State Highway 169

Corridor Management Plan

HIGHWAY 169 CORRIDOR PLAN
IRC
Moving Minnesota

May 2002

Developed by Mn/DOT

IN ASSOCIATION WITH
ITS CORRIDOR PARTNERS

SRF CONSULTING GROUP, INC.

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TH 169 CORRIDOR VISION STATEMENT

Highway 169 is an important corridor that provides essential transportation connections between numerous communities, the entire southwest Minnesota region and the Twin Cities. It provides commuter-type services to larger metropolitan areas, it serves as a conduit for moving commercial, agricultural and manufacturing products, and it provides regional access to recreational facilities such as Valley Fair, Renaissance Festival, Minnesota Valley Wildlife Refuge and Canterbury Park. It serves major businesses such as the Taylor Corporation, Harvest States, Cargill, and Seagate. It also serves many institutional facilities such as Minnesota State University, Gustavus Adolphus, and South Central Technical College. In addition, Highway 169 facilitates interaction between the smaller and larger trade centers located along and near the corridor.

As a result of the role Highway 169 fulfills, the safe and efficient movement of people and goods on Highway 169 is of primary importance to the economy of Minnesota and all of the communities and areas that it serves. In an effort to maintain and/or enhance the safety and performance of the corridor, Highway 169 has been classified as a High Priority Interregional Corridor (HPI) from I-494 to Highway 19 at the south Scott County border. South of Highway 19, Highway 169 is currently classified as a Medium Priority Interregional Corridor (MPI). The different classifications for the corridor reflect the change in economic activity and land uses along the corridor, as well as expectations for how the facility should perform.

Current performance levels for the corridor were measured through travel-time runs. Results of the travel runs indicate that the average travel speeds for the entire corridor is 61 mph (posted speeds on the corridor typically range from 50 – 65 mph), with the exception of historic St. Peter which has a lower posted speed through the downtown area. The travel-time runs also show that the northern part of the corridor (HPI) is performing slightly below (59 mph) the minimum target level of 60 mph[1] and the southern portion of the corridor (MPI) is performing above (63 mph) the minimum target of 55 mph. Future performance, calculated following the guidelines outlines in *Interregional Corridors: A Guide for Plan Development and Corridor Management*, indicate that performance levels will decline over the next 20-years to an estimated speed of 50 mph in the northern part of the corridor and 56 mph in the southern portion of the corridor. The decline in performance is a direct result of anticipated signalization and capacity problems along the corridor.

To preserve/improve the current performance and safety of Highway 169 and to plan for the future needs of the corridor, the partners have recommended a performance goal of 65 mph for the entire corridor. While this goal doesn't have to be met in every part of the corridor, the partners would like to achieve this on the aggregate over the entire corridor. This goal will be achieved by addressing poor performing areas of the corridor through management and/or capital investments. Improvements to the corridor should also consider the corridor context. This includes how the improvements remain sensitive to environmental and community values and the visual quality of the Minnesota River Valley and bluff areas.

[1] Performance Target set by the original Interregional Corridor Study and adopted by the 2000 State Transportation Plan. The minimum target level for HPI is 60 mph and the minimum level for MPI is 55 mph.

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FOREWORD

United States (U.S.) Highway 169 is also commonly referred to as State Highway 169 and Trunk Highway (TH) 169. For the purpose of this report, Highway 169 will be referred to as either State Highway 169 or TH 169.

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Minnesota Department of Transportation

Transportation Building
395 John Ireland Boulevard
Saint Paul, Minnesota 55155-1899

March 29, 2002

To Our Highway 169 Corridor Partners:

We would like to take the opportunity to thank the Corridor Partners for their involvement in developing the Trunk Highway (TH) 169 Corridor Management Plan. This Plan represents a new approach to long-term planning and cooperation between the Minnesota Department of Transportation (Mn/DOT), local communities, and regional and state agencies. This new approach has provided a common vision for the TH 169 corridor that all of us can work towards. In addition, the ongoing management strategies in the Plan will enable Partners to better coordinate activities and respond to changes.

Although there currently is not enough funding to realize the vision in the next 20 years, the framework for what needs to be done has been established. This framework will enable Partners to make land use and transportation decisions that will improve safety and mobility as well as enhance the long-term function of the corridor.

We look forward to building on our relationships with the Corridor Partners so that together we can achieve the vision set forth in this Plan.

Sincerely,

Jon A Huseby

Jon A. Huseby, P.E.
Transportation District Engineer
Mankato District

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In 2000, the Minnesota Department of Transportation (Mn/DOT) identified and adopted a statewide system of arterial roadways that are critical to serving the economic interests of the state. This system, the Interregional Corridor (IRC) System, is comprised of two percent of the roadway miles in the state, but accounts for over 30 percent of the miles traveled.

Congestion and growth pressures threaten the mobility and safety of many important transportation corridors.

Over the past decade, many of the IRCs have been under increasing congestion and growth pressures. These pressures threaten the ability of Mn/DOT to deliver safe and efficient transportation services both now and in the future. To better address immediate needs and to plan for long-term transportation needs in the most threatened corridors, Mn/DOT developed seven Corridor Management Plans (CMPs). One of the corridors selected for a CMP was the 73-mile section of State Highway 169 from the I-494 beltway to TH 60 south of Mankato.

The State Highway 169 study began by forming a broad-based Corridor Partnership, comprised of approximately 40 representatives from agencies and communities along the corridor. The Partnership was established to assist Mn/DOT in the development of the Corridor Plan, as well as to assist in ongoing corridor management and implementation. The Partnership had two working groups, a Technical Committee, whose role was to provide technical advice and direction to both Mn/DOT and the Policy Committee, and a Policy Committee, whose role was to review and advise Mn/DOT on major policy issues and corridor strategies.

The State Highway 169 Corridor Management Plan was developed through a broad-based Partnership.

The process used in the development of the TH 169 Corridor Management Plan was intended to create a better understanding of the issues and concerns along the corridor, as well as to develop consensus with Corridor Partners for a long-term vision and action plan that will be implemented over time. The process was also intended to demonstrate how investments and decisions in one part of the corridor can significantly impact the overall performance of the entire corridor and, very importantly, the process emphasized the need for Corridor Partners to build relationships among the group in order to resolve common problems and support each other in realizing the corridor's vision.

State Highway 169 is a critical transportation linkage to southwest Minnesota.

State Highway 169 is an important corridor that provides essential connections between southwestern Minnesota and the Twin Cities. It carries commuter traffic; serves as a conduit for commercial, agricultural and manufacturing products; and provides regional access to retail, institutional, recreational and entertainment facilities.

A significant amount of effort in the development of the TH 169 Corridor Management Plan was focused on identifying the key issues and transportation needs in the corridor, from the users' perspective, as well as the perspective from local communities and agencies. The following is a summary of some of the major issues in the corridor:

- The corridor is located in the scenic Minnesota River Valley. Parks, wildlife refuges, bluffs, ravines, floodplains, and historic areas all contribute to the context of the communities and the corridor.

Flooding of Minnesota River bridges and TH 169 causes significant delays and additional travel in spring.

- Flooding of river bridges and State Highway 169 causes significant delays, detours and economic hardship. River bridges that are susceptible to flooding include TH 101, TH 41, CSAH 9, TH 19, TH 99 and TH 22.

  Significant development is occurring in the northern portion of the corridor. This development will lead to additional increases in traffic volumes and will put even greater pressure on river crossing links. The traffic demand at signalized and unsignalized intersections is also expected to increase as development occurs.

Congestion is a significant problem at I-494, Anderson Lakes Parkway and Pioneer Trail.

- Congestion and traffic delays are a significant problem at the I-494, Anderson Lakes Parkway and Pioneer Trail intersections. Significant backups are common throughout this section during the peak hours. Significant delays are also beginning to occur at TH 41.

  The northern portion of the corridor is performing near the minimum target level for High Priority Interregional Corridors (60 mph), while the southern portion is performing above the minimum level for Medium Priority Interregional Corridors (55 mph). Performance is expected to decline significantly over the next 20 years, especially in the northern segments of the corridor. Performance decline will result from rising volumes (greater congestion) and delays from ten additional traffic signals.

Approximately 600 crashes occur each year, costing citizens $31 million.

- On average, 600 crashes occur each year on TH 169. These crashes cost citizens over $31 million annually. While crash severity and rates are presently near the statewide average, safety problems are anticipated to worsen as volumes and congestion increase.

- State Highway 169 plays a significant role in moving freight and commodities. It is one of two connections to the Savage Ports, the main terminal for moving commodities by river barge to the Gulf of Mexico.

The Corridor Partners recommend a 65 mph performance-based vision.

To enhance the safe and efficient movement of goods and people over the long term, the Corridor Partners developed a performance-based vision that sets a target of 65 mph for the entire corridor. The vision minimizes the loss of mobility in the corridor and provides flexibility to address traffic demands beyond 2025. This vision also addresses safety problems throughout the corridor. To achieve this long-term vision, Corridor Partners will need to invest significant capital resources into major projects, develop spot improvements to address operational and safety issues, plan supporting transportation systems, and implement land use and access management strategies to preserve right-of-way. These changes will need to be sensitive to the natural environment and community values that exist throughout the corridor.

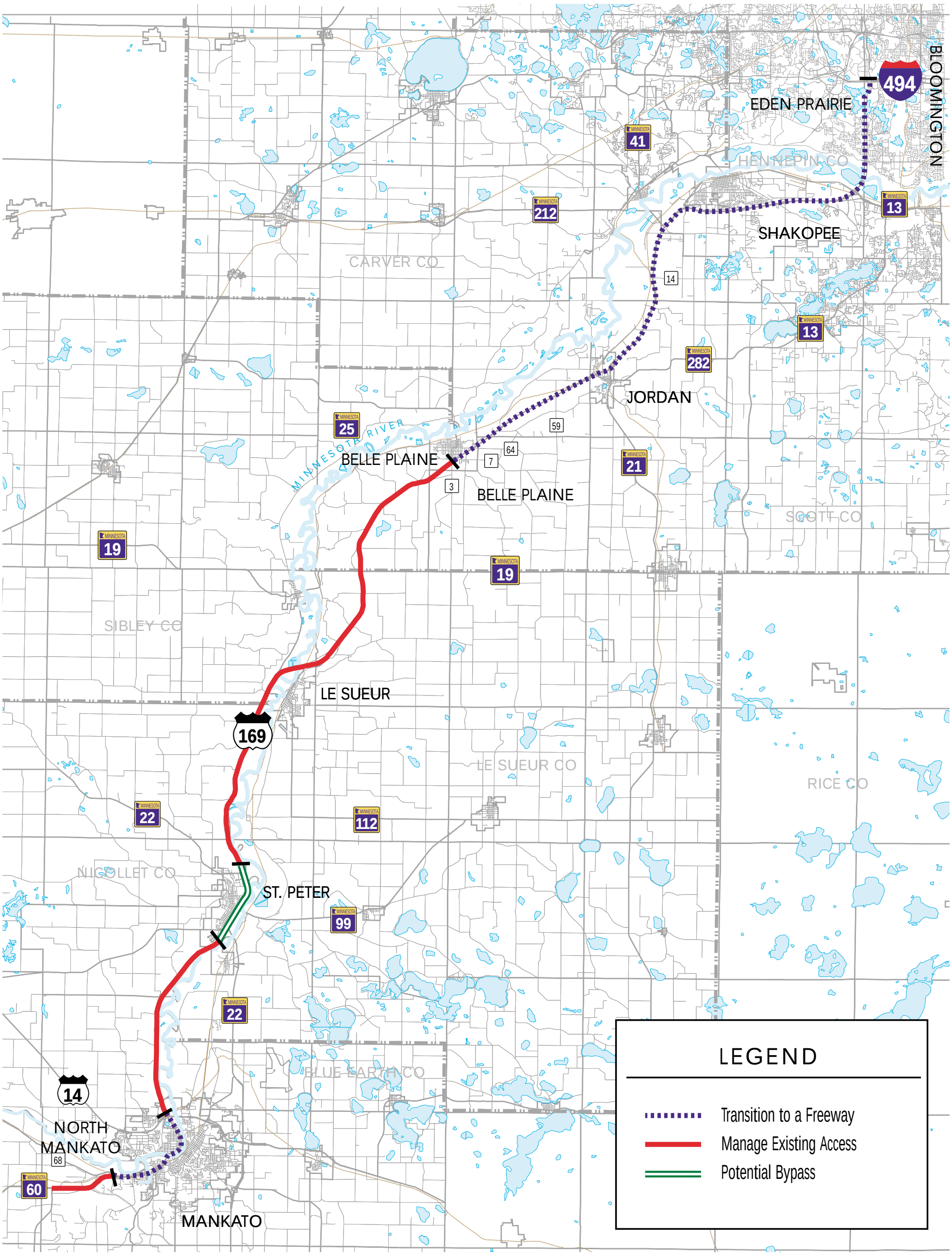
An overall strategy was developed to guide Corridor Partners in their implementation of the corridor vision. This strategy is based on corridor performance, identifying locations where the risk for additional traffic signals is high, identifying locations where there are significant safety problems and identifying areas where congestion is anticipated to increase. The basic strategy for achieving the corridor vision is identified in Figure E1.

Transition to freeway-type facility north of Belle Plaine and through Mankato/ North Mankato.

Major Capital Projects

Part of the overall improvement strategy requires significant capital investment in infrastructure improvements. In the northern half of the corridor (I-494 to Belle Plaine), the Corridor Partners have recommended transitioning TH 169 to a freeway facility.

The Partners also recommended a freeway facility through the Mankato area (just north of TH 14 to TH 68). Communities in these areas are encouraged to require developers to plan for, construct, or make accommodations for future frontage/backage roads that will be needed as TH 169 transitions to a freeway. As funding allows, grade-separated interchange access will be developed.



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HIGHWAY 169 CORRIDOR PLAN

IRC

Manage access where capacity is not anticipated to be a problem.

In rural areas where volumes are not expected to approach capacity and side street demand is low, it is recommended that the rural expressway and access characteristics be managed in accordance with the Land Use and Access Management Strategies identified in the main report. The basic thrust of this strategy is to allow current access to remain or to be reduced to minimize land use change or additional access points in these areas. It is recommended that these strategies be targeted for the areas between Belle Plaine and St. Peter, St. Peter and Mankato, and from TH 68 to the junction of TH 60.

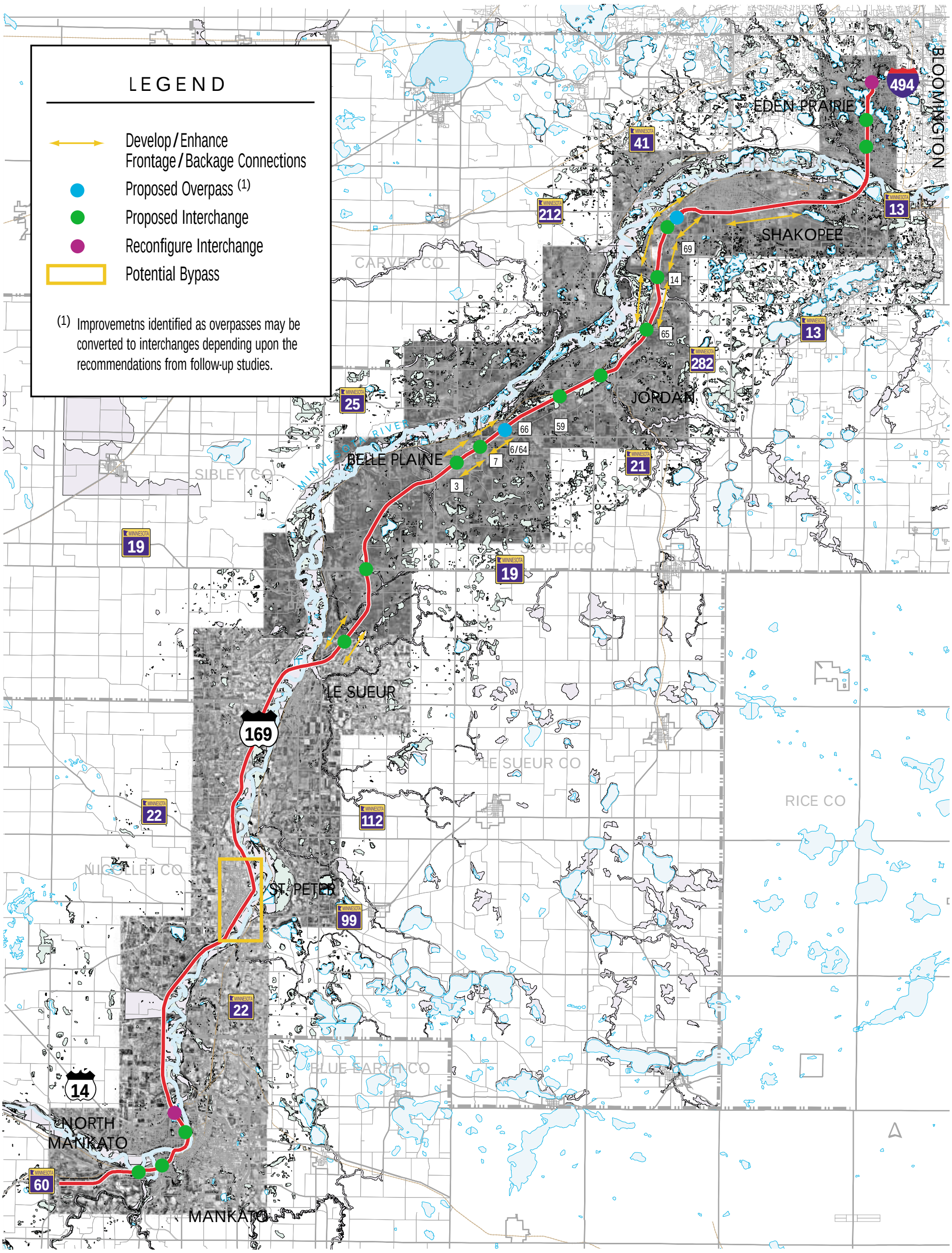
Consider a bypass of St Peter.

In the southern end of the corridor, a potential bypass of the City of St. Peter was examined. Previous studies, including the Transportation Action Model and Governors Design Team, advocated alternatives for TH 169. The City has indicated that heavy traffic volumes in the downtown divide the community, thereby making it difficult to conduct business in the area and maintain the historic downtown atmosphere. Although the technical analysis revealed that a bypass was not necessary to achieve minimum performance targets or to resolve current safety problems, the bypass is consistent with the performance vision and two previous studies.

Major capital projects were prioritized on a corridor-wide basis.

The Corridor Partners prioritized the major capital projects needed to transition TH 169 to a freeway in the northern half of the corridor and through the Mankato area. They also included the bypass of St. Peter, as well as capital projects needed to bring corridor performance to 65 mph. These projects were prioritized based on their ability to address performance, improve safety, mitigate congestion and potential environmental and socio-economic impacts, and on their benefit-cost ratios. Figure E2 identifies the prioritized projects, their locations and their costs. Because the projects are grouped into different categories, it is possible that projects within a category may be advanced over other projects in that same category based on a change in need, environmental documentation and/or local efforts to advance projects.

It should be noted that the improvement list does not include the planned interchange at the intersection of TH 169 and TH 19 (Scott County line). This interchange is scheduled for construction in 2002. It should also be noted that all major capital projects should be designed to provide accommodations for pedestrians and bicyclists crossing TH 169.



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Mega Projects

Priority A **Reconfigure I-494/TH 169 Interchange** [1]

Priority B TH 41 River Crossing [2]

Major Capital Projects

Priority A **Pioneer Trail Interchange** [3]
Anderson Lakes Parkway Interchange [3]

Priority B **TH 41 Interchange** [4]
CSAH 69 Overpass [5]
TH 282 Interchange (Jordan) [6]
*CSAH 6/64 Interchange (Belle Plaine) [7]
*TH 14/Lind/Webster Interchange (Mankato/North Mankato)
CSAH 14 Interchange
*TH 25 Interchange (Belle Plaine)
CSAH 65 Interchange [8]

Priority C CSAH 59 Interchange
St. Peter Bypass
CR 66 Overpass[9]
*CSAH 33/TH 68 Interchange [10]
Le Sueur Interchange [11]

Bold font indicates a project is needed for minimum mobility performance targets.
(*) Indicates a project is needed for safety reasons only.

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[1] An Environmental Assessment will be completed by June of 2002. The environmental documentation will include analysis for six lanes on TH 169 between I-494 and Bloomington Ferry Bridge.

[2] The TH 41 river crossing has been identified as a regional river crossing issue. The susceptibility to flooding, amount of truck traffic, and proximity to downtown Chaska suggest that the current facility has limited use as a regional crossing route. Mn/DOT is moving ahead with a TH 41 river crossing scoping study to investigate this issue. This project is not on TH 169, but it plays an important role in how TH 169 will function in the future.

[3] An Environmental Assessment will be completed by June of 2002.

[4] The current TH 41 intersection operates at LOS F. Even with a new TH 41 river crossing, the current crossing is anticipated to have sufficient traffic, similar to 2000 levels, to generate the need for an interchange. Mn/DOT is developing interim fixes to improve operations and limit access. The final configuration of this project will depend upon the results of the river crossing study.

[5] The City of Shakopee has indicated its opposition to a change in access at this location. Mn/DOT has agreed to study this access along with the TH 41 river crossing to determine an appropriate solution.

[6] Mn/DOT is working with the City of Jordan to identify a preferred interchange concept.

[7] Mn/DOT is nearing completion of an interchange/access study. Mn/DOT is pursuing acquisition of right-of-way in 2002.

[8] Scott County has shown need for a future east-west arterial connection in this area. This connection should be considered as long-term access is planned in this area.

[9] Project may be converted to an interchange if Scott County pursues an east-west arterial route in this location.

[10] Mn/DOT is pursuing interim improvements for 2002. Long-term access concepts identified in TH 169 intersections study (1998).

[11] Le Sueur County reconstructing CSAH 28 in area. Need to identify future access location and local road connections.

Other Improvements

There is little funding for the major capital projects identified on the previous pages. As a result, a number of smaller projects may be needed to address short-term needs and safety issues. The following projects are recommended to improve safety and to make the corridor function as well as possible without some of the major improvements.

Presently, there is little funding for the identified major capital projects.

a) Mn/DOT should install longitudinal rumble strips on the shoulders of TH 169 in order to reduce the number of run-off-road crashes. Before and after studies have shown that run-off-road crashes are reduced by up to 65 percent where these devices are in place. Longitudinal rumble strips are lacking in the Scott County portion of the corridor (primarily on outside shoulder).

