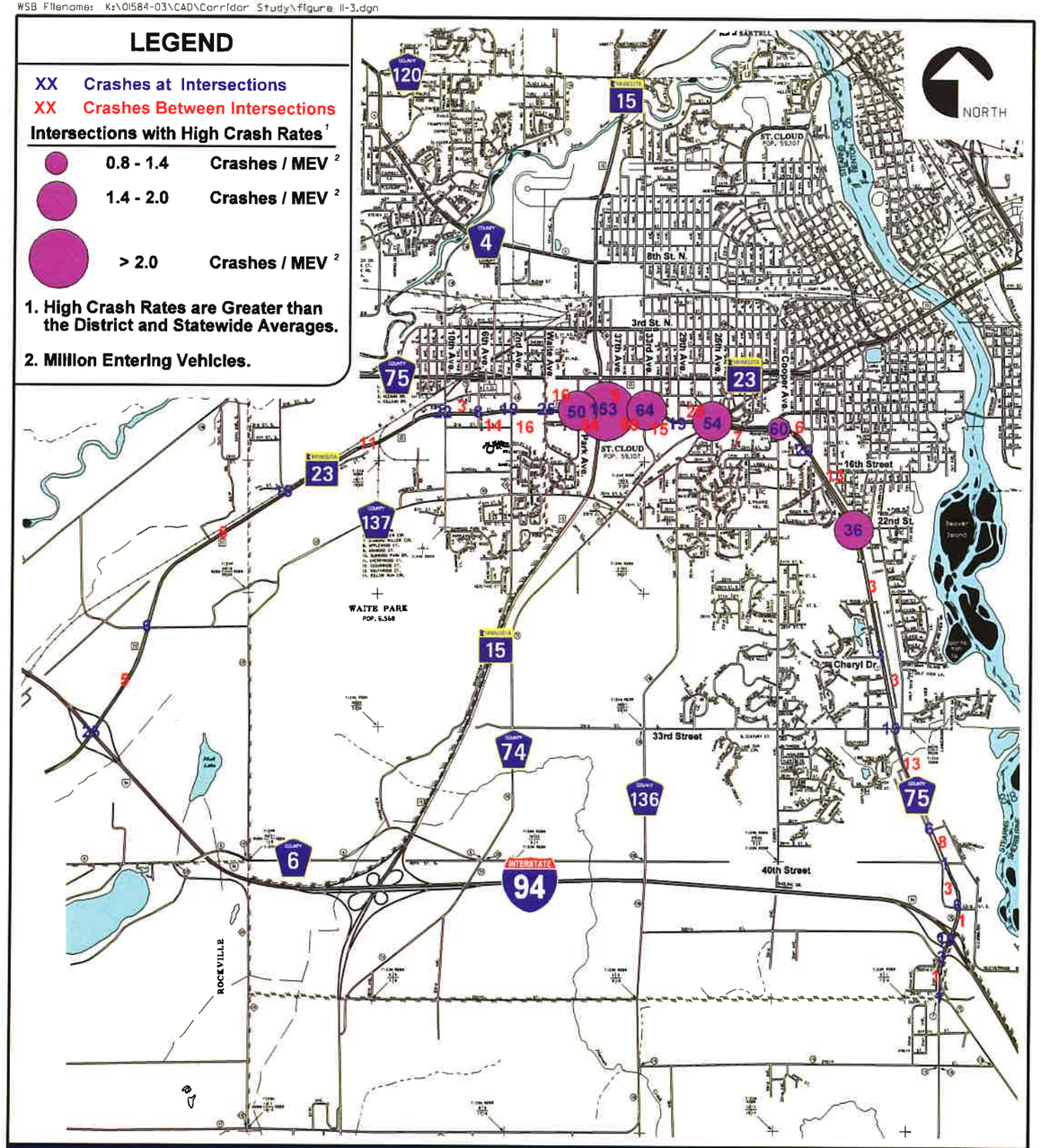

TH 23 / CSAH 75 Corridor Study

Crashes - 2002 to 2004

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure II-3

Table II-4: TH 23/CSAH 75 Segment Crashes (2002 to 2004)

Segment	Number of Crashes						Segment Length (miles)	ADT	Crash Rate*	Severity Rate	Crash Type (Number and Percent) of Total Crashes in Segment							
	Fatality	Injury A	Injury B	Injury C	N	Total					1 Rear End	2+9 Sd Swp	3 Left Turn	4+7 ROR Left+Right	5 Right Angle	6 Right Turn	8 Head On	0/90/98/99 Unknown
1 - TH 23 from Interstate 94 interchange to west of 10th Ave. S. - **4-Lane Expressway**	2	5	9	14	37	67	3.74	16800	**0.97**	**1.77**	6	6	4	4	24	1	4	18
											9%	9%	6%	6%	36%	1%	6%	27%
2 - TH 23 from west of 10th Ave. S. through the Park Ave. intersection. - **4-Lane Divided**	0	2	11	40	154	207	1.18	23700	**6.76**	**8.98**	95	18	8	4	41	2	4	35
											46%	9%	4%	2%	20%	1%	2%	17%
3 - CSAH 75 from east of TH 15 through the Cooper Ave. intersection. - **4-lane Divided**	0	8	27	32	265	332	1.4	21100	**10.26**	**13.66**	169	7	40	7	74	3	8	24
											51%	2%	12%	2%	22%	1%	2%	7%
4a - CSAH 75 from south of the Cooper Ave. intersection through the 33rd St. Intersection. - **4-lane Divided**	0	2	16	18	67	103	2.74	17300	1.98	3.06	35	8	15	8	15	0	1	21
											34%	8%	15%	8%	15%	0%	1%	20%
4b - CSAH 75 from south of the 33rd St. S. to north of the 41st St. intersection. - **4-lane Undivided**	0	2	8	7	14	31	1.12	19200	1.32	2.55	12	3	0	3	1	0	3	9
											39%	10%	0%	10%	3%	0%	10%	29%
4c - CSAH 75 from north of the 41st St. intersection thru Interstate 94 interchange. - **4-lane Divided**	0	2	2	4	20	28	0.54	19200	2.47	3.70	11	1	0	5	6	0	1	3
											39%	4%	0%	18%	21%	0%	4%	11%

***Statewide average for Urban 4-Lane Divided	4.8	7.1
***District 3 average for Urban 4-Lane Divided	5.5	8.4
***Statewide average for Rural 4&6-Lane Expressways	0.9	1.4
***District 3 average for Rural 4&6-Lane Expressways	0.9	1.3
***Statewide average for Urban 4-Lane Undivided Highways	6.1	8.7
***District 3 average for Urban 4-Lane Undivided Highways	4.4	7.0

* Crashes/Million Vehicles Miles
** Does not include intersection with TH 15
*** Source Mn/DOT 2000-2002
Note: Segments include intersection crash numbers and crash types.

Note: Numbers in bold exceed Statewide and/or District 3 averages.

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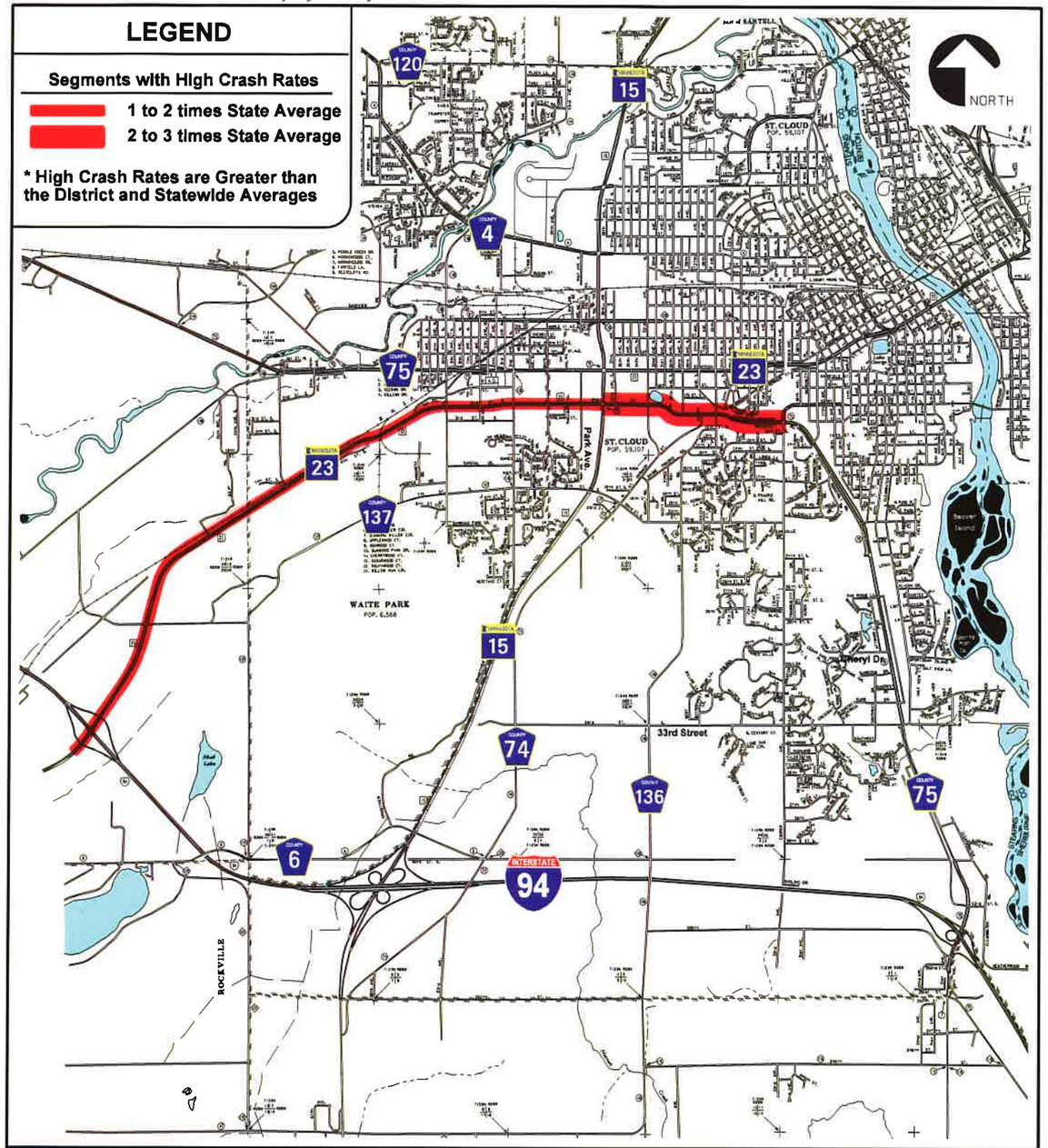


Figure II-4

- CSAH 75/33rd and 25th Avenue intersections: Rear-end crashes comprise 50% and 37% of the crashes respectively at these two intersections. Again, the next highest type of crash is right angle with 31% and 24% respectively. These intersections are signalized. However, they are lacking right-turn lanes on the westbound CSAH 75 approaches which may be contributing to the number of rear ends at this location. Improvements are scheduled on 25th Avenue which would add a continuous through lane on the northbound and southbound approaches to CSAH 75.
- CSAH 75/Cooper Avenue South: Similar to the first four intersections, a high percentage of the crashes (45%) are rear-end crashes. Again, the next highest type of crash is right-angle at 27%. This intersection has the highest entering volumes of all the intersections analyzed along CSAH 75 (with the exception of TH 15).
- CSAH 75/22nd Street South: This intersection has the highest crash rate and severity rate of all the intersections analyzed (with the exception of TH 15). It has a severity rate that is two times the average district and statewide crash rates and severity rates. The intersection has low entering volumes when compared to the other intersections analyzed; however, the geometry at the intersection may be contributing to the crash rates. Eleventh (11th) Avenue intersects 22nd Street South only 130 feet away from this intersection. Also, the west leg of the 22nd Street and CSAH 75 intersection is from a frontage road that parallels CSAH 75 with no storage area for cars stopped at the signal. Many of the crashes in this location are left turn crashes (25%). Another 25% of the crashes are unknown or other.

Segment Crashes: Table II-4 summarizes the segment crash rates along TH 23 and CSAH 75. The numbers in bold are those that exceed the statewide and/or district crash rates and severity rates averages. Figure II-4 also provides an illustration of the segment crash rates.

- The crash rates and severity rates in Segment 1 are just over the statewide and district wide averages for four-lane rural expressways.
- Due to the number of crashes at the TH 15 and 2nd Street South intersection, this intersection's crashes were not included in the Segments 2 and 3 crash numbers. The crash rates and severity rates in Segment 2 are over the statewide and district averages for similar facilities. Along CSAH 75, Segment 3 is also exceeding the crash rate and severity rate averages for the district and state. The rates are two times greater than the district wide and statewide averages for a four-lane divided urban facility. Both of these segments go through the core business area where there are several private and public accesses. The access spacing in both of these segments does not meet Mn/DOT or APO guidelines. The highest number of crashes are rear-end crashes with 46% and 53% of the crash types for Segments 2 and 3. The second highest type of crashes are right angle with 20% and 22%.

Travel Speeds

Travel speed runs were conducted during PM peak hours in November 2005 to assess the current travel conditions in the corridor. Table II-5 details the average travel and running

speeds experienced on TH 23 and CSAH 75 during the PM peak hours surveyed. The travel speeds include intersection delays while running speeds are the actual speeds vehicles are traveling between intersections. Along the western segment of TH 23, the surveyed travel and running speeds are close to the posted speed limit. This segment of TH 23 is over four miles long, has only two signalized intersections, and the remaining intersections have no control on TH 23. Within the western segment of the core business area (Segment 2) the average travel and running speed in the eastbound direction is close to the lower posted speed limit of 40 mph. However, the westbound direction average travel speeds are almost 15 mph lower than the 40 mph posted speed limit. The directional split of 60% westbound and 40% eastbound may be contributing to the difference in travel and running speeds between directions.

The average travel and running speeds in Segment 3 are worse than Segment 2 with travel speeds of 11 to 26 mph lower than the posted speed limit of 40 mph. Westbound CSAH 75 through this segment has an average travel speed of 14.3 mph. The directional split on this segment is almost 50/50 and the signal spacing is similar to Segment 2. From Cooper Avenue through the I-94 interchange the speeds pick up considerably with average travel speeds of 40 mph or higher.

Table II-5: TH 23/CSAH 75 Travel Speeds

Segment	Location	Posted Speed Limits (mph)	Distance (mi)	Eastbound		Westbound	
				Travel Speed (mph)	Running Speed (mph)	Travel Speed (mph)	Running Speed (mph)
1	I-94 WB Ramp to 10th Avenue	65/60	2.8	59.4	61.5	58.4	60.3
2	10th Avenue to TH 15	60/40	0.4	36.4	36.4	26.6	30.7
3	TH 15 to Cooper Avenue	40	1.4	29.0	35.7	14.3	24.4
4	Cooper Avenue to South of I-94	40/50	4.4	40.4	49.5	41.7	42.0

Source: WSB & Associates

Notes: Travel runs were completed on weekdays between 3 p.m. and 6 p.m.
Travel speed includes the delay at intersections.
Running speed is the average speed of vehicles moving between intersections and excluding intersection control delay.

LOS

The existing traffic operations were analyzed for segments of TH 23 and CSAH 75 and at key intersections along the corridor. The traffic operations analysis is based on established methodologies documented in the Highway Capacity Manual (TRB, 2000). The HCM analysis typically provides results in the form of a letter grade from A to F, otherwise called level of service (LOS). The letter gives a qualitative estimate of the operational efficiency or effectiveness. The system is set up similar to a report card, with A representing high-quality operations and F representing poor operations. At LOS A, motorists experience very little delay or interference. On a roadway or intersection with LOS F conditions, motorists would experience extreme delay or severe congestion. Although LOS A conditions represent the best possible level of traffic flow, the cost to construct roadways and intersections to such high standards often exceeds the benefit to the user.

The HCM defines levels of service for both intersections as well as for roadway segments that may contain multiple intersections. Intersection LOS is based on average vehicle delay while roadway segment LOS is based on average travel speeds for the facility type. For purposes of this study, the roadway segment LOS is based upon the surveyed travel time and flow rate, while intersection LOS was based on analysis of the pm peak hour turning movements using simulation software.

Existing Segment Level of Service Analysis

For arterial segments, the roadway LOS was based on the measures in Table II-6 using HCM urban street classification as defined below:

- Type I – Principal arterials with a high-speed design, including low-access density, separated left-turn lanes, and no parking. Free-flow speeds tend to be between 55 to 45 mph.
- Type II – Principal or minor arterials with suburban or intermediate design, including a low to moderate access density, separated left-turn lanes, and no parking. Free-flow speeds tend to be between 45 to 35 mph.
- Types III or IV – Principal or minor arterials with an urban design, including a high access density, undivided facilities, and possible parking. Free-flow speeds tend to be between 35 to 25 mph.

Table II-6: Roadway Segment Level of Service Measures

Urban Street Class	**I**	**II**	**III**	**IV**
Range of free-flow speeds (FFS)	55 to 45 mph	45 to 35 mph	35 to 30 mph	35 to 25 mph
Typical FFS	50 mph	40 mph	35 mph	30 mph
LOS	***Average Travel Speed (mph)***			
A	> 42	> 35	> 30	> 25
B	> 34-42	> 28-35	> 24-30	> 19-25
C	> 27-34	> 22-28	> 18-24	> 13-19
D	> 21-27	> 17-22	> 14-18	> 9-13
E	> 16-21	> 13-17	> 10-14	> 7-9
F	≤ 16	≤ 13	≤ 10	≤ 7

Source: Exhibit 15-2, Highway Capacity Manual (2000)

Table II-7: TH 23/CSAH 75 Existing (2005) Roadway Segment Level of Congestion

Segment	Location	Posted Speed Limits (mph)	Type of Section	HCM Urban Street Class.	Travel Time (sec)	Travel Speed	LOS
1	From I-94 WB Ramp to 10th Avenue	65/60	High-Speed Urban	I	Eastbound	59.4 mph	A
					Westbound	58.4 mph	A
2	From 10th Avenue to TH 15	60/40	Suburban	II	Eastbound	36.4 mph	A
					Westbound	26.6 mph	C
3	From TH 15 to Cooper Avenue	40	Suburban / Urban	II	Eastbound	29.0 mph	B
					Westbound	14.3 mph	E
4	From Cooper Avenue to 255th Street	40/50	Suburban	II	Eastbound	40.4 mph	A
					Westbound	41.7 mph	A

Source: WSB & Associates

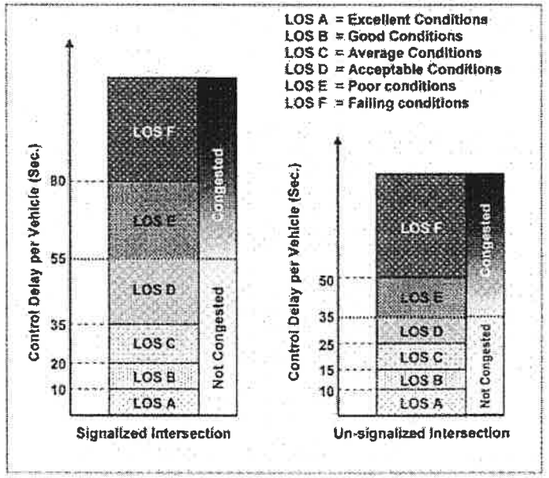
The existing LOS for different segments of TH 23 and CSAH 75 are summarized in Table II-7. The table details the average travel speeds that were measured in the travel time runs and compares to the values in Table II-6 to determine segment LOS. The westbound leg of Segment 3 has travel speeds that indicate it is operating at a LOS E.

Existing Intersection Level of Service Analysis

For intersections, LOS is primarily a function of AM and PM peak hour turning movement volumes, intersection lane configuration, and traffic control. The intersection LOS is based on average control delay per vehicle as defined by the HCM (see Figure II-5).

The existing intersection operations were evaluated using Synchro and SimTraffic for the PM peak hour. The intersection geometry and turning movements were based upon 2005 conditions. The results of the intersection analysis are illustrated on Table II-8. All intersections are currently operating above the LOS D threshold.

Figure II-5: Intersection LOS Measures



Source: Tables 16-2 and 17-2, Highway Capacity Manual (2000)

Table II-8: TH 23/CSAH 75 Intersection Level of Service

Intersection	Type of Intersection	Traffic Control	SimTraffic Control Delay (sec/veh)	LOS
28th Avenue S	Partial Access	Signalized	8.7	A
10th Avenue	Full Access	Signalized	19.6	B
6th Avenue	Full Access	Signalized	8.5	A
2nd Avenue/CR 135	Full Access	Signalized	18.6	B
Waite Avenue	Full Access	Signalized	19.8	B
TH 15	Full Access	Signalized	21.2	C
33rd Avenue	Partial Access	Signalized	17.8	B
29th Avenue	Partial Access	Signalized	11.4	B
25th Avenue	Full Access	Signalized	20.3	C
Cooper Avenue	Full Access	Signalized	20.7	C
Washington Memorial Dr.	Partial Access	Signalized	5.7	A
22nd Street	Partial Access	Signalized	16.5	B
33rd Street/Clearwater Rd	Full Access	Signalized	21.3	C
Hadrian Road/43rd Street	Full Access	Signalized	8.6	A

Source: WSB & Associates, Inc.