Provide left turn lanes at all full access points or restrict to right-in/right-out.

b) Mn/DOT should add left turn lanes at all access points in high-speed areas or restrict access points to right-in/right-out. Additionally, all commercial acess should have right turn lanes. Modifications should be done as time and funding permit or as resurfacing or other projects arise.

c) Mn/DOT should pursue, as funding allows, the development of living snow fences in areas where blowing snow limits visibility and affects operations of TH 169 during winter snow events. It is recommended that Mn/DOT work with the DNR in these areas to determine if there may be mutual benefits in terms of developing wildlife habitat.

Minimize drifting and flooding problems.

d) Mn/DOT should elevate TH 169 in areas that are prone to flooding. If raising the roadway is not feasible, flap gates or other barriers to limit flooding should be installed to reduce the number of days that TH 169 is out of service. It is recommended that Mn/DOT evaluate current pavement conditions and prioritize areas based on pavement condition, flood frequency and detour length. In addition, it is recommended that Mn/DOT pursue funds that may be available to assist in reducing future flood events.

e) It is recommended that Mn/DOT pursue interim improvements at the intersection of TH 41 to reduce delay. This improvement is scheduled for 2004.

f) Interim improvements to intersections south of Mankato near Le Hillier should be completed to improve safety at the

CSAH 69, CSAH 33 and TH 68 intersections. These improvements are scheduled for 2002.

g) Local agencies should ensure that adequate frontage and/or backage roads are developed along TH 169 in the areas transitioning to a freeway. The majority of these roadways should be constructed as development occurs. Municipal agreement funding or Mn/DOT funding should only be used to address hardship cases or to address timing problems.

h) Mn/DOT and local agencies should consider providing park-and-pool facilities near major public access points to TH 169. While a formal busway is not planned for this corridor, park-and-pool facilities can provide choices for users.

Evaluate need for other east-west arterial capacity in northern part of corridor

i) Consideration should be given to providing additional east-west arterial capacity in the northern half of the corridor. Existing east-west routes I-494, TH 13 and TH 41 have capacity issues that will worsen as development in the area continues. New east-west connections will be needed to handle increasing demand.

j) As an interim measure, consideration should be given to implementing ITS improvements at existing traffic signals[12]; see Mn/DOT report *Truck Priority at Traffic Signals*, February 2002.

Land Use and Access Management Strategies

Work with communities to implement land use ordinances.

It is recommended that the communities along the corridor adopt the land use and access policies and strategies and incorporate them into their local ordinances and regulations. Mn/DOT should work with local agencies to incorporate land use and access policies into local ordinances as local plans and ordinances are updated. This should include presentations and/or work sessions with local planning commissions. These policies can be summarized as follows:

- County, city and township land use and transportation plans should support the long-term vision of the TH 169 Corridor Management Plan (CMP).

[12] For additional information, please refer to Mn/DOT's report, "Truck Priority at Traffic Signals," February 2002. Mn/DOT's OATS office has a copy of this report.

Local ordinances should prohibit direct property access and guide growth in the corridor.

- Local ordinances should prohibit direct property access to TH 169, making any existing access legal non-conforming. Existing access may continue as long as alternative access is not feasible; however, the existing use may not expand or reestablish and these accesses may be limited to right-in/right-out.

- Local ordinances should provide a review of site access (conformance with the TH 169 CMP) as conditional use permits are issued or modified.

- Local plans should guide development to identified growth areas. Rezoning of property should not precede the availability of the local road network.

- Acquisition of right-of-way should be completed as part of the rezoning or platting process.

- Temporary access may be granted to TH 169 if no other feasible alternative is available; these accesses will be removed/ shifted to the local street network as it becomes available.

Local plans should support conversion of access in freeway transition areas.

- Local plans should support conversion of access in freeway transition areas. Access will be converted to frontage/backage roads over time.

- Local policies should promote the adoption of official maps to protect right-of-way in areas that have a high risk for development.

Implementation Studies

In order to implement the improvement strategies previously outlined (major capital improvements, interim and other improvements, and land use and access strategies), two significant efforts must be undertaken. First, Corridor Partners and Mn/DOT will need to educate citizens and businesses about the long-term vision, the necessary funding required to achieve the vision, and the interim improvements that could be utilized to mitigate concerns.

Pursue additional studies to resolve complex issues and provide guidance for local agencies, landowners and the public.

Secondly, Mn/DOT and Corridor Partners should pursue additional scoping and environmental studies on the highest priority projects so that access and design issues can be resolved. This will enable communities to adequately prepare for new development in terms of right-of-way preservation and frontage/backage road

development. Figure E3 shows the locations of the identified studies. The studies include the following:[13]

- *I-494, Anderson Lakes Parkway and Pioneer Trail study
- TH 41 Minnesota River crossing study[14]
- TH 41/69 interchange and access study[15]
- *TH 282/TH 21 access study
- *CSAH 6/64 and TH 25 interchange and access study
- Le Sueur Hill interchange and access study[16]
- CSAH 14 and CR 65 interchange study
- TH 14 and Lind/Webster interchange study
- St. Peter bypass scoping study
- CSAH 59 interchange and CR 66 overpass study
- Shakopee/Jackson Township frontage roads[17]
- Southern Metro Area East-West Arterial Study[18]
- Scott County east-west arterial study[19]
- Scott County land use study[20]

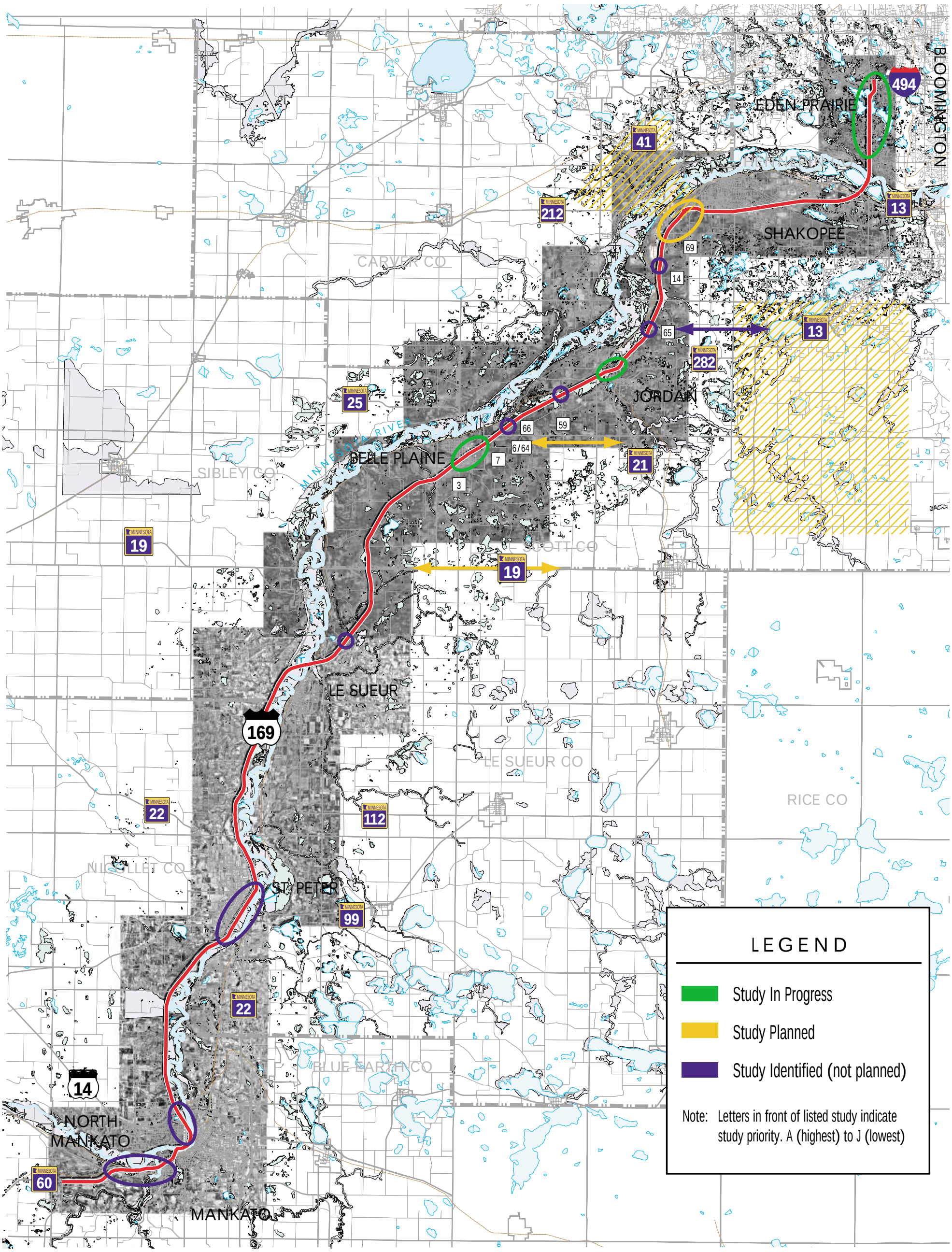
In addition to the implementation strategies previously described, Corridor Partners and Mn/DOT should consider the following:

- Continue to anticipate future local, regional and private projects and leverage funds to develop pieces of the overall vision over time.

[13] Studies with an * are in progress.
[14] Mn/DOT anticipates beginning this study in the summer of 2002.
[15] Should be included in TH 41 Minnesota River crossing study.
[16] Le Sueur County improving CSAH 28 connection in 2005.
[17] City of Shakopee and Scott County responsibility.
[18] Study is scheduled to begin in 2002 (Mn/DOT is leading effort).
[19] Scott County is in the process of prioritizing east-west corridor studies within the county.
[20] Study would investigate future urbanization of agricultural land east of east of Jordan and south of Shakopee

Partners should meet at least annually to review and discuss corridor implementation issues.

- Continue to pursue a variety of funding sources, including federal, state, local, public/private partnerships, development agreements and other special grants or loan funds.
- Explore ways to reduce or spread peak hour demand so capacity is utilized more efficiently.
- Partners should meet at least annually to review corridor recommendations and discuss implementation issues.
- Form a corridor coalition to bring the recommendations of the study forward to decision-makers at the state and federal level.



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HIGHWAY 169 CORRIDOR PLAN

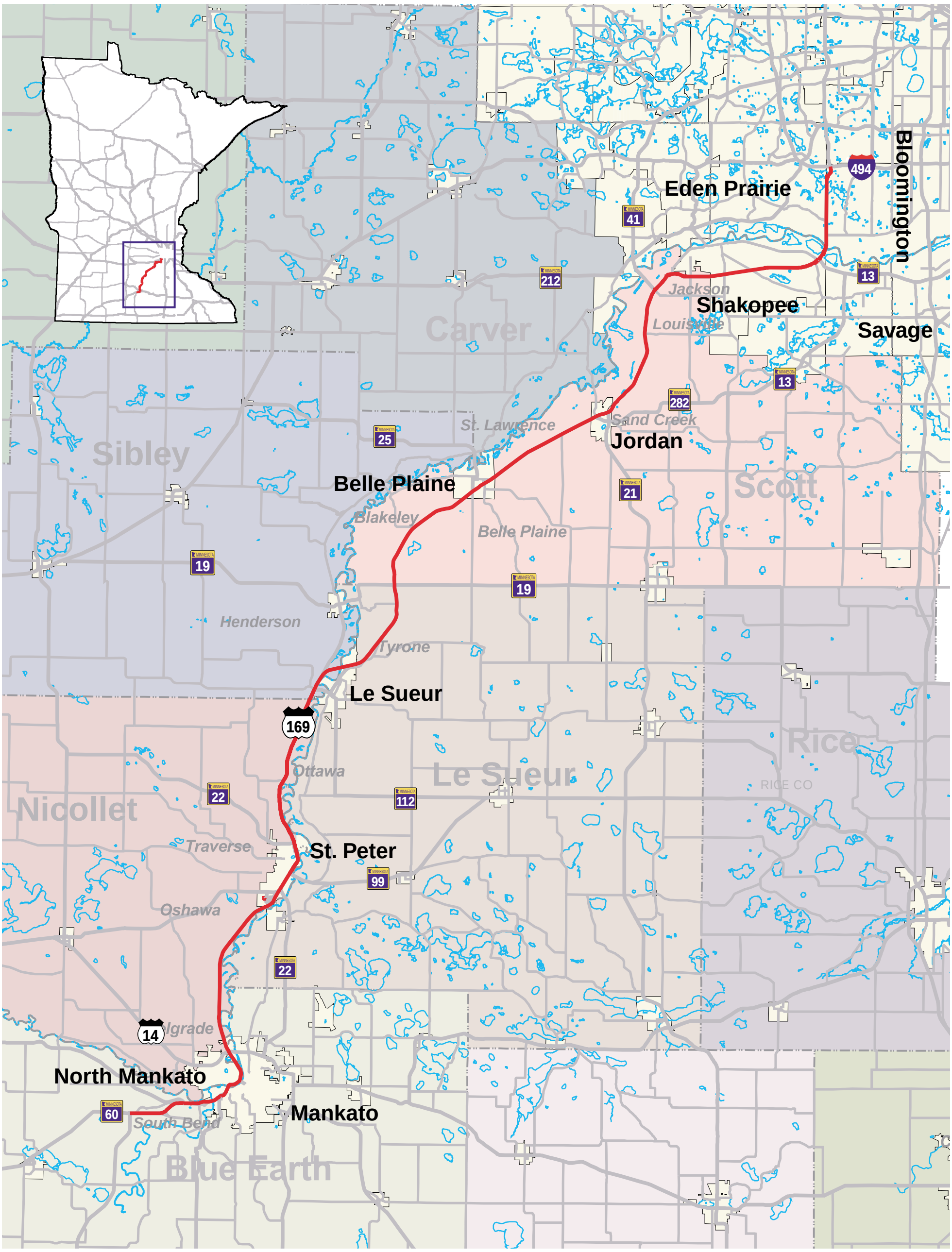
1.0 INTRODUCTION AND BACKGROUND INFORMATION

State Highway 169 (TH 169) is an important corridor that provides essential transportation connections between numerous communities, the entire southwest Minnesota region and the Twin Cities (Figure 1-1). It provides commuter-type services to larger metropolitan areas; it serves as a conduit for moving commercial, agricultural and manufacturing products; and it provides regional access to recreational and entertainment facilities such as ValleyFair, Renaissance Festival, Minnesota Valley Wildlife Refuge and Canterbury Park. As a result of the statewide role TH 169 fulfills, it has been identified as a principal arterial route, a National Highway System (NHS) route and an Interregional Corridor (IRC). In addition, portions of the route have been designated as a scenic byway.

In recent years, the Minnesota Department of Transportation (Mn/DOT) has focused a great deal of time and effort on the Interregional Corridor System. In 1999, the Department identified the routes on the IRC System and in 2000 it created "*Interregional Corridors: A Guide for Plan Development and Corridor Management*". The guide was created to help the department conduct corridor studies by providing overall principles and guidelines as to how a corridor plan should be approached. Appendix A provides information on IRC principles and policies.

Over the past five years, many of the Interregional Corridors, including State Highway 169, have been experiencing increasing congestion and growth pressures, which limit their ability to deliver safe and efficient transportation service. To preserve and enhance its current mobility and safety, and to better plan for the future needs of State Highway 169, Mn/DOT established a broad-based Corridor Partnership, comprised of representatives from agencies and communities between Bloomington and Mankato/North Mankato. This group of 30 to 50 people has actively participated in the development of a long-term, performance-based corridor plan, and is expected to participate in ongoing management activities of the corridor. Development of the corridor plan focused on the following:

- Documentation of existing conditions
- Development of a long-term corridor vision
- Identification of future performance problems
- Identification of modal uses and issues
- Identification and development of major land use opportunities and strategies
- Identification and development of long-term access strategies and principles
- Identification and evaluation of potential solutions
- Development of a corridor action plan
- Endorsement by Corridor Partners



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It is important to note that this study focused almost entirely on the functional aspects of the corridor rather than the physical condition of its various components (i.e., pavement condition, bridge ratings, traffic signal condition and lighting). While these elements are important in terms of life-cycle costs and potential timing of projects, they have limited impact on identifying and establishing an overall corridor vision that meets long-term transportation needs of local communities, the region and the state.

1.1 Plan Purpose

The purpose of the State Highway 169 Corridor Plan is to develop a long-term corridor vision and action plan that can be implemented by Corridor Partners over time. The Corridor Plan is focused on preserving and enhancing the safety and mobility of TH 169 from Interstate 494 through Mankato. It is also intended to assist communities by providing a long-term planning framework in their communities.

In addition to creating a long-term vision and action plan, the corridor planning process is intended to develop and enhance relationships between the Corridor Partners. Many decisions that affect the corridor are made at the local level, and these decisions impact the rest of the communities along the corridor that rely on State Highway 169. The planning process for the TH 169 corridor was intended to create a better understanding of how decisions and investments in one area of the corridor impact others, and, very importantly, the process emphasized the need for Corridor Partners to build relationships among the group to resolve common problems and support each other in realizing the corridor vision. Corridor Partners have demonstrated commitment to better cooperation with one another based on discussions throughout the planning process and through formal endorsement of the TH 169 Corridor Plan.

1.2 Corridor Partners

The State Highway 169 Corridor Plan is a joint effort between Mn/DOT, state and regional agencies, and the communities located along the corridor. All of the following agencies, groups and communities participated in the development of the TH 169 Corridor Plan:

- Area Legislators
- Department of Natural Resources
- Blue Earth County
- Le Sueur County
- Scott County
- City of Belle Plaine
- City of Eden Prairie
- City of Le Sueur
- City of North Mankato
- City of Shakopee
- Metropolitan Council
- Region 9 Development Commission
- Hennepin County
- Nicollet County
- Sibley County
- City of Bloomington
- City of Jordan
- City of Mankato
- City of St. Peter
- Townships along the corridor

Policy Advisory Committee and Technical Advisory Committee

The Corridor Partners contributed to the development of the State Highway 169 Corridor Plan in a number of ways. Most communities and agencies had representatives that served on the study's Policy Advisory Committee or Technical Advisory Committee. The Policy Advisory Committee (PAC) was designed to include elected officials from communities along TH 169, as well as Mn/DOT representatives and state legislators who have portions of their districts along TH 169.

The role of this committee was to:

- Communicate information to constituents;
- Review the work of the Technical Advisory Committee (discussed below) to ensure consistency with the corridor vision and the IRC principles;
- Provide ongoing guidance, support and input to Mn/DOT;
- Serve as a forum for discussing implementation strategies, corridor investment priorities and potential funding options; and,
- Serve as advocates for the corridor.

- The Technical Advisory Committee (TAC) consisted of state and regional agency representatives, as well as county, city and township representatives with an understanding of the issues on the corridor that impact its performance. The role of the TAC was to:

- Review development and transportation issues and concerns along the corridor;
- Identify non-highway modal issues and opportunities along the corridor;
- Evaluate existing and future performance scenarios;
- Make recommendations to the PAC regarding the corridor vision and implementation priorities;
- Serve as a contact to local jurisdictions regarding potential impacts of corridor vision;
- Assist the Policy Advisory Committee in communicating the vision and function of the corridor; and,
- Continue to meet after the completion of the plan to discuss corridor vision implementation concerns and issues.

1.3 Study Process

The State Highway 169 Corridor Plan followed a process outlined by Mn/DOT in, "*Interregional Corridors: A Guide for Plan Development and Corridor Management*". The main steps in developing the plan included the following:

1. Organization and Initiation, including development of a public outreach plan
2. Issue Identification and Confirmation
3. Identification and Evaluation of Alternatives
4. Implementation and Staging of Improvements
5. Ongoing Management

Figure 1-2 shows the tasks that were completed in each step of the planning process.

1.4 Public Outreach

A corridor management plan is a process for effective decision-making that is intended to foster a cooperative spirit and build trust and relationships between and among Mn/DOT, state, regional and local partners and the public. These relationships are one of the most important elements in developing and implementing a corridor management plan. The success of a plan will not hinge on a final report, but will be judged on the partners' ability to work together to influence and guide decisions in the corridor that improve safety and mobility, address environmental concerns and respect community values. This requires the early and continuous involvement of all affected interests identified at the earliest stages of study planning.

The State Highway 169 Corridor Study used the following methods to promote public involvement:

Small Group Meetings

At key points in the study process, a series of small group meetings was held. The meetings involved key community leaders, select business owners, state and regional agency representatives, and local officials. Attendees of these meetings commented and provided input on the development of the corridor vision and implementation plan. The meetings solicited input on key issues and set the stage for the process that was followed in the development of the plan.

Open House Meetings

In addition to the small group meetings, two open houses were used to gather input from the public. Comments collected at the open houses were used in the development and refinement of the plan. A summary of these comments is included in Appendix B.

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Project Web Site

As part of the study, a Web site was developed to facilitate communication with the public and interested agencies (http://projects.dot.state.mn.us/srf/169/index.html). Information of the Web site was updated as issues were identified and alternatives were developed. The Web site communicated the following:

- Purpose of the project
- Tentative timeframe of plan development
- Goals and objectives of the plan
- Findings
- Resources
- Opportunities to comment on the study

Newsletter

Two newsletters were produced during the study to assist local, regional and state agencies in communication information about the study. Information contained in the newsletters was similar to that on the Web site.

Policy Advisory Committee (PAC) and Technical Advisory Committee (TAC)

As explained earlier, the PAC and TAC play an important role in communicating information to constituents, as well as providing constructive input into the plan's goals, objectives, strategies and recommendations. Many of the agencies involved in the study brought forth and discussed work on the State Highway 169 Corridor Plan at city council meetings, planning commission meetings, town board meetings, county board meetings and other meetings where the public was present. PAC and TAC members also served as a local contact for questions regarding the development of the plan.

Sub-Area Studies

In addition to the State Highway169 Corridor Plan, other studies along the corridor were either underway, recently completed and/or were started during the corridor study. These studies typically were more focused on addressing specific problems, i.e., developing an interchange concept to address safety and performance issues at a specific intersection. In addition, these studies also included input from the public. Important results and recommendations from these studies were included in the TH 169 Corridor Plan. The following list identifies the studies:

- TH 169 and TH 19 Interchange Development
- TH 169/I-494 to Pioneer Trail Environmental Assessment Worksheet (EAW)

- TH 169 and TH 41 Interim Improvement Study
- Jordan Interchange Study
- Belle Plaine Interchange Development
- Belle Plaine Access Study
- MATAPs Special Area Study
- Trunk State Highway 169 Intersection Study
- Scott County Township Road Planning Partnership Study

Comprehensive plans of the communities along the corridor were also reviewed to glean additional information regarding potential projects and community interests.

2.0 CORRIDOR ISSUES IDENTIFICATION AND CONFIRMATION

One of the more important steps in the development of the State Highway 169 Interregional Corridor Plan was the identification and confirmation of issues along and near the corridor. Without this step, recommendations and improvements would have little context and may not fully address the needs of those traveling on or living near the corridor. This section of the report discusses the issues identified through the public involvement strategies identified in the previous section. Initially, a set of core issues was identified through a series of small group meetings with all of the agencies and a variety of interests along the corridor. Figure 2-1 depicts the key issues identified through this process and other analysis. A more detailed description of the issues identified through the public involvement process is summarized in Appendix C.

In addition to the small group meetings, a significant amount of data was gathered and analyzed to further evaluate conditions in the corridor. These areas are described in more detail in the following sections:

2.1 Demographics

2.2 Land Use

2.3 Access

2.4 Safety

2.5 Traffic

2.6 Modal Users

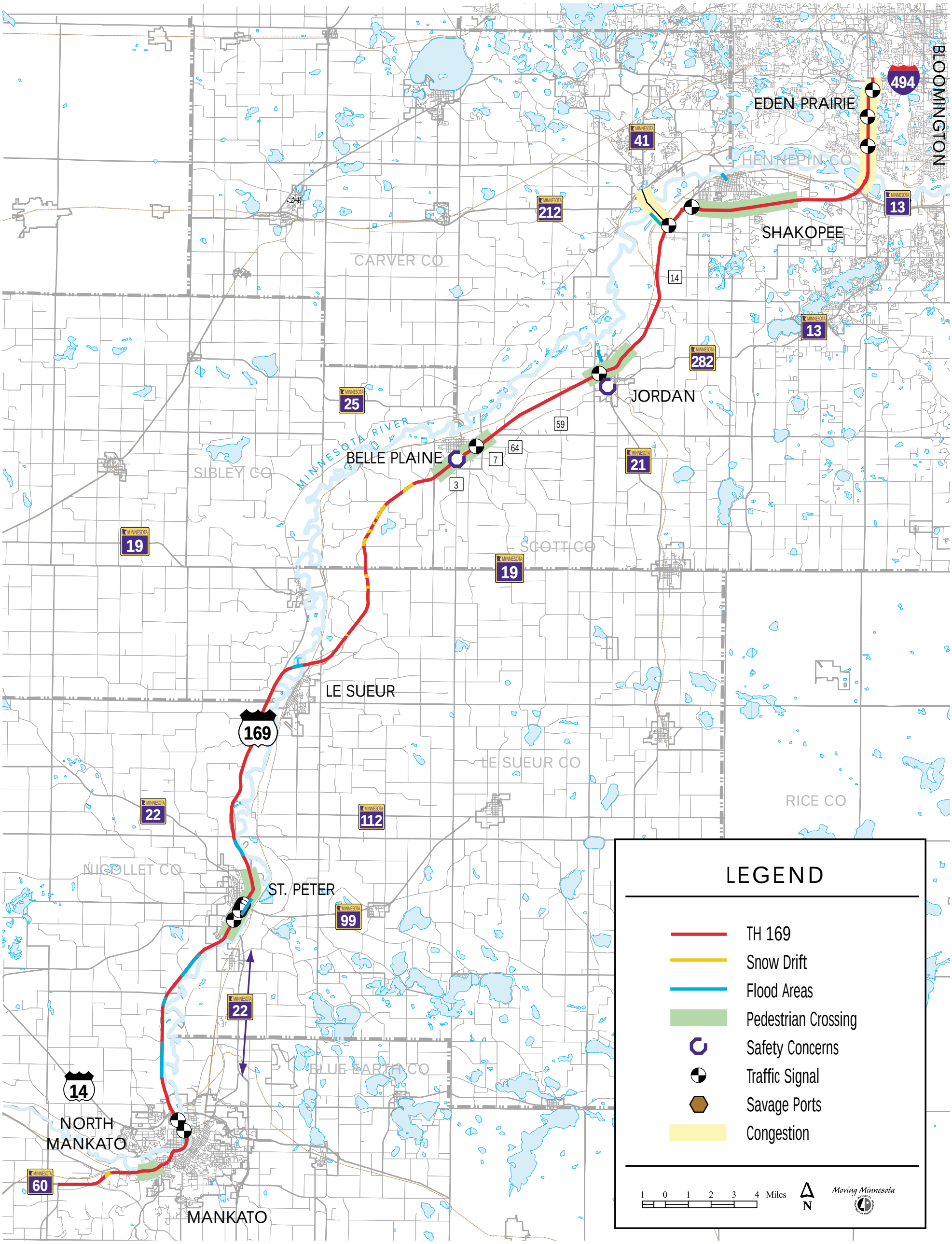
2.7 Operations

2.8 Performance

Corridor Segmentation

One of the initial tasks in analyzing the corridor was to develop a consistent way to evaluate different corridor characteristics such as access, safety, performance and traffic volumes. This involved breaking the corridor into relatively homogeneous segments based on adjacent land use, facility type and traffic volumes.

Based on the above factors, the 73-mile corridor was broken into 26 segments. For most analyses, this was the lowest level for which data was collected, assembled and reported; however, there are numerous instances where information for the 26 segments was summarized by geographic area (northern, central and southern section) and/or by Interregional Corridor Level (High Priority or Medium Priority). The segments and geographic areas are shown in Figure 2-2.



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Segment	Description From	Description To	True Length (miles)
A	I-494	Old Shakopee Road (108th Street)	3.64
B	Old Shakopee Road (108th Street)	TH 13	1.43
C	TH 13	CSAH 69	7.72
D	CSAH 69	TH 41	1.28
E	TH 41	CSAH 14	2.35
F	CSAH 14	North Jordan City Limits	4.71
G	North Jordan City Limits	TH 282	0.70
H	TH 282	South Jordan City Limits	0.29
I	South Jordan City Limits	CSAH 6/64	6.06
J	CSAH 6/64	TH 25	1.14
K1	TH 25	South Limits of Belle Plaine	0.58
K2	South Limits of Belle Plaine	TH 19	6.32
L	TH 19	CR 28	3.30
M	CR 28	Township Road 197 (LeSueur Rest Area)	0.76
N	Township Road 197 (LeSueur Rest Area)	Minnesota River Crossing at LeSueur	1.57
O	Minnesota River Crossing at LeSueur	TH 22 (Dodd Road)	10.48
P	TH 22 (Dodd Road)	Union Street	1.11
Q	Union Street	TH 295 (Regional Treatment Center)	1.86
R	TH 295 (Regional Treatment Center)	North Limits of Mankato (Happy Chef)	9.12
S	North Limits of Mankato (Happy Chef)	TH 14	0.36
T	TH 14	Belgrade Avenue	1.68
U	Belgrade Avenue	Minnesota River Crossing (Blue Earth-Nicollet)	0.64
V	Minnesota River Crossing (Blue Earth-Nicollet)	Blue Earth River	1.18
W	Blue Earth River	TH 68	1.56
X	TH 68	CSAH 90	1.20
Y	CSAH 90	TH 60	1.58

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2.1 Demographics

Understanding the current demographics along the corridor and how they are changing is important in identifying future transportation needs of the corridor. To assess the demographics of the corridor, an examination was made of the year 1990 and 2000 census information including population and employment growth. Growth in population and employment are two key factors that translate into increasing traffic demands. In addition, population and employment trends also provide an indication of development pressures that each community or area is undergoing.

Population Changes

Counties within the State Highway 169 study corridor include Hennepin, Scott, Sibley, Le Sueur, Nicollet and Blue Earth. Growth in these counties has a direct influence on what happens to TH 169. Carver County also has a significant influence on what happens to TH 169. Carver County borders the study area and influences growth in traffic patterns in the northern part of the corridor. Table 2-1 summarizes the change in population for the six study-area counties, Carver County and the state of Minnesota. All of the counties listed in the table experienced population gains over the last ten years; however, the largest population gains were in Hennepin, Carver and Scott Counties. The growth in these three counties accounted for 25 percent of the total population gain in Minnesota over the last ten years.

TABLE 2-1
COUNTY POPULATION CHANGE 1990 TO 2000

County	1990 Population	2000 Population	Ten-year Population Change	Percentage Change
Hennepin	1,032,431	1,116,200	83,769	8.1
Carver	47,915	70,205	22,290	46.5
Scott	57,846	89,498	31,652	54.7
Sibley	14,366	15,356	990	6.9
Le Sueur	23,239	25,426	2,187	9.4
Nicollet	28,076	29,771	1,695	6.0
Blue Earth	54,044	55,941	1,897	3.5
Corridor Subtotal	**1,257,917**	**1,402,397**	**144,480**	**11.5**
State of Minnesota	**4,375,099**	**4,919,479**	**544,380**	**12.4**

Source: MN Planning

While this growth is significant, some has less of a direct impact on the State Highway 169 study corridor. For example, the majority of Hennepin County's growth is centered in the western and northwest suburbs of Plymouth, Maple Grove and Brooklyn Park. Eden Prairie is one of the few cities in Hennepin County adjacent to TH 169 that had significant growth. However, much of

this growth has occurred and is occurring west of the study corridor in newer areas of the city. The City of Bloomington, which is a fully developed city and borders Eden Prairie, lost 1,000 persons or 1.3 percent of its population in the 1990s.

The prime force behind much of the traffic growth in the corridor is a result of population changes and labor force changes in Scott and Carver Counties. This growth has occurred in cities such as Shakopee, Savage, Jordan and Belle Plaine in Scott County, and in Chaska and Chanhassen in Carver County. In fact, Shakopee and Savage were among Minnesota's top ten fastest-growing cities in the 1990s. Together, these cities have added roughly 34,000 persons over the last ten years. A summary of the city population changes is shown below in Table 2-2 for these cities, as well as other cities in and adjacent to the corridor.

In addition, Table 2-2 indicates that cities on the fringe of the Twin Cities metropolitan area are beginning to experience higher growth trends. For example, the cities of Jordan and Belle Plaine experienced large percentage increases in population, although absolute numbers of persons added to these communities were not as great as Shakopee or Savage. However, these cities have experienced even more growth since the census (i.e., Belle Plaine's estimated population based on building permits is 4,470 (January 2002)). It should be noted that population growth in the southern study area cities (Le Sueur, St. Peter and Mankato) was relatively small in comparison to metro fringe communities; however, these gains should be viewed in comparison to other southwestern Minnesota rural areas, which typically lost population over the last ten years. Overall, the TH 169 corridor had a city population increase of 23 percent.

TABLE 2-2
CITY POPULATION CHANGE 1990 TO 2000

City	1990 Population	2000 Population	10-yr Population Change	Percentage Change
Chanhassen	11,732	20,321	8, 589	73.2
Chaska	11,339	17,449	6,110	53.9
Bloomington	86,335	85,172	-1,163	-1.3
Eden Prairie	39,311	54,901	15,590	39.7
Shakopee	11,739	20,568	8,829	75.2
Savage	9,906	21,115	11,209	113.2
Jordan	2,909	3,833	924	31.8
Belle Plaine	3,149	3,789	640	20.3
Le Sueur	3,714	3,922	208	5.6
St. Peter	9,481	9,747	266	2.8
Mankato	31,405	32,427	1,022	3.3
North Mankato	10,662	11,798	1,136	10.7
Corridor Subtotal	231,682	285,042	53,360	23.0

Source: MN Planning

Labor Force Changes

Labor force estimates indicate that most study area counties will enjoy a modest growth in employment over the next 20 years. Scott County and Sibley County are the exceptions. As the population continues to grow near the Twin Cities Metropolitan Area, employment growth in Scott County is anticipated to occur at a far greater rate than for other counties within the study area. Employment within Scott County grew by nearly 25 percent from 1990 to 2000. This rate of growth is expected to continue over the next 20 years, while Sibley County's labor force is anticipated to remain constant. Given the lack of major regional trade centers in Sibley County and the trend towards larger farms, this estimate is not surprising. Table 2-3 provides labor force estimates for the study area.

TABLE 2-3
COUNTY LABOR FORCE ESTIMATES 1990 TO 2020 (1)

County	1990	2000	Percentage Change (2)	2010 (estimated)	2020 (estimated)	Percentage Change (3)
Hennepin	600,245	641,660	6.9	681,920	682,480	6.4
Scott	32,134	40,210	24.9	47,650	51,130	27.4
Sibley	7,032	7,050	<1	7,130	6,970	-1.1
Le Sueur	11,568	12,250	5.9	12,830	13,000	6.1
Nicollet	15,148	16,480	8.8	17,610	17,650	7.1
Blue Earth	29,183	30,420	4.2	32,360	32,170	5.8

(1) Source: MN Planning

(2) Percentage change based on year 1990 to 2000

(3) Percentage change based on year 2000 to 2020

Demographic Trends Summary

The majority of population and employment growth is expected to occur in the northern study area counties and cities. As more people and jobs continue to cluster around the Twin Cities Metropolitan Area, traffic will continue to grow on the system of roads that support this area, particularly on river crossing links such as State Highway 41 and State Highway 169, and on other corridors linking this area to outlying regional trade centers. While population and employment will grow at high rates in the northern study area, projected growth rates in the southern study area (south of Scott County) indicate growth, but at a lower rate. Greater levels of growth are expected around the larger centers such as Mankato/North Mankato and the City of St. Peter. This suggests that the issues facing the northern study area will be different in magnitude and scope than those that communities may face in the southern portion of the corridor.

2.2 Land Use

The IRC principles encourage orderly growth and development, and promote accountability for local land use decisions. These principles rely heavily on local units of government to make local transportation systems function better, and to encourage growth at appropriate land use intensities in areas where transportation investments and infrastructure are in place. Growth in rural and/or developing areas that lack the necessary infrastructure can result in safety and mobility problems.

Land use in and near the State Highway 169 corridor was investigated to determine development trends and to provide input into the traffic analysis and policy-level planning areas. The analysis focused primarily on where growth was occurring, where it is likely to occur over the next 20 years, and what kinds of controls or tools communities are using to guide growth. Land use information was obtained from county and city comprehensive plans where it was available. Counties and cities within the seven-county metropolitan area had recently updated comprehensive plans in 2000. Areas outside the seven-county metropolitan area have little map-based land use information; however, most of these counties are primarily rural with little development outside urbanized areas. A couple of exceptions include Faxon and Jessenland Townships in Sibley County. As part of the land use analysis, local agency land use ordinances were reviewed. The future growth areas along TH 169 are shown in Figure 2-3. Areas in the northern half of the corridor (TH 19 to I-494) have growth areas identified through 2040.

2.3 Access

An issue closely linked to land use discussions is the amount and type of access to the State Highway 169 corridor. As part of the State Highway 169 Corridor Study, an inventory of all the access points along the corridor was taken. This inventory identified public street access points, private residential driveways, private commercial driveways and farm field entrances. The intent of completing the access inventory was threefold. First, the inventory was completed to identify the location and type of access along the corridor. Second, the inventory was completed to compare existing access locations to the Access Spacing Guidelines developed by Mn/DOT. Finally, the inventory was completed to use as a tool to improve safety and mobility along the corridor.

The access inventory revealed that there are a total of 480 access points onto State Highway 169 in the study area. In the northern portion of the corridor (segments A-G) there are 100 total access points. Over 65 percent of these access points are located south of the City of Shakopee. About half of the access points are public street intersections, the other half belong to private driveways and field entrances. In the central portion of the corridor, segments H-O, there are 174 access points. Two-thirds of the access points in this portion of the corridor are private driveways or field entrances. In the southern portion of the corridor (segments P-Y) there are 206 access points. A little over half of the access points are public street intersections. Many of the access points for this section of the corridor are located in the City of St. Peter.

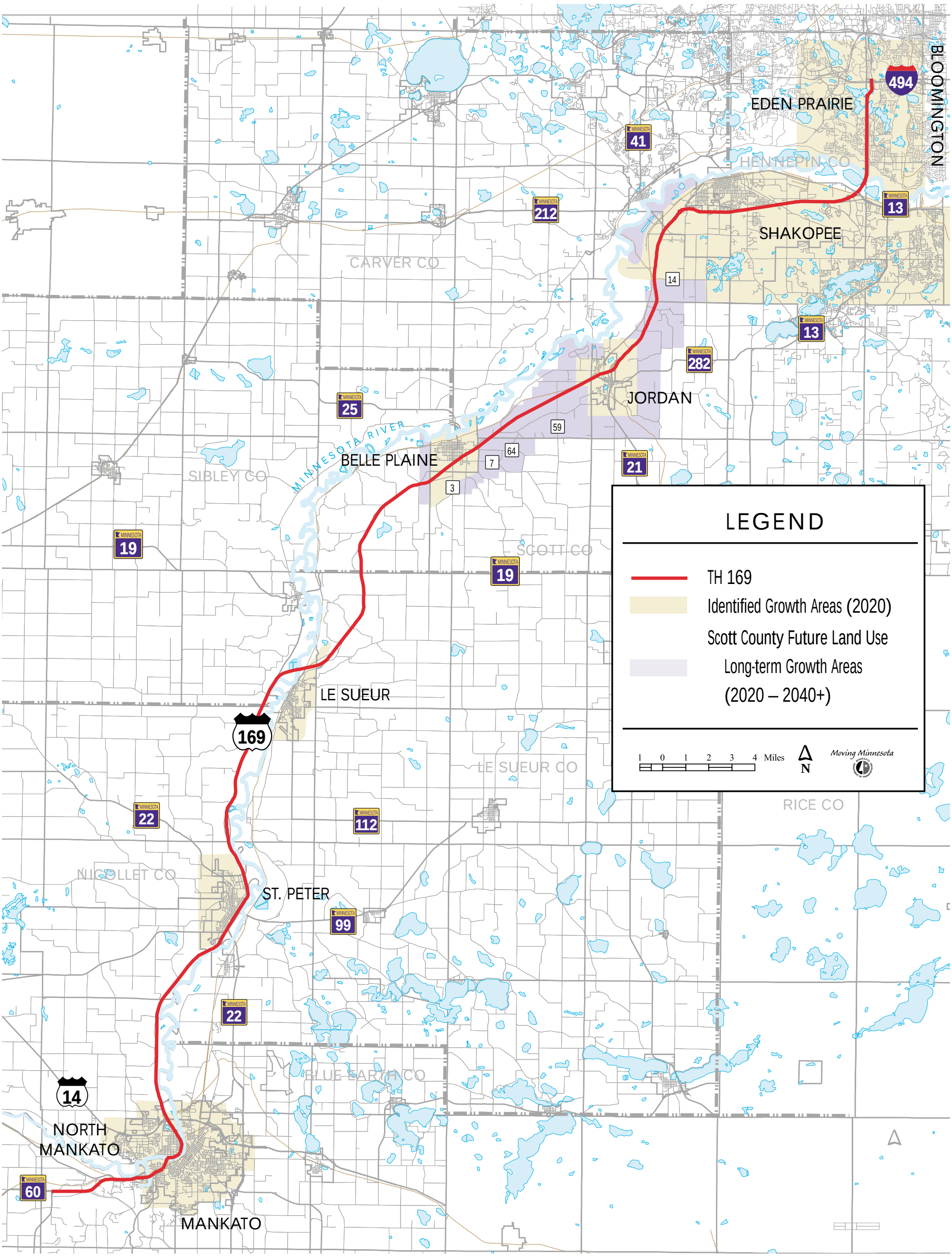

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Table 2-4 summarizes the access points on State Highway 169 by corridor sections. Appendix D shows all of the access points along the corridor. It also shows the type of access at each location. It should be noted that most of the communities and agencies along the corridor have done an excellent job in controlling direct access to TH 169. In many instances, the connections to TH 169 have been directed to public streets. In areas where there are a group of direct access points to TH 169, it is hoped that frontage roads and other local connections can be developed to remove direct access from the corridor.

2.4 Safety

Safety is always a primary concern for Mn/DOT and all public agencies. Safety on State Highway 169 is a concern because of high traffic volumes and higher speeds, as well as a variety of at-grade intersections and the mix of large and small vehicles. Understanding current conditions, crash patterns and trends as they exist today, and how they might change as growth occurs, is critical to identifying and prioritizing improvements that could impact safety.

The safety data that was analyzed for this report was obtained from Mn/DOT's crash database for approximately a four-year period from January 1, 1997 to December 13, 2000. The listing of crashes was broken down into the three sub-areas and 26 corridor study segments for further analysis. The types and severities of crashes, crash frequency, location and proximate cause were evaluated and are discussed below.

Overall Corridor and Sub-Area Safety Analysis

The State Highway 169 corridor is predominately a four-lane rural expressway corridor with a couple of freeway segments and one short segment of urban arterial. On average, approximately 600 crashes occur each year along the corridor. Of these crashes, one percent is fatal, 29 percent are injury and 70 percent are property damage. This translates to six fatalities, 174 injuries and 420 property damage crashes each year, which is estimated to cost citizens over $31 million annually[1].

Even though the number and severity of crashes seem high, the percentage of fatal and injury crashes for the overall corridor is slightly less than the statewide average. Rural expressways typically average 1.3 percent fatal crashes and 33 percent injury crashes.[2] Further analysis of the data using the sub-areas reveals that the central sub-area has a higher percentage of fatal crashes (14 of the 24 fatal crashes occurred in this area). Table 2-5 shows crash severity by sub-area. A review of all of the fatal crashes was made and a summary is included in the Appendix E. Based on this review, there was not a clear pattern identified for these crashes.