C. Analysis of Future Conditions

This section discusses what traffic conditions may be like on TH 23 and CSAH 75 in 20 years if no improvements are made in the corridor.

Forecast Average Daily Traffic on TH 23/CSAH 75

Table II-9 below shows the historical traffic volumes on TH 23 and CSAH 75. Segments of TH 23 are showing annual growth rates of 3 to 5%. CSAH 75 western growth rates range from 1.1 to 1.6%. The eastern segment from Traverse Road to I-94 has growth rates of 2.8 to 3.9%.

Table II-9: Historical Traffic Volumes on TH 23 and CSAH 75

TH 23	AADT's						1994-2004
SEGMENT	1994	1996	1998	2000	2002	2004	AGR[1]
I-94 to Julep Rd.	10,500	10,700	11,600	15,100	15,100	15,000	4.3%
Julep Rd. to 2nd Ave.	14,100	15,800	15,600	16,900	18,900	21,400	5.2%
2nd Ave. to TH 15	23,600	24,300	26,200	28,100	27,400	32,000	3.6%
CSAH 75	**AADT's**						**1995-2003**
SEGMENT		**1992**	**1995**	**1999**	**2001**	**2003**	**AGR[1]**
TH 15 to 25th Ave.		22,000	22,900	26,200	25,000	25,900	1.6%
25th Ave. to Washington Memorial Dr.		20,650	22,800	23,800	22,300	24,800	1.1%
Washington Memorial Dr. to Traverse Rd.		12,300	11,500	23,100	20,100	16,800	5.8%
Traverse Rd. to 22nd St.		---	12,300	8,000	14,500	15,100	2.8%
22nd St. to 33rd St.		---	12,800	10,300	16,800	17,300	4.4%
33rd St. to I-94		---	14,600	13,700	15,700	19,200	3.9%

1. AGR - Linear Annual Growth Rate

Source: Mn/DOT Traffic Flow Maps

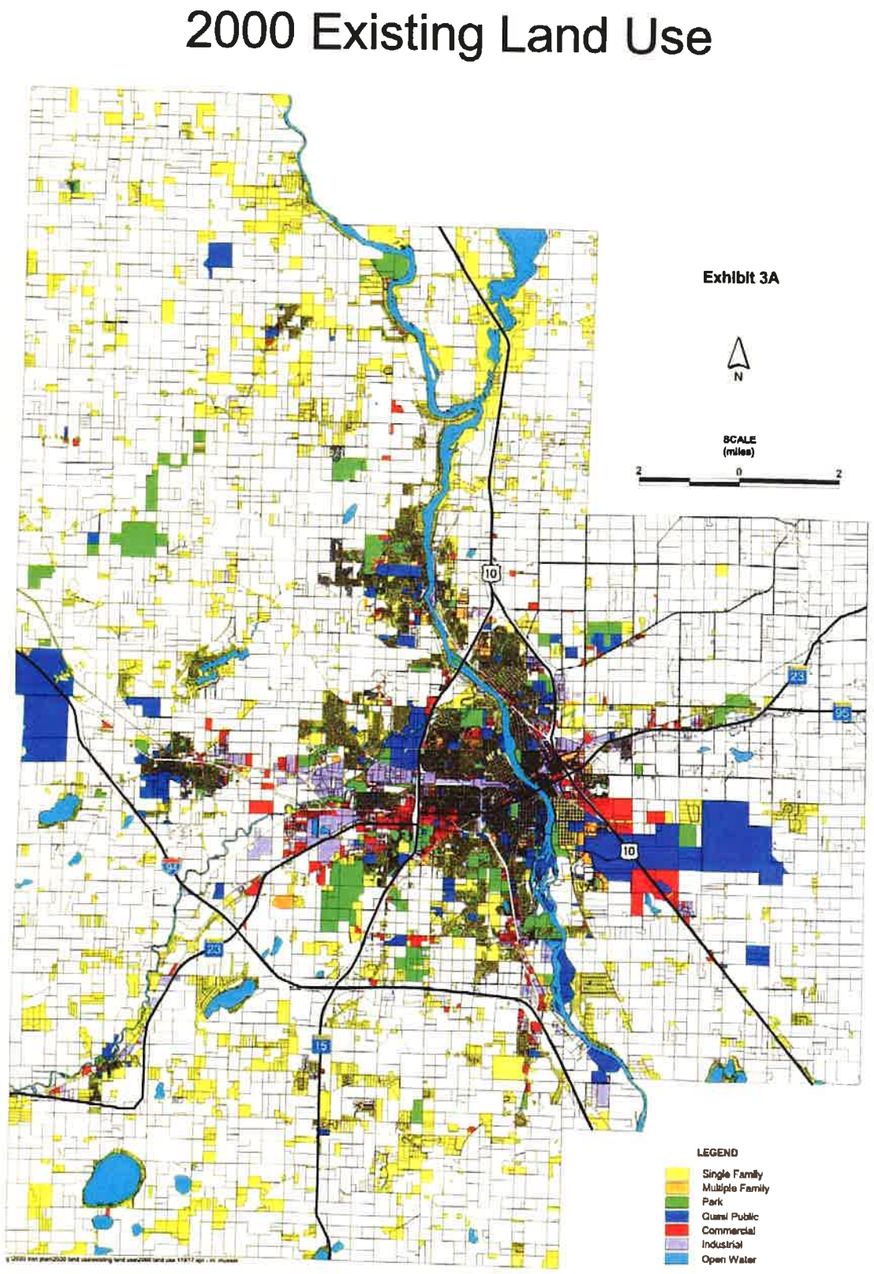
As the St. Cloud Metropolitan Area population and employment continues to grow, the traffic on the existing roadway system will grow as well. The St. Cloud Area Planning Organization 2030 Transportation Plan indicates that the metropolitan area population and employment is estimated to grow 53% and 41% respectively by 2030 (see Table II-10). While the outer boundary of the metropolitan area is expected to stay the same, the most densely populated area at the center is expected to expand outwards. Commercial development is anticipated along TH 23 in Waite Park with pockets of residential development between TH 23 and TH 15. More intense development is anticipated near CSAH 75 where land between TH 15 and CSAH 75, which is mostly vacant today, is anticipated to develop into residential areas with some pockets of commercial along the CSAH 75 corridor. See Figure II-6 and Figure II-7 for 2000 and 2030 land use.

Table II-10: St. Cloud Metropolitan Area Population and Forecasts

	2000	2030	30 Year Increase
Population	113,292	173,161	53%
Employment	65,750	93,003	41%

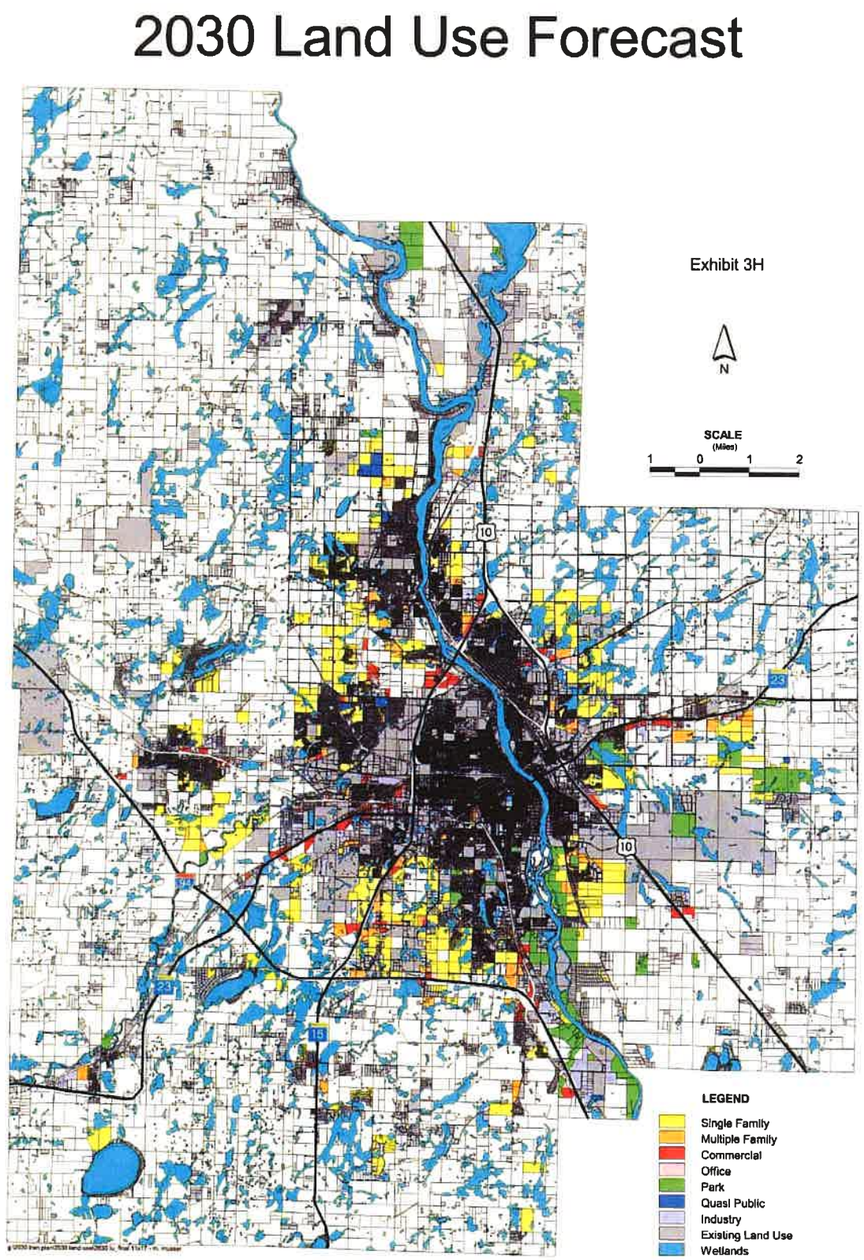
Source: St. Cloud APO 2030 Transportation Plan

Figure II-6: 2000 Existing Land Use



Source: St. Cloud APO 2030 Transportation Plan

Figure II-7: 2030 Forecast Land Use



Source: St. Cloud APO 2030 Transportation Plan

The St. Cloud Area Planning Organization's 2030 Financially Constrained travel demand model was used to estimate the potential future demand on TH 23 and CSAH 75 for the forecasted 2030 land use. These forecast volumes are detailed in Table II-11. The first scenario, the APO Financially Constrained network assumes capacity improvements (six-lanes) on TH 23 and CSAH 75 from 2nd Avenue to 25th Avenue, although these projects have uncommitted timeframes. The financially constrained network was adjusted to represent a "true" no build condition, which includes no capacity increases on TH 23 and CSAH 75 corridors under study. The forecast volumes decrease significantly in the capacity constrained areas near TH 15. Figure II-8 and Figure II-9 provides an illustration of the forecast volumes compared to the threshold volumes for basic roadway facilities. Notice that all (with the exception of one segment along CSAH 75) of the 2030 forecast volumes (no build, and financially constrained) are beyond the LOS D capacity for a four-lane divided arterial. The 2030 traffic volumes on the proposed six lane segment of CSAH 75 are beyond the LOS D threshold for a six-lane arterial. CSAH 75, from 33rd Street to I-94, exceeds the LOS D threshold for a four-lane divided urban roadway and according to the chart is well into LOS F. However, this segment may be operating more like an expressway with higher average travel speeds and limited access spacing. As an expressway the 2030 forecast volumes are within just beyond LOS D threshold volume of a four-lane divided arterial.

Table II-11: Existing and Future Travel Demand

	SEGMENT	2004/ 2003 Existing AADT's	2030 APO Financially Constrained Network[1] ADT	2030 APO Financially Constrained Network[1] AGR[2]	2030 "True" No Build Network[3] ADT	2030 "True" No Build Network[3] AGR[2]	2050 Population Based ADT Estimate ADT	2050 Population Based ADT Estimate AGR[2]
TH 23	I-94 to 10th Ave.	15,000	36,200	5.4%			44,526	4.3%
	10th Ave. to 2nd Ave.	21,400	31,200	1.8%			38,376	1.7%
	2nd Ave. to TH 15[1]	32,000	43,000	1.3%	33,200	0.1%	52,890	1.4%
CSAH 75	TH 15 to 25th Ave.[1]	25,900	47,600	3.1%	35,400	1.4%	58,548	2.7%
	25th Ave. to Washington Memorial Dr.	24,800	32,400	1.1%			39,852	1.3%
	Washington Memorial Dr. to 33rd St.	16,800	28,000	2.5%			37,884	2.7%
	33rd St. to I-94	19,200	37,600	3.5%			46,248	3.0%

1. APO's 2030 Financially Constrained network assumes 6-lanes on these segments.
2. AGR - 2003 or 2004 to 2030 or 2050 Linear Annual Growth Rate
3. Capacity and Speeds on TH 23 & CSAH 75 are the same as existing (2000) network.

Source: WSB & Associates

Year 2050 traffic volumes were calculated assuming the estimated 30-year population growth from 2000 to 2030 was linear and that the 2030 traffic volumes would grow at the same linear growth rate from the year 2030 to 2050. Because it is such a distant timeframe, this assumption should provide information for at least a scoping level analysis of volumes and levels of service.

Based on the projected 2050 ADTs, all of the segments would exceed a LOS D for four-lane divided arterial as well as a four-lane divided expressway. TH 23 and CSAH 75 from 10th Avenue to 25th Avenue, would exceed LOS D assuming a six-lane divided urban street.

Figure II-8: TH 23 Forecasts and Capacity Thresholds

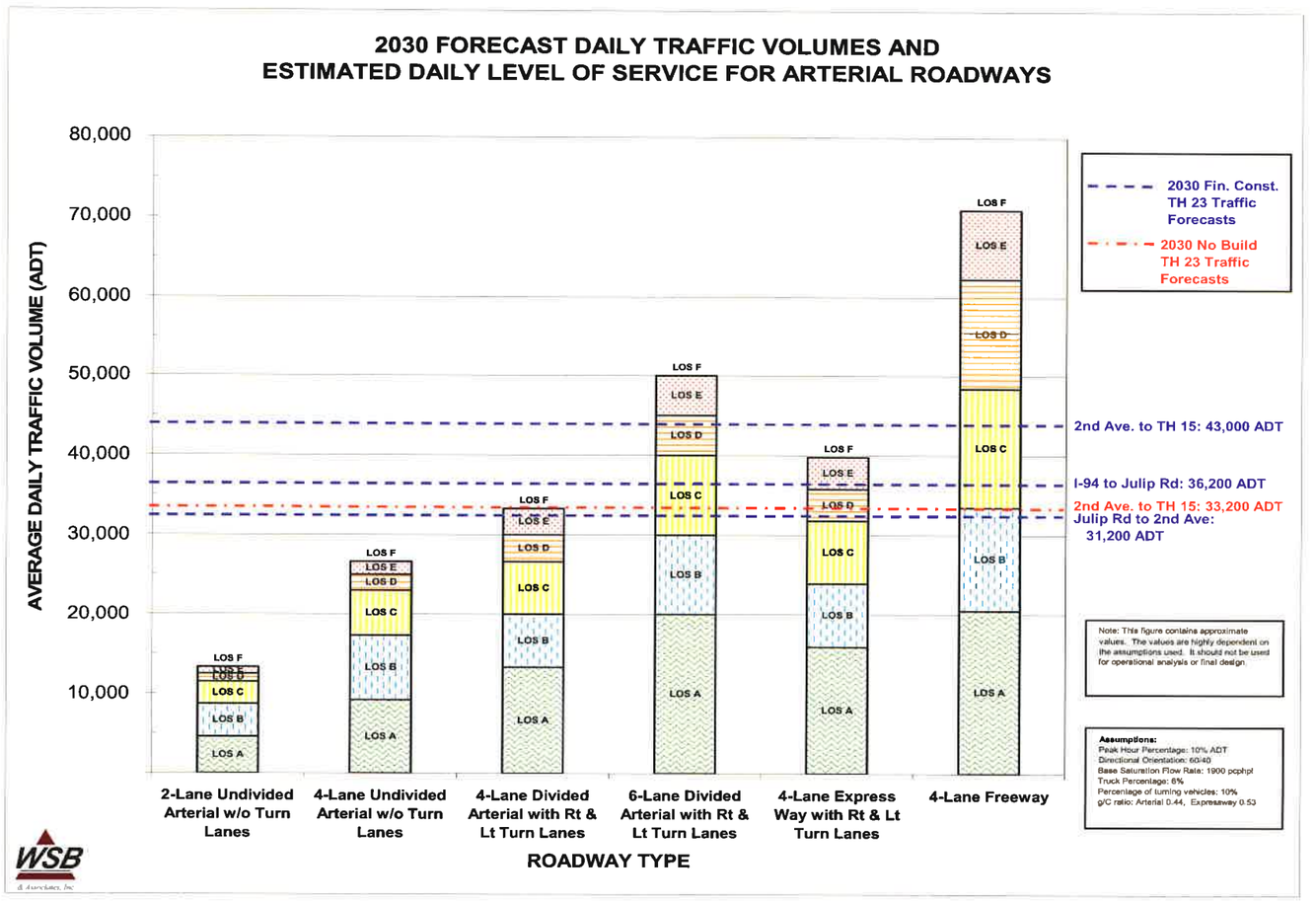
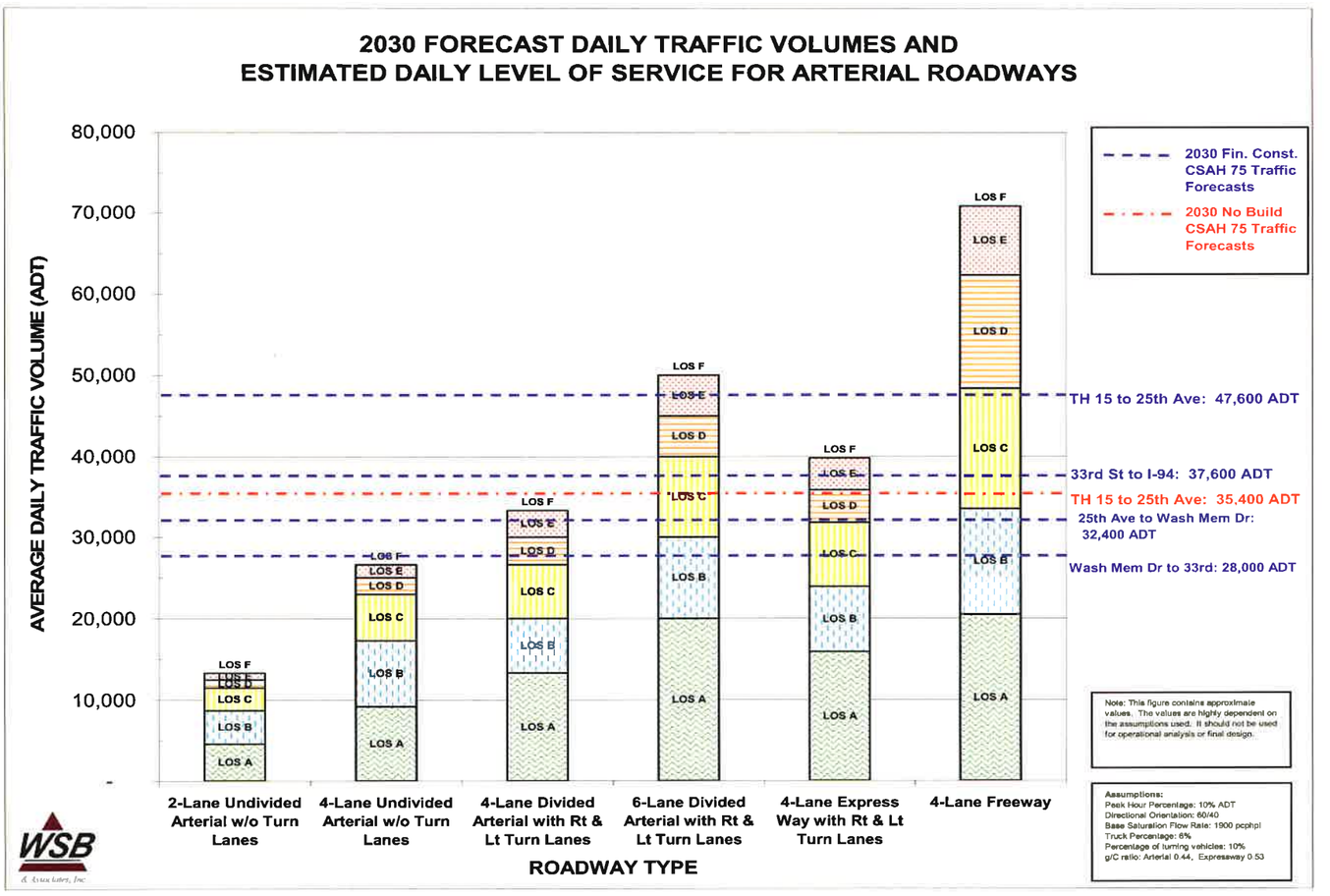


Figure II-9: CSAH 75 Forecasts and Capacity Thresholds



Travel Speeds

To determine future travel speeds and traffic operations for the in-place network (No Build), forecasted PM peak-hour turning movements (APO financially constrained network) were modeled in Synchro/SimTraffic. The calibrated existing (2005) Synchro/SimTraffic model for TH 23/CSAH 75 was used as a basis for developing the future model for TH 23/CSAH 75. The "No Build" future model does assume planned upgrades on the side street approaches to TH 23 and CSAH 75 to meet the traffic demand volumes. Also, lane additions were added on TH 15 since this is the heaviest volume intersection. Heavy delays at this intersection would overwhelm the operations on the entire network. The TH 15 study addresses the needed intersection improvements at TH 23/CSAH 75 intersection with TH 15. However, no improvements were assumed on TH 23 or CSAH 75. The No Build model does include new access points at the following locations as indicated in the APO's 2030 financially constrained network:

- full and improved access at Bel Clare Drive (33rd Street extension to TH 23)
- full and improved access at 28th Avenue (28th Avenue extension)

Table II-12 summarizes the simulated travel speeds and compares them to the existing 2005 conditions on TH 23 and CSAH 75. With no improvements on TH 23/CSAH 75, the future travel speeds are significantly lower (6 to 38 mph) than what are experienced today. The No Build condition does not meet the travel speed objective of maintaining or improving average travel speeds along the corridor.