[1] Based crash costs for fatal, injury and property damage crashes as provided for in OIM's June 01 memorandum.
[2] Based on Mn/DOT traffic engineering data from 1997 to 2000

TABLE 2-4
CORRIDOR ACCESS POINTS

Segment	From	To	True Length Miles	EXISTING CONDITIONS						Turnaround	Mn/DOT (1) Access Category	Recommended (2) Spacing
				On and Off Ramps	Full Access	T Intersection	Right In and Right Out	Total Access	Total Access Per Mile			
A	I-494	Old Shakopee Road (108th Street)	3.64	4	6	0	0	10	3	0	1A	1 Mile
B	Old Shakopee Road (108th Street)	TH 13	1.43	10	0	0	0	10	7	1	1AF	Interchange Access Only
C	TH 13	CSAH 69	7.72	12	2	0	0	14	2	4	1AF	Interchange Access Only
D	CSAH 69	TH 41	1.28	0	6	1	2	9	7	0	1A	1 Mile
E	TH 41	CSAH 14	2.35	0	13	2	6	21	9	0	1A	1 Mile
F	CSAH 14	North Jordan City Limits	4.71	1	19	6	7	33	7	0	1A	1 Mile
G	North Jordan City Limits	TH 282	0.70	0	2	0	1	3	4	0	1A	1 Mile
A-G	**I-494**	**TH 282**	**21.82**	**27**	**48**	**9**	**16**	**100**	**5**	**5**		
H	TH 282	South Jordan City Limits	0.29	0	0	0	0	0	0	0	1A	1 Mile
I	South Jordan City Limits	CSAH 6/64	6.06	0	24	6	2	32	5	0	1A	1 Mile
J	CSAH 6/64	TH 25	1.14	0	8	1	2	11	10	0	1A	1 Mile
K1	TH 25	South Limits of Belle Plaine	0.58	0	2	0	1	3	5	0	1A	1 Mile
K2	South Limits of Belle Plaine	TH 19	6.32	0	35	6	14	55	9	0	1A	1 Mile
L	TH 19	CR 28	3.30	0	12	1	7	20	6	0	2A	1 Mile
M	CR 28	Township Road 197 (LeSueur Rest Area)	0.76	0	4	0	0	4	5	0	2A	1 Mile
N	Township Road 197 (LeSueur Rest Area)	Minnesota River Crossing at LeSueur	1.57	4	0	0	0	4	3	0	2A	1 Mile
O	Minnesota River Crossing at LeSueur	TH 22 (Dodd Road)	10.48	4	22	15	4	45	4	4	2A	1 Mile
H-O	**TH 282**	**TH 22 (Dodd Road)**	**30.50**	**8**	**107**	**29**	**30**	**174**	**6**	**4**		
P	TH 22 (Dodd Road)	Union Street	1.11	0	6	0	0	6	5	0	2B	1 Mile
Q	Union Street	TH 295 (Regional Treatment Center)	1.86	0	84	3	9	96	52	0	2C	300 to 660 feet
R	TH 295 (Regional Treatment Center)	North Limits of Mankato (Happy Chef)	9.12	0	35	3	11	49	5	0	2A	1 Mile
S	North Limits of Mankato (Happy Chef)	TH 14	0.36	4	4	2	0	10	28	0	2B	1 Mile
T	TH 14	Belgrade Avenue	1.68	4	4	0	2	10	6	0	2B	1 Mile
U	Belgrade Avenue	Minnesota River Crossing (Blue Earth-Nicollet)	0.64	4	0	0	0	4	6	0	2AF	Interchange Access
V	Minnesota River Crossing (Blue Earth-Nicollet)	Blue Earth River	1.18	6	0	0	0	6	5	0	2AF	Interchange Access
W	Blue Earth River	TH 68	1.56	0	8	0	0	8	5	0	2B	1 Mile
X	TH 68	CSAH 90	1.20	3	5	2	1	11	9	1	2A	1 Mile
Y	CSAH 90	TH 60	1.58	1	3	2	0	6	4	0	2A	1 Mile
P-Y	**TH 22 (Dodd Road)**	**TH 60**	**20.29**	**22**	**149**	**12**	**23**	**206**	**10**	**1**		
TOTAL			**72.61**	57	304	50	69	480		10		

(1) Please refer to MN/Dot's report on access spacing for detailed descriptions of each category.
(2) Initial MN/Dot access category assigned at beginning of TH 169 IRC Study; spacing is suggested spacing based on category assigned.

TABLE 2-5
CRASH SEVERITY DISTRIBUTION [1]

Sub-Area	Segment	Fatal (Crashes/Percent)		Injury (Crashes/Percent)		Property (Crashes/Percent)	
Northern	A-G	8	0.75	311	29	750	70
Central	H-O	14	2.20	181	29	435	69
Southern	P-Y	2	0.30	189	28	485	72
Corridor Average			**1.1**		**28.6**		**70.3**

[1] Based on crash records from January 1997 to December 2000

In addition to looking at the number and type of crashes occurring along the corridor, the analysis also considered the percent of crashes compared to vehicle miles traveled for the three different corridor sub-areas. By looking at the vehicle miles traveled in comparison to the number of crashes, areas of high crash rates can be identified more clearly. The northern sub-area, segments A-G, account for 45 percent of all crashes in the corridor. However, this segment also has the highest traffic volumes. Table 2-6 compares the overall percentage of crashes in the corridor to the vehicle-miles-traveled (VMT) for each sub-area. Based on this comparison, the northern and central sub-areas have lower overall crash rates than the southern sub-area. Compared to statewide averages, crashes on State Highway 169 are above the average rural expressway rate of 0.9 crashes per million vehicle miles. While not all segments of TH 169 are this type of facility, the vast majority of the corridor is considered a rural expressway.

TABLE 2-6
CRASH DISTRIBUTION [1]

Sub-Area	Segment	Total Crashes	Percent Crashes	Percent VMT	Crash Rate [2]	Comparison to Statewide Average [3]
Northern	A-G	1,069	45	49.2	1.09	21 percent higher
Central	H-O	630	26.5	29.7	1.06	18 percent higher
Southern	P-Y	676	28.5	21.1	1.6	78 percent higher
Totals		**2,375**	**100**	**100**	**1.25**	**39 percent higher**

[1] Based on crash records from January 1997 to December 2000
[2] Crashes per million vehicle miles (MVM)
[3] Comparison of TH 169 crash rate to statewide rural expressway average of 0.9 crashes per million vehicle miles.

Segment-level Safety Analysis

Because it is difficult to identify proximate causes of crashes based on larger geographic regions, crash information was also tabulated for each of the 26 corridor segments. This process provided a more direct way to assess the number, severity, frequency and type of crashes within the corridor and also provided indications for where to focus resources to address safety issues.

Based on the analysis, the following problems were noted in the corridor:

- Rear-end crashes accounted for 28 percent of all the crashes in the corridor. The northern sub-area accounted for 68 percent of this type of crash. Rear-end crashes generally occur at locations where there is unstable traffic flow and/or in areas where there are traffic control devices (signalized intersections). The signalized intersections at Highwood, Anderson Lakes, Pioneer Trail and TH 41 seem to have a significant number of rear-end crashes. Many of the approaches to the signalized intersection have visible skid marks and signs of glass and other vehicle parts. In addition to the crash data provided by Mn/DOT, several rear-end crashes were observed in these areas on trips through the corridor during the study.

- Run-off-road crashes accounted for 19 percent of the total crashes in the corridor. A higher percentage of these crashes occurred in the Bloomington Ferry Bridge area and in Mankato near the Minnesota River crossing. While there is limited access in these areas, weather and/or surface conditions could have contributed to the high number of these types of crashes. Some fatal run-off-road crashes occurred between Belle Plaine and Le Sueur. Most of these crashes occurred in areas where rumble strips were not present during the time of the crash. Rumble strips have since been installed in some of these areas.

- Right-angle crashes account for 15 percent of the total crashes in the corridor. Higher numbers of right-angle crashes occurred at the major intersections of TH 41 and TH 282, at the intersections through Belle Plaine (skewed intersections), TH 19 (sight distance/grade issues) and the at-grade intersections near Happy Chef in Mankato.

Finally, an overall safety comparison was made in an effort to identify the most problematic segments in the corridor from a safety perspective. Five criteria were considered which looked at a combination of crash frequency, severity and crash rate comparison. These criteria are listed below:

- Number of fatal crashes per mile
- Number of injury crashes per mile
- Number of total crashes per mile
- Total annual crash cost per mile
- Crash rate comparison to statewide average

In order for a segment to be identified as problematic, a segment needed to be significantly above the corridor average in at least three out of the five categories. Based on this comparison, eight of 26 segments were identified: A, B, H, J, Q, S, T and V. All of the segments are shown in Table 2-7. It should be noted that segments H and S had segment lengths less than one mile. The shortness of these segments could have skewed the results in their favor.

The analysis does a fair job of identifying problematic areas. For example, areas A and B have a high number of incidents, and even though these incidents may be less severe, they occur in sufficient number to elevate the costs. Other segments, such as those in Belle Plaine, have significantly fewer incidents; however, they are more severe (in fact, Belle Plaine had 64 percent injury crashes as compared to the corridor average of 29 percent). As a result, segments needed both a sufficient number and/or severity of crashes to be identified.

2.5 Traffic

Traffic volumes and facility characteristics play a significant role in how well the corridor functions from a safety and mobility perspective. To assess the current operation of State Highway 169, a variety of traffic information was assembled and analyzed:

- Average Annual Daily Traffic (AADT-Year 2000)
- Automatic Traffic Recorder (ATR-1997 to 2000)
- 24-hour counts (2001)
- Turning movement counts at key intersections
- Truck percentage
- Origin/destination information

Information from previous studies was also used to fill gaps or provide a reference for comparisons. These studies include the Scott County Transportation Plan, the Carver County Transportation Plan, the Mankato Area Transportation and Planning Study (MATAPS), the Golden Triangle Traffic Study and the State Highway 169 Intersections Study.

Information identified above was analyzed to identify general trends along the State Highway 169 corridor. The following section highlights significant findings in regard to AADT, peak-hour characteristics, available gaps to access State Highway 169 from at-grade intersections, seasonal peaking, heavy truck movements and major traffic patterns.

Annual Average Daily Traffic

Traffic volumes in the corridor vary significantly depending upon the location in the corridor and the proximity to a regional trade center. The Average Annual Daily Traffic Volumes (AADT) for the year 2000 were obtained from Mn/DOT's traffic flow maps and are shown in Figure 2-4.

TABLE 2-7
SEGMENT COMPARISON

SEGMENT	DESCRIPTION FROM	DESCRIPTION TO	FATALS PER MILE	TOTAL INJURIES PER MILE	CRASHES PER MILE	ANNUAL COST PER MILE	CRASH RATE
A	I-494	Old Shakopee Road (108th Street)	⊘	●	●	●	○
B	Old Shakopee Road (108th Street)	TH 13	⊘	⊘	⊘	⊘	○
C	TH 13	CSAH 69	○	○	○	○	○
D	CSAH 69	TH 41	○	○	⊘	⊘	○
E	TH 41	CSAH 14	○	○	⊘	⊘	○
F	CSAH 14	North Jordan City Limits	○	⊘	○	○	○
G	North Jordan City Limits	TH 282	○	⊘	○	○	○
H	TH 282	South Jordan City Limits	●	●	●	●	●
I	South Jordan City Limits	CSAH 6/64	○	○	○	○	○
J	CSAH 6/64	TH 25	●	○	●	●	●
K1	TH 25	South Limits of Belle Plaine	○	○	○	⊘	⊘
K2	South Limits of Belle Plaine	TH 19	⊘	○	○	○	○
L	TH 19	CR 28	○	○	○	⊘	⊘
M	CR 28	Township Road 197 (LeSueur Rest Area)	●	○	○	●	○
N	Township Road 197 (LeSueur Rest Area)	Minnesota River Crossing at LeSueur	⊘	○	○	○	●
O	Minnesota River Crossing at LeSueur	TH 22 (Dodd Road)	○	○	○	○	⊘
P	TH 22 (Dodd Road)	Union Street	○	○	○	○	○
Q	Union Street	TH 295 (Regional Treatment Center)	○	⊘	●	⊘	○
R	TH 295 (Regional Treatment Center)	North Limits of Mankato (Happy Chef)	○	○	○	○	⊘
S	North Limits of Mankato (Happy Chef)	TH 14	●	⊘	⊘	●	●
T	TH 14	Belgrade Avenue	○	⊘	⊘	⊘	⊘
U	Belgrade Avenue	Minnesota River Crossing (Blue Earth-Nicollet)	○	○	⊘	○	⊘
V	Minnesota River Crossing (Blue Earth-Nicollet)	Blue Earth River	○	○	●	⊘	●
W	Blue Earth River	TH 68	○	○	⊘	○	○
X	TH 68	CSAH 90	○	○	○	●	●
Y	CSAH 90	TH 60	○	○	○	○	○

(1) Crash data from January 1, 1997 to December 13, 2000.
(2) Fatal crashes were added to "A" injury crashes and the total was compared by segment to the overall corridor average.
(3) Total injury crashes include fatal crashes and the total was compared by segment to the overall corridor average.

Notes:
● = High (Over 2 times the corridor average)
⊘ = Medium (1-2 times the corridor average)
○ = Low (Less than the corridor average)
A Shaded segments have greater safety problems.

The information printed on the traffic flow maps comes from counts that are taken on a statewide basis every two years. The traffic flow maps provide good information on the daily use of State Highway 169, as well as a historical perspective on volume growth in the corridor over time. Based on a review of current and historic traffic flow maps, the following trends were identified:

- Year 2000 volumes range from 56,000 vehicles per day in the Eden Prairie/Bloomington area to 13,000 vehicles per day between Mankato and St. Peter.

- Volume growth in the northern portion of the corridor (Jordan to Interstate 494) is significantly greater than in other parts of the corridor. For example, volume north of the Bloomington Ferry Bridge increased from 42,000 in 1998 to 56,000 in 2000, and the count in 2001 was 64,000 vehicles per day. This increase of 24,000 vehicles in three years is greater than the existing traffic volumes in many other parts of the corridor. The growth in traffic volumes is directly related to population and employment increases in Carver, Hennepin and Scott Counties.

- As one travels south on TH 169 volume levels tend to decrease; however, some increases occur as the corridor passes through urbanized areas of St. Peter and Mankato/North Mankato.

A detailed matrix showing volume changes over time is shown in Appendix F.

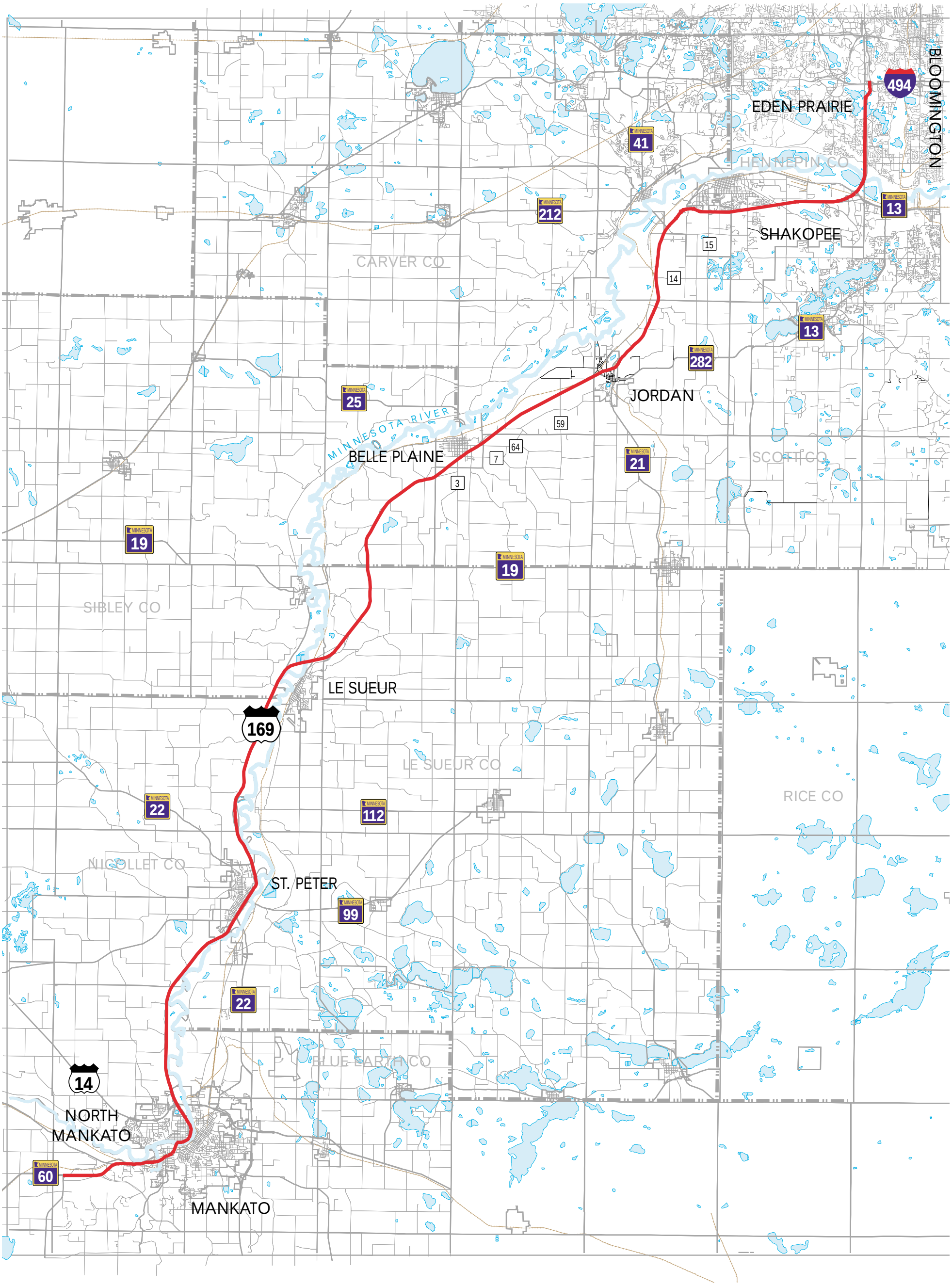
Peak Hour Characteristics

While daily volumes reported on the traffic flow maps can be used to approximate operational problems, a significant number of operational issues on the facility are most affected by traffic volumes that use the highway during the busiest hour (peak hour). Hourly volumes were collected in five different areas of the corridor. Figure 2-5 shows the hourly volumes for these locations. Based on the hourly information, the following observations were made:

- Segments in the northern part of the corridor have significantly higher peak hour volumes than other parts of the corridor. The peak hour volume near Old Shakopee Road (5,500 vehicles per hour) is nearly double the hourly volume at TH 41 (2,600 vph) and nearly four times the hourly volume in segments south of Jordan (1,500 vph). Appendix G shows percent peak hour and directional splits for five different areas.

- Due to the proximity of the metropolitan area, the commuter peaks in the northern segments are much more pronounced. Peaks at Old Shakopee Road show an increase of 1,500 to 2,000 vehicles per hour over volumes during midday, while peaks in the southern portion of the corridor are almost indistinguishable from midday volumes.

- High-speed expressways operating at peak capacity typically accommodate 750 to 900 vehicles per lane per hour (vpl/hr). Volumes in the northern part of the corridor exceed the facility's capacity during the peak period – in some locations of the corridor, there are 1,400 vehicles per lane per hour.



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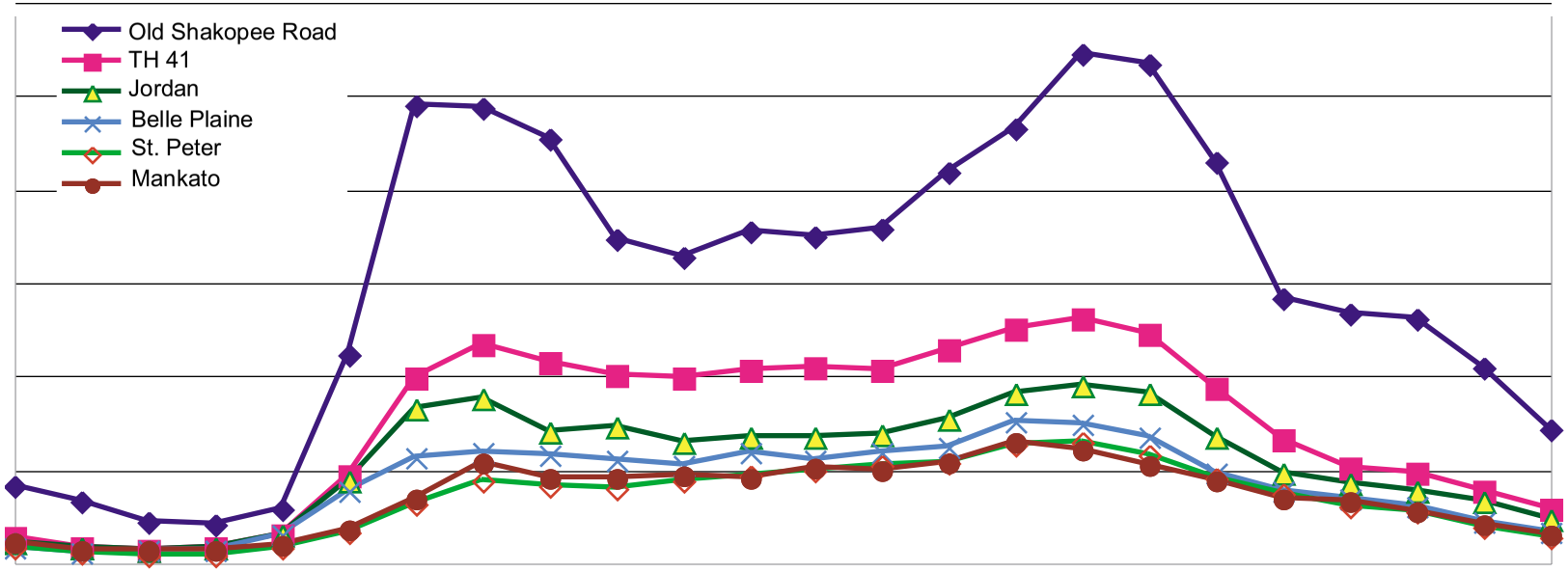

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- Analysis of the intersections in the northern part of the corridor indicates an operations level of service F (failing). These intersections have long traffic queues, high rear-end crashes and significant vehicle delays.

The pictures on the previous page illustrate significant queuing issues that are currently present in the corridor. Long queues exist during peak hours from the Bloomington Ferry river bridge near Shakopee to I-494. These queues occur during the peak hours and spill into other adjacent hours.

In the Highway 41 area, the longest queues occur on southbound approach to State Highway 169. It is common to see queues, even during midday, extending one-quarter to one-half mile to the north. In peak travel times, this queue can extend into the river bottom area. The queues on Highway169 in this area are currently much shorter; however, these can extend one-quarter to one-half mile in either direction.