Table II-12: TH 23/CSAH 75 No Build Segment Travel Speeds and LOS

Segment	Location	HCM Urban Street Class.	Travel Time (sec)	2005 (Existing)		2030 No Build	
				Travel Speed	LOS	Travel Speed	LOS
1	From I-94 WB Ramp to 10th Avenue	I	Eastbound	59.4 mph	A	21 mph	E
			Westbound	58.4 mph	A	20 mph	E
2	From 10th Avenue to TH 15	II	Eastbound	36.4 mph	A	10 mph	F
			Westbound	26.6 mph	C	8 mph	F
3	From TH 15 to Cooper Avenue	II	Eastbound	29.0 mph	B	15 mph	E
			Westbound	14.3 mph	E	8 mph	F
4	From Cooper Avenue to 255th Street	II	Eastbound	40.4 mph	A	16 mph	E
			Westbound	41.7 mph	A	16 mph	E

Source: WSB & Associates

LOS

Segment Level of Service Analysis

Table II-12 summaries the results of simulated segment travel speeds and LOS along TH 23/CSAH 75 for the No Build Alternative and compares it to existing conditions.

The modeled average travel speeds are compared to the values in Table II-6 to determine segment LOS. The signal timing was designed to balance green time between high volume cross streets and TH 23/CSAH 75. This resulted in better overall operations but increased delays on TH 23 and CSAH 75. In the future, the entire network operates at a LOS E or F. This is consistent with the traffic volume thresholds discussed earlier. Segments 2 and 3 perform the worst with LOS F for the westbound direction and LOS F along TH 23 in the eastbound direction. Segment 1 has the best overall traffic speeds, but the facility has a different HCM classification than the rest of the segments resulting in a LOS E on this segment as well.

Intersection Level of Service Analysis

Table II-13 summarizes the intersection LOS results from the traffic simulations for the 2030 No Build compared to existing conditions. In the future, 14 intersections are forecast to operate at LOS E or F. The No Build includes upgrading the approaches at side streets with planned improvements but not on TH 23 or CSAH 75.

Table II-13: TH 23/CSAH 75 No Build Intersection Level of Service

Intersection	2005 Existing			2030 No Build		
	Traffic Control	SimTraffic Control Delay (sec/veh)	LOS	Traffic Control	SimTraffic Control Delay (sec/veh)	LOS
I-94 WB Ramp	Thru-Yield	2.7	A	Signalized	45.0	D
I-94 EB Ramp	Thru-Yield	5.1	A	Signalized	15.6	B
33rd Street/86th Avenue/Bel Clare Drive	Thru-Stop	5.2	A	Signalized	56.0	E
Julip Road	Thru-Stop	5.4	A	Signalized	40.0	D
28th Avenue S	Signalized	8.7	A	Signalized	54.7	D
10th Avenue	Signalized	19.6	B	Signalized	302.3	F
6th Avenue	Signalized	8.5	A	Signalized	79.5	E
2nd Avenue/CR 135	Signalized	18.6	B	Signalized	90.8	F
Waite Avenue	Signalized	19.8	B	Signalized	105.1	F
TH 15	Signalized	21.2	C	Signalized	108.6	F
33rd Avenue	Signalized	17.8	B	Signalized	126.7	F
29th Avenue	Signalized	11.4	B	Signalized	53.6	D
St. Germain Street/27th Avenue	Thru-Stop	21.5	C	Thru-Stop	65.0	F
25th Avenue	Signalized	20.3	C	Signalized	223.9	F
Cooper Avenue	Signalized	20.7	C	Signalized	129.1	F
Washington Memorial Dr.	Signalized	5.7	A	Signalized	41.8	D
22nd Street	Signalized	16.5	B	Signalized	29.4	C
Cheryl Drive/Sportsman Island Rd	Thru-Stop	7.7	A	Signalized	31.4	C
33rd Street/Clearwater Rd	Signalized	21.3	C	Signalized	63.6	E
36th Street	NA	NA	NA	Signalized	257.2	F
Hadrian Road/43rd Street	Signalized	8.6	A	Signalized	180.6	F
I-94 WB Ramp	Thru-Yield	2.2	A	Signalized	67.9	E
I-94 Exit Ramp	Thru-Yield	0.2	A	Signalized	21.6	C

Source: WSB & Associates

Summary of Deficiencies

The following tables summarize the existing and No Build conditions for TH 23 and CSAH 75 and whether the stated objectives are met. Only the first four objectives,

access spacing, safety, travel speeds, and LOS are summarized since the benefit/cost and SEE impacts are not influenced by the exiting and No Build conditions.

Segment 1: TH 23 – I-94 to 10th Avenue

Along this segment of TH 23, the current and No Build access spacing does not meet Mn/DOT's guidelines. It is anticipated that traffic control (signal, roundabout, etc.) will be needed on TH 23 at Bel Clare Drive due to the extension of 33rd Street from TH 15 to TH 23 in the Bel Clare Drive vicinity. If the area around Julip Avenue develops, traffic control may be necessary at this intersection with TH 23 in the future as well. For the No Build analysis, it was assumed that signals would be used as traffic control devises when determining operations and access spacing. Therefore, with the exception of signal spacing, the remainder No Build access spacing is expected to stay the same as existing conditions.

Since access on this segment is mostly unchanged, it is expected that the crash rates will not change. This results in future crash rates above the statewide and District 3 averages.

The addition of traffic control and increase in traffic volumes along this segment of the corridor are anticipated to have a negative affect on travel speeds. The modeling indicates that with the future traffic projections, travel speeds will decrease 38 mph in the westbound and eastbound directions. The average travel speeds will result in segment LOS E for the future condition on TH 23. The No Build condition also results in one intersection at LOS E which does not meet the objective of LOS D or better at all intersections.

Table II-14: Segment 1 - Summary of Deficiencies

Objective				Location	2005 Existing	2030 No Build
Access Spacing (Miles)	Mn/DOT Guideline					
	Signal	Cat. 2A	Discouraged	I-94 to Western W. limits of Waite Park	---	**0.63**
		Cat. 2B		W. limits of Waite Park to 10th Avenue	**1.13**	**1.13**
	Full Access	Cat. 2A	1 mile	I-94 to Western W. limits of Waite Park	**0.63**	**0.63**
		Cat. 2B	0.5 miles	W. limits of Waite Park to 10th Avenue	**0.48**	**0.48**
	Partial Access	Cat. 2A	0.5 miles	I-94 to Western W. limits of Waite Park	0.63	0.63
		Cat. 2B	0.25 miles	W. limits of Waite Park to 10th Avenue	0.42	0.42
	Private Access (#)	Cat. 2A	Exception or Deviation	I-94 to Western W. limits of Waite Park	**1**	**1**
		Cat. 2B		W. limits of Waite Park to 10th Avenue	**9**	**9**
Safety (crashes/ million vehicle miles)	*Statewide Avg. Rural 4&6 Lane Expressways = 0.9			I-94 to 10th Avenue	**0.97**	**No Change**
	*D3 Avg. Rural 4&6 Lane Expressways = 0.9					
Travel Speeds (mph)	Does Alternative Maintain or Improve Travel Speeds from Existing?			I-94 to 10th Avenue - Eastbound	59.4	**21**
				I-94 to 10th Avenue - Westbound	58.4	**20**
LOS	HCM Urban Street Class. I			I-94 to 10th Avenue - Eastbound	A	**E**
				I-94 to 10th Avenue - Westbound	A	**E**
	Provide LOS D or Better			Full Intersections	LOS B or Better	**1 LOS E**

* Source Mn/DOT 2000-2002, Segments include intersection crash numbers except for TH 15
Note: Values in bold do not meet stated objectives.

Segment 2: TH 23 – 10th Ave. to TH 15

This segment is within the urban core along TH 23 which provides access to the core business area. The access is dense with signal spacing at quarter mile and many other public and private accesses. The No Build assumes the access does not change from existing. From 10th Avenue to 2nd Avenue, the Mn/DOT access spacing category is 2B, which means this segment is within an urban/urbanizing area. If this segment was considered an urban core (Cat. 2C), the segment would meet the access spacing guidelines.

This segment has a high-crash rate of 6.76 which is higher than both the statewide and District 3 averages. Since access remains unchanged in the future No Build condition, it is anticipated that the crash rates along this segment would remain the same.

In the future, with no improvements, the travel speeds along the corridor are anticipated to decrease significantly from 18 to 26 mph. This results in a segment LOS of F and three intersections operating at LOS E and F.

Table II-15: Segment 2 – Summary of Deficiencies

Objective				Location	2005 Existing	2030 No Build
Access Spacing (Miles)	Mn/DOT Guideline					
	Signal	Cat. 2B	Discouraged	10th Ave. to 2nd Ave.	**0.25 miles**	**0.25 miles**
		Cat. 2C	0.25 miles	2nd Ave. to TH 15	0.33 miles	0.33 miles
	Full Access	Cat. 2B	0.5 miles	10th Ave. to 2nd Ave.	**0.25 miles**	**0.25 miles**
		Cat. 2C	300' - 600'	2nd Ave. to TH 15	1162'	1162'
	Partial Access	Cat. 2B	0.25 miles	10th Ave. to 2nd Ave.	0.25 miles	0.25 miles
		Cat. 2C	300' - 600'	2nd Ave. to TH 15	792'	792'
	Private Access (#)	Cat. 2B	Exception	10th Ave. to 2nd Ave.	**15**	**15**
		Cat. 2C	Permitted	2nd Ave. to TH 15	16	16
Safety (crashes/ million vehicle miles)	*Statewide Average for Urban 4-Lane Divided = 4.8 *D3 Average for Urban 4-Lane Divided = 5.5			10th Ave. to TH 15	**6.76**	**No Change**
Travel Speeds (mph)	Does Alternative Maintain or Improve Travel Speeds from Existing?			10th Ave. to TH 15 - Eastbound	36.4	**10**
				10th Ave. to TH 15 - Westbound	26.6	**8**
LOS	HCM Urban Street Class. II			10th Ave. to TH 15 - Eastbound	A	**F**
				10th Ave. to TH 15 - Westbound	C	**F**
	Provide LOS D or Better			Full Intersections	LOS C or Better	**1 LOS E 2 LOS F**

* Source Mn/DOT 2000-2002, Segments include intersection crash numbers except for TH 15
Note: Values in bold do not meet stated objectives.

Segment 3: CSAH 75 – TH 15 to Cooper Ave.

Since this segment is a county road, the St. Cloud APO's access guidelines govern. The segment of CSAH 75 from TH 15 to 25th Avenue, does not meet the APO's recommended guidelines for signal spacing, full intersections, and partial and private access. The existing signal spacing is approximately a quarter mile and provides access to the core business area described earlier.

This segment of CSAH 75 has very high crash rates, which are two times higher than the statewide averages for similar facilities. Again, if the access remains unchanged in the future, the crash rates are not anticipated to change either.

The travel speeds along this segment are the lowest of the entire corridor and are expected to decrease even more by 2030 with no improvements. Four of the signalized intersections are anticipated to operate poorly in the future providing LOS F.

Table II-16: Segment 3 – Summary of Deficiencies

Objective			Location	2005 Existing	2030 No Build
Access Spacing (Miles)	APO Guideline				
	Signal	2310' - 4400'	TH 15 to 25th Ave.	**1531'**	**1531'**
			25th Ave. to Cooper Ave.	2640'	2640'
	Full Access	2310' - 4400'	TH 15 to 25th Ave.	**740'**	**740'**
			25th Ave. to Cooper Ave.	**1320'**	**1320'**
	Partial Access	2310' - 4400'	TH 15 to 25th Ave.	**740'**	**740'**
			25th Ave. to Cooper Ave.	**1055'**	**1055'**
	Private Access (#)	Highly Restricted	TH 15 to 25th Ave.	**14**	**14**
			25th Ave. to Cooper Ave.	**7**	**7**
Safety (crashes/ million vehicle miles)	*Statewide Average for Urban 4-Lane Divided = 4.8 *D3 Average for Urban 4-Lane Divided = 5.8		TH 15 to Cooper Ave.	**10.26**	**No Change**
Travel Speeds (mph)	Does Alternative Maintain or Improve Travel Speeds from Existing?		TH 15 Cooper Ave. - Eastbound	29	**15**
			TH 15 Cooper Ave. - Westbound	14	**8**
LOS	HCM Urban Street Class. II		TH 15 Cooper Ave. - Eastbound	A	**F**
			TH 15 Cooper Ave. - Westbound	C	**F**
	Provide LOS D or Better		Full Intersections	LOS C or Better	**4 LOS F**

* Source Mn/DOT 2000-2002, Segments include intersection crash numbers except for TH 15
Note: Values in bold do not meet stated objectives.

Segment 4: CSAH 75 – Cooper Ave. to I-94

The signal spacing along this segment of roadway meets the APO guidelines and even though the signal spacing decreases in the future due to newly developed corridors accessing CSAH 75 and full access points requiring some type of intersection control, they are still within the APO guidelines. However, the spacing of full and partial access points along the corridor do not meet the APO guidelines. The many private accesses along CSAH 75 do not meet the APO guideline which states it is highly restricted.

In the future, corridor travel speeds are anticipated to decrease significantly by as much as 26 mph. Four intersections are anticipated to have poor operations of LOS E and F.

Table II-17: Segment 4: Summary of Deficiencies

Objective			Location	2005 Existing	2030 No Build
Access Spacing (Miles)	APO Guideline				
	Signal	2310' - 4400'	Cooper Ave. to I-94	4013'	2640'
	Full Access	2310' - 4400'	Cooper Ave. to I-94	**2006'**	**1850'**
	Partial Access	2310' - 4400'	Cooper Ave. to I-94	**1531'**	**1425'**
	Private Access (#)	Highly Restricted	Cooper Ave. to I-94	**9**	**9**
Safety (crashes/ million vehicle miles)	**Statewide/D3 Average for Urban 4-Lane Divided = 4.8/5.5 **Statewide/D3 Average for Urban 4-Lane Undivided = 6.1/4.4		Cooper Ave. to 33rd St. S. Urban 4-lane Divided	1.98	No Change
			33rd St. S. to 41st St. Urban 4-lane Undivided	1.32	No Change
			41st St. S. to I-94 Urban 4-lane Divided	2.47	No Change
Travel Speeds (mph)	Does Alternative Maintain or Improve Travel Speeds from Existing?		Cooper Ave. to I-94 - Eastbound	40	**16**
			Cooper Ave. to I-94 - Westbound	42	**16**
LOS	HCM Urban Street Class. II		Cooper Ave. to I-94 - Eastbound	A	**E**
			Cooper Ave. to I-94 - Westbound	A	**E**
	Provide LOS D or Better		Full Intersections	LOS C or Better	**2 LOS E 2 LOS F**

* Source Mn/DOT 2000-2002, Segments include intersection crash numbers except for TH 15
Note: Values in bold do not meet stated objectives.

III. Social, Economic, and Environmental Overview

Improvements to the TH 23/CSAH 75 Corridor may result in social, economic, and environmental impacts. Although the need for improvements in this corridor are clearly demonstrated by the analysis in the previous section, the costs and impacts of these improvements need to be considered in determining the most appropriate vision for the corridor. This chapter provides a description of the social, economic, and environmental considerations within the TH 23/CSAH 75 area of influence. Figure III-1 and Figure III-2 illustrate many of the environmental elements and their physical relationship to TH 23/CSAH 75 discussed below. The overview includes a review of readily available environmental and land-use databases. It does not take the place of formal environmental documentation. Issues related to future specific highway improvements will be addressed through the proper environmental documentation in accordance with the National Environmental Policy Act (NEPA), Minnesota Environmental Policy Act (MEPA), and Mn/DOT's Highway Project Development Process (HPDP).

A. Land Use

Segment 1: TH 23 - I-94 to 10th Avenue South

TH 23 between I-94 and 28th Avenue South is currently undeveloped with agricultural land and wetlands. A commercial site does exist at the intersection of TH 23 and Bel Clare Drive. Most of the area is expected to remain agricultural with a slight increase in commercial development. TH 23, between 28th Avenue South and 10th Avenue South, is mostly industrial with a few single-family homes. The City of Waite Park, within Stearns County, is located in this section. This area is expected to develop primarily with commercial land uses.

Segment 2 – 10th Avenue South to TH 15

This segment passes through an urban commercial district which has been identified by the study as the Core Business Area. The Cities of St. Cloud and Waite Park are located in this segment, both within Stearns County. TH 23 provides direct access to several commercial properties along 2nd Street South. It is important to maintain good access for the businesses in this area.

Segment 3: CSAH 75 - TH 15 to Cooper Avenue

This segment of CSAH 75 passes through an urban commercial district which has been identified by the study as the Core Business Area. Heritage Park runs along the south side of CSAH 75 from TH 15 to 33rd Avenue South. A low-density residential area exists along the north side of CSAH 75 from 25th Avenue South to Cooper Avenue. CSAH 75 provides direct access to several commercial properties along 2nd Street South. It is important to maintain good access for the businesses in this area. The City of St. Cloud, within Stearns County, is located in this segment.

TH 23 Environmental Overview Map

TH 23 / CSAH 75 Corridor Study

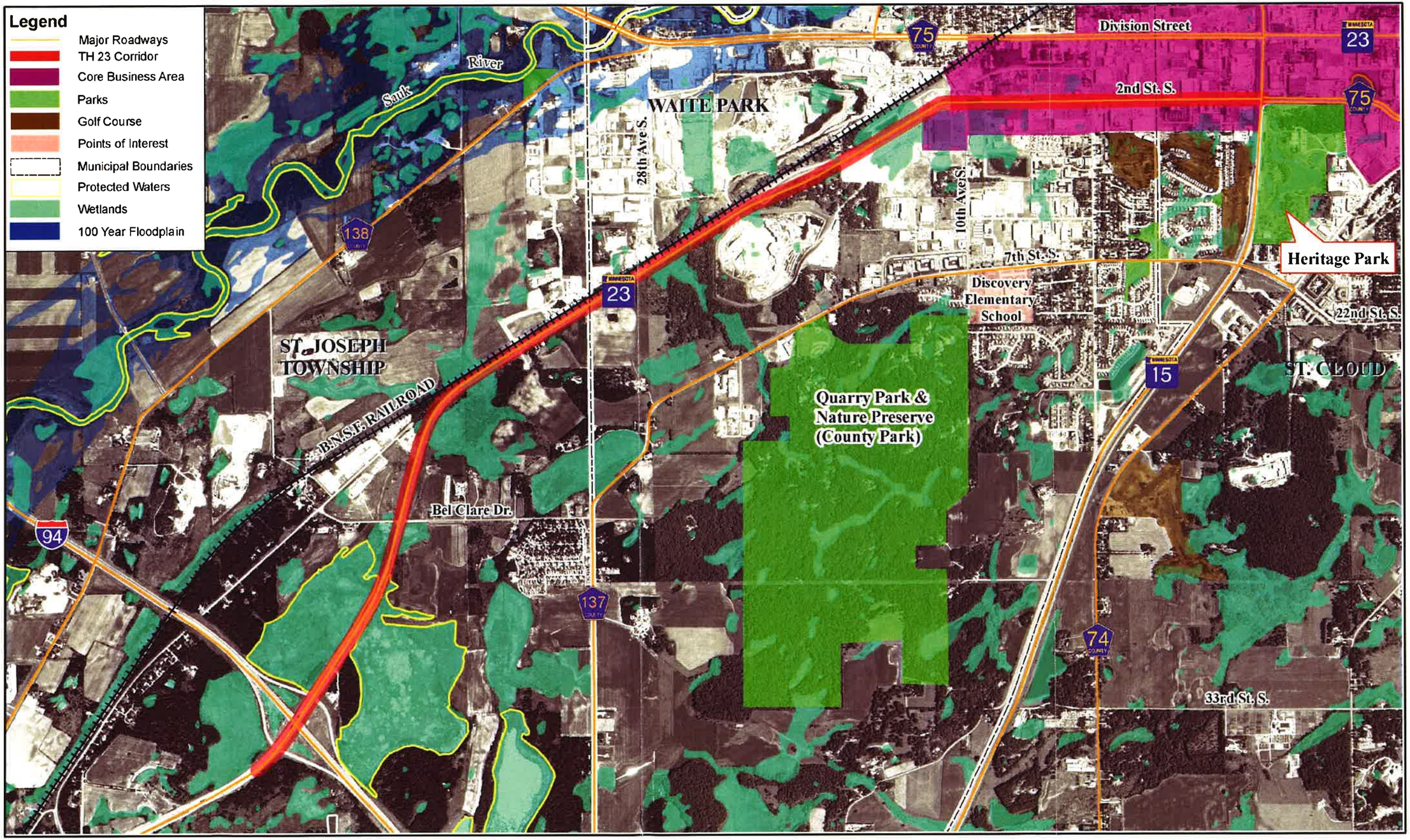


Figure III-1

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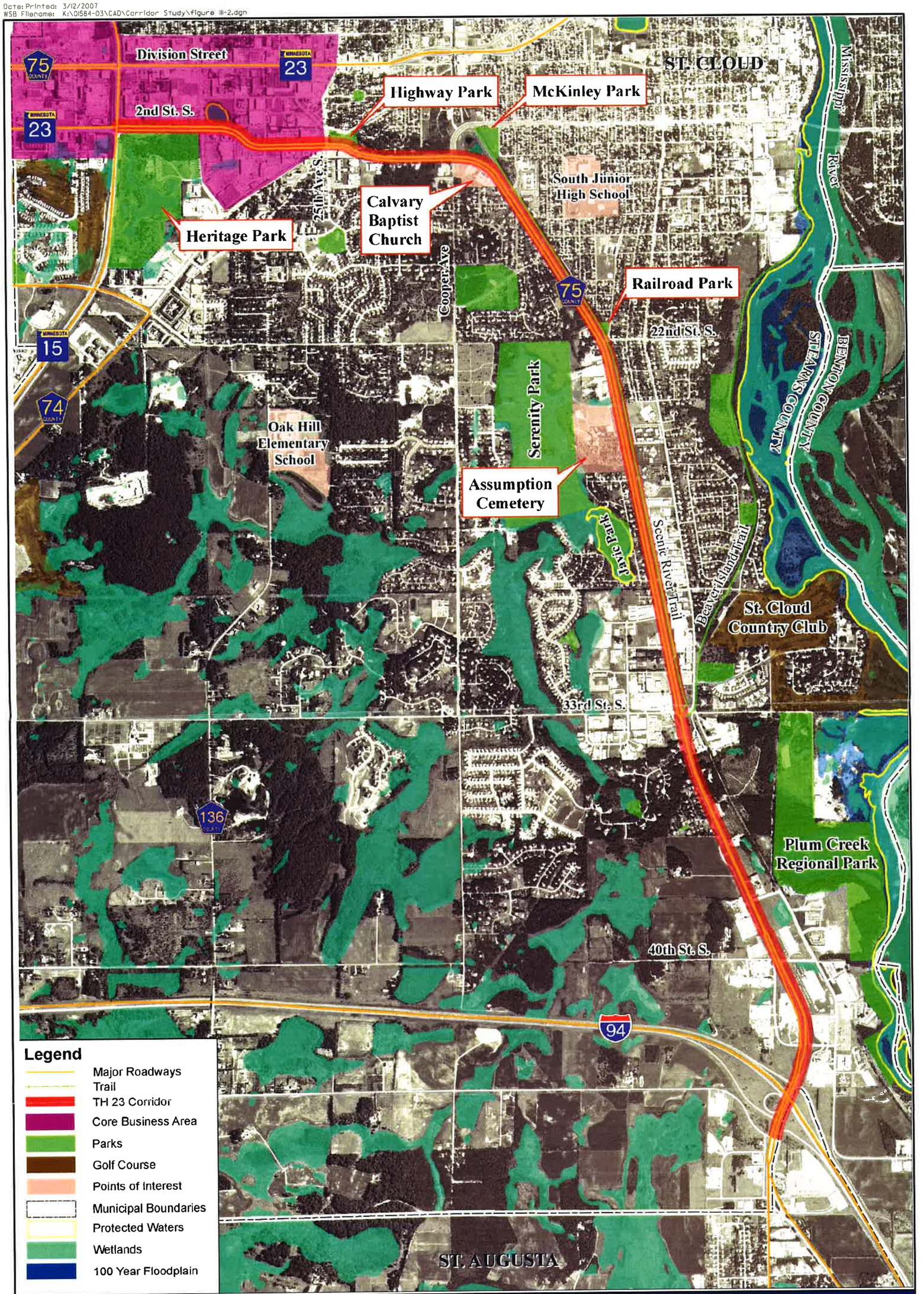

TH 23 / CSAH 75 Corridor Study

CSAH 75 Environmental Overview Map

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Figure III-2

Segment 4: CSAH 75 - Cooper Avenue to I-94

The land use in this segment is mixed between residential, commercial, and industrial. A cemetery exists along the west side of CSAH 75 just south of 22nd Street South. The Scenic River Trail runs along the east side of CSAH 75 from just east of Cooper Avenue to 33rd Street South. Plum Creek Regional Park is south of 33rd Street South and east of the commercially developed area along CSAH 75. The Mississippi River parallels CSAH 75 to the east of Plum Creek Regional Park. The City of St. Cloud, within Stearns County, is located in this segment. The northern portion of this segment is urbanizing but expected to remain mostly residential. The southern portion of this segment is developing with commercial and industrial land uses.

Schools

No Schools are adjacent to the project limits.

B. Modal Uses

Rail Transportation:

A Burlington Northern Santa Fe Railroad (BNSF) spur-line track parallels TH 23's north side from Interstate 94 to 10th Avenue South. The BNSF is a Class I long-haul carrier running from the West Coast to Chicago.

Air Transportation

A public airport, St. Cloud Regional Airport, exists in St. Cloud, but is not within the project vicinity. The airport is located east of the Mississippi River off of TH 10 on Del Tone Road (Sherburne County Road 7). Scheduled commercial air passenger service is provided at this airport. There are no anticipated project impacts for this airport.

Truck Transportation

The TH 23 corridor currently (2003) carries more than 500 Heavy Commercial Vehicles Per Day (HCAADT). The District 3 2030 Transportation Plan indicates that the corridor will experience huge increases in freight flow by 2020.

The St. Cloud APO solicited input from key stakeholders such as local freight haulers, major retail stores, and large manufactures to develop an understanding of the trucking issues within the St. Cloud Metropolitan Area. One recommendation indicated providing an interchange on TH 15 and TH 23/CSAH 75 (2nd Street South).

Transit Transportation

The St. Cloud Metro Bus has fixed routes on TH 23 and CSAH 75. The route on TH 23 is from 2nd Avenue South to TH 15. The routes on CSAH 75 are from TH 15 to 33rd Avenue South and from 25th Avenue South to Traverse Rd. Transit signal priority has been implemented on all fixed routes. The St. Cloud APO's 2030 Transportation Plan indicates that a long-term travel demand management strategy would be to provide transit

vehicles the ability to bypass congested traffic by utilizing bus lanes or shoulders due to projected traffic volume increases and related peak-hour congestion along many priority transit corridors. Therefore, any future improvements on TH 23 and CSAH 75 should consider bus traffic.

Pedestrian/Bicycle Transportation

The St. Cloud APO 2030 Transportation Plan indicates TH 23 and CSAH 75 as trip barriers to pedestrian and bicycle flow across the metro. For a successful pedestrian and bicycle network, TH 23 and CSAH 75 should accommodate these modes by providing appropriately designed crossings to ensure safe and efficient travel. The plan also calls for local jurisdictions to include pedestrian facilities on both sides of all urban roadways as infrastructure projects occur in existing developed areas and where there are missing linkages to the sidewalk system. Therefore, any improvements should include sidewalks.

An existing bicycle route currently runs along CSAH 75 between TH 15 and Cooper Avenue. A bicycle route is defined as a roadway which is open to both bicycle and motor vehicle traffic. This may be an existing roadway, street with wide curb lanes, or road with paved shoulders.

The Scenic River Trail is an existing shared-use path that runs along CSAH 75 between Washington Memorial Drive and 33rd Street South. A shared-use path is defined as a bikeway that is physically separated from motorized vehicular traffic by an open space or barrier and either within the right-of-way or within an independent right-of-way. Shared-use paths may also be used by pedestrians, skaters, wheelchair users, and other non-motorized users.

A shared-use path along TH 23 between Interstate 94 and just west of 10th Avenue South is recommended for the integration of future bicycle and pedestrian facilities. Also, bike lanes are called for on TH 23 from the eastern end of the shared-use path to 10th Avenue South. Any improvements on cross street, interchange, or at-grade intersections should also accommodate the planned bicycle and pedestrian through movement.

C. Environmental Elements

National Wetland Inventory/Protected Waters

The existing wetland information for the study area shown on Figure III-1 and Figure III-2 was obtained from the National Wetland Inventory. Many wetlands are located in the vicinity of the TH 23 / I-94 interchange.

Floodplains

Two 100-year floodplains exist outside the project limits at the Sauk River and Mississippi River.

Parks

Heritage Park: Approximately 1,650 ft. of Heritage Park's northern boundary is adjacent to CSAH 75. TH 15 borders it to the west. The park is owned by the City of St.

Cloud. It totals 92.5 acres and contains a recreation center, museum, and recreational trails. Wetlands are located within the park.

Highway Park: Approximately 650 ft. of Highway Park's southern boundary is adjacent to CSAH 75. West St. Germain Street borders it to the north. The park is owned by the City of St. Cloud. It totals 3.2 acres and contains a playground, basketball court, and tennis courts.

Railroad Park: Approximately 350 ft. of Railroad Park's western boundary is adjacent to CSAH 75 and the Scenic River Trail. Eleventh (11th) Avenue South borders it to the east. The park is owned by the City of St. Cloud. It totals 0.74 acres and contains a playground and a half basketball court.

Plum Creek Regional Park: This 140-acre park along the Mississippi River lies outside the project limits. It is located east of CSAH 75 between 33rd Street South and 41st Street South. It offers a diverse ecosystem and access to the river.

Scenic River Trail: Approximately 2.5 miles of the trail runs along the east side of CSAH 75 from Washington Memorial Drive to 33rd Street South. Impacts to the trail could occur if CSAH 75 was widened to the east.

Beaver Island Trail: This trail intersects the Scenic River Trail where 33rd Street South and CSAH 75 intersect. Minimal impacts to the trail entrance would be expected if CSAH 75 was widened to the east.

Golf Courses

St. Cloud Country Club: This course is outside the project limits. It is located north of 33rd Street South and borders the Mississippi River.

Mississippi River

In 1976, the Mississippi River was designated as a state Wild and Scenic River for the 53-mile length of river from the 10th Street Dam in St. Cloud to the western border of the Cities of Anoka and Champlin at the northwest corner of the Twin Cities metropolitan area. It is also designated as a state Canoe/Boating Route. The Mississippi River is in close proximity and parallels CSAH 75 from 22nd Street South to Interstate 94.

Sauk River

Currently, no state river designations belong to this river. The Sauk River is in close proximity and parallels TH 23 from Interstate 94 to 10th Avenue South.

Sauk River Watershed District

The Sauk River Watershed, located in Central Minnesota, is one of 16 major watersheds in the Upper Mississippi River Basin. Coordination with the District will be necessary with future project development. The portion of TH 23 between Interstate 94 and just west of 10th Avenue South lies within the Sauk River watershed. Improvements on TH 23 may require a permit.

IV. Alternatives

A. Access Alternatives

The location of access on TH 23 and CSAH 75 is an important issue along the corridor. Even though the average spacing along a segment may meet the Mn/DOT and/or APO access guidelines, if the access points are not evenly distributed, the coordination of signals is less efficient than if they are equally spaced. For the purposes of this study, the results of the operations' analysis assumes a signal at high-volume intersections to move traffic more efficiently. However, since roundabouts are becoming a more acceptable alternative to signals, access spacing will be defined as full access points which would require some type of intersection control (signal, interchange, roundabout, etc.).

Segment 1: TH 23 – I-94 to 10th Avenue

This segment of the corridor is currently rural in nature and is classified as an expressway. There are a few access changes anticipated along this segment due to new corridors crossing TH 23. See Figure IV-1 for an illustration of the access discussion below.

- **Bel Clare Avenue/33rd Street South:** The 33rd Street corridor is proposed to extend west of TH 15 and intersect with TH 23. At TH 23 it may connect into the proposed southwest beltway that travels northerly through Waite Park and/or St. Joseph. The most appropriate location for this intersection with TH 23 will be determined in future studies. However, for the purposes of this study, it was assumed that the 33rd Street Corridor would intersect with TH 23 at Bel Clare Avenue. The 2030 forecasts assumed the 33rd Street extension but not the extension of the Southwest Beltway, since the forecasts were based on the St. Cloud APO's financially constrained plan.
- **Julip Road:** Traffic control is necessary in the future at this location in order to accommodate traffic trying to enter Julip Road from TH 23. For the purposes of the 2030 operational analysis a signal was assumed for the traffic control device at this intersection.
- **28th Avenue:** The extension of 28th Avenue south to CR 137 was assumed for the 2030 alternatives. This is consistent with the St. Cloud APO's 2030 Financially Constrained plan. Also, a plat has already been developed with the 28th Avenue extension.
- **4th Street and 1st Street:** To best meet the access spacing guidelines and maintain mobility, it was recommended that all other public access points be limited to right-in/right-out in the future. This would include both 4th Street and 1st Street.
- **Private Access:** It is recommended the remaining private accesses along this segment be closed in the future. Since this area is rural in nature, new development should provide a local roadway system that uses the access points onto TH 23 that are identified above.

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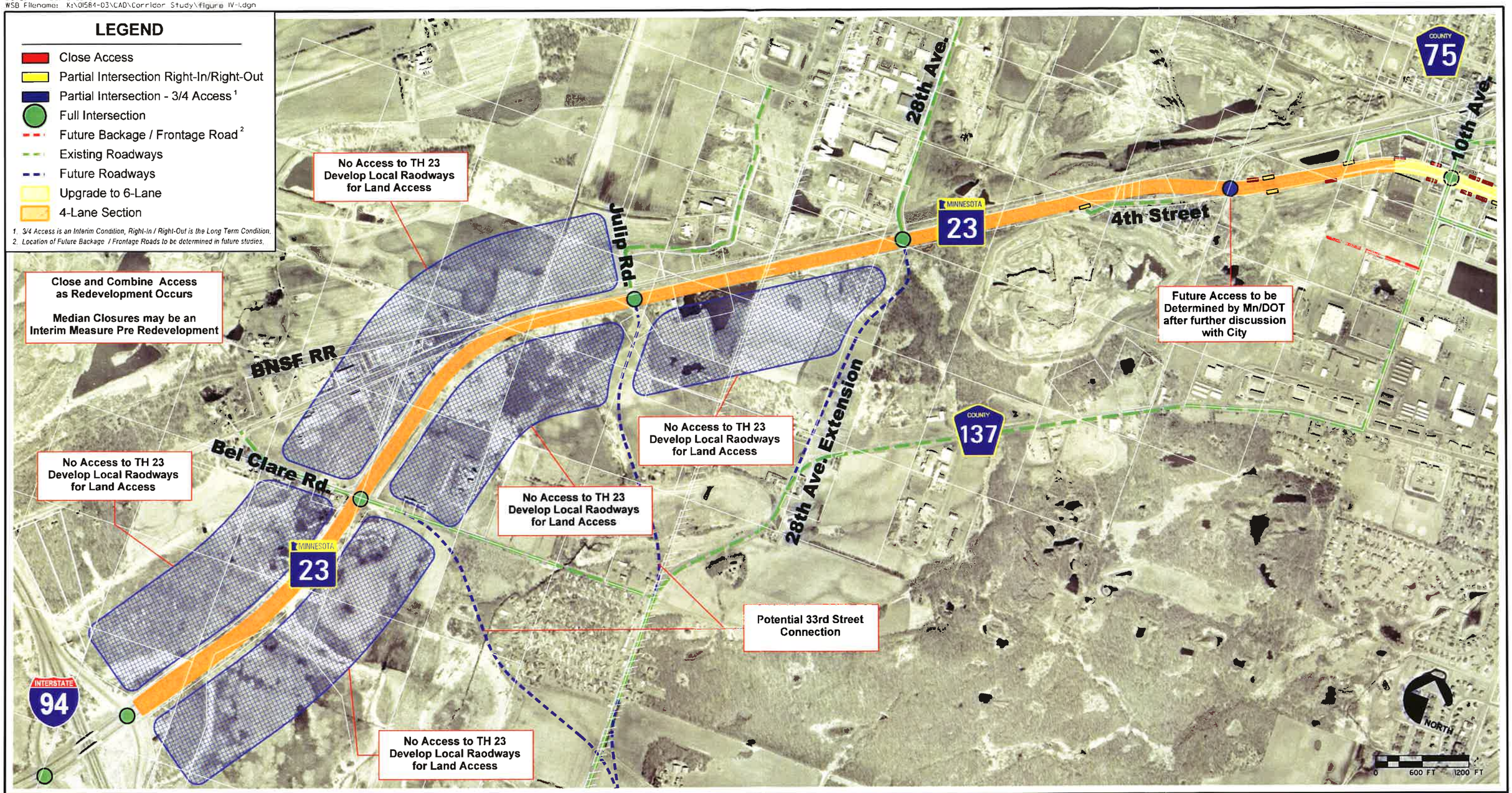
LEGEND

- Close Access
- Partial Intersection Right-In/Right-Out
- Partial Intersection - 3/4 Access [1]
- Full Intersection
- Future Backage / Frontage Road [2]
- Existing Roadways
- Future Roadways
- Upgrade to 6-Lane
- 4-Lane Section

1. 3/4 Access is an Interim Condition, Right-In / Right-Out is the Long Term Condition.
2. Location of Future Backage / Frontage Roads to be determined in future studies.



TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 1

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure IV-1

Segment 2: TH 23 – 10th Avenue to TH 15

Since this segment provides access to the core business area, it is recommended that all of the existing signalized intersections be retained. If the westerly part of this segment is categorized as 2C (Medium Priority IRC, Urban Core) the full access spacing (and signal spacing) meets Mn/DOT's guidelines. It also provides equally spaced full access points for efficient signal coordination.

- **Private Access**: Private access is prevalent along this segment of the corridor. It is recommended that private access points be closed over time as properties redevelop and that mid-block (between full access points) combined access to properties be developed preferably at public streets.
- **Backage/Frontage Road Connections**: Since it is proposed to close or combine the private accesses along this segment, a backage/frontage road system is necessary for traffic circulation and access to businesses. First (1st) Street South and 3rd Street South already provide these connections; however segments are missing. As redevelopment occurs, it is recommended to extend these backage roads similar to what is shown in Figure IV-2.
- **Park Avenue:** Currently this roadway has full access to TH 23. As traffic continues to increase at the intersection of TH 15 and TH 23, traffic turning left out of Park Avenue will experience long delays unless a signal is installed. Due to the close spacing between Park Avenue and TH 15, it is not recommended to signalize this intersection. Instead, three quarter access could be allowed which allows left turns into Park Avenue but not out with an ultimate right-in/right-out access when the area redevelops.