Available Gaps in Traffic

A significant portion of the corridor is a rural expressway with two-way, stop-controlled intersections. The operation of these intersections depends upon the number of available gaps in the mainline flow. Too few gaps will result in excessive delays for drivers at the crossing street. Drivers that become impatient because of a long delay may create a potential safety problem by accepting shorter gaps, causing lane shifts and/or greater changes in mainline speeds. On TH 169, the spacing between northbound and southbound lanes, for the majority of the corridor, is sufficient to store passenger vehicles. However, it is not able to store larger trucks. Therefore, while autos can gain access by finding gaps in one direction at a time, larger vehicles need gaps in both directions.

An analysis was done to examine these gaps based on mainline volumes for the different segments of the corridor. The results indicate that there are very few gaps in traffic flow in northern portion of the corridor during the peak hour. The number of available gaps is expected to decrease as traffic volumes on the mainline increase. Figure 2-6 shows available gaps at various traffic volumes. Based on this analysis and knowledge of corridor growth trends, the availability of gaps will continue to be limited during the peak hours in the area between CSAH 69 and Belle Plaine.

Seasonal Peaking

Traffic volumes also change based on the time of year. In Minnesota, daily volumes are generally the lowest in January and the highest in July and August. On corridors that serve recreational areas, daily summer traffic volumes can exceed the AADT by as much as 25 to 40 percent, while in non-recreational corridors, daily summer volumes are typically 10 to 15 percent greater than AADT volumes. This fluctuation in volume can have a significant affect on the operation of a facility if volumes are near capacity.

Information on seasonal volume changes for State Highway 169 was obtained from an Automatic Traffic Recorder (ATR) station located just south of Jordan. This station continually counts traffic volumes for every day of the year. Average daily volumes were obtained and graphed for each month for the years 1997 to 2000. Figure 2-7 shows the graphed data from the Jordan ATR station. In reviewing the information presented in Figure 2-7, the following conclusions can be drawn:

- Overall average daily volumes for typical months have increased by 2,000 to 6,000 vehicles per day.

- Overall volumes have increased by 30 to 40 percent over the last four years. This growth occurred relatively uniformly across the year.

- July volumes for years 1997, 1998 and 1999 are lower when compared to adjacent months, while the July volumes for the year 2000 are near the peak volume. This change in pattern may suggest that State Highway 169 is becoming more of a commuter and manufacturing corridor rather than a corridor focused on agricultural movements and activities.

- Average daily volume for the peak summer months in 2000 is 10 to 15 percent higher than the average annual daily volume. This is typical of a non-recreational type corridor.

Heavy Truck Movements

Heavy commercial traffic (truck volumes) is a significant element in the corridor. Truck volumes account for 10 to 12 percent of the daily volumes in the corridor with the exception of Segments A and B, which are closer to 5 to 6 percent due to heavy commuter volumes. A significant amount of truck traffic is destined for or originates from quarries along the river, industrial areas in Shakopee and the Savage ports. In addition, State Highway 169 also functions as a link to I-90 and connects many outside manufacturing facilities.

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Major Traffic Patterns

State Highway 169 is a diagonal route that flows into the Twin Cities metropolitan area from southwest Minnesota. As a result, it serves both as a north-south route and an east-west route for communities and regions in the area. A comprehensive origin-destination study was not performed for this corridor; however, some traffic patterns were identified based on discussions with communities, reviews of traffic map flow volumes, review of selected turning movements and information from an origin-destination survey conducted in St. Peter. This section of the report identifies the major traffic patterns in the corridor. The locations of these movements are shown on Figure 2-8, and are described below.

A. Connection to Interstate 494 (metropolitan beltway)

Perhaps the most important connection in the corridor is with Interstate 494, which is a principal arterial facility and is the major beltway or ring around the Twin Cities. This facility provides connections to all other major routes and/or major facilities in the region. The connection of these two facilities is currently considered a major "bottleneck." It is a major source of congestion for both Interstate 494 and State Highway 169.

B. Connection to TH 13 (southerly reliever for I-494 and access to the Savage Ports)

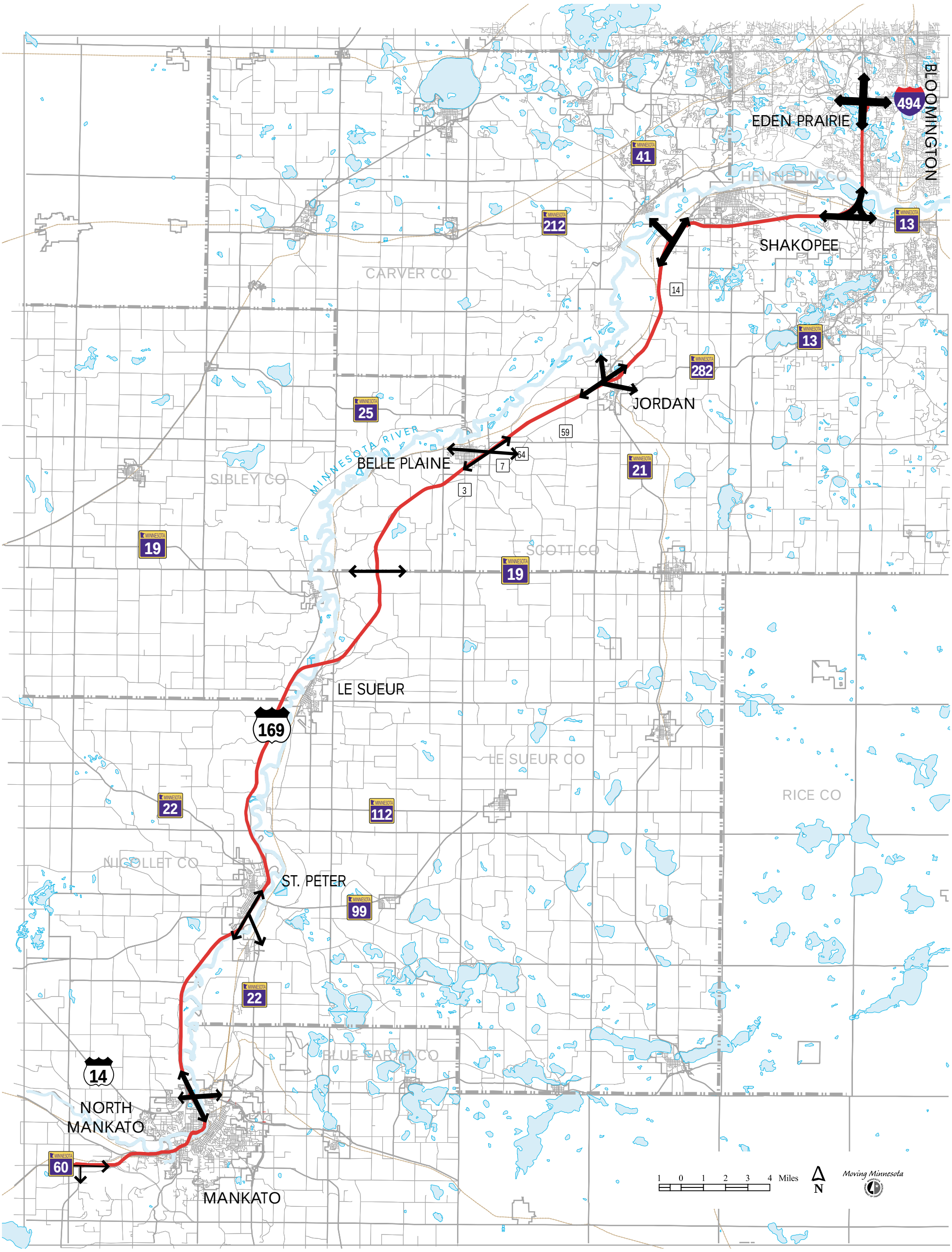
Another traffic key pattern or movement is the interaction with TH 13. Highway 13 is a principal arterial facility that connects TH 169 with I-35W in the southern portion of the Twin Cities metropolitan area. While the orientation of this facility would allow it to function as a reliever to I-494 south of the Minnesota River, it currently is capacity constrained and therefore has a limited reliever function. In addition, this facility serves as the key access to the Savage Ports. This river port serves as one of the primary modal transfer points for shipping bulk materials by river to New Orleans (see additional discussion in modal area).

C. Connection to TH 41 (Minnesota River crossing and link to TH 212)

The number of major river crossings is limited. Highway 41 is principal arterial route that serves as a major river crossing. It connects rapidly growing eastern Carver County with northern Scott County and is one of the few crossings that one can use to cross the river without having to use the I-494 beltway. Highway 41 also connects to TH 212, an east west principal arterial route that serves western Minnesota. This enables grain and other agricultural movements to access the Savage Ports.

D. Connection to TH 21/282 (Jordan)

Highway 21/282 is minor arterial that connects to State Highway 169 in Jordan. These facilities provide access to smaller trade centers and provides north/south movement of goods between I-35W and State Highway 169.



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E. Connection to County Highway 6/64 (Belle Plaine)

County Highway 6/64 is a potential east-west corridor connecting TH 169 with Interstate 35. Further study will be needed to determine if this corridor should be extended. If the future study identifies this area as an east-west connection, steps will need to be taken to preserve the corridor and the connections to TH 169 and I-35.

F. Crossing at TH 19

TH 19 is an east-west arterial that crosses TH 169. In the future, this roadway may play a more prominent role as growth occurs and more options for east-west movements are needed at the southern end of the Twin Cities metropolitan area.

G. Connection to So. Junction TH 22 (St. Peter)

Highway 22 is a minor arterial and provides an alternative connection to the north side of Mankato. The northeast side of Mankato has become the retail shopping and entertainment center for the region. As a result, people traveling to the eastern side of Mankato from the north will typically choose this route over TH 169 to the south. This area also has a number of large aggregate pits. This connection is used to haul materials to desired locations.

H. Connection to TH 14 (Mankato/North Mankato)

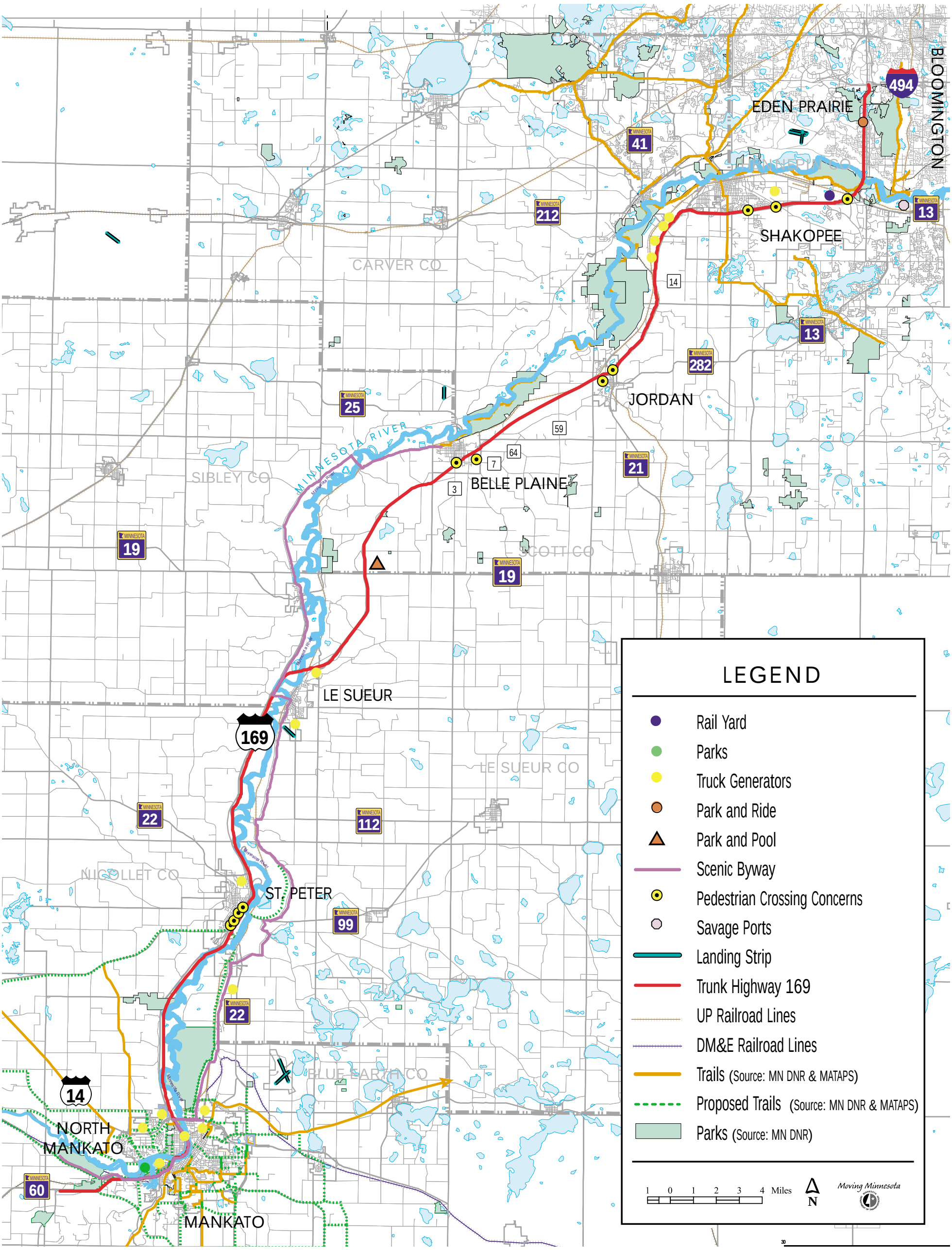
Highway 14 is an east-west principal arterial route that connects several major trade centers across southern Minnesota. Highway 14 was also designated as an IRC route connecting New Ulm to Rochester. It also connects several other major north-south facilities such as I-35W and TH 52. In the Mankato/North Mankato area, it serves as part of the regional beltway system that provides mobility for the Mankato area.

I. Connection to TH 60 (south of Mankato)

As State Highway 169 extends south of Mankato, the IRC designation transfers to TH 60, another principal arterial route. Highway 60 is a diagonal route that connects several regional trade centers and also connects to Interstate 90. This connection provides the most direct access between the Twin Cities metropolitan area and Sioux Falls and Sioux City, other large trade centers.

2.6 Modal Users

Providing access to transportation options is one of the key goals of the statewide transportation system. As part of developing the State Highway 169 Corridor Plan, alternate transportation issues and needs were evaluated. Currently, many different forms of transportation exist within the corridor, from truckers that move commodities to the Savage Ports, pedestrians that cross TH 169, and park-and-ride users who carpool to work. This section of the report describes the current modal users in the corridor and some of the issues that need to be addressed over time. Figure 2-9 shows identified modal information.



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Trucking

The movement of agricultural commodities and other freight is an important function of the State Highway 169 corridor. Truck traffic accounts for 10 to 12 percent of the daily volume on a majority of the corridor.

One of the key elements associated with truck movements in the corridor is the Savage Ports. This shipping terminal is located on the Minnesota River near Shakopee, just off of State Highway 13. The Savage Ports play a key role in the movement and distribution of Minnesota's agricultural exports. Most of the agricultural exports that leave the state ship out of the Ports. Access to the ports is limited; with entrances from State Highways 169 to 13 from the west, and Interstate 35W to TH 13 from the east. There are approximately 800 trucks that enter and exit this facility on a daily basis.

Access to the ports can be problematic during peak hours. Occasionally, there are backups on State Highway 13 that spill onto State Highway 169 due to lane assignments. This problem is expected to increase as volumes continue to grow. Another issue associated with access from TH 169 to the Ports occurs in the spring. The last few years have brought flooding to TH 13, which in turn has caused backups and detours off of TH 169.

In addition to the movement of the agricultural and other commodities to the Savage Ports, there are a number of other key facilities that generate a significant amount of truck traffic, such as Shakopee's industrial park. Most of these facilities have good access to TH 169. However, there are a number of locations along the corridor where trucks have trouble accessing TH 169. The most problematic areas are unsignalized access points between Shakopee and Jordan. In most of these locations, the median is not large enough to store semi-trailers or large farm equipment. This forces the large trucks and farm equipment to wait until there is a suitable gap in traffic to make it across four lanes of traffic. As traffic volumes on State Highway 169 increase, the number of available gaps for the trucks and farm equipment to cross State Highway 169 will decrease.

In addition, one of the concerns we heard expressed by the trucking interests was the potential for additional traffic signals. These cause significantly more delays and disruptions for trucks than autos.

Railroads

The Union Pacific Railroad runs parallel to State Highway 169 from Shakopee to Mankato. Many of the trips on this line are destined to the Savage Ports. Rail traffic on this corridor is fairly light; however, the railroad authority is making improvements and upgrades to this facility. Given the amount of improvements that are being made, it is likely that rail traffic will increase.

Because the rail line runs parallel to TH 169, there are few, if any, issues for motorists traveling on TH 169. There are however, issues associated with roadways connecting into TH 169. In some of these locations, especially in the northern end of the corridor where traffic volumes on the cross streets are high, queuing on the connecting roadway can back up enough to cross the

railroad. A situation where this occurs increases the exposure risk for the railroad and for the vehicles crossing the tracks. As traffic volumes continue to increase on the side streets, and improvements such as overpasses and interchanges are promoted, special attention should be made to address rail-crossing issues. In some instances, it may be worth the added expense of bridging over the railroad to reduce exposure risk.

Another railroad that has the potential to influence the TH 169 corridor is the Dakota, Minnesota & Eastern Railroad (DM&E). This rail line is looking to expand its capacity and modify its existing alignment in the Mankato area. Improvements to the rail line could increase the risk of exposure for vehicles traveling on roadways that connect to TH 169. As traffic volumes increase on the side streets, improvements to intersections should consider including separated-grade crossings of the rail line.

Pedestrians and Bicyclists

The large number and speed of vehicles present on State Highway 169 present an obstacle to pedestrian and bicycle use along the corridor. It is also a detriment to pedestrians and bicyclists trying to cross the corridor from one side of a community to the other. This concern is especially prevalent in the northern end of the corridor, where traffic volumes are high, populations are growing and development is occurring along both sides of TH 169, but it was a concern expressed by most communities along the corridor.

Because of the high-volume and high-speed nature of the corridor, bicycle and pedestrian uses on TH 169 itself will not be encouraged. Bicyclists that are using TH 169 for commuting purposes will be able to do so at their own discretion. Although special efforts will not be made to encourage recreational uses along TH 169, all of the recommended interchange and overpass projects include pedestrian and bicycle enhancements to enable these users to cross TH 169.

Connectivity of existing and proposed trails is another area of concern that should be addressed as improvements are made to the corridor and the supporting local road networks. The U.S. Fish and Wildlife Service and Minnesota Department of Natural Resources both own large amounts of land located in the Minnesota River Valley. Several trails exist within this land and in the communities surrounding the area. Connecting these trails to one another and to key origins and destinations should be given consideration to allow people alternatives to on-road bicycle and pedestrian travel. The City of St. Peter has expressed a desire to have a regional trail connect their area to the Twin Cities Metropolitan area and the Mankato area.

Transit

There is very limited transit service along State Highway 169. Nor were there many requests during public meetings for adding these services. In the metro area, two transit entities serve TH 169. Metro Transit serves the City of Bloomington; however, there are no park-and-ride facilities or bus stops located along TH 169 that directly serve commuter type trips. Southwest Metro is the other provider. They serve the City of Eden Prairie and have a park-and-ride location at Anderson Lakes Parkway and TH 169. The City of Shakopee is not directly served by regional transit service; however, the City does provide a free rush hour shuttle to the

Eden Prairie Transit Hub operated by Southwest Metro. The Cities of Jordan and Belle Plaine are also not served by any transit facilities or services. However, all of Scott County is covered by a dial-a-ride service. In the southern half of the corridor, St. Peter, Le Sueur and Mankato/North Mankato have transit within their individual communities.

As mentioned previously, the only park-and-ride facility located within the corridor is in Eden Prairie. There are ongoing discussions to provide a new park-and-ride facility at the intersection of TH 169 and Canterbury Road in Shakopee. Final plans for this area have not been completed. There is a small, unofficial park-and-pool lot located at TH 169 and TH 19. This lot is not officially recognized by a transit agency, but is typically used by people carpooling into the Twin Cities. This lot will be removed as part of the TH 19/TH 169 interchange project.

While transit and park-and-ride facilities are currently rather limited, the potential for various transit options is present, especially in the northern half of the corridor. The Shakopee area is developing quite rapidly, both in terms of residential and commercial developments. As this area becomes more urbanized, transit services are likely to be expanded; however, this expansion is more likely to be between adjacent suburbs than to downtown Minneapolis. According to a recent Metro-Transit study, there is very limited demand for this area of the Twin Cities to travel to the core downtowns of Minneapolis and St. Paul. It also should be noted that bus on shoulder lanes are provided on TH 169 north of TH 62 (outside the study area).

Intercity bus services are provided by some of the communities in the southern half of the corridor to communities in the northern half of the corridor, as well as to the rest of the Twin Cities metropolitan area. Regular intercity bus routes travel from Mankato through the Cities of St. Peter, Le Sueur, Belle Plaine and Jordan. Mankato Land-to-Air offers service to nine communities from south-central Minnesota, with a separate airport shuttle. At this time, there are no plans for light rail or heavy rail commuter lines along TH 169.

Airports

Within the TH 169 corridor, there are two airports and one private airstrip. The Mankato Airport is a precision approach airport that provides local and regional air cargo services. Preparations are underway to provide scheduled regional air service within approximately one year. The Le Sueur Airport provides facilities for smaller corporate jets and recreational flying. This facility will be receiving federal and state funds to upgrade and expand its runway infrastructure. The City of Belle Plaine is home to a privately owned airstrip that is open for public use.

In addition to the two airports and private airstrip along the corridor, two other airports that impact the TH 169 corridor are Flying Cloud Airport and the Minneapolis-St. Paul International Airport. The Flying Cloud Airport, located in the City of Eden Prairie along TH 212, is a reliever airport to the Minneapolis-St. Paul International Airport. The Flying Cloud Airport primarily conducts a large portion of corporate air business, however the facility is looking to expand its cargo shipping business. The expansion in services could impact the amount of traffic using Highways 169 and 41 to access Flying Cloud. For south-central Minnesota, TH 169 provides an essential connection to the Minneapolis-St. Paul International Airport. Many

travelers from this part of the state use TH 169 and Interstate 494 to get to Minnesota's largest airport.