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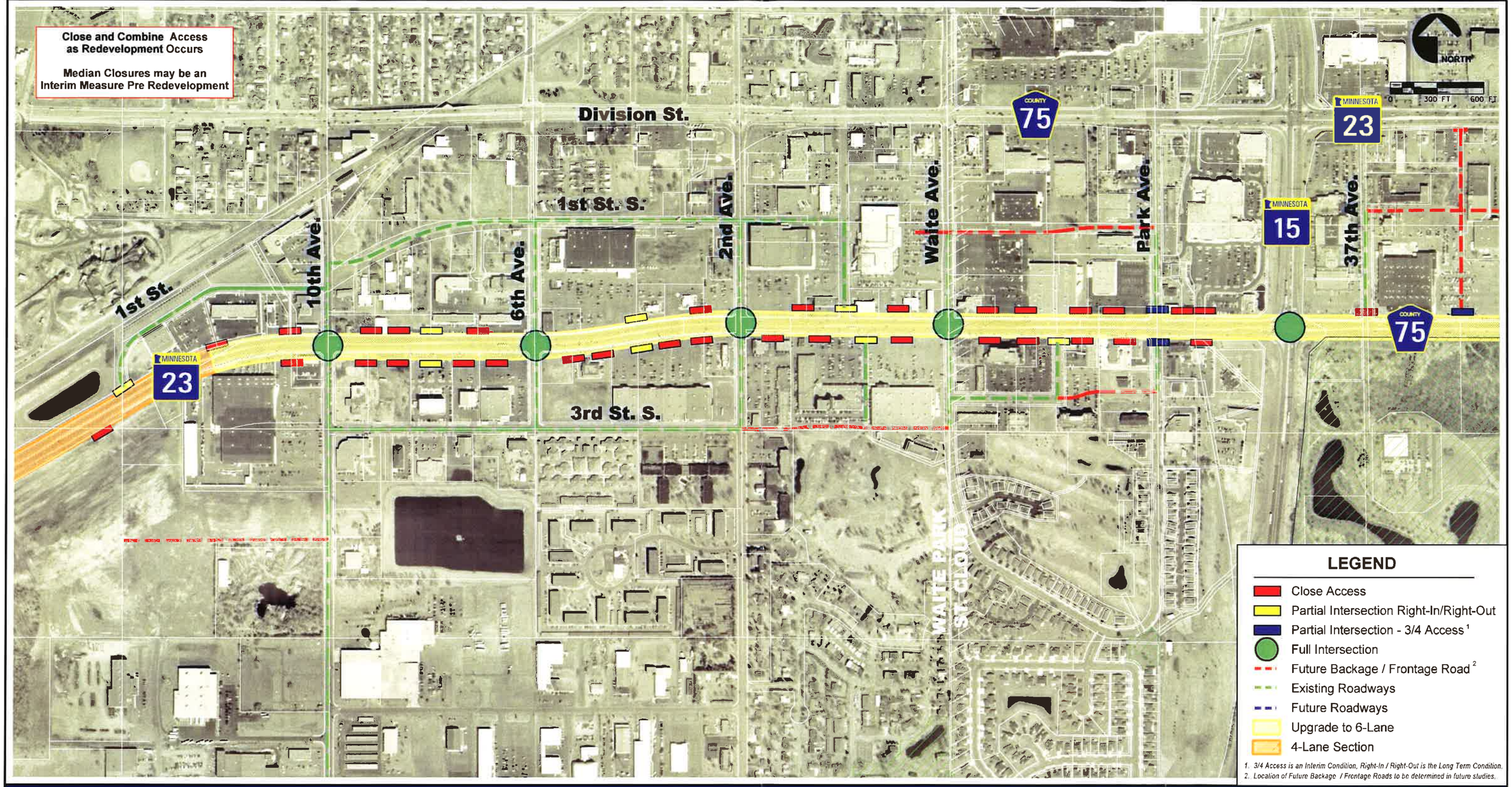

TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 2

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure IV-2

Segment 3: CSAH 75 – TH 15 to Cooper Avenue:

Like Segment 2, this segment provides access to the core business area. This segment has the highest crash rates (above 10 crashes per million vehicle miles) of all the segments along the corridors. It is recommended that all signalized intersections along this segment be retained since they would provide the most efficient access to this area. An illustration of the access plan in this area is provided in Figure IV-3. The signal spacing along this segment does not meet the St. Cloud APO guidelines, but the following access changes will bring this segment closer to meeting the access guidelines.

- **37th Avenue**: This full access intersection is currently unsignalized and is very close to the TH 15 intersection (within 500 feet). The intersection crash analysis indicates that safety is a problem at this intersection. It is recommended that as the area redevelops, this intersection should be closed entirely. A new ¾ access (left-in and right-in/right-out only) should be provided at a new north/south roadway in the vicinity of 35th Avenue. This new access would ultimately be right-in/right-out.
- **Partial Access**: The remaining unsignalized full access intersections should be converted to right-in/right-out as the area redevelops.
- **Private Access**: All private access along the corridor should be closed as the area redevelops.
- **Backage/Frontage Roads**: This segment lacks any frontage and backage roads that would provide alternative access and circulation of the businesses along the corridor. As the area redevelops, a system of backage roads should be provided similar to what is shown in Figure IV-3.
- **Frontage Road West of Cooper Avenue**: This northern frontage road currently provides access to a neighborhood just west of Cooper Avenue. Conversations with residents in the area have indicated a safety problem due to the location of access on CSAH 75 from this frontage road. Residents trying to turn left from CSAH 75 onto the frontage road make a U-turn at the Cooper/CSAH 75 intersection. The right turn merging lane from Cooper Avenue creates a weave with the traffic making the u-turn. Also, the west access onto CSAH 75 from the frontage road is close to the CSAH 75 median opening. Traffic trying to make a left out to go eastbound goes the wrong way on CSAH 75 to reach the median opening. It is recommended that the end access points on this frontage road be closed and a new right-in/right-out access onto CSAH 75 at Denora Place (see Figure IV-3) be added.

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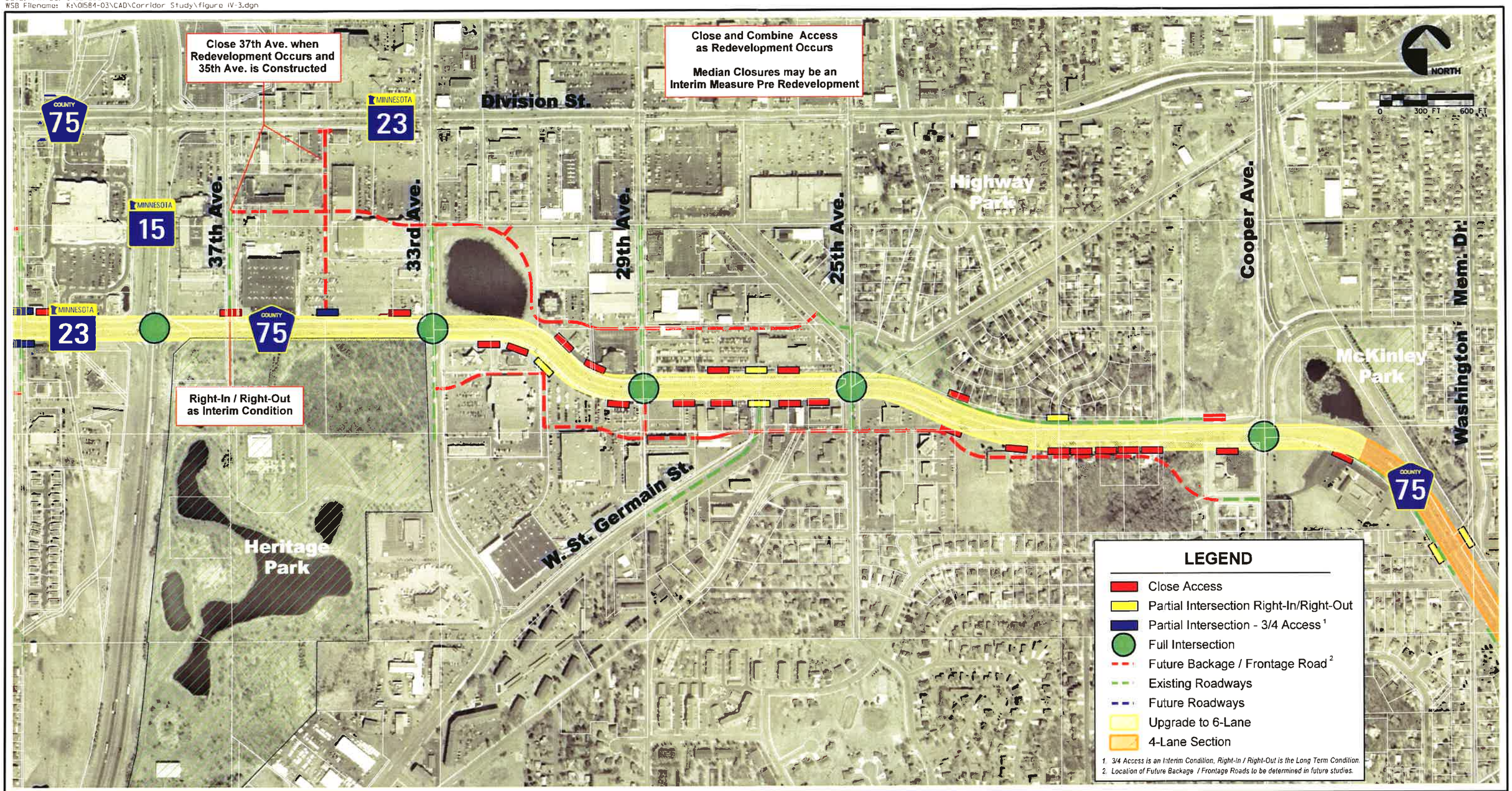

TH 23 / CSAH 75 Corridor Study

Recommened Plan - Segment 3

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure IV-3

Segment 4: CSAH 75 – Cooper Avenue to I-94

This segment of CSAH 75 is urbanizing and is expected to have additional access due to new corridors which are identified in the APO plan. The signalized intersections along this segment are unevenly spaced which complicates signal coordination for efficient traffic movement through the corridor. As new corridors are implemented, it is recommended that their future access points on CSAH 75 are located to ensure equal spacing of signalized intersections of approximately ½ mile. The following access points were considered when determining the most appropriate plan for this segment of CSAH 75. See Figure IV-6 for an illustration of the items discussed below.

- **Washington Memorial Drive**: The signalized intersection at Washington Memorial Drive is only 1,500 feet away from the Cooper Avenue signalized intersection with CSAH 75. Due to the close signal spacing, the study evaluated whether this signal is needed in the future. The 2030 travel demand at Washington Memorial Drive with full access to CSAH 75 is approximately 10,000 vehicles/day. Currently, the left turns out at this intersection are high (230 vehicles in the PM hour) as traffic is trying to go southbound on CSAH 75. A signal would be necessary to accommodate this movement. However, if the median were closed and the intersection were converted to right-in/right-out, the traffic demand moves to Cooper Avenue which would increase the forecast 2030 volumes at Cooper Avenue by approximately 16%. The PM left turns from the north approach at Cooper Avenue are currently fairly low (71 vehicles), but with the removal of full access at Washington Avenue, these are expected to increase substantially. If Washington Memorial Drive is closed, then dual left-turn lanes will be required at the Cooper Avenue intersection to handle the additional traffic demand. A 2030 traffic analysis was completed to determine the traffic speeds and LOS from west of Cooper Avenue to south of Washington Memorial Drive with and without a signal at Washington Memorial Drive.

Table IV-1: LOS with and without a signal at Washington Memorial Drive

Traffic Operations Measure of Effectiveness	CSAH 75 - TH 15 to Cooper Avenue.			
	4-Lane		6-Lane	
	w/ signal	right-in/out	w/ signal	right-in/out
CSAH 75 (West of Cooper to south of Wash. Mem. Dr.) Average Travel Speed (NB/SB - mph)	17/22	20/27	25/25	31/20
Cooper delay (sec/veh)	62.0	84.4	28.7	40.9
Cooper LOS	E	F	C	D
Wash. Mem. Dr. delay (sec/veh)	34.5	9.0	27.7	20.1
Wash. Mem. Dr. LOS	C	A	C	C

The table above summarizes a 2030 Synchro/SimTraffic analysis of CSAH 75 from west of Cooper Avenue to south of Washington Memorial Drive with and without a signalized intersection at Washington Memorial Drive. The analysis assumes intersection improvements at Cooper Avenue to meet the 2030 traffic demand. The analysis indicates that the traffic speeds increase on CSAH 75 if the Washington Memorial Drive signal is removed and converted to right-in/right-out. However, this results in an increase in traffic volumes at Cooper Avenue which would add more

delay at this intersection. However, the intersection would operate at LOS D or better (assuming six-lanes on CSAH 75 – TH 15 to Cooper) which meets the performance objective.

Removing the signal at Washington Memorial Drive and converting it to a right-in/right-out will improve the travel speeds on CSAH 75 and improve safety. Therefore, it is recommended to remove the signal; however, the intersection at Cooper Avenue will need to be widened to accommodate the additional traffic volumes.

- **16th Street/Traverse Road**: Currently Traverse Road intersects CSAH 75 from the west at a signalized full-access intersection. It is proposed that 16th Street be extended west and intersect CSAH 75 at the Traverse Road intersection. The extension of 16th Street to CSAH 75 will relieve 10th Avenue and the intersection of Cooper Avenue and CSAH 75. However, the resulting through traffic that would occur on Traverse Road is undesirable, as this is a neighborhood street with several accesses. The study considered alternatives to provide full access at this intersection but prevent through traffic onto Traverse Road. Figure IV-4 shows two alternatives that were considered for this intersection. The first alternative attempts to prevent the westbound through movement from 16th Street to Traverse Road yet allow the left turn out from Traverse Road and 16th Street onto CSAH 75. The second alternative converts the intersection to a ¾ intersection allowing left-ins and right-in/right-out from CSAH 75 but no left turn out from Traverse Road or 16th Street.

  Alternative 1 does not entirely prevent the through movement between 16th Street and Traverse Road since the left-turns onto CSAH 75 can then make a right to continue through. Since the through movement on Traverse Road is undesirable, Alternative 2 was recommended as the preferred alternative.

- **22nd Street/24th Street:** An existing signal exists at 22nd Street. A pre-NEPA corridor study was undertaken by the APO for the extension of 24th Street between TH 15 and CSAH 75. It is anticipated that this roadway would provide relief to CSAH 75. The study indicated that 24th Street would be extended east to intersect with CSAH 75 across from Halliday Road. The Halliday Road intersection is an equal distance between Traverse Road and Cheryl Drive. Full access in this location provides approximately ½ mile spacing, from Halliday to 33rd Street. It is recommended that the 22nd Street intersection be converted to a right-in, right-out intersection and a full access intersection be provided at 24th Street. This will provide connectivity to the 24th Street corridor from CSAH 75. When the extension of 24th Street is complete with access to CSAH 75, the full intersection at 22nd Street should be converted to right-in/right-out.

- **36th Street:** An extension of this roadway to CSAH 75 is proposed as the area develops. The location of the access point on CSAH 75 is approximately midway between 33rd Street and 40th Street. This results in ½ mile spacing between these full intersections. The equidistant spacing is preferred since it provides the best spacing for coordinating potential signals.

TH 23 / CSAH 75 Corridor Study

Alternatives Considered

Alternative 1 - CSAH 75 at 16th Street

Alternative 2 - CSAH 75 at 16th Street (Preferred)

LEGEND: Roadway, Median, Bikeway, Shoulder, Sidewalk, Signalized Intersection

Figure IV-4

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- **40th Street:** The extension of this roadway between CSAH 75 and CR 136 is currently under study. The location of access on CSAH 75 from this improved corridor was considered for this study. Three alternatives were considered for access from 40th Street to CSAH 75.
  - **Alternative 1: 40th Street:** This alternative assumes that 40th Street would be extended directly to CSAH 75 and 43rd Street would be converted to a right-in, right-out access. If the signal were removed at 43rd Street and full access with traffic control be provided at 40th Street, the spacing along CSAH 75 would meet approximately ½ mile spacing from 33rd Street to I-94. This alternative was analyzed to determine the operations during the future year PM peak hour. The analysis indicated that CSAH 75 is reaching its capacity along this segment, and full access with traffic control at 40th Street would provide better traffic operations than a full access at 43rd Street. The analysis indicated that 43rd Street is too close to the I-94 ramp intersections and that traffic queues at the intersection would extend back into the next intersection. However, the widening necessary to accommodate the future traffic at 40th Street would have right-of-way impacts on businesses along 40th Street. Also access to businesses on the east side of CSAH 75 just north of I-94 would not be as convenient.
  - **Alternative 2: Connect 40th Street into 43rd Street:** A traffic analysis indicated that by 2030 in the PM peak hour a signal at 43rd Street would operate at LOS F and the southbound queue at the CSAH 75 intersection with the I-94 westbound ramps would extend beyond 43rd Street. Therefore, it is recommended that this alternative be eliminated.
  - **Alternative 3: Relocate Full Access at 43rd Street to 42nd Street:** Due to the right-of-way impacts at 40th Street in Alternative 1 and current development plans in the area west of CSAH 75 and north of I-94, a third alternative was considered that would provide a full access with traffic control intersection between 40th and 43rd Street. The intersection at 43rd Street would be converted to a right-in, right-out intersection. A traffic analysis of the 2030 PM peak hour traffic indicated that this alternative provides better operations than Alternative 2 since the queue at a at the I-94 westbound ramps would not extend back into this intersection. Although the analysis indicates that full access at this location provides an acceptable level of service, it does not result in the desired spacing of ½ mile between full intersections on CSAH 75.

  It is recommended that the full intersection on CSAH 75 from the 40th Street extension should be located at 40th Street and the signal should be removed at 43rd Street. As redevelopment occurs, 43rd Street should be converted to a right-in/right-out intersection.

- **Frontage/Backage Roads**: Several frontage roads exist along this segment of CSAH 75. However, the frontage roads are located very close to CSAH 75, and there is very little space for storing vehicles between the frontage road and CSAH 75 at the full access intersections. As the recommended roadway and intersection improvements are implemented, it is recommended that the frontage road be moved

farther away from CSAH 75 at the full intersections to provide storage for vehicles at the intersections.

The City of St. Cloud proposes to cul-de-sac Clearwater Road north of 33rd Street due to its close proximity to the 33rd Street intersection with CSAH 75. Since private accesses onto CSAH 75 are desirable, it is recommended to extend Clearwater Road north of 39th Street to 33rd Street (see Figure IV-6). This would provide alternative access to the businesses fronting CSAH 75.

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Alternative 1 (Preferred)

Alternative 2 (Dropped)

Alternative 3

TH 23 / CSAH 75 Corridor Study

Alternatives Considered - 40th / 43rd Street

LEGEND: Roadway, Shoulder, Median, Sidewalk, Existing Access Road, Signalized Intersection

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure IV-5

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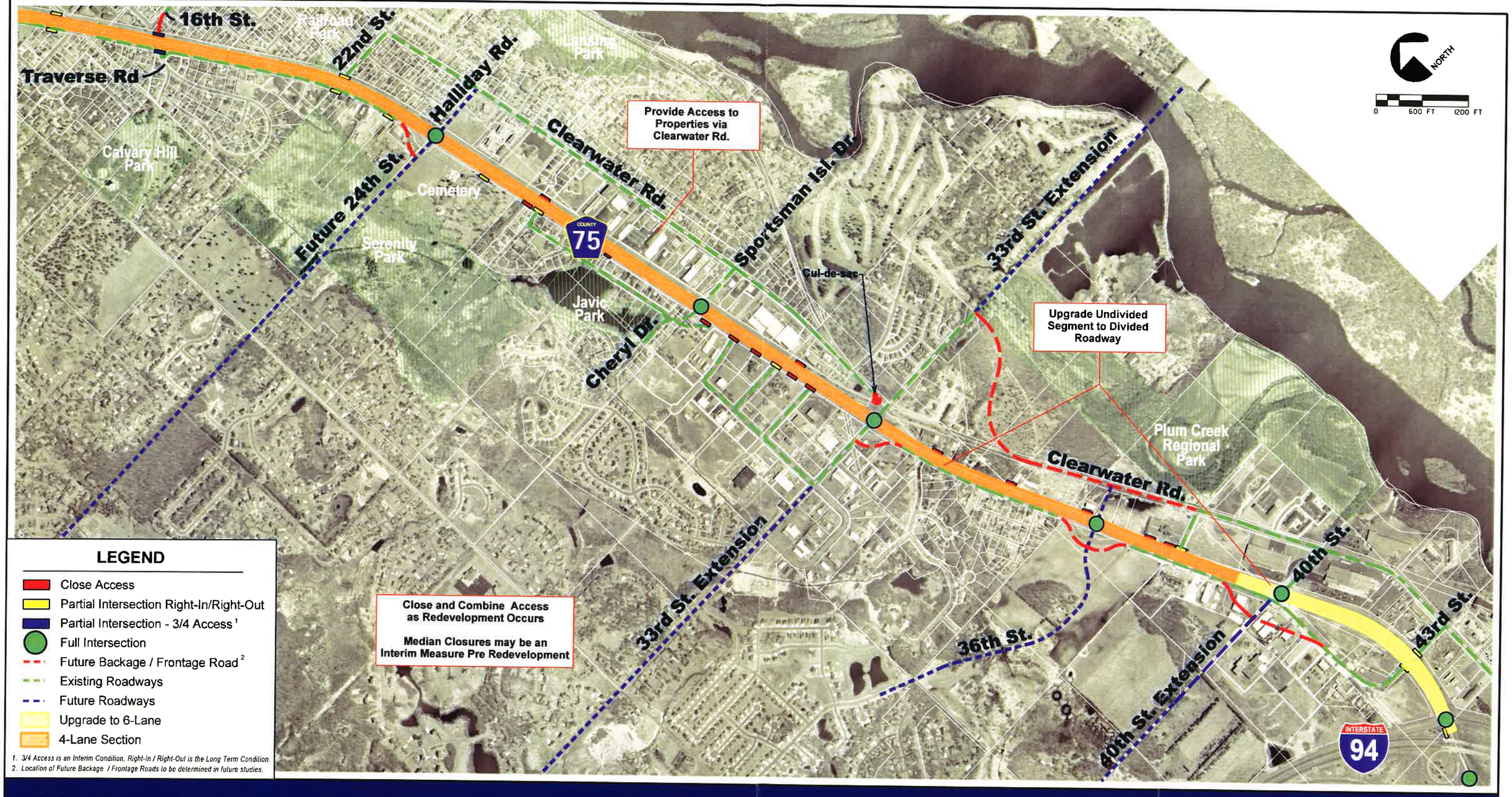

LEGEND

- Close Access
- Partial Intersection Right-In/Right-Out
- Partial Intersection - 3/4 Access [1]
- Full Intersection
- Future Backage / Frontage Road [2]
- Existing Roadways
- Future Roadways
- Upgrade to 6-Lane
- 4-Lane Section

1. 3/4 Access is an Interim Condition, Right-In / Right-Out is the Long Term Condition.
2. Location of Future Backage / Frontage Roads to be determined in future studies.

TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 4

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure IV-6

B. Corridor Alternatives

The corridor alternatives were evaluated in conjunction with the recommendations for access described earlier. That is if all of the alternatives assume the access changes recommended in the previous section. The corridor wide alternatives focused on options for increasing capacity along TH 23 and CSAH 75. It is assumed that the roadways that intersect with TH 23 and CSAH 75 will be improved as appropriate. The assumptions made on the cross-streets are described for each section. The alternatives for each segment are discussed below:

Segment 1: TH 23 – I-94 to 10th Avenue

Segment 1 is currently a four-lane divided expressway with at-grade intersections.

Two alternative cross sections and scenarios were developed for this roadway segment. These include, and are labeled as:

1A - 4-lane divided roadway

1B - 6-lane divided roadway.

Both scenarios would consolidate access points at six full intersections, and provide other right-in/right-out intersections. These intersections would connect into the local roadway network (with the exception of I-94 ramps), which would provide access to properties along TH 23. Access to property fronting on TH 23 would be provided via frontage or backage roads which would be implemented as the area is developed.

The six full access points on TH 23 would include (as described earlier in the access section):

1. TH 23 @ I-94 Eastbound Ramps
2. TH 23 @ I-94 Westbound Ramps
3. TH 23 @ Bel Clare Road (with Bel Clare Road being extended to the east)
4. TH 23 @ Julip Road (with Julip Road being extended to the south)
5. TH 23 @ 28th Avenue (existing signal)
6. TH 23 @ 10th Avenue (existing signal)

The assumptions for the cross-streets intersecting with TH 23 are summarized in

Table IV-2.

Table IV-2: Segment 1 - Intersection Assumptions

Location	Side Street			TH 23 Alt. - 1A / 1B		
	Thru Lanes	Left Turn Lanes	Right Turn Lanes	Thru Lanes	Left Turn Lanes	Right Turn Lanes
I-94 WB Ramps	---	1	1	2 / 3	1	1
I-94 EB Ramps	---	1	1	2 / 3	1	1
Belle Claire Road (33rd Street Connection)	2	1	1	2 / 3	2	1
Julip Road	1	1	1	2 / 3	1	1
28th Avenue	1	2	1	2 / 3	2	1
10th Avenue	2	2	1	2 / 3	2	1

Source: WSB & Associates, Inc.

Segment 2: TH 23 – 10th Avenue to TH 15

Segment 2 is currently a four-lane divided urban arterial with at-grade intersections.

Four alternative cross sections and scenarios were developed for this roadway segment. These include, and are labeled as:

2A - 4-lane divided roadway (existing geometry)

2B – Full-width (150 feet R/W) 6-lane divided roadway with dual left turn lanes on TH 23 (all lanes would be 12-feet wide) See Figure IV-7.

2C - Modified 6-lane divided roadway with single left turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W). See Figure IV-7.

2D - Modified six-lane divided roadway with single left turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W). This scenario would allow ¾ access at mid-block locations which would allow all movements except left-outs. These access points would be unsignalized. See Figure IV-7.

Full access (with traffic control such as a signal or roundabout) for all four cross-section alternatives (2A, 2B, 2C, and 2D) would be provided at five intersections (as described earlier in the access section). These include:

1. TH 23 @ 10th Avenue (existing signal)
2. TH 23 @ 6th Avenue (existing signal)
3. TH 23 @ 2nd Avenue (existing signal)
4. TH 23 @ Waite Avenue (existing signal)
5. TH 23 @ TH 15 (existing signal)

For alternative 2D, additional three quarter access points would be provided mid-block along the corridor at approximately these locations:

- Between 10th and 6th Avenues (access to north and south)
- Between 6th and 2nd Avenues (access to north and south)

- 1st Avenue (access to north and south)
- Between Waite Avenue and Park Avenue (access to south)
- Park Avenue (access to north and south)

The intent of the three-quarter access is to allow travelers access closer to their destination which would reduce left-turning traffic movements at the full access intersections and on the intersecting cross-streets.

The assumptions for the cross-streets intersecting with TH 23 are summarized in Table IV-3.

Table IV-3: Segment 2 – Intersection Assumptions

	Side Street			TH 23 Alts. 2A / 2B / 2C - 2D		
	Thru Lanes	Left Turn Lanes	Right Turn Lanes	Thru Lanes	Left Turn Lanes	Right Turn Lanes
10th Avenue	2	2	1	2 / 3 / 3	1 / 2 / 1	1
6th Avenue	1	1	1	2 / 3 / 3	1 / 2 / 1	1
2nd Avenue	1	1	1	2 / 3 / 3	1 / 2 / 1	1
Waite Avenue	1	2	1	2 / 3 / 3	1 / 2 / 1	1

Source: WSB & Associates, Inc.

Segment 3: CSAH 75 – TH 15 to Cooper Avenue

Segment 3 is currently a four-lane divided urban arterial with at-grade intersections.

Four alternative cross sections and scenarios were developed for this roadway segment. These include, and are labeled as:

3A - 4-lane divided roadway (existing geometry)

3B – Full-width (150-feet R/W) six-lane divided roadway with dual left-turn lanes (traffic lanes would be 12-feet wide). See Figure IV-7.

3C - Modified 6-lane divided roadway with single left-turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W). See Figure IV-7.

3D - Modified 6-lane divided roadway with single left-turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W). This scenario would allow ¾ access at mid-block locations which would allow all movements except left-outs. These access points would be unsignalized. See Figure IV-7.

Full access for all four cross-section scenarios (3A, 3B, 3C, and 3D) would be provided at five intersections. These include:

1. CSAH 75 @ TH 15 (existing signal)
2. CSAH 75 @ 33rd Avenue (existing signal)
3. CSAH 75 @ 29th Avenue (existing signal)
4. CSAH 75 @ 25th Avenue (existing signal)
5. CSAH 75 @ Cooper Avenue (existing signal)

The mid-block three-quarter access points would be located at approximately these four locations:

- 35th Avenue (access to north)
- Between 33rd and 29th Avenues (access to north and south)
- West St. Germain Street (access to north and south)
- Danora Place access to the north

The assumptions for the cross-streets intersecting with CSAH 75 are summarized in Table IV-4.

Table IV-4: Segment 3 - Intersection Assumptions

	Side Street			CSAH 75 Alts.3A / 3B / 3C - 3D		
	Thru Lanes	Left Turn Lanes	Right Turn Lanes	Thru Lanes	Left Turn Lanes	Right Turn Lanes
33rd Avenue	2	2	1	2 / 3 / 3	1 / 2 / 1	1
29th Avenue	1	1	1	2 / 3 / 3	1 / 2 / 1	1
25th Avenue	2	2	1	2 / 3 / 3	1 / 2 / 1	1
Cooper Avenue	2	2	1	2 / 3 / 3	1 / 2 / 2	1

Source: WSB & Associates, Inc.

Segment 4: CSAH 75 – Cooper Avenue to I-94

Segment 4 is currently a four-lane arterial roadway with at-grade intersections.

Two alternative cross sections and scenarios were developed for this roadway segment. These include, and are labeled as:

4A - 4-lane divided roadway (This alternative assumes conversion of the section of 4-lane undivided roadway between 33rd Street and 40th Street to a divided section)

4B – 4/6-lane divided roadway (This alternative is similar to 4A except that it assumes six lanes from 40th Street to the I-94 ramp intersections.

Both scenarios would consolidate access points at eight full access requiring traffic control intersections plus one three quarter access intersection and complete the partial frontage road located on the east side of CSAH 75 between Halliday Road and 43rd Street. All but one private accesses would be closed over time.

Of the eight proposed full access intersections, only three currently exist with the remaining being new or relocated intersections. The eight full intersections would include:

1. CSAH 75 @ Cooper Avenue (existing signal)
2. CSAH 75 @ Halliday Road (with Halliday Road connecting to the future extension of 24th Street; 22nd would be converted to right-in, right-out)
3. CSAH 75 @ Cheryl Drive (existing signal)
4. CSAH 75 @ 33rd Street (existing signal)

5. CSAH 75 @ 36th Street (approximate location, 36th Street would be constructed to intersect with CSAH 75 from the west)
6. CSAH 75 @ 40th Street (Intersection at 43rd Street would be converted to right-in, right-out as the analysis for 2030 conditions concluded it would not function at an acceptable level, particularly given its proximity to the I-94 on/off ramps.)
7. CSAH 75 @ I-94 Westbound Ramps
8. CSAH 75 @ I-94 Eastbound Ramps

In addition to the eight full access intersections, a three-quarter intersection would be provided on CSAH 75 at 16th Street and Traverse Road.

The assumptions for the cross-streets intersecting with CSAH 75 are summarized in Table IV-5.

Table IV-5: Segment 4 – Intersection Assumptions

	Side Street			CSAH 75 Alts. 4A / 4B		
	Thru Lanes	Left Turn Lanes	Right Turn Lanes	Thru Lanes	Left Turn Lanes	Right Turn Lanes
Cooper Avenue	2	2	1	3	2	1
Halliday Road	1	1	1	2	1	1
Cheryl Drive	1	1	1	2	1	1
33rd Street	1	2	1	2	1	1
36th Street	1	1	1	2	1	1
40th Street	1	2	1	2 / 3	2	1
I-94 WB Ramps	---	1	1	2 / 3	1	1
I-94 EB Ramps	---	1	1	2 / 3	1	1

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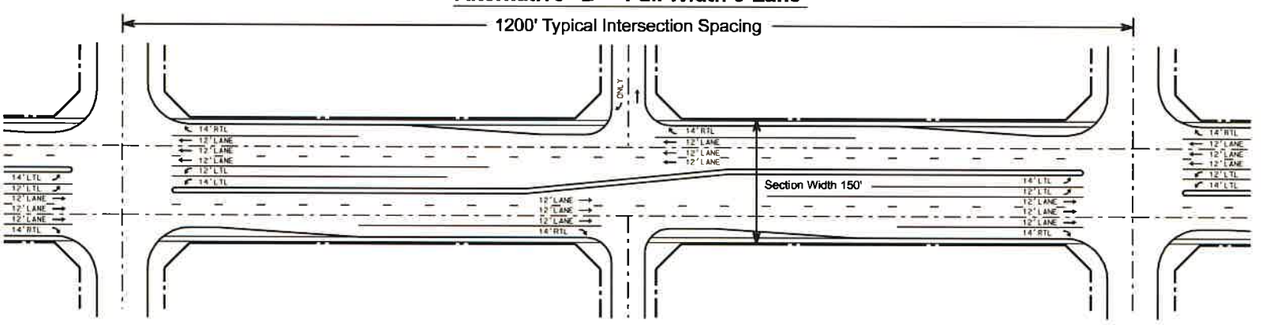
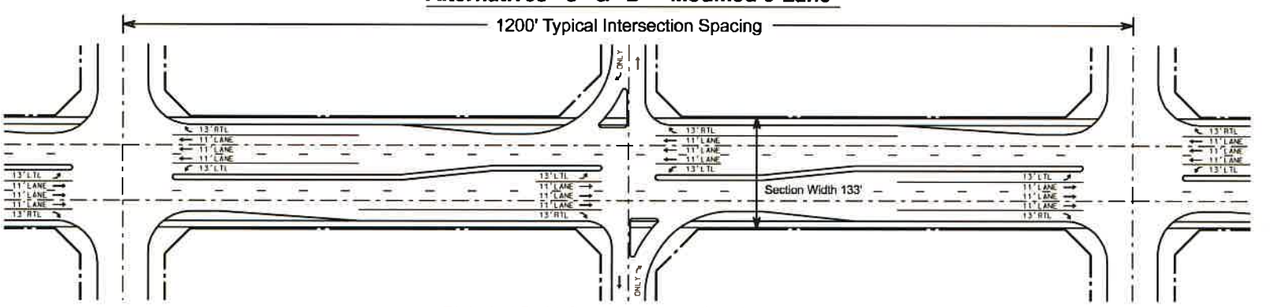
Alternative "B" - Full Width 6-Lane



Right In / Right Out
Mid-Block Access

Alternatives "C" & "D" - Modified 6-Lane



Right-In / Right-Out (Alternative "C" - Preferred)
Three Quarter (Alternative "D")
Mid-Block Access

TH 23 / CSAH 75 Corridor Study

6-Lane Alternative Sections

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure IV-7

V. Evaluation of Alternatives

Based on the access recommendations as detailed in the previous section, the corridor alternatives were evaluated to determine how effectively each alternative addresses the study's six objectives. The following table presents the objectives and measure of effectiveness used for the analysis:

Table V-1: Study Objectives and Measure of Effectiveness (MOEs)

Objective	Measure of Effectiveness
1. Access Spacing Guidelines	Does it meet Mn/DOT access spacing guidelines, yet provide reasonable land access.
2. Crash Rate	Does it have crash or severity rates at or below statewide rates for similar facilities.
3. Travel Speed	Does it maintain or improve average travel speeds.
4. Level of Service (LOS)	Does it provide LOS D on roadway segments and isolated at-grade intersections.
5. B/C Ratio	Does it have a Benefit/Cost ratio greater than 1.0.
6. Social/Environ./Econ. Impact	Does it minimize social, environmental, and economic impacts.

Source: WSB & Associates, Inc.

The operations' analysis used for the future year assumed that the full intersections described in the access alternatives section would be signalized. For the build alternatives, it was assumed that the side streets would be upgraded to improve intersection operations. The specific improvements assumed on the side streets are summarized in the previous section.

The alternative improvements, and how well they address the stated objectives, are described in the following sections broken out by the identified segments along the corridors.

Segment 1: TH 23 – I-94 to 10th Avenue

As described in the alternatives section the build alternatives include:

1A - 4-lane divided roadway

1B - 6-lane divided roadway

Table V-2 summarizes the results of the analysis of the alternatives relative to each objective MOE as well as the existing and No Build conditions.

Access Spacing: Both build alternatives would consolidate full access into six full intersections (including I-94 Ramp intersections). Although TH 23 is classified as a Medium Priority Interregional Corridor (IRC) by Mn/DOT in which traffic signals are strongly discouraged, signalization may be necessary as it would provide safer ingress and egress onto the highway. At such time that these intersections may need a signal, it is projected that the adjacent land use would be categorized as urban/urbanizing which recommends public access spacing of at least one-half mile. The planned intersections at Bel Clare Road and Julip Road are consistent with this spacing guideline.

Both the four-lane and the six-lane scenarios meet the objective of providing acceptable access.

Table V-2: Summary of Alternative MOEs - Segment 1

Objective				Location	2005	2030 Alternative		
					Existing	No Build	1a	1b
Access Spacing per Mn/DOT Guidelines (Miles)	Mn/DOT Guideline							
	Signal	Cat. 2A	Discouraged	I-94 to W. limits of Waite Park	---	0.63	0.63	
		Cat. 2B		W. limits of Waite Park to 10th Avenue	1.13	1.13	1.13	
	Full Access	Cat. 2A	1 mile	I-94 to W. limits of Waite Park	0.63		0.63	
		Cat. 2B	0.5 miles	W. limits of Waite Park to 10th Avenue	0.48		1.13	
	Partial Access	Cat. 2A	0.5 miles	I-94 to W. limits of Waite Park	0.63		0.63	
		Cat. 2B	0.25 miles	W. limits of Waite Park to 10th Avenue	0.42		0.48	
	Private Access (#)	Cat. 2A	Exception or	I-94 to W. limits of Waite Park	1		---	
		Cat. 2B	Deviation	W. limits of Waite Park to 10th Avenue	9		---	
Safety (crashes/ million vehicle miles)	**Statewide Avg. Rural 4&6 Lane Expressways = 0.9 **D3 Avg. Rural 4&6 Lane Expressways = 0.9			I-94 to 10th Avenue	0.97	No Change	Decrease	Decrease
Travel Speeds (mph)	Does Alternative Maintain or Improve Travel Speeds from Existing?			I-94 to 10th Avenue - Eastbound	59.4	21	39	42
				I-94 to 10th Avenue - Westbound	58.4	20	22	30
LOS	HCM Urban Street Class. I			I-94 to 10th Avenue - Eastbound	A	E	B	B
				I-94 to 10th Avenue - Westbound	A	E	D	C
	Provide LOS D or Better			Full Intersections	LOS B or Better	1 LOS E	1 LOS E	LOS D or Better
B/C	*Is Benefit/Cost Ratio Greater than 1?			I-94 to 10th Avenue	N/A	N/A	N/A	N/A
Social, Economic, & Environmental	Right-of-Way - Strip (Acres)			I-94 to 10th Avenue	---	---	---	---
	Parcels Impacted (#)				---	---	---	---
	Total Takes (#)				---	---	---	---
	Parks (Acres)				---	---	---	---
	Wetlands (Acres)				---	---	---	---
	Construction Cost (millions)				---	---	---	---
	Right-of-Way Cost (millions)				---	---	---	---

** Source Mn/DOT 2000-2002, Segments include intersection crash numbers
Source: WSB & Associates

Safety: The crash and severity rates for Segment 1 are currently 0.97 crashes per million vehicle miles. The statewide average crash and severity rates for both rural four and six-lane expressways were 0.9 million vehicle miles traveled. Since the build alternatives have an overall decrease in access compared to the existing and No Build conditions which are a significant contributing factors to crash frequency, it is projected that the crash rate will decrease in the future in both build conditions.

Travel Speed: Current (2005) travel speeds for Segment 1 averaged 59.4 (eastbound) and 58.4 (westbound) mph during the PM peak period. Using a micro-simulation software package Synchro/SimTraffic, future travel speeds with 2030 projected traffic volumes were calculated for the two alternatives. With the inclusion of the traffic signals or roundabouts, it would be expected that the overall travel speeds would be lower. The calculated PM peak hour speeds and the representative LOS are:

1A: 39-mph (EB) / 22-mph (WB), which translates to LOS B and D, respectively.

1B 42-mph (EB) / 30-mph (WB), which translates to LOS B and C, respectively.

Alternative 1B best meets the objective by producing the highest travel speeds of all the alternatives; however, the travel speeds will go down in the future with the inclusion of signals or some form of intersection control at the cross streets. However, these speeds are better than the No Build condition.

Level of Service: LOS values were calculated for both the mainline roadway (see above section) and intersections.

For Alternative 1A, the intersection of TH-23@ Bel Clare Road (potential future 33rd Street connection and southwest beltway) is forecast to operate at LOS F. All others would operate at acceptable levels. For Scenario 1B, all intersections would operate at an acceptable LOS.

Alternative 1B best meets the level of service objective. However, this alternative adds a lane to TH 23 due to one intersection performing poorly. It is recommended to further study the intersection operations on TH 23 when an alignment is set for the future 33rd Street connection/Southwest Beltway. Other forms of intersection control (i.e., roundabout or interchange) may be necessary in order to mitigate the traffic impacts on TH 23. It is recommended that a six-lane section on TH 23 only be considered if other intersection options are determined unfeasible.