As growth along and near the corridor occurs, airports are particularly concerned about access to their facilities from TH 169. Many of the connections to airports outside of the Twin Cities are on low-volume roadways that are substandard. As development occurs, these roadways often do not receive the upgrades needed to handle additional traffic. Efforts should be taken to evaluate the connection from the airport facility to TH 169 as growth occurs and as upgrades are made to the airport facilities.

2.7 Operations

Two of the three key operational issues on State Highway 169 are related to the weather. During the spring thaw, flooding has become a prominent issue due to detours and road closures. Blowing and drifting snow has been a long-standing issue in areas along the corridor in open areas. The third operational issue, delay caused by traffic signals, is a year-round issue.

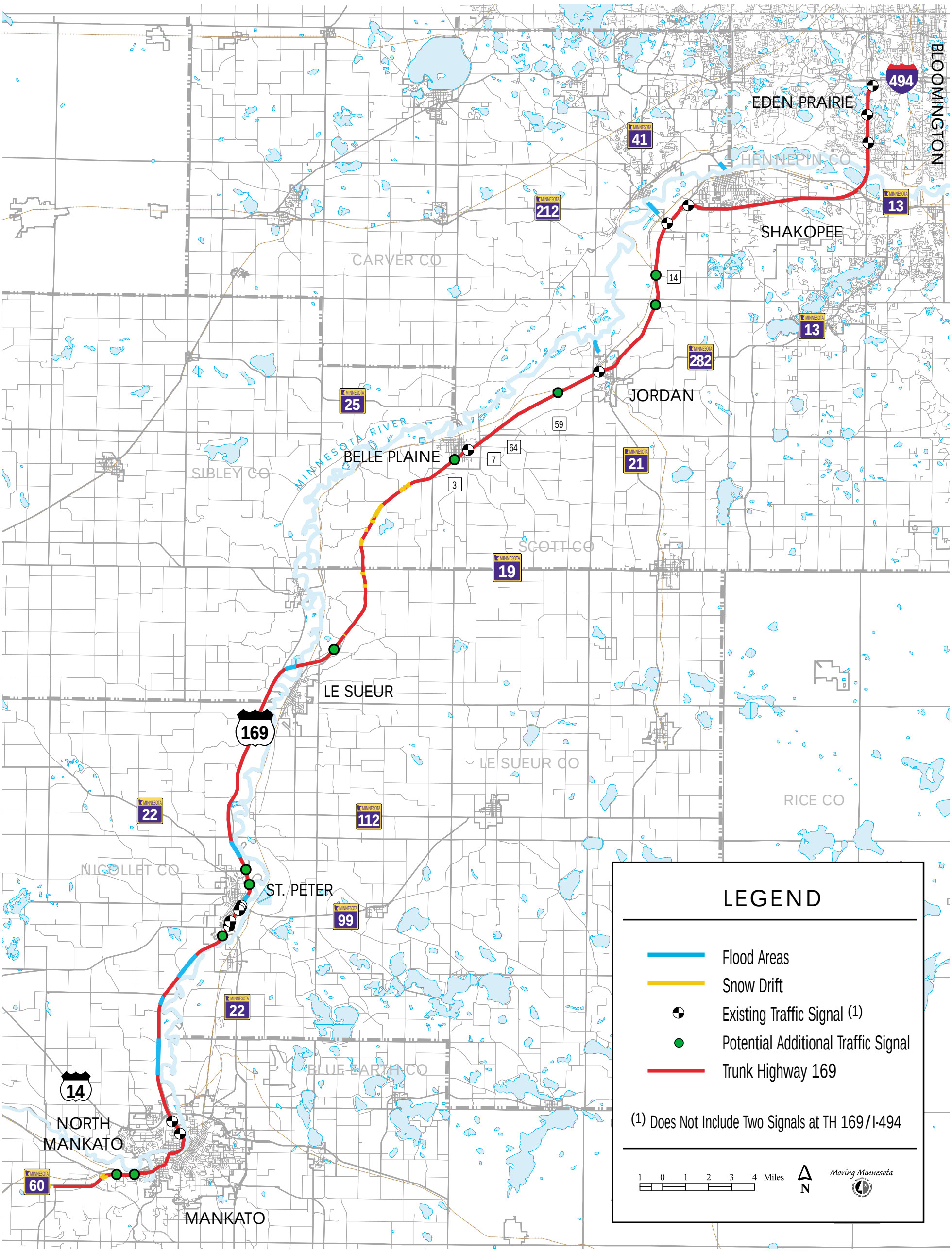
Flooding

Flooding has become a serious concern on TH 169 and on roadways that connect to it. Over the past five years, flooding has forced the closure of portions of TH 169 and adjacent roadways. The closure of TH 169 is an inconvenience for motorists that are forced to detour onto local roadways. In some instances, drivers are forced many miles out of their way. In addition to being an inconvenience for motorists, these detours can also have negative impacts to the integrity of local road networks that were not designed to carry high traffic volumes or significant numbers of heavy commercial vehicles.

Some traffic is forced to go 40-60 miles out of its way in order to find a crossing that is not flooded. In the spring of 2001, all of the river crossings in the northern half of the corridor except the Bloomington Ferry Bridge were closed due to flooding. Traffic had to either stay on TH 169 into the metro area or go south of Jordan to find another river crossing that was open. Figure 2-10 shows areas that flooded in the spring of 2001.

This will continue to be a major safety and congestion issue as additional growth occurs in these areas.

The other major flooding issue involves the Minnesota River bridge crossings. Many of the bridges, including TH 101, CSAH 9, TH 19, TH 99 and TH 22, all close when significant flooding occurs.



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Blowing and Drifting Snow

Blowing and drifting snow is another weather-related issue on State Highway 169. In some of the rural areas, which are very open, snow blows from one side of TH 169 to the other. This blowing and drifting can make it difficult for motorists to see the roadway, and can make the roadway slippery and/or cause the roadway to drift over or fill with snow. These conditions reduce performance and cause increased costs in terms of safety and/or maintenance. The Minnesota Department of Transportation has identified areas along the corridor where blowing and drifting occur. Figure 2-10 shows areas that are prone to blowing and drifting.

Traffic Signals

Most people do not like to stop for traffic signals. In addition to being an inconvenience for motorists on their way through the corridor, there are a number costs associated with these devices that are often overlooked. For large commercial vehicles, it generally costs upwards of $3.00 for every time they are forced to come to a complete stop (costs are calculated based on braking time, time stopped for waiting on the red light, time needed to accelerate up to full speed and drive time).[3] As traffic volumes increase on State Highway 169, there will be temptation to install additional traffic signals to address safety problems. As more traffic signals are installed, the greater the impacts will be to through vehicles and to the performance and efficiency of the TH 169 corridor. Figure 2-10shows areas where traffic signals are currently installed and where signals may be installed over the next 20 years if no improvements are made to TH 169.

2.8 Performance

Management of the Interregional Corridor (IRC) System is focused on protecting and enhancing the long-term economic vitality of the state and preserving connections between regional trade centers. Economic health and trade center connections are judged by the degree to which the corridor satisfies the mobility goals or targets, and the degree to which safety problems are mitigated. As a beginning point, it is necessary to know how the corridor is currently performing with respect to the IRC targets and how it is anticipated to perform based on traffic growth trends. This section of the report provides background information on IRC performance targets and explains existing and future performance in the corridor.

IRC Performance Targets

The *Interregional Corridor Plan* identified a system of key arterial routes that connected Minnesota's regional trade centers. The plan also identified two levels of Interregional Corridors, High Priority (HPI) and Medium Priority (MPI). Different minimum performance targets were established for these two levels. On HPI routes, typically freeways and high-level expressways, a minimum performance of 60 mph during the peak period was established. On MPI routes, typically expressways and two-lane arterials, a minimum performance of 55 mph

[3] For additional information, please refer to Mn/DOT's report, "Truck Priority at Traffic Signals," February 2002. Mn/DOT's OATS office has a copy of this report.

was established. For the State Highway 169 corridor, the area north of Highway 19 is designated as a HPI segment and the area south of Highway 19 is designated as a MPI segment.

The established targets were intended to provide an overarching goal for the roadway. The targets were not intended to make every segment within the corridor perform at the minimum target levels. Some segments of the corridor will perform below the targeted speed and other segments will perform above the minimum speeds; overall, however, the corridor should strive to achieve the minimum target levels.

Existing Performance – Process

Existing performance of the corridor was measured by conducting actual travel time runs using the floating car method [4]. In order to conduct the travel time runs, the corridor was divided into the three geographical areas described earlier: northern, central and southern (see Figure 4 on page 2-2 for boundaries). These areas were selected by significant changes in peak-hour volumes. Where peak-hour volumes approach roadway capacity, as in the northern end of the corridor (Jordan to Interstate 494), slower travel speeds and additional delays are anticipated. In areas like this, it is essential to conduct travel time runs during the peak period. Where volumes are well below roadway capacity, such as the central part of the corridor (Jordan to St. Peter), free-flow conditions exist and travel times are not influenced by the peak hour. As a result, travel runs for these areas can be collected during the peak or off-peak periods.

For the northern and southern areas of the corridor, four travel-time runs were conducted during the morning peak period and four travel-time runs were conducted and evening peak period. For the central area, eight travel-time runs were conducted throughout the day. Travel-time results from the central area confirmed the assumption that the travel times would be unaffected by time of day; no change in time was observed between runs during the peak hours and runs during off-peak hours.

Current Performance – Travel Speeds

After the travel runs were completed, average travel speeds were computed for each geographic area and corridor segment. Additionally, the data was aggregated to compute travel time for the High Priority half of the corridor (TH 19 to Interstate 494) and the Medium Priority half of the corridor (TH 19 to TH 60). The current performance is shown by segment, geographic area and corridor priority in Table 2-8.

The performance (speeds in mph) shown in Table 8 indicates that the overall corridor is performing at 61 mph. The High Priority section of the corridor (I-494 to Highway 19) is currently performing near the minimum performance target at 60 mph. Several segments near the junction of I-494 appear to be responsible for most of the poor performance in the northern portion of the corridor. There are also a few isolated segments near Highway 41 that have performance problems.

[4] Please refer to the IRC Corridor Management Plan Guide or the ITE Traffic Engineer's Manual for a description of the floating car method.

TABLE 2-8
CURRENT PERFORMANCE (TRAVEL TIME METHODOLOGY)

Segment	From	To	Current Performance (mph)[1]
A	I-494	Old Shakopee Road	37
B	Old Shakopee Road	TH 13	58
C	TH 13	CSAH 69	64
D	CSAH 69	TH 41	50
E	TH 41	CSAH 14	56
F	CSAH 14	North Jordan Limits	67
G	North Jordan Limits	TH 282	53
A-G	**Northern Sub-Corridor Totals**		**55**
H	TH 282	South Jordan Limits	55
I	South Jordan Limits	CSAH 6/64	70
J	CSAH 6/64	TH 25	60
K1	TH 25	South Belle Plaine Limits	61
K2	South Belle Plaine Limits	TH 19	70
A-K2	**High Priority Sub-Corridor Totals**		**60**
L	TH 19	CR 28	70
M	CR 28	TR 197	70
N	TR 197	MN River Crossing – Le Sueur	68
O	MN River Crossing – Le Sueur	TH 22	69
H-O	**Central Sub-Corridor Totals**		**69**
P	TH 22	Union Street	58
Q	Union Street	TH 295	34
R	TH 295	North Limits Mankato	68
S	North Limits Mankato	TH 14	57
T	TH 14	Belgrade Ave	46
U	Belgrade Ave	MN River Crossing – Mankato	55
V	MN River Crossing – Mankato	Blue Earth River	56
W	Blue Earth River	TH 68	62
X	TH 68	CSAH 90	67
Y	CSAH 90	TH 60	69
P-Y	**Southern Sub-Corridor Totals**		**58**
L-Y	**Medium Priority Sub-Corridor Totals**		**63**
A-Y	**Entire Corridor**		**61**

[1] All speeds rounded to nearest mph.

The southern portion of the corridor, currently performing at 63 mph, performs well above the minimum targets for its Medium Priority designation. However, there are some segments near Mankato and the City of St. Peter where performance falls below the minimum targets. In these areas, the lower performance is at least partially explained by posted speed limits at or below 50 mph. Posted travel speeds through the City of St. Peter drops to 30 mph.

Future Performance – Process

Understanding how the corridor is currently performing and how it is anticipated to perform in the future is necessary to develop recommendations for corridor improvements. The IRC Planning Guide defined a methodology for determining future corridor performance. This methodology is based on posted speed limits, number of signalized intersections, and level of congestion. To properly estimate the future performance for State Highway 169 the following three steps were taken: projecting future traffic volumes and congestion levels, estimating the number and location for additional signals, and assessing any likely changes in posted speed limits.

1. Future Volume Projections

   Because State Highway 169 serves both local and statewide travel sheds, future traffic volumes are directly related to future land use and growth trends along the corridor, as well as larger regional and statewide growth trends. The specific demographic and land use trends were discussed in sections 2.1 and 2.2 of this report. These trends were further evaluated and used to supplement other information. The methodology for establishing future volumes for 2025 was as follows.

   Historic volume changes by segment were tabulated and trend lines were developed for every segment. In the seven-county metropolitan area (where the TRANPLAN regional model is available), these trends were compared to volume projects identified in recently completed comprehensive plans (Hennepin County, City of Bloomington, City of Eden Prairie, Scott County, City of Shakopee, City of Jordan, and City of Belle Plaine). Because the regional model is a better tool in areas with significant growth, future volumes from comprehensive plans were used and projections based on historic trends were used as checks.

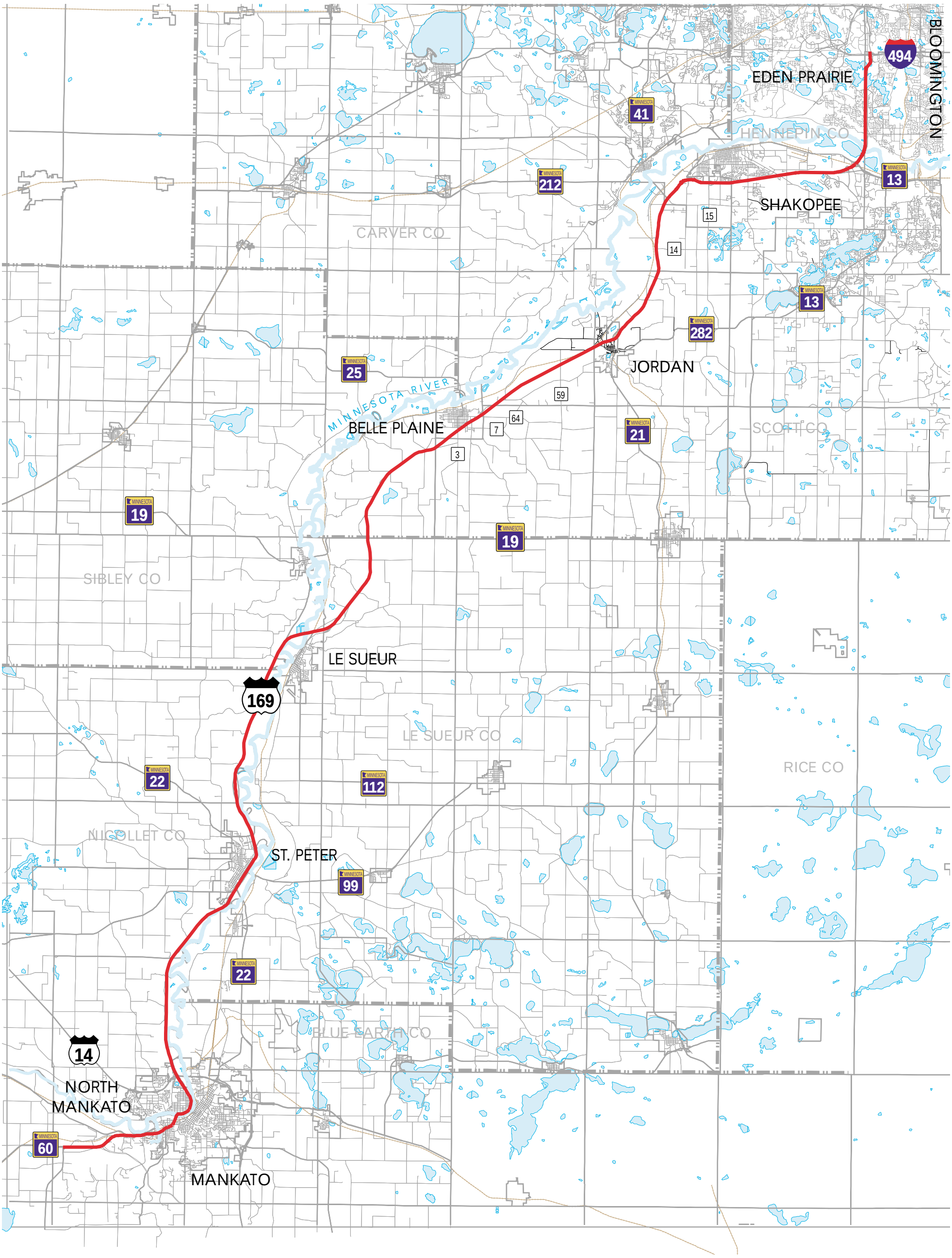
   Outside the seven-county metropolitan area, historic trends were used to estimate future volumes. These trends were then compared to more detailed studies, if they were available (i.e., TH 169 Intersection Study). Table 2-9 lists existing and future volumes for each segment. Figure 2-11 shows existing and future traffic volumes.

   Once future traffic volumes were calculated and agreed to by the Technical Advisory Committee, an analysis was done to determine the amount of congestion on a segment-by-segment basis. The level of congestion was then used to determine if a delay penalty should to be added to future estimated travel times. A complete description of the future performance calculation methodology for estimating delay due to congestion can be found in Appendix H.

TABLE 2-9
EXISTING AND FUTURE TRAFFIC VOLUMES

Segment	From	To	Existing Volumes (2000)	Future Volumes (2025)[1]
A	I-494	Old Shakopee Road	**56,000**	**110,00**
B	Old Shakopee Road	TH 13	54,000	**83,500**
C	TH 13	CSAH 69	33,000	**64,000**
D	CSAH 69	TH 41	**34,000**	**58,000**
E	TH 41	CSAH 14	27,500	**46,400**
F	CSAH 14	North Jordan Limits	25,500	**39,400**
G	North Jordan Limits	TH 282	25,000	**37,100**
H	TH 282	South Jordan Limits	18,400	**33,000**
I	South Jordan Limits	CSAH 6/64	18,400	**33,000**
J	CSAH 6/64	TH 25	18,400	25,500
K1	TH 25	South Belle Plaine Limits	13,600	23,200
K2	South Belle Plaine Limits	TH 19	12,700	20,400
L	TH 19	CR 28	12,700	20,400
M	CR 28	TR 197	12,700	20,400
N	TR 197	MN River Crossing – Le Sueur	12,700	20,400
O	MN River Crossing – Le Sueur	TH 22	13,700	20,400
P	TH 22	Union Street	14,800	22,700
Q	Union Street	TH 295	13,000	22,700
R	TH 295	North Limits Mankato	12,600	15,800
S	North Limits Mankato	TH 14	12,600	15,800
T	TH 14	Belgrade Ave	23,000	**35,000**
U	Belgrade Ave	MN River Crossing – Mankato	23,000	**35,000**
V	MN River Crossing – Mankato	Blue Earth River	21,800	**32,000**
W	Blue Earth River	TH 68	18,800	26,000
X	TH 68	CSAH 90	13,500	18,000
Y	CSAH 90	TH 60	13,500	16,000

[1] Based on year 2000 comprehension plans, and on historic traffic growth projection.
[2] **Bold** type represents areas with volumes over capacity thresholds based on current roadway type.



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2. Identifying Future Traffic Signal Locations

The number of traffic signals on State Highway 169 directly impacts the capacity of the corridor and the amount of delay experienced by motorists. While the number and location of existing signals are known and can be accounted for, the number of and location of future signals are not.

Common sense suggests that as mainline traffic volumes increase and side street volumes increase there will be a need for a traffic signal; however, some process needs to be followed so that a consistent application and threshold is applied throughout the corridor. With guidance from *Interregional Corridors: A Guide for Plan Development and Corridor Management*, the following process was used to identify the number of potential additional traffic signals within the next 20 years:

- An assessment was made of current and future mainline volume levels and how these volume levels related to the signal justification threshold levels for their specific facility type.
- An assessment was made of the seasonal volume fluctuations and how this fluctuation might justify intersections just below the threshold levels identified above.
- The proximity of cross streets to identified growth areas and/or ability of area to stay rural was assessed.
- The functional classification of cross streets was assessed to determine the influence area or size of travel shed.
- An assessment of the current and future cross street volume was made based on historic trends, similar facilities and/or future land use changes.
- An assessment was made of past/present development pressures within close proximity of key intersections.

Intersections along TH 169 were reviewed based on the above criteria. Based on this review, ten additional signalized intersections where identified. These locations were then input into the performance analysis matrix and used to help determine future performance along the corridor. Table 2-10 shows intersections were future traffic signals are assumed. A complete description of the future performance calculation methodology for estimating delay due to congestion can be found in Appendix H.