Benefit/Cost (B/C) Ratio: Removing and combining access is recommended on the corridor as properties develop or redevelop. The access to TH 23 can be negotiated through the local platting process at the time of development or redevelopment. This would result in little costs for changing the access on TH 23. Therefore, the cost of changing access was not estimated. As a result, a B/C was not conducted for alternatives on this segment of TH 23, since construction costs or property acquisition costs would not be incurred for Alternative 1A. A B/C ratio for Alternative 1B would likely be much lower than 1A, since adding a lane on TH 23 would have construction costs and possibly right-of-way costs. The benefit to cost was not completed for this alternative; however, since there were no other build alternatives to compare the B/C ratio.

Social/Environmental/Economic Impacts: The social, environmental, and economic impacts associated with the build alternatives will be minimal as the area is largely undeveloped, and it is expected that the roadway will remain in its current alignment.

Alternative 1A best meets the objective of minimizing right-of-way impacts.

Alternative 1B would not require much additional right-of-way as an urban section. However, some right-of-way may be required for water quality treatment.

Conclusion

Alternative 1A, Existing four-lane Expressway, is the recommended alternative in this section.

Segment 2: TH 23 – 10th Avenue to TH 15

As described in the alternatives section the build alternatives include:

2A - 4-lane divided roadway (existing geometry)

2B – Full-width (150-feet R/W) 6-lane divided roadway with dual left-turn lanes (traffic lanes would be 12-feet wide)

2C - Modified 6-lane divided roadway with single left-turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W).

2D - Modified six-lane divided roadway with single left-turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W). Three-quarter (¾) access is provided at mid-block locations.

Table V-3 summarizes the results of the analysis of the alternatives relative to each objective MOE as well as the existing and No Build conditions.

Table V-3: Summary of Alternative MOEs – Segment 2

Objective				Location	2005	2030 Alternative				
					Existing	No Build	2a	2b	2c	2d
Access Spacing per Mn/DOT Guidelines	Mn/DOT Guideline									
	Signal	Cat. 2B	Discouraged	10th Ave. to 2nd Ave.	0.25 miles		0.25 miles			
		Cat. 2C	0.25 miles	2nd Ave. to TH 15	0.33 miles		0.33 miles			
	Full Access	Cat. 2B	0.5 miles	10th Ave. to 2nd Ave.	0.25 miles		0.25 miles			
		Cat. 2C	300' - 600'	2nd Ave. to TH 15	1162'		1742'			
	Partial Access	Cat. 2B	0.25 miles	10th Ave. to 2nd Ave.	0.25 miles		0.25 miles			
		Cat. 2C	300' - 600'	2nd Ave. to TH 15	792'		792'			
	Private Access (#)	Cat. 2B	Exception	10th Ave. to 2nd Ave.	15		4			
		Cat. 2C	Permitted	2nd Ave. to TH 15	16		---			
Safety (crashes/ million vehicle miles)	**Statewide Average for Urban 4-Lane Divided = 4.8 **D3 Average for Urban 4-Lane Divided = 5.5			10th Ave. to TH 15	6.76	No Change	Decrease	Decrease	Decrease	No Change
Travel Speeds (mph)	Does Alternative Maintain or Improve Travel Speeds from Existing?			10th Ave. to TH 15 - Eastbound	36.4	10	11	26	24	26
				10th Ave. to TH 15 - Westbound	26.6	8	11	22	21	25
LOS	HCM Urban Street Class, II			10th Ave. to TH 15 - Eastbound	A	F	F	C	C	C
				10th Ave. to TH 15 - Westbound	C	F	F	D	D	C
	Provide LOS D or Better			Full Intersections	LOS C or Better	1 LOS E 2 LOS F	1 LOS E 2 LOS F	LOS D or Better	LOS D or Better	LOS D or Better
B/C	*Is Benefit/Cost Ratio Greater than 1?			10th Ave. to TH 15	N/A	N/A	N/A	1.45	3.54	
Social, Economic, & Environmental	Right-of-Way - Strip (Acres)			10th Ave. to TH 15	---	---	---	6.4	3.2	
	Parcels Impacted (#)				---	---	---	48	45	
	Total Takes (#)				---	---	---	7	0	
	Parking Stalls (Each)				---	---	---	461	144	
	Parks (Acres)				---	---	---	0	0	
	Wetlands (Acres)				---	---	---	1.2	0.6	
	Construction Cost (millions)				---	---	$0.0	$6.5	$5.9	
	Right-of-Way Cost (millions)				---	---	$0.0	$16.9	$3.5	

*Note: B/C does not include the cost of closing and/or relocating access.
** Source Mn/DOT 2000-2002, Segments include intersection crash numbers except for TH 15
Source: WSB & Associates

Access Spacing: All four build alternatives would have full access intersections spaced a minimum of one-quarter mile apart. Access to properties adjacent to the roadway would be provided via the intersecting streets and backage roads or mid-block right-in/out access points. Ultimately, the plan would eliminate most of the private access to TH 23. The number of private access points under Alternatives 2A and 2B would decrease from approximately 31 to four. The total number of full access points would be five. In Alternatives 2A to 2C, mid block access would be allowed via right-on/right-out access at mostly public streets. Alternative 2D differs in that it would provide mid-block 3/4 access; thereby, allowing for more direct travel routes to get to destinations between the traffic controlled full intersections.

All four scenarios (2A, 2B, 2C, and 2D) meet Mn/DOT's signal and non-signalized intersection spacing guidelines assuming this segments access spacing category is 2C (Medium IRC – urban core).

Safety: The crash rate for Segment 2 is currently 6.76 crashes per million vehicle miles traveled. The statewide and District 3 average crash rates for urban four-lane divided

expressways were 4.8 and 5.5 respectively. With the consolidation of access points, the roadway should be more consistent with similar roadways within the State. This should translate into a lower crash rate for this roadway segment. However, if the segment were upgraded to six-lanes with ¾ mid block access (Alternative 2D) left turns would be crossing more traffic lanes at an uncontrolled intersection than they do today. Therefore, the crash rate for this alternative may not change in the future condition.

Travel Speed: Current (2005) travel speeds for Segment 2 averaged 36.4 (eastbound) and 26.6 (westbound) mph during the PM peak period. Using the traffic micro-simulation software package Synchro/SimTraffic, travel speeds for this roadway alternative with 2030 projected traffic volumes were calculated for the three scenarios. The calculated speeds and the representative LOS are:

2A: 11-mph (EB) / 11-mph (WB), which translates to LOS F

2B: 26-mph (EB) / 22 mph (WB), which translates to LOS C and D, respectively

2C: 24-mph (EB) / 21-mph (WB), which translates to LOS C and D, respectively.

2D: 26 mph (EB) / 25 mph (WB), which translates to LOS C for both directions.

Alternative 2D provides the highest speeds on TH 23 for all the build alternatives for the future condition by taking some of the left turns out of the full intersection and allowing the movement at mid-block. However, the tradeoff for this alternative would be a possible safety problem at the ¾ intersections.

Alternative 2B has the next highest average travel speeds, but is not much better than Alternative 2C and 2D which has a tighter cross section with less right-of-way impacts.

Level of Service: LOS values were calculated for both the mainline roadway (see above section) and intersections.

For Alternative 2A (four lane), three intersections would operate at LOS E or F. All intersections under the six-lane Alternatives 2B through 2D would operate at acceptable LOS D or better.

Benefit/Cost (B/C) Ratio: The benefit/cost for widening the roadway to six-lanes on TH 23 was completed using regional wide statistics from the APO travel demand model. Since the travel demand model cannot predict the changes in vehicle miles of travel and vehicles hours of travel from simply adding turn lanes on TH 23 (Alternative 2A), the benefit/cost was not completed for this alternative. Also, the costs for removing or combining access on TH 23 were not estimated since it is anticipated that these improvements would be made over time as redevelopment occurs along the corridor. The costs would be minimal as the access would be negotiated through the local platting process.

The B/C ratio for adding an additional through lane on TH 23 is over one for all the six-lane alternatives (2B-2D). Since, the alternatives with a narrowed right-of-way footprint (Alternatives 2C and 2D) have significantly less cost, the B/C ratio on these alternatives are above three. The regional travel time and travel length benefits are assumed to be the same for all the six-lane alternatives.

Social/Environmental/Economic (SEE) Impacts: The SEE impacts were estimated for the alternatives that widen TH 23 to six-lanes. The six-lane footprint, Alternative 2B, with the widest R/W footprint has a much greater impact that the narrower footprint alternatives. This is becomes the narrower footprint six-lane alternatives (2C and 2D) stay within the grass boulevards of the corridor and don't have much impact on adjacent property parking or circulation.

Conclusion

Alternative 2C, Modified six-lane divided roadway with single left turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W).

Segment 3: CSAH 75 – TH 15 to Cooper Avenue

As described in the alternatives section the build alternatives include:

3A - 4-lane divided roadway (existing geometry)

3B – Full-width (150-feet R/W) 6-lane divided roadway with dual left-turn lanes (traffic lanes would be 12-feet wide)

3C - Modified 6-lane divided roadway with single left-turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W

3D - Modified 6-lane divided roadway with single left-turn lanes (traffic lanes would be 11-feet wide – 133-feet R/W). Three-quarter (¾) access points provided at mid-block locations.

Table V-4 summarizes the results of the analysis of the alternatives relative to each objective MOE as well as the existing and No Build conditions.

Access Spacing: All four build alternatives would have full access intersections spaced a minimum of 1,500 feet apart, since the full access spacing is needed to provide appropriate access to core business area. The most eastern part of this segment is outside the core business area and the access spacing meets the recommended APO guidelines. Several full access points exist on Segment 3 that have no intersection control on CSAH 75. All of the build alternatives convert these access points to partial accesses improving the full access spacing along the corridor. All of the private access is removed in the build alternatives.

Safety: The crash rate for CSAH 75 is currently 10.26 crashes per million vehicle miles on this segment. This is approximately twice the statewide and District 3 average for similar roadways, which is 4.8 and 5.8 per million vehicle miles traveled, respectively. The consolidation of access points, as proposed under all four build alternatives, should have a positive impact on crash reduction. However, since Alternative 3D proposed ¾ access on a six-lane facility, the additional conflict due to left turning traffic across three lanes of traffic may have a negative affect on crash reductions.

Table V-4: Summary of Alternative MOEs – Segment 3

Objective			Location	2005 Existing	2030 Alternative				
					No Build	3A	3B	3C	3D
Access Spacing per APO Guidelines	APO Guideline								
	Signal	2310' - 4400'	TH 15 to 25th Ave.	1531'			1531'		
			25th Ave. to Cooper Ave.	2640'			2640'		
	Full Access	2310' - 4400'	TH 15 to 25th Ave.	740'			1561'		
			25th Ave. to Cooper Ave.	1320'			2640'		
	Partial Access	2310' - 4400'	TH 15 to 25th Ave.	740'			900'		
			25th Ave. to Cooper Ave.	1055'			1795'		
	Private Access (#)	Highly Restricted	TH 15 to 25th Ave.	14			---		
			25th Ave. to Cooper Ave.	7			---		
Safety (crashes/ million vehicle miles)	**Statewide Average for Urban 4-Lane Divided = 4.8 **D3 Average for Urban 4-Lane Divided = 5.8		TH 15 to Cooper Ave.	10.26	No Change	Decrease	Decrease	Decrease	No Change
Travel Speeds (mph)	Does Alternative Maintain or Improve Travel Speeds from Existing?		TH 15 Cooper Ave. - Eastbound	29	15	16	23	23	23
			TH 15 Cooper Ave. - Westbound	14	8	8	24	22	22
LOS	HCM Urban Street Class. II		TH 15 Cooper Ave. - Eastbound	A	F	F	C	C	C
			TH 15 Cooper Ave. - Westbound	C	F	F	C	D	D
	Provide LOS D or Better		Full Intersections	LOS C or Better	4 LOS F	2 LOS F	LOS D or Better	LOS D or Better	LOS D or Better
B/C	*Is Benefit/Cost Ratio Greater than 1?		TH 15 to Cooper Ave.	N/A	N/A	N/A	1.96	2.73	
Social, Economic, & Environmental	Right-of-Way - Strip (Acres)		TH 15 to Cooper Ave.	---	---	---	8.1	4.3	
	Parcels Impacted (#)			---	---	---	32	31	
	Total Takes (#)			---	---	---	3	0	
	Parking Stalls (Each)			---	---	---	204	0	
	Parks (Acres)			---	---	---	0.76	0.63	
	Wetlands (Acres)			---	---	---	0	0	
	Construction Cost (millions)			---	---	---	$6.8	$6.2	
	Right-of-Way Cost (millions)			---	---	---	$7.5	$3.7	

*Note: B/C does not include the cost of closing and/or relocating access.
** Source Mn/DOT 2000-2002, Segments include intersection crash numbers except for TH 15
Source: WSB & Associates

Travel Speeds: Current (2005) travel speeds for Segment 3 averaged 29 (eastbound) and 14 (westbound) mph during the PM peak period. Using the travel micro-simulation software package Synchro/SimTraffic, travel speeds for this roadway alternative with 2030 projected traffic volumes were calculated for the three scenarios. The calculated speeds and the representative LOS are:

3A: 16 mph (EB) / 8 mph (WB), which translates to LOS F

3B: 23 mph (EB) / 24 mph (WB), which translates to LOS's C and D, respectively

3C & 3D: 23 mph (EB) / 22 mph (WB), which translates to LOS's C and D, respectively

Alternatives 3B through 3D have the highest average travel speed with the 2030 traffic demand. These speeds are slightly lower than the existing in the eastbound direction but slightly higher than existing in the westbound direction. **LOS**: LOS values were calculated for both the mainline roadway (see above section) and intersections.

For Scenario 3A, two intersections would operate at LOS F. All intersections under Scenarios 3B through 3D would operate at acceptable LOS D or better.

Benefit/Cost (B/C) Ratio: The B/C ratio for widening CSAH 75 to six-lanes were estimated using region wide statistics from the APO travel demand model. Since the

travel demand model cannot predict the changes in vehicle miles of travel and vehicle hours of travel from simply adding turn lanes on CSAH 75 (Alternative 3A), the benefit/cost was not completed for this alternative. Also, as explained in previous sections, the costs for removing or combining access on CSAH 75 was not estimated either.

The B/C ratio for an additional through lane on CSAH 75 is over one for all the six-lane alternatives (3B-3D). However, the alternatives with a narrower right-of-way width have higher benefit costs due to the decrease in right-of-way costs. Similar to Segment 2, the travel time benefits and travel length benefits are assumed the same for all the six-lane alternatives.

Social/Environmental/Economic (SEE) Impacts: Alternative 3B (full width six-lane) has the greatest social and economic impacts by costing the most and requiring the most R/W. Parks along CSAH 75 are also impacted for the six-lane alternatives. Again, the narrower six-lane alternative (Alternative 3B-3D) stays mostly within boulevard to boulevard width resulting in less parking and circulation impacts on adjacent properties.

Conclusion

Alternative 3C, Modified six-lane divided roadway with single left turn lanes (traffic lanes would be 11 feet wide – 133-feet R/W) is the recommended improvement for Segment 3.

Segment 4: CSAH 75 – Cooper Avenue to I-94

As described in the alternatives section of this report, the build alternatives for Segment 4 include:

4A - 4-lane divided roadway

4B – 4/6-lane divided roadway

Table V-5 summarizes the results of the analysis of the alternatives relative to each objective MOE as well as the existing and No Build conditions.

Access Spacing: Due to proposed corridors connecting with CSAH 75, the full access spacing would increase for both the No Build and Build alternatives. However, the Build alternatives have improved spacing over the No Build alternatives providing approximately half mile spacing between full accesses on CSAH 75. Partial access is reduced to one-quarter mile in the Build Alternatives. Private access is improved over the existing and No Build condition and limited to one private access point (existing cemetery access).

Safety: The crash analysis of existing conditions for the years 2002 to 2004 indicated that this segment of CSAH 75 had lower crash and severity rates than similar statewide and District 3 facilities. The consolidation and removal of direct access onto CSAH 75 should aid in maintaining the current safety conditions on this segment.

Table V-5: Summary of Alternative MOEs - Segment 4

Objective			Location	2005	2030 Alternative		
				Existing	No Build	4A	4B
Access Spacing per APO Guidelines	APO Guideline						
	Signal	2310' - 4400'	Cooper Ave. to I-94	4013'	2640'	3065'	
	Full Access	2310' - 4400'	Cooper Ave. to I-94	**2006'**	**1850'**	3065'	
	Partial Access	2310' - 4400'	Cooper Ave. to I-94	**1531'**	**1425'**	**1795'**	
	Private Access (#)	Highly Restricted	Cooper Ave. to I-94	**9**	**9**	**1**	
Safety (crashes/ million vehicle miles)	**Statewide/D3 Average for Urban 4-Lane Divided = 4.8/5.5 **Statewide/D3 Average for Urban 4-Lane Undivided = 6.1/4.4		Cooper Ave. to 33rd St. S. Urban 4-lane Divided	1.98	No Change	No Change	
			33rd St. S. to 41st St. Urban 4-lane Undivided	1.32	No Change	No Change	
			41st St. S. to I-94 Urban 4-lane Divided	2.47	No Change	No Change	
Travel Speeds (mph)	Does Alternative Maintain or Improve Travel Speeds from Existing?		Cooper Ave. to I-94 - Eastbound	40	**16**	**26**	**28**
			Cooper Ave. to I-94 - Westbound	42	**16**	**23**	**33**
LOS	HCM Urban Street Class. II		Cooper Ave. to I-94 - Eastbound	A	**E**	C	C
			Cooper Ave. to I-94 - Westbound	A	**E**	C	B
	Provide LOS D or Better		Full Intersections	LOS C or Better	**2 LOS E 2 LOS F**	**1 LOS E 1 LOS F**	LOS D or Better
B/C	*Is Benefit/Cost Ratio Greater than 1?		Cooper Ave. to I-94 - Eastbound	N/A	N/A	N/A	N/A
Social, Economic, & Environmental	Right-of-Way - Strip (Acres)		Cooper Ave. to I-94	---	---	**2.1**	**2.1**
	Parcels Impacted (#)			---	---	**10**	**10**
	Total Takes (#)			---	---	0	0
	Parking Stalls (Each)			---	---	**37**	**37**
	Parks (Acres)			---	---	0	0
	Wetlands (Acres)			---	---	0	0
	Construction Cost (millions)			---	---	**$3.2**	**$5.8**
	Right-of-Way Cost (millions)			---	---	**$1.8**	**$1.8**

** Source Mn/DOT 2000-2002, Segments include intersection crash numbers
Source: WSB & Associates

Travel Speeds: Current (2005) travel speeds for Segment 1 averaged 40 (eastbound) and 42 (westbound) mph during the PM peak period. Using the travel micro-simulation software package Synchro/SimTraffic, travel speeds for this roadway alternative with 2030 projected traffic volumes were calculated for the two build alternatives. With the inclusion of the traffic control at full access intersections, it would be expected that the overall travel speeds would be lower. The calculated speeds and the representative LOS are:

4A: 26-mph (EB) / 23-mph (WB), which translates to LOS's C and C, respectively.

4B: 28-mph (EB) / 33-mph (WB), which translates to LOS's C and B, respectively.

Alternative 4B best meets the travel speed objective by providing the highest average travel speed in 2030 on this segment of CSAH 75.

LOS: LOS values were calculated for both the mainline roadway (see above section) and intersections.

For Alternative 4A, the intersections of CSAH 75/Cooper Avenue and CSAH 75/40th Street would operate at LOS E/F. All others would operate at acceptable levels. For Alternative 4B, all intersections would operate at an acceptable LOS.

Benefit/Cost Ratio: For the same reasons explained in Segment 1, a Benefit/Cost analysis was not completed for this segment of the corridor since the cost and benefit for Alternative 4A is difficult to estimate. Since Alternative 4B had no other build alternatives for comparing B/C an analysis was not completed for this alternative either.

Social/Environmental/Economic (SEE) Impacts: The SEE impacts for the build alternatives along this segment are minimal due to the sufficient right-of-way on CSAH 75 for the proposed improvements. However, there are still costs associated with upgrading the undivided section of roadway to divided, and adding another through lane on CSAH 75 near I-94.

Conclusion

Alternative 4B, four/six-lane divided roadway is the recommended improvement for Segment 4.

Evaluation Summary and Conclusion

The evaluation indicates that adding capacity on TH 23 and CSAH 75 in the core (Segment 2 and 3) is needed and cost effective. Using narrower traffic lanes reduces the impacts on parking and circulation of adjacent properties and will maximize the benefits from adding an additional lane on TH 23 and CSAH 75. With a wider cross-section, the parking and circulation impacts quickly increase the costs and offset the benefits of improved travel time and traffic operations. Access management is also necessary and cost effective along the entire length of the corridor if it is performed over time as the adjacent properties develop and/or redevelop. The following summarizes the recommended improvements throughout the corridor.