TABLE 2-10
FUTURE TRAFFIC SIGNAL LOCATIONS

Segment	Ref Point	Cross Street	Existing Cross Street Characteristics	Existing Volumes (*)		Future Volumes		Future Cross Street Characteristics	
			Traffic Control	Cross Street (ADT)	Mainline (ADT)	Cross Street (ADT)	Mainline (ADT)	Functional Class	Notes
A	122+00.172	I-494 WESTBOUND RAMPS	signalized		56,000	N/A	110,000	Principal Arterial	(1)
A	122+00.156	I-494 EASTBOUND RAMPS	signalized		56,000	N/A	110,000	Principal Arterial	(1)
A	121+00.580	78TH ST W WB LT M-5, HIGHWOOD DR WB MSAS-424 RT	signalized	7,000	56,000	N/A	110,000	Major Collector	(1)
A	120+00.129	ANDERSON LAKES PKWY EB LT, BLOOM FERRY RD EB RT	signalized	15,000	56,000	N/A	110,000	B Minor Arterial	(2)
A	118+00.682	PIONEER TR EB X-ING CSAH-1 LT,MSAS 428 RT	signalized	10,400	56,000	N/A	110,000	A Minor	(3)
D	107+00.724	CSAH-69 NB LT,CR-69 NB RT	signalized	8,800	33,000	15,000	58,000	A Minor/Collector	(4)
D	106+00.452	JCT MNTH-41,S URB BDRY METRO AREA CR-78 RT	signalized	18,900	33,000	33,000	58,000	B Minor Arterial	(5)
E	104+00.097	SMITH DR LT T-174,150TH ST W RT CSAH-14	**	1,200	26,500	3,000	46,400	B Minor Arterial	(6)
F	102+00.784	BLUFF DR X-ING T-111	**	700	25,500	3,000	39,400	Local	(7)
H	098+00.687	JCT MNTH-282 CSAH-9 LT	signalized	5,700	20,000	14,500	29,000	A Minor Arterial	(8)
I	096+00.681	CR 59	***	840	18,400	2,500	33,000	Collector	(9)
I	092+00.321	E MAIN ST LT CSAH-6,225TH ST W RT CR-64	@	4,700	18,400	7,000	33,000	Collector	(10)
J	091+00.907	LAREDO AV CSAH-5 X-ING	signalized	1,650	18,400	2,500	25,500	Collector	(11)
J	091+00.177	JCT MNTH-25 CSAH-3 RT	**	2,300	18,400	6,000	25,500	B Minor Arterial	(12)
K1, K2	084+00.302	JCT MNTH-19,LE SUEUR-SCOTT CO LINE	@	2,200	12,700	4,000	22,000	B Minor Arterial	(13)
N	080+00.239	T-197 LT	***	1,000	12,900	3,000	20,000	Collector	(14)
O	077+00.586	N JCT MNTH-93		1,650	12,900		20,400		
O, P	068+00.170	N JCT MNTH-22,DODD RD	**	1,600	12,900	4,500	21,500	Minor Arterial	(15)
P	067+00.509	W ST JULIEN ST LT MSAS-109	**	2,500	14,800	3,500	22,000	Collector	(16)
Q	066+00.706	W SKARO ST X-ING MSAS-123 LT, M-31 RT			13,000		22,700		
Q	066+00.426	N JCT MNTH-99,W BROADWAY AVE	signalized	5,300	13,000	6,500	22,000	Collector	(17)
Q	066+00.285	W NASSAU ST X-ING M-41	signalized	2,400	13,000	3,000	22,000	Local	(18)
Q	066+00.148	W MULBERRY ST X-ING M-45	signalized	1,400	13,000	2,000	22,000	Local	(19)
Q	065+00.574	W JEFFERSON ST MSAS-101 XING	signalized	1,750	13,000	2,500	22,000	Collector	(20)
Q	065+00.437	S JCT MNTH-22	**	8,200	15,000	12,000	22,000	Minor Arterial	(21)
	065+00.291	S JCT MNTH-99			13,000		22,700		(18)
R	056+00.025	N LIM MANKATO HAPPY CHEF XOVER			11,400		15,800		(18)
T	055+00.397	W LIND ST X-ING M-427	signalized	2,500	23,000	3,000	35,000	Minor Collector	(22)
T	054+00.844	WEBSTER AVE M-1 XING	signalized	4,100	23,000	4,500	35,000	Minor Collector	(23)
U, V, W	051+00.928	HAWLEY ST CSAH-69 RT T-489 LT		1,350	23,000		35,000		(18)
W	051+00.414	CSAH-33 RT	**	2,700	18,800	4,400	26,000	Minor Arterial	(24)
W, X	050+00.658	JCT MNTH-68 W URB BDRY MANKATO CSAH-69 RT	**	2,500	13,500	4,300	24,000	Principal Arterial	(25)

(*) Current volumes were taken from most recent count available (1998 - 2000) and factored to the year 2000. Where no counts were available, volumes were estimated.

** = Potential Signal *** = Potential Signal (Borderline) @ = Planned Interchange (STIP)

(1) Included in proposed I-494 interchange project. Located within the urbanized area of TH 169 corridor.

(2) Interchange planned for 2005 - 2006. Located within urbanized area.

(3) Interchange planned for 2005 - 2006. Located within urbanized area. Some additional development pressure on west side of TH 169.

(4) High development pressure present. Located within urbanizing area. Annexation discussions occuring.

(5) Included in urbanizing area of corridor. High development pressure present. TH 41 is a major river crossing link.

(6) Additional industrial and residential growth. (Developments have been proposed.)

(7) Additional industrial and residential growth. (Developments have been proposed.)

(8) Development pressure due to proximity to Jordan. Located within Jordan growth area.

(9) Assumed as future signal under Base Scenario. Long term vision assumes future interchange. Development pressure due to proximity between Jordan and Belle Plaine.

(10) Additional residential and commercial/industrial growth in Belle Plaine.

(11) Closest access to future residential and new school site.

(12) TH 25 overpass/interchange? City of Belle Plaine growth area.

(13) Major east-west cross-county route.

(14) New industrial/residential Le Sueur Area

(15) New St. Peter growth area (Industrial/Commercial and Residential). Some development pressure exists as St. Peter develops to the west and north.

(16) High cross-street volume within the City of St. Peter, increasing as the City continues to develop.

(17) Development pressure present due to river crossing. Located within the City of St. Peter. As City develops, traffic will continue to increase.

(18) Located within the City of St. Peter. Currently signalized intersection, as City develops, development pressures continue.

(19) Currently a signalized intersection within the City of St. Peter. As development continues on the western edge of City, development pressure will continue.

(20) Increasing traffic to Mankato Commercial area. Signal installed in fall of 2001.

(21) Increasing traffic to Mankato Commercial area

(22) Existing signals to be removed. Due to location within Mankato, development pressure present.

(23) Existing signals to be removed. Due to location within Mankato, development pressure present.

(24) Potential future signal due to development pressure.

(25) Industrial growth exists. Potential future signal.

3. Potential Speed Limit Changes

Another factor that needs to be considered when calculating future performance is posted speed limits. The posted speed limit on State Highway 169 varies from 30 mph in the City of St. Peter to 65 mph in the freeway segments and in the rural expressway segments of the corridor. Any improvements to the corridor need to take into consideration the impact that they could have on potential speeds. For instance, the Minnesota Department of Transportation is planning to install interchanges at Anderson Lakes Parkway and Pioneer Trail in the years 2006 and 2007. Installing these interchanges will convert this section of TH 169 to a freeway and the posted speed limit is likely to increase from 55 to 65 mph for this area. All improvements were evaluated for their ability to improve performance. In areas where no improvements were contemplated, posted speed limit changes were not made. In areas that had significant upgrades to TH 169, (i.e., conversion to a freeway) received adjustments of future speeds to 65 mph. Scenarios that included an in-town bypass of St. Peter had future speeds adjusted to 45.

In order to develop confidence in projecting future performance levels, the IRC performance methodology was used to predict current performance. A comparison was made between the current measured performance (travel time runs) and current predicted performance levels as calculated by the IRC methodology. The comparison shows that for most individual segments, and on an overall corridor basis, the IRC methodology was within three miles per hour of the measured performance. These results provide credibility for future performance predictions based on different improvement and management assumptions. Table 2-11 compares actual travel times to predicted travel times.

Future Performance – Travel Speeds

Once a template was developed for incorporating future traffic volumes, congestion, additional traffic signals and facility type, several scenarios were run to see how the corridor could operate in the future. The following section explains the base future performance that was calculated for State Highway 169.

The base-future performance was calculated in order to understand how the corridor would function in the future if no improvements were made. Having this baseline data enabled the Technical and Policy Advisory Committees to make comparisons between the future improvement scenarios discussed in the following section. It also provided Committee members with an understanding of what segments of the corridor were particularly troublesome.

The base-future performance assumed no major capital improvements are constructed, and there are no significant changes in land use and access management. To analyze this alternative, 2025 traffic volumes were input for all segments and ten additional signals were assumed at the locations identified in the signal analysis previously outlined. The results of the analysis indicate that performance in the High Priority area (TH 19 to Interstate 494) will decline from 60 mph to 49 mph, and performance in the Medium Priority area (TH 19 to TH 60) will decline from 63 mph to 56 mph.

TABLE 2-11
CURRENT PERFORMANCE COMPARISON

Segment	From	To	Actual Performance (mph)[1]	Performance–IRC Methodology (mph)[1]
A	I-494	Old Shakopee Road	37	28
B	Old Shakopee Road	TH 13	58	58
C	TH 13	CSAH 69	64	67
D	CSAH 69	TH 41	50	43
E	TH 41	CSAH 14	56	55
F	CSAH 14	North Jordan Limits	67	68
G	North Jordan Limits	TH 282	53	57
A-G	**Northern Sub-Corridor Totals**		**55**	**52**
H	TH 282	South Jordan Limits	55	46
I	South Jordan Limits	CSAH 6/64	70	68
J	CSAH 6/64	TH 25	60	48
K1	TH 25	South Belle Plaine Limits	61	68
K2	South Belle Plaine Limits	TH 19	70	68
A-K2[2]	**High Priority Sub-Corridor Totals**		**60**	**56**
L	TH 19	CR 28	70	68
M	CR 28	TR 197	70	68
N	TR 197	MN River Crossing – Le Sueur	68	68
O	MN River Crossing – Le Sueur	TH 22	69	68
H-O	**Central Sub-Corridor Totals**		**69**	**67**
P	TH 22	Union Street	58	53
Q	Union Street	TH 295	34	26
R	TH 295	North Limits Mankato	68	68
S	North Limits Mankato	TH 14	57	53
T	TH 14	Belgrade Ave	46	44
U	Belgrade Ave	MN River Crossing – Mankato	55	53
V	MN River Crossing – Mankato	Blue Earth River	56	53
W	Blue Earth River	TH 68	62	68
X	TH 68	CSAH 90	67	68
Y	CSAH 90	TH 60	69	68
P-Y	**Southern Sub-Corridor Totals**		**58**	**55**
L-Y[3]	**Medium Priority Sub-Corridor Totals**		**63**	**60**
A-Y	**Entire Corridor**		**61**	**58**

(1) All speeds rounded to nearest mph.
(2) High Priority minimum target 60 mph (segments A-K2)
(3) Medium Priority minimum target 55 mph (segments L-Y)

The reduction in performance in the northern portion of the corridor is probably underestimated because of the extreme capacity problems in segments A and B. Because the two segments are already at the maximum congestion adjustment, additional delays due to increases in traffic volumes are not reflected in the final speed. Other causes for the performance decline in the northern half of the corridor include additional signalized intersections south of State Highway 41 and near Belle Plaine. The performance decline in the Medium Priority area is mostly due to additional traffic signals around the City of St. Peter and in the Mankato area. While the decline in performance in this area is significant, it is predicted to perform above the minimum target levels.

3.0 IDENTIFICATION, EVALUATION AND SELECTION OF ALTERNATIVES

Once the existing and future conditions of the corridor were determined, potential solutions were identified. The process of developing potential solutions began with the Technical and Policy Advisory Committees identifying how they expected State Highway 169 to perform in the future given the growth and the constraints in the corridor. Their expectations were set forth in the corridor vision. This section of the report identifies the corridor vision outlined by the Technical and Policy Advisory Committees. It also describes six different improvement scenarios and how they relate to achieving the goals outlined in the corridor vision. Additionally, this section of the report identifies the types of capital improvements, other interim improvements and policy improvements needed to fully realize the corridor vision.

Section 3 of the report is broken into the following subsections:

3.1 Corridor Vision

3.2 Future Improvement Performance Scenarios – Identification and Evaluation

3.3 Proposed Improvements

3.1 Corridor Vision

The *Interregional Corridor Plan* set minimum performance targets for both Medium and High Priority Interregional Corridors. The follow-up study to the *Interregional Corridor Plan, Interregional Corridors: A Guide for Corridor Plan Development and Management* recognized that no two corridors would be the same regardless of the minimum performance targets that were set. Instead, the Guide entrusts the Corridor Partners to make a recommendation for long-term corridor performance based on individual corridor studies.

The corridor vision for TH 169 identifies how the Partners want the corridor to perform on a long-term basis given the level of current performance, how performance may change over time, the physical context of the corridor, and community and agency input. Based on a review of these characteristics, the State Highway 169 Corridor Partners established 65 mph performance-based vision for the corridor. While a speed of 65 mph does not have to be achieved in every segment of the corridor, the Partners want to meet this goal on the aggregate over the entire corridor.

The 65 mph vision is five miles per hour higher than the minimum target established by Mn/DOT for High Priority Interregional Corridors and 10 miles per hour higher than the target for Medium Priority Interregional Corridors. The rationale for establishing the higher performance target is as follows:

- Currently, the corridor performs at 61 mph, which is close to the identified vision. One of the issues that received significant discussion during the development of the IRC performance targets was the issue of non-degradation. There was strong support to minimize any loss of performance and enhance performance if significant deficiencies exist. The vision established by the TH 169 Corridor Partners is consistent with this philosophy.

- Performance can only be estimated based on projected volumes through 2025. Because of the level of growth in the Scott County area, and the desire to establish a vision that will function beyond 2025, the Corridor Partners feel that the higher performance target provides leeway to address future growth levels.

Because of TH 169's proximity to the Minnesota River Valley and the number of communities that it passes through, implementation of the vision will require improvements to be sensitive to environmental and community values, as well as the visual quality of the Minnesota River Valley and bluff areas. A copy of the vision statement for State Highway 169 can be found at the beginning of the report.

3.2 Future Improvement Performance Scenarios

Six future improvement scenarios were developed and analyzed for State Highway 169. The scenarios were tested using the methodology outlined in Section 2.8 and Appendix H. The scenarios included only major capital improvements that were considered to a have a measurable impact on performance. Other interim improvements and/or policies, such as those that are needed to address safety, land use and access concerns, are addressed later in this section of the report.

As mentioned above, major improvements included in the six scenarios were capital investments that have a measurable impact on facility performance. For example, each freestanding traffic signal theoretically reduces the capacity of a four-lane free-flowing facility by one half. Removing these signals or preventing their installation will increase capacity and reduce mainline delays. Other types of improvements that have a significant impact on performance include the following:

- Adding travel lanes to the mainline in areas where there is severe congestion
- Constructing parallel facilities to reduce mainline demand
- Constructing frontage and/or backage roadways to serve local trips and reduce mainline demand.
- Constructing interchanges or overpasses to reduce the number of mainline and side street stops.
- Constructing bypasses in urban areas where it is impossible to consolidate or significantly reduce access to the mainline.
- Changes in posted speed limits to correspond to facility type (i.e., increasing posted speeds in areas that transition to a freeway and in areas where traffic signals are removed).

Because one of the IRC guiding principles is to promote the use of existing facilities, limited consideration was given to moving State Highway 169 to a new corridor alignment. The only area where a major realignment was considered was in the City of St. Peter due to the City's desire to bypass their downtown core. For more information on IRC guiding principles, please refer to Appendix A.

Major capital investments and/or improvements for transit facilities were not included in the analysis for the six scenarios. Transit investments, such as commuter rail, light rail and/or busways, were not included in the TH 169 analysis because these types of investments were not identified in any state, regional or local plans, nor were they identified by any agency and/or the public as being a feasible solution to the identified problems. In addition, these types of improvements generally have a minor influence on diversion of trips from the mainline. They are also not likely to significantly reduce the peak hour demand. Although transit improvements were not included in the future performance scenarios, recommendations for park-and-pool investments are made later in the report.

Performance Scenarios

The major improvement scenarios that were identified and analyzed are described below along with the performance results. A summary of the results for the six scenarios is shown in Table 3-1.

1. Scenario 1 – No Additional Signals

This scenario maintains the existing 14 traffic signals along TH 169, but does not provide for any additional signals. This alternative is not considered a realistic scenario because growth pressures (traffic demands) will force changes to occur. However, the scenario was tested to show the impact, in terms of performance, of ten additional signals. This scenario produced an average speed of 51 mph in the High Priority area and an average speed of 58 mph in the remainder of the corridor (Medium Priority). This scenario was used as the base scenario for developing the benefit-cost analysis.

2. Scenario 2 – Northern Freeway

This scenario assumes that the northern portion of the corridor would transition to a free-flowing design. Interchanges or grade-separated access along the corridor would be provided from I-494 through the City of Belle Plaine. In addition, this scenario includes the removal of both traffic signals within the Cities of Mankato and North Mankato (Lind and Webster). The removal of the signals in the Mankato is consistent with the MATAPs plan that was developed in 1997. The addition of interchanges and grade-separated access north of Belle Plaine would result in the eventual closing of all other access points in this area. A series of frontage roads would provide replacement access and/or parcels would be purchased if alternate access were not feasible.

Under this scenario, it is anticipated that the High Priority area will perform at 63 mph, and the Medium Priority area will perform at 57 mph. This scenario would meet the minimum targets established by Mn/DOT. Overall corridor performance under this scenario is 60 mph.

TABLE 3-1
PERFORMANCE SUMMARY

Segment	Prediction of Existing	Current Performance (mph)	Base Future Performance[1] (mph)	Future Performance Scenarios					
				Scenario 1: No Additional Signals[2] (mph)	Scenario 2: Northern Freeway[3] (mph)	Scenario 3: In-town bypass (St. Peter)[4] (mph)	Scenario 4: Out-of-town bypass (St. Peter)[5] (mph)	Scenario 5: Mankato Freeway[6] (mph)	Scenario 6: Freeway to Jordan [7] (mph)
A-G	51.6	55.3	43.3	44.6	60.1	60.1	60.1	44.7	58.7
H-O	66.7	68.8	63.9	66.3	67.1	67.4	67.4	64.2	63.9
P-Y	54.7	58.2	49.2	51.6	51.4	60.2	64.5	60.2	51.4
High Priority	56.3	59.8	49.1	50.8	63.0	63.0	63.0	50.2	59.8
Medium Priority	59.9	62.6	55.5	57.7	57.1	63.0	65.5	63.0	57.1
Total Corridor	58.0	61.2	52.1	54.1	59.9	63.0	64.3	55.9	58.4

Notes:

[1] No improvements beyond 3-yr STIP and ten new signals in corridor (total signals = 24)

[2] No additional improvements beyond 10-yr work study plan and no additional signals in corridor (total signals = 14)

[3] Freeway to Belle Plaine; remove Mankato signals (construct interchange), assume two additional signals in St. Peter (total signals = 8)

[4] Freeway to Belle Plaine; remove Mankato signals (construct interchange); in-town bypass through St. Peter (total signals = 2)

[5] Freeway to Belle Plaine; remove Mankato signals (construct interchange); St. Peter out-of-town bypass (1 signal)

[6] Interchanges at Anderson Lakes and Pioneer Trail, in-town bypass (St. Peter), freeway through Mankato (total signals = 12)

[7] Freeway to Jordan; remove Mankato signals (construct interchange), assume two additional signals in St. Peter and three additional signals in the northern portion of the corridor (total signals =13)

3. Scenario 3 – In-Town Bypass (St. Peter)

This alternative incorporates the improvements outlined in Scenario 2 (northern freeway and removal of signals in Mankato) as well as an in-town bypass of the City of St. Peter. The in-town bypass reduces the number of potential traffic signals in St. Peter from seven to one. The only traffic signal remaining after the bypass is constructed is the signal at TH 99. Similar to Scenario 2, Scenario 3 results in access closures in areas that are transitioning to a freeway-type facility.

Under this scenario, both the High and Medium Priority areas are anticipated to perform at 63 mph. Overall corridor performance is also expected to be 63 mph.

4. Scenario 4 – Out-of-Town Bypass (St. Peter)

This option incorporates the improvements outlined in Scenario 2 (northern freeway and removal of traffic signals in Mankato), as well as an out-of-town bypass in the City of St. Peter. The out-of-town bypass of St. Peter removes all traffic signals from TH 169. Similar to Scenario 3, Scenario 4 results in access closures in areas that are transitioning to a freeway-type facility.

Under this scenario, the High Priority portion of TH 169 is anticipated to average 63 mph, while the Medium Priority area would average 66 mph. Overall corridor performance is 64 mph. This scenario is close to the target identified by the Corridor Partners.

5. Scenario 5 – Mankato Freeway

This scenario assumes most of the major capital improvements are focused on the southern end of the corridor. Improvements currently programmed for Anderson Lakes Parkway and Pioneer Trail were included for the northern half of the corridor. The improvements under this scenario for the southern half of the corridor include an in-town bypass through St. Peter and a freeway design through Mankato. This scenario leaves 11 traffic signals in the corridor.

Scenario 5 results in an average speed of 50 mph in the High Priority area, while the Medium Priority area is anticipated to have an average speed of 63 mph. Overall corridor performance falls to 56 mph.

6. Scenario 6 – Freeway to Jordan

Scenario 6 is similar to Scenario 2; however, the freeway portion would run only from Interstate 494 to the north side of Jordan. It assumes that the existing traffic signal in Jordan (TH 282) will remain in place, as well as the signal in Belle Plaine. The southern portion of this scenario is the same as Scenario 2 (removal of traffic signals in Mankato).

Under Scenario 6, the High Priority half of TH 169 is anticipated to average 60 mph, while the Medium Priority segment averages 57 mph. Overall corridor performance under this scenario is 58 mph.

Identifying the performance levels of different improvement scenarios assisted the Corridor Partners in determining the types of investments needed to reach minimum performance targets and to achieve the corridor vision. As indicated from the results of the technical analysis, all of the scenarios enable the southern half of the corridor to achieve the minimum performance target of 55 mph, and Scenarios 3, 4 and 6 enable the northern half of the corridor achieve the minimum performance target of 60 mph. None of the scenarios, however, meet the corridor vision of 65 mph. Scenarios 3 and 4 provide the highest overall corridor performance at 63 mph and 64 mph.

After reviewing the results of the future performance scenarios, the Technical and Policy Advisory Committees recommended that the improvements for TH 169 should include the major capital projects identified in Scenario 3 or 4. Although neither of these scenarios achieved the corridor vision of 65 mph, Scenarios 3 and 4 slightly exceed the current performance level of the corridor consistent with the non-degradation goal, improve safety by reducing at-grade conflicts, and bring the corridor within one or two miles per hour of the corridor vision.

3.3 Proposed Improvements

This section of the report outlines the strategies and actions needed to ensure that the corridor can meet the long-term performance envisioned by Corridor Partners. These strategies include the development of major capital projects that will address significant capacity deficiencies and/or bottlenecks, other less-costly improvements that address specific safety and/or operational issues, and policy-type directives that proactively promote development of the corridor vision through local ordinances and access guidelines. These strategies are shown below.