- **Segment 1: Access Management and Improve Intersection Capacity**
- **Segment 2 & 3: Access Management and Widen to six-lanes (Narrowed Typical Section)**
- **Segment 4: Access Management, Improve Intersection Capacity, and Widen to six-lane from 40th Street to I-94.**

The recommended plan is also illustrated in Figure V-1 through Figure V-4.

Date Printed: 3/23/2007
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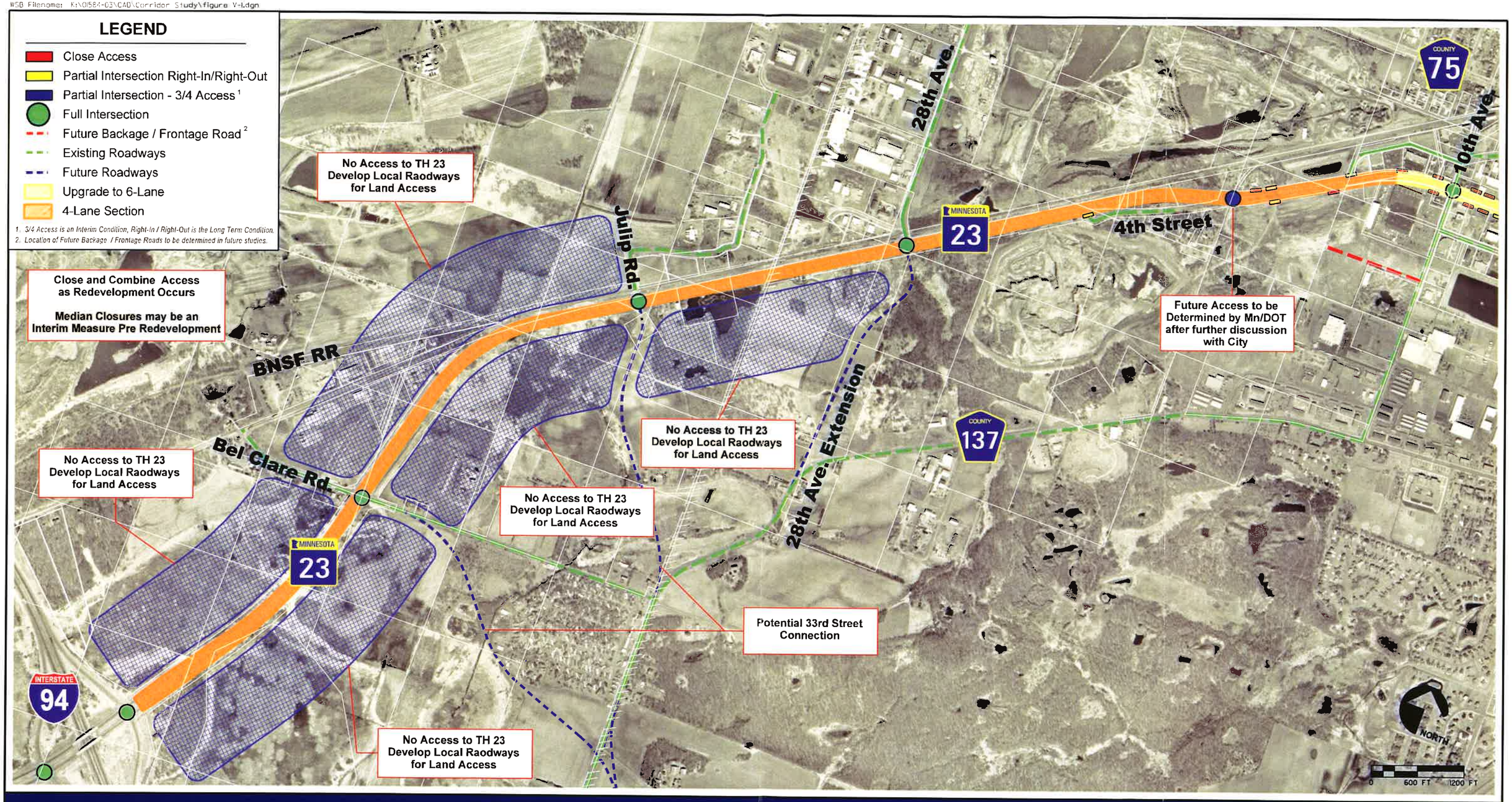
LEGEND

- Close Access
- Partial Intersection Right-In/Right-Out
- Partial Intersection - 3/4 Access [1]
- Full Intersection
- Future Backage / Frontage Road [2]
- Existing Roadways
- Future Roadways
- Upgrade to 6-Lane
- 4-Lane Section

1. 3/4 Access is an Interim Condition, Right-In / Right-Out is the Long Term Condition.
2. Location of Future Backage / Frontage Roads to be determined in future studies.



TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 1

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure V-1

Date: Printed: 3/22/2007
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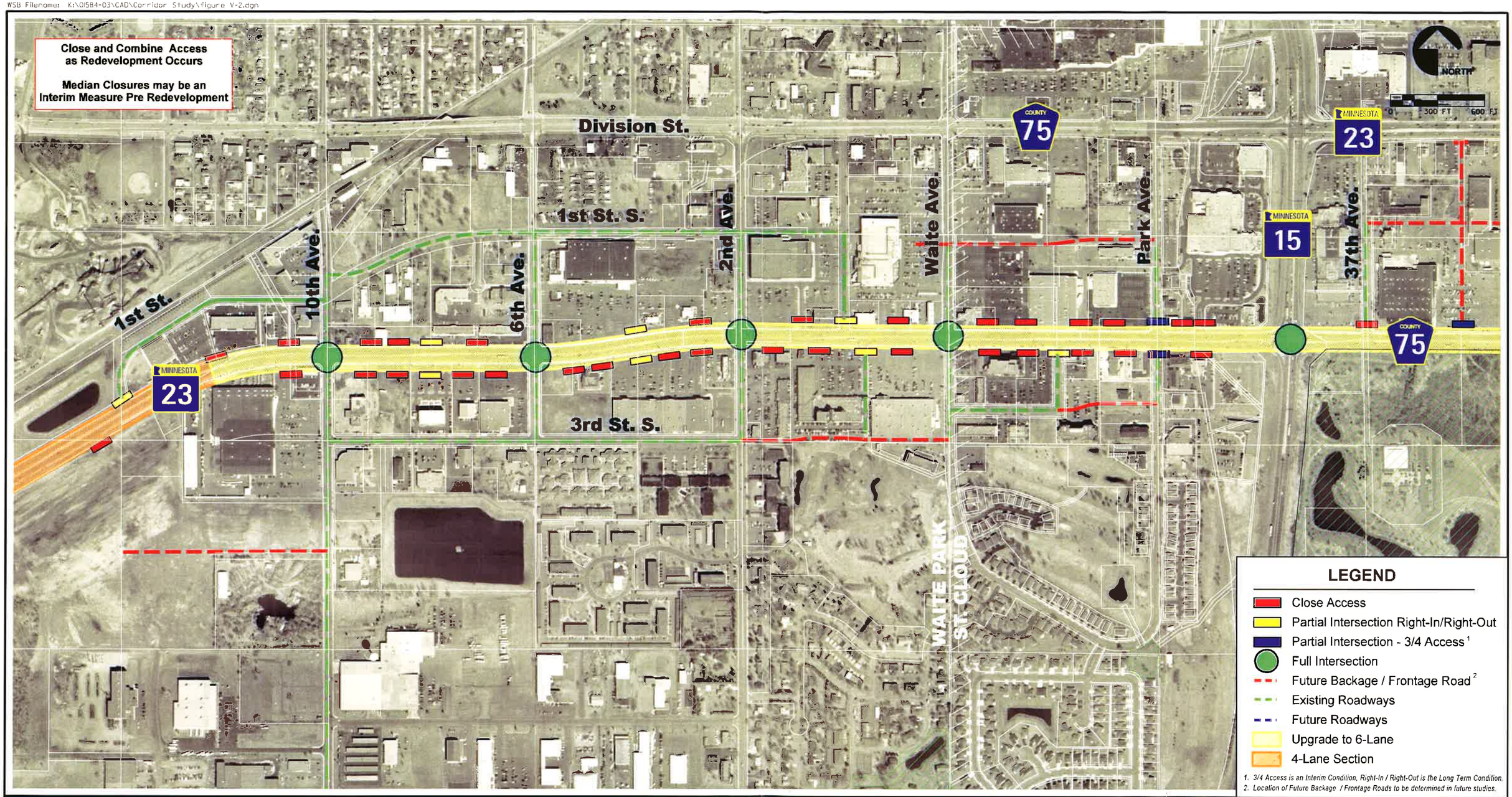

TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 2

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure V-2

Date: Printed: 3/22/2007
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Close 37th Ave. when Redevelopment Occurs and 35th Ave. is Constructed

Close and Combine Access as Redevelopment Occurs

Median Closures may be an Interim Measure Pre Redevelopment

Right-In / Right-Out as Interim Condition

Division St.

37th Ave.

33rd Ave.

29th Ave.

25th Ave.

Cooper Ave.

Highway Park

McKinley Park

Mem. Dr.

Washington

W. St. Germain St.

Heritage Park

COUNTY 75

MINNESOTA 23

MINNESOTA 15

NORTH

0 300 FT 600 FT

LEGEND

- Close Access
- Partial Intersection Right-In/Right-Out
- Partial Intersection - 3/4 Access [1]
- Full Intersection
- Future Backage / Frontage Road [2]
- Existing Roadways
- Future Roadways
- Upgrade to 6-Lane
- 4-Lane Section

1. 3/4 Access is an Interim Condition, Right-In / Right-Out is the Long Term Condition.
2. Location of Future Backage / Frontage Roads to be determined in future studies.

TH 23 / CSAH 75 Corridor Study

Recommened Plan - Segment 3

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure V-3

Date: Printed: 3/22/2007
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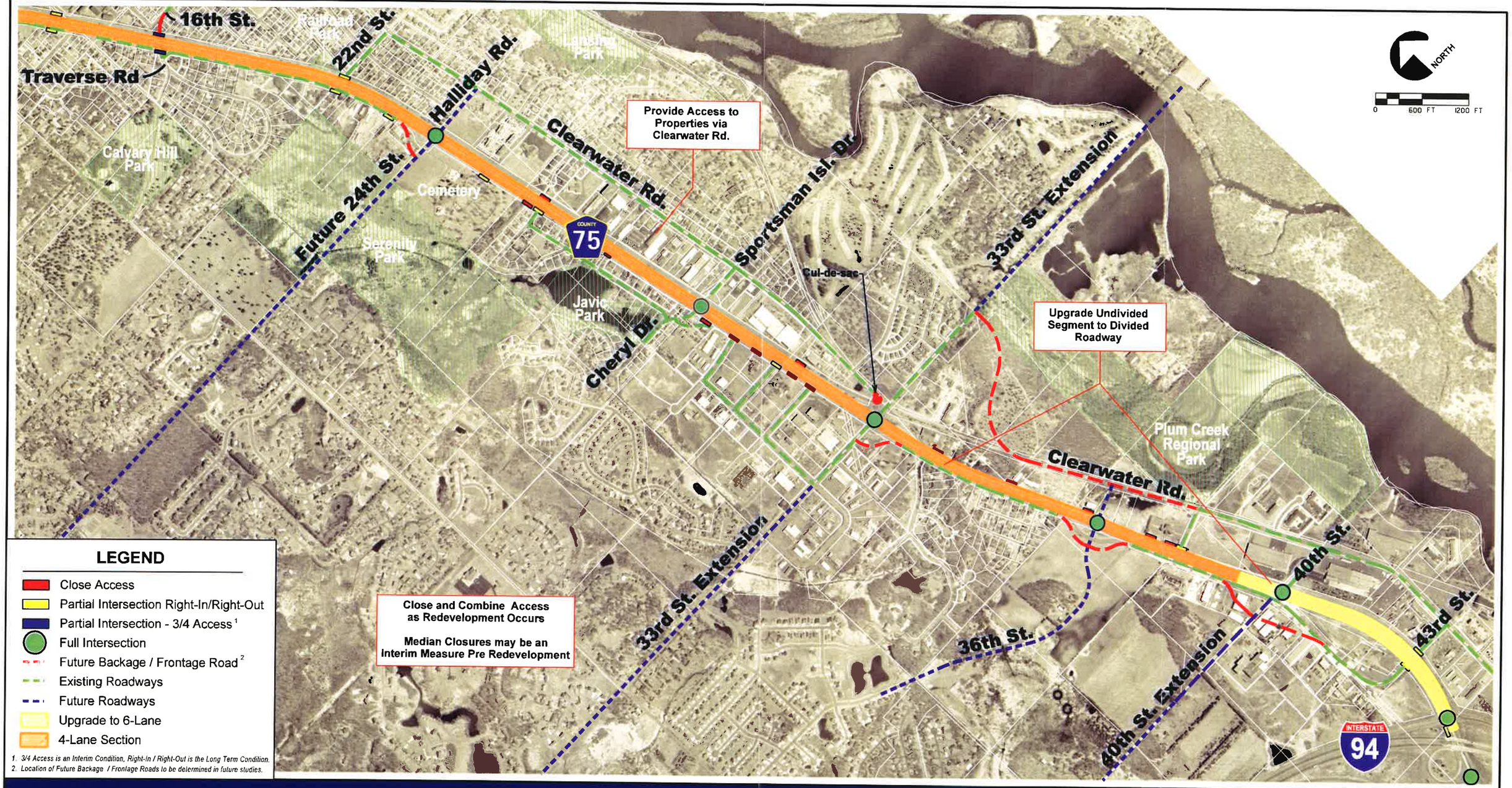

LEGEND

- Close Access
- Partial Intersection Right-In/Right-Out
- Partial Intersection - 3/4 Access [1]
- Full Intersection
- Future Backage / Frontage Road [2]
- Existing Roadways
- Future Roadways
- Upgrade to 6-Lane
- 4-Lane Section

1. 3/4 Access is an Interim Condition, Right-In / Right-Out is the Long Term Condition.
2. Location of Future Backage / Frontage Roads to be determined in future studies.

TH 23 / CSAH 75 Corridor Study

Recommended Plan - Segment 4

MINNESOTA DEPARTMENT OF TRANSPORTATION

Figure V-4

VI. Public Involvement

The public involvement plan for this study was comprised of monthly study update meetings with the Technical Advisory Committee, periodic study update meetings with the Policy Advisory Committee, and two public information meetings.

A. Technical Advisory Committee

The Technical Advisory Committee met monthly to discuss study findings and give direction to the consultant team completing the technical analysis. The committee members were comprised of technical staff from the various local agency partners adjacent to the corridor. The members included:

Claudia Dumont	Project Manager	Mn/DOT District 3
Terry Humbert	District 3 Project Development Engineer	Mn/DOT District 3
Tim Mitchell	Planning Engineer	FHWA
Scott Mareck	Planning Manager	St. Cloud APO
Mitch Anderson	County Engineer	Stearns County
Jodi Teich	Assistant County Engineer	Stearns County
Bob Kozel	County Engineer	Benton County
Steve Gaetz	City Engineer	St. Cloud
Patti Gartland	City Administrator	Sartell
Bill Schluenz	Public Works Director	Waite Park
Todd Schultz	Community Development Director	Sauk Rapids
Bill McCabe	City Administrator	St. Augusta
Tony Heppelmann	Consultant Project Manager	WSB & Associates
Brandi Popenhagen	Consultant Project Engineer	WSB & Associates

B. Policy Advisory Committee

The Policy Advisory Committee met periodically to discuss study findings and give direction to the TAC. The committee members were comprised of elected officials from the various local agencies adjacent to the corridor. The members and the year(s) they were involved on this committee included:

Bob Kroll	St. Augusta Mayor	St. Cloud APO Board/St. Augusta
DeWayne Mareck	Commissioner	Stearns County
Steve Gottwalt	Council Member ('05-'06)	St. Cloud
Sonja Berg	Council Member ('06)	St. Cloud
Art Daniels	Council Member ('05-'06)	Sauk Rapids
Brad Gunderson	Council Member ('07)	Sauk Rapids
Bob Pogatshnik	Mayor ('05-'06)	Sartell
Tim O'Driscoll	Mayor ('07)	Sartell
Carla Schaefer	Mayor	Waite Park
Greg Berg	Chair	St. Joseph Township

C. Public Information Meetings

Two public meetings were held to gather public input on the needs in the TH 23 and CSAH 75 corridors and potential solutions. In addition, information was mailed to interested property owners and citizens. The draft report and recommendations will be posted on MnDOT's website and all adjacent property owners will be notified of the availability of the draft recommendations and report.

August 22, 2006 Public Information Meeting

This meeting was advertised in the newspapers and on the radio. Due to the low attendance, a second meeting was scheduled to target property owners along the corridor.

September 26, 2006 Public Information Meeting

The second meeting was held on September 26, 2006 for the property owners adjacent to the corridor. For this meeting, a mailing went out to the property owners describing the study and encouraging attendance for the upcoming meeting. Fifty-seven (57) people signed in who attended this meeting. Nineteen (19) comment cards were filled out. The following summarizes their comments.

General Comments:

- Consider bicycles when planning for these roads.
- Work with local governments to preserve right-of-way now for the future needs in these corridors.

TH 23 Comments: None

CSAH 75 Comments:

- Provide full access to Grace United Methodist Church off of CSAH 75.
- Calvary Community Church opposes eliminating the signal at Washington Memorial Drive and CSAH 75. Also extend frontage road at this location to Traverse Road.
- Open connection to 16th Street now.
- Hoping that signal at 22nd Street would stay.
- Choose Alternative 3 for CSAH 75 intersection with 40th/43rd Street (2 comments).
- Please provide a park in the area south of CSAH 75 between Cooper Avenue and the Old School District building. Do not tear down the houses that exist there for another vacant strip mall.

VII. Implementation

A. Conclusion

Based on the alternatives evaluation, adding capacity on TH 23 and CSAH 75 in the core (Segment 2 and 3) is needed and cost effective. Using narrower traffic lanes reduces the impacts on parking and circulation of adjacent properties and will maximize the benefits from adding an additional lane on TH 23 and CSAH 75. With a wider cross-section, the parking and circulation impacts quickly increase the costs and offset the benefits of improved travel time and traffic operations. Access management is also necessary and cost effective along the entire length of the corridor if it is performed over time as the adjacent properties develop and/or redevelop. Mn/DOT, the Cities, and Counties should try to preserve the right-of-way that will be needed to upgrade the core area to six-lanes, and where possible begin to implement the access management changes shown in the recommended plan. The following summarizes the recommended improvements throughout the corridor:

- **Segment 1: Access Management and Improve Intersection Capacity**
- **Segment 2 & 3: Access Management and Widen to six-lanes (Narrowed Typical Section)**
- **Segment 4: Access Management, Improve Intersection Capacity, and Widen to six-lane from 40th Street to I-94.**

The recommended plan is also illustrated in Figure V-1 through Figure V-4.

B. Staging

The following is a staging plan for improvements on TH 23 and CSAH 75. While specific construction improvements are not in the near future, the preservation of right-of-way and consolidation of access as redevelopment occurs along the corridor could occur as the opportunities present themselves.

Short Term (0 to 10 Years)

- Improve the intersection capacity at TH 23 and 28th Avenue with the extension of 28th Avenue project.
- As development/redevelopment occurs on TH 23, between 28th Avenue and 10th Avenue, remove access to local roadways system per this reports Recommended Plan.
- As development/redevelopment occurs at CSAH 75 and 43rd Street, relocate full access at 43rd Street to 40th Street

Long Term (10 plus Years)

- Upgrade Segments 2 and 3 (TH 23 from 10th Avenue to TH 15 and CSAH 75 from TH 15 to Cooper Avenue) to six-lanes.

C. Next Steps

The following actions are recommended by the agencies responsible for implementation of elements of the TH 23 and CSAH 75 Plan:

Approval of Study through Local Resolutions

- Cities of St. Cloud, St. Augusta, and Waite Park approve the study through City Council Resolutions.
- Stearns County approve study through Resolution from County Board
- The St. Cloud Area Planning Organization approves study through Resolution from APO Board.

Planning Updates

- Mn/DOT incorporates study into District 3 Plan Update.
- Stearns County incorporates study into County Transportation Plan.
- St. Cloud APO incorporates study into Metropolitan Transportation Plan.
- Cities of St. Cloud, St. Augusta, and Waite Park incorporate study in Transportation Elements of Comprehensive Plans.

Environmental Documentation

Mn/DOT completes the environmental review for the TH 23 corridor.

Stearns County complete the environmental review for the CSAH 75 corridor.

Staff Approved Layout and Official Map

Mn/DOT should work with the local agencies to create a staff approved layout for municipal consent. The layout will provide the footprint for an official map that would be adopted after the environmental review is complete.

Stearns County should work with the local agencies to create a layout which provides a footprint for an official map that would be adopted after the environmental review is complete.

Pursue Funding

Mn/DOT, Stearns County, and the St. Cloud APO should pursue funding for the TH 23 and CSAH 75 improvements.