CORRIDOR VISION

Major Projects

- Interchanges/Overpasses
- Additional Lanes
- Bypasses

Other Improvements

- Edgeline Rumble Strips
- Spot Improvements (intersections)
- Turn Lanes
- Flooding/Drifting Snow Improvements
- Pedestrian/Bicycle Crossings
- Park-and-Pool

Land Use and Access Policies and Ordinances

- Existing Land Use
- Future Land Use
- Existing Access
- Future Access

The three main strategies identified above are considered essential to accomplishing the long-term corridor vision. However, certain elements of these strategies will play a larger role in one area of the corridor versus another depending on the identified issues, constraints and goals. To better communicate the roles each of these elements in the different corridor segments, a framework was developed that generalized the types of improvements needed for specific geographic areas of the corridor.

Framework for Corridor Strategies

A framework was established to enable Corridor Partners to select the appropriate improvements to enhance safety and performance on TH 169. Based on this objective, the framework shown in Table 3-2 was established.

TABLE 3-2
TH 169 IMPROVEMENT FRAMEWORK

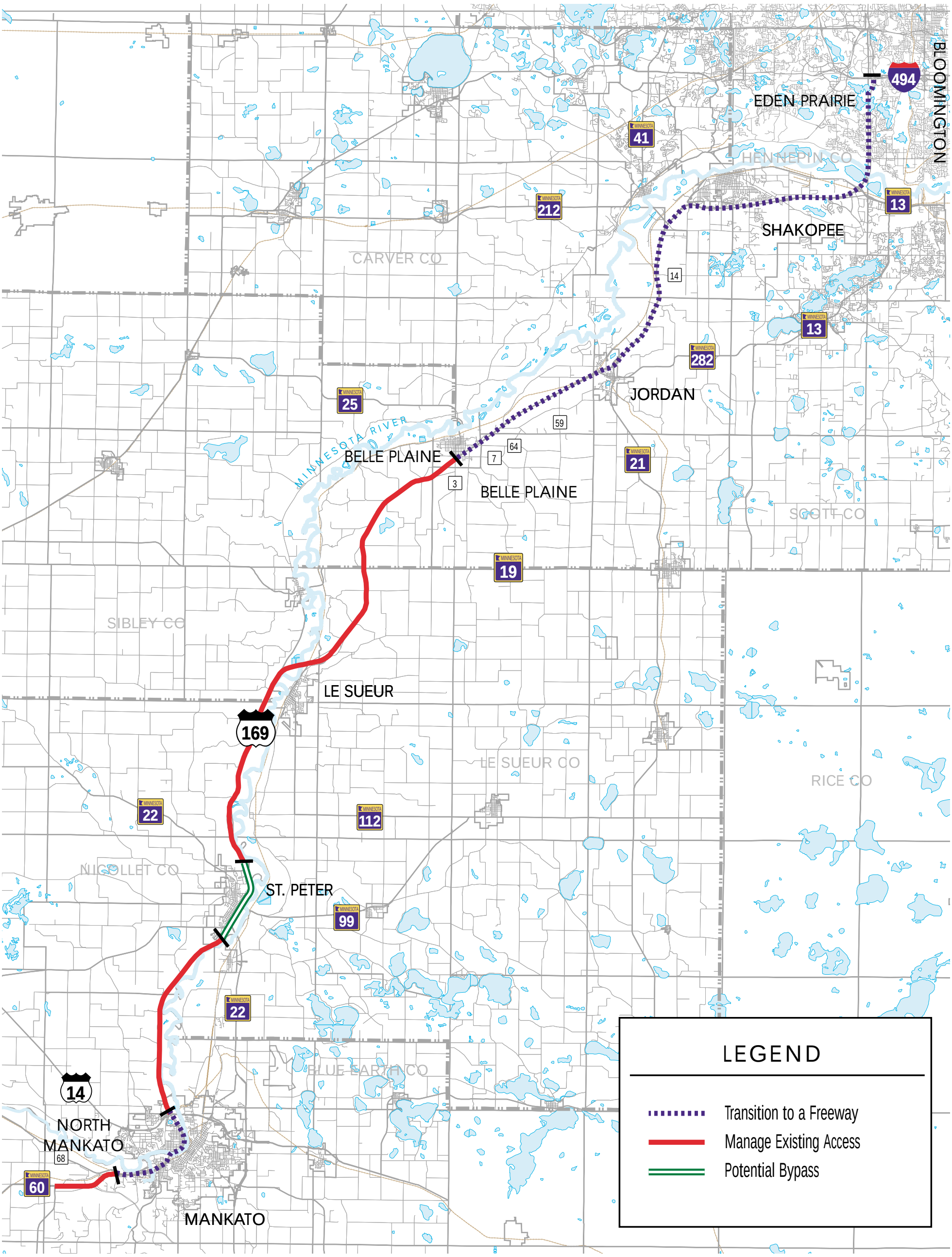
Area	Transition to a Freeway	Manage Existing Access	Potential Bypass
Interstate 494 to Belle Plaine	**X**		
Belle Plaine to St. Peter		**X**	
St. Peter			**X**
St. Peter to Just North of TH 14		**X**	
TH 14 through Mankato/North Mankato TH 68	**X**		
TH 68 to TH 60		**X**	

Figure 3-1 shows the areas and their corresponding strategy. Each of the strategies are described in more detail below:

1. <u>Transition to a Freeway-type Facility</u>

It is recommended that rural expressway areas transition to controlled-access freeway type facilities where volumes approach capacity levels of the rural expressway, the risk for additional traffic signals is high, and/or transition to controlled-access would present a safer and more consistent design type in comparison with adjacent sections of the corridor. Transition areas include I-494 to Belle Plaine and one-half mile north of TH 14 in Mankato to TH 68 through Mankato.

To facilitate this transition, it is recommended that Mn/DOT reclassify these areas to a 1AF (minimum of one-mile spacing with grade-separated access) access category. In addition, it is recommended that local, regional and state agencies manage land use and access along the corridor in accordance with the recommended Land Use and Access Management Strategies outlined later in this report.



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Areas of the corridor that transition to a freeway-type facility will require the following types of improvements:

- Major capital projects
- Other projects to address safety issues or performance issues prior to the development of major capital projects
- Closure of all at-grade access locations
- Development of appropriate land uses and spacing near interchange locations

2. Manage Existing Access

In rural areas where volumes are not expected to approach capacity and side street demand is low, it is recommended that the rural expressway and access characteristics be managed in accordance with the Land Use and Access Management Strategies identified in this report. This strategy assumes that the rural nature of the corridor will continue long into the future. The basic thrust of this strategy is to allow current access to remain as long as it does not become a safety problem, and to and minimize changes and/or additional access points in these areas. In a few instances, where development is planned, i.e., Le Sueur Hill, isolated interchanges may be considered.

Areas of the corridor that manage existing access will require the following types of improvements:

- A limited number of major capital projects at specific locations
- Other projects to address safety issues or performance issues – geometric improvements, rumble strips, turn lanes, etc.
- Restrictions on additional access to the corridor

3. Consider a St. Peter Bypass

A majority of the communities along TH 169 have been bypassed at least once. Every time a bypass has been constructed, the community has redeveloped around the bypass. When this occurs, often the issues forcing the bypass in the first place are recreated – communities become split by the roadway, access to the bypass becomes an issue for motorists as well as pedestrians and bicyclists, and congestion from local trips decreases the function of the bypass.

Bypasses are intended to separate longer through-trips on the mainline from shorter trips that are utilizing businesses in the downtown areas. The City of St. Peter has indicated that it would be in favor of a bypass that took through traffic away from its core downtown. Citizens in St. Peter feel that the heavy traffic volumes through the historic portion of downtown divides the community, damages the structure of the historic buildings, is a deterrent to conducting business in the downtown, and poses safety concerns for pedestrians. To remedy the existing situation for the long-term, the City is asking for a bypass that would move TH 169 one block east (Front

Street) so that it would be next to the Minnesota River. Although the need for a bypass is not universally shared, and has the potential for significant environmental issues, it is consistent with the performance vision identified by the study partners.

While the City has shown a preference for an alignment close to the river, a significant amount of environmental analysis is needed in order to identify a preferred alignment that meets all of the federal and state requirements. Given the time constraints of the corridor study, it was impossible to do all of the needed environmental analysis. If a bypass is pursued, the next logical next step is to conduct an environmental scoping study. The scoping study would identify feasible bypass alternatives, establish a basis for the purpose and need of a bypass, and identify likely issues to be addressed in additional environmental studies. This scoping study, as well as studies for other capital improvements along the corridor have been identified and prioritized in Section 4 of this report.

If a bypass is pursued, the following types of improvements will be needed:

- Major capital projects, including environmental documentation
- Other projects to address safety issues or performance issues prior to the development of major capital projects
- Closure of at-grade access locations
- Alternative access for properties located on the western side of bypass (if an in-town bypass option is pursued)
- Development of appropriate land uses near interchange locations
- Jurisdictional transfers (turnbacks).

Major Capital Project Identification

The framework outlined above helped to focus the major capital investments needed to enhance safety and increase performance. Most of the major capital improvement projects identified for the corridor are directed to areas that will be transitioning to freeways, although there are a few projects identified for areas that will manage existing access. In addition to looking at areas that are intended to transition to a freeway, specific projects were identified for areas that were currently performing below target, were expected to function below target in the future, were identified to be at high-risk for additional traffic signals in the future, or had serious safety concerns. All of the identified projects are intended to work toward the identified corridor vision. Table 3-3 lists the segments and improvements where the major capital improvements are proposed. Figure 3-2 shows the locations of the proposed projects. Appendix I provides **potential** concepts for these major capital improvements[5]. Physical development of major capital improvement projects will require additional environmental analysis and public involvement in determining the exact configuration of improvements.

[5] These potential concepts represent one or more of the options that were discussed with local agencies; however, they do not represent final layouts and/or agreements on the design concept. The concepts were developed in order to further discussion, and to provide assessments of environmental impacts and costs.

TABLE 3-3
PROPOSED MAJOR CAPITAL PROJECTS

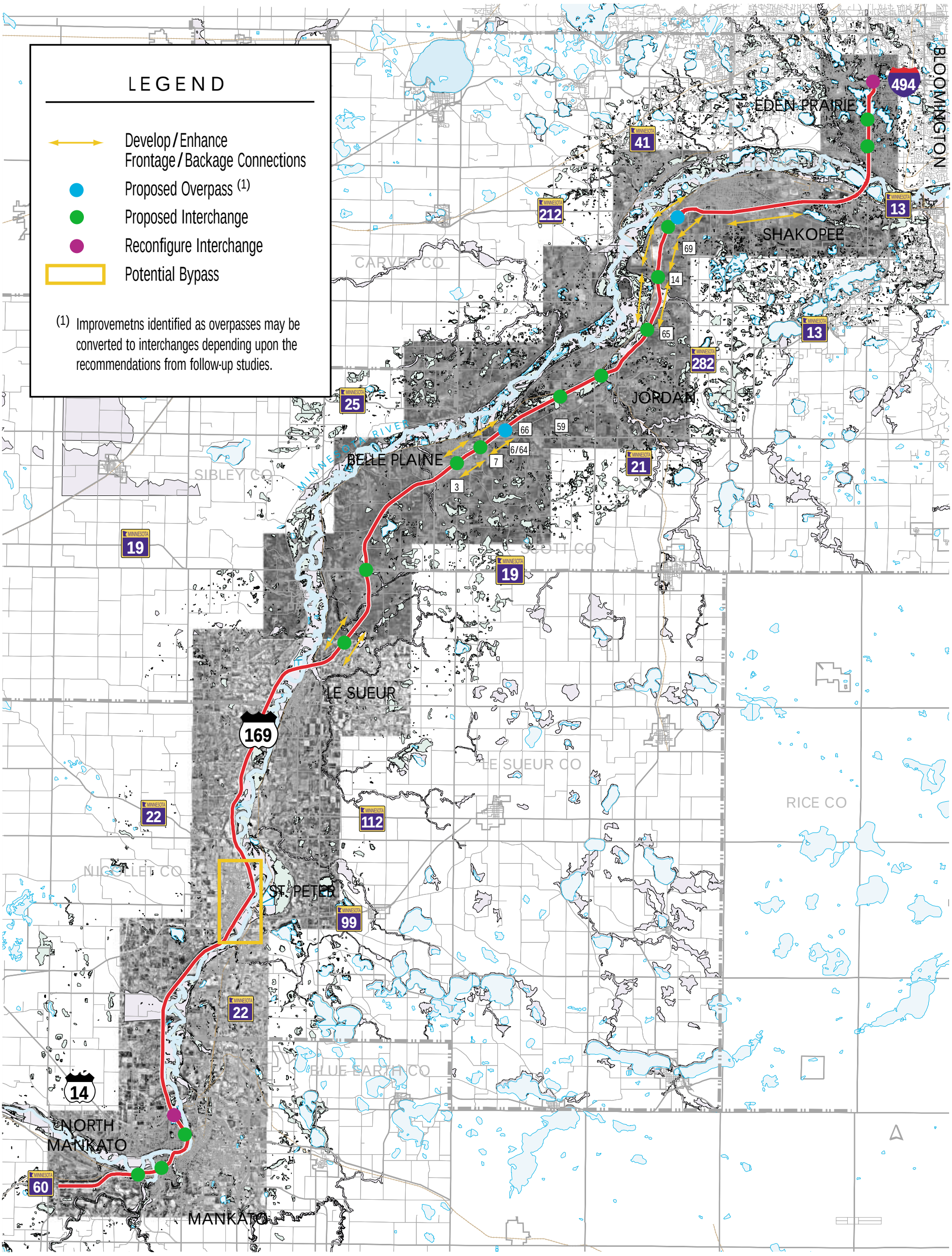
Segment	Proposed Improvements
A	▪ Reconfigure interchange at TH 169 and I-494 to eliminate signals. ▪ Remove traffic signal at Anderson Lakes Parkway and install an interchange. ▪ Remove traffic signal at Pioneer Trail and install an interchange.
B	▪ Raise posted speed limit to 65 (already a freeway segment)
D	▪ Remove the traffic signal at CSAH 69 and replace with an overpass. Install a frontage road system connecting CSAH 69 to TH 41. [6] ▪ Remove the traffic signal at TH 41 and replace with an interchange. Install a frontage road system connecting TH 41 to CSAH 69.[7]
E	▪ Install an interchange at CSAH 14 and install a frontage road connecting to TH 41 in the north and connecting to CR 65 in the south.
F	▪ Install an interchange at CR 65. Develop a frontage road that connects to CSAH 14 and one that connects to the City of Jordan.[8] ▪ Close the median at TH 21 in Jordan and enhance the local connection through frontage road development.
G	▪ Remove the traffic signal at TH 282 and replace with an interchange.
I – K_1	▪ Install an interchange at CSAH 59. ▪ Install an overpass at CR 66 and develop frontage roads connecting to CSAH 6/64 in Belle Plaine. [9] ▪ Remove the traffic signal at Laredo and install an interchange at CSAH 6/64. Develop a frontage system connecting CR 66 and TH 25. ▪ Install an interchange at TH 25 and develop a frontage system connecting to CSAH 6/64.
O – Q	▪ Develop a bypass of St. Peter. City preference is an in-town bypass next to the Minnesota River. Other alternatives will need to be developed if the project is to move forward.
S – W	▪ Replace the Webster and Lind traffic signals with an interchange system. This completes the freeway section through Mankato and North Mankato. ▪ Install an interchange at CSAH 33 / TH 68. This improvement addresses a safety concern; it is not needed for performance.

[6] A recommendation for an overpass at CSAH 69 is being proposed. This recommendation was made on the understanding that Mn/DOT will initiate a new river crossing study. Based on the outcome of the study, access at CSAH 69 could move from its existing location, remain the same, or be modified to an interchange. A final recommendation for access to CSAH 69, existing TH 41 and a new crossing will be made as a part of the study.

[7] A recommendation for an interchange at existing TH 41 is being proposed based on information from the Carver County Transportation plan indicating that an interchange will be needed at existing TH 41 even if a new river crossing is developed. This recommendation was made on the understanding that Mn/DOT will initiate a new river crossing study in the area. A final recommendation for access to CSAH69, existing TH 41 and a realigned TH 41 (new crossing) will be made as a part of the study.

[8] An interchange at this location may be difficult due to the proximity of the railroad and floodplain.

[9] A concept was also developed for an interchange at this location. Final design will depend upon the type of east-west connection in the area. Scott County will study this area in more detail.



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Other Project Improvements Identification

Based on past funding availability, most of the improvements outlined in the major project identification section are not likely to be implemented within the next twenty years. Because funding will not likely be available, and because some of the major projects are needed beyond the 20-year planning horizon, interim improvements and smaller capital projects will be needed to enhance safety and performance in the years before 2020. In addition, for areas that are managing existing access, geometric and safety enhancements will play a key role in ensuring that the existing access will continue to function in the future as traffic volumes increase.

The following short and mid-term investments were identified and approved within the context of the planning process, with the participation of Mn/DOT as well as local partners:

<u>Roadway Geometrics/Design</u>

- Add left turn lanes at public and residential locations for at-grade access points.
- Add right turn lanes at public entrances for at-grade access points.
- Add right turn lanes at commercial entrances for at-grade access points.
- Lengthen existing turn lanes to allow for adequate deceleration.
- Install edge-line rumble strips in areas where there are currently none.
- Modify the existing TH 41 intersection by providing additional turn lanes.
- Improve geometrics in the Le Sueur Hill area.
- Strategic median closures in downtown St. Peter.

<u>Operations Maintenance</u>

- Plant living snow fences and provide backsloping in snowdrift areas.
- Reconstruct sections of State Highway 169 and connecting roadways that are prone to flooding.

<u>Improve Existing Bridges and Enhance Connections for Multi-Modal Travel</u>

- Replace deficient bridges.
- Encourage the development of park-and-pool lots as growth occurs and as subdivisions are reviewed.

- Make local connections for pedestrian/bicycle crossings at identified major capital improvement locations (all major capital improvements except for the identified improvements at I-494 and TH 169 allow for pedestrian/bicycle crossings).

Policy-Based Improvements Identification

The physical improvements identified for the TH 169 corridor will be implemented incrementally over the next 20 to 60 years depending upon funding availability and development near the corridor. Over this time period, many of the adjacent communities will be experiencing significant change in terms of land development and redevelopment. To ensure the long-term safety and performance of the corridor, each local community corridor partner will need to guide and manage its development to conform to the long-range vision and planned improvements.

The implementation of access management strategies should be both pro-active and opportunity-based, with the goal of maintaining the operational integrity (meeting minimum performance goals) and safety of the corridor. The ability to successfully implement this vision will hinge on:

- Maintaining relationships and communications between agencies so that work is done in a cooperative manner.

- Keeping property owners informed about the safety and mobility issues on TH 169 and how they relate to the level of access and development.

- Fairly and consistently administrating access policies and changes in the corridor.

Because there are a number of issues in specific sections of the corridor, policies and strategies relating to land use and access have been developed for each of the areas identified in the improvement framework. Due to the length of these specific strategies and policies, it was decided to place them in Appendix J. The following list outlines the general types of land use and access policies that are recommended for the corridor. Please refer to Appendix J for more specific information on each of the corridor areas, as there are some differences in how accesses are addressed.

1. Direct property access to TH 169 should be prohibited, making these uses legal non-conforming. Existing access may continue as long as alternative access is not feasible; however, the existing use may not expand or reestablish.

2. Left-turn lanes should be provided at all high-speed areas or access should be restricted to right-in/right-out to enhance safety and mobility.

3. Right-turn lanes should be provided at commercial and public street access points.

4. As conditional use permits are issued or modified, access to the sites will be reviewed for conformance with the plan.

5. Rezoning of properties should not precede the availability of the local road network.

6. Temporary access may be granted to TH 169 if no other feasible alternative is available; these accesses will be removed/shifted to the local street network as it becomes available or they may be limited to right-in/right-out.

7. Access in freeway transition areas will be converted to frontage/backage roads over time.

8. Local units of government are encouraged to develop and adopt interchange access circulation plans.

9. New development should be limited to identified growth areas.

10. New development should have its access from local street networks (no direct access off of TH 169) with connections to identified full-access intersections/interchanges.

4.0 IMPLEMENTATION AND STAGING OF IMPROVEMENTS

After all of the improvements for the State Highway 169 Corridor were identified, a process was developed to prioritize the major capital improvements over the entire corridor. Prioritization is intended to give direction to local, regional and state agencies as they work to develop environmental documentation and seek funding for projects. In addition, it provides direction to private interests as they make development decisions. This process included an assessment of each project relative to:

- Safety
- Need to achieve minimum performance levels
- Need to meet the identified corridor vision
- Need to remove and/or prevent additional traffic signals
- System connectivity (local and regional)
- Potential cultural and environmental impacts[10]
- Potential socio-economic impacts
- Benefit-cost ratio[11]

In addition to prioritizing major projects, an effort was also made to prioritize environmental studies that would precede the development of the major capital improvement projects in and adjacent to the corridor. This section of the report outlines the processes used to develop the project and study rankings.

4.1 Project Prioritization Process

As indicated above, a number of objective factors were analyzed for each major capital improvement. Every project was assigned a ranking of one to five for each factor. These factors are described in more detail in Appendix L. Individual scores for each of the factors were tallied to come up with a total score for each improvement. Total scores were then compared between proposed improvements to assist the Corridor Partners in evaluating relative benefits. Projects were then assigned to one of three priorities: a – first tier priority, b – second tier priority, and c – third tier priority (Table 4-1). The lone exception to this is the I-494/TH 169 interchange, which was ranked separately because of its large cost and regional significance.

[10] Environmental issues were mapped and an initial screening was done. Information for proposed improvements in northern area of the corridor is included in the front of Appendix I

[11] Benefit cost assumptions are provide in Appendix K

TABLE 4-1
SUMMARY EVALUATION MATRIX [A]

EVALUATION CATEGORY	LOCATION																
	SEGMENT A [1]			SEGMENT D [2]		SEGMENT E [3]	SEGMENT F [4]		SEGMENT G-H [5]	SEGMENT I-K1 [6]				SEGMENT N [7]	SEGMENT O-Q [8]	SEGMENT S-W [9]	
Operations and Side Street Delay	$46,064,000			$18,352,000		$6,817,000	$6,495,000		$7,140,000	$10,289,000				$2,300,000	$7,000,000	$9,400,000	
Time Savings (Mainline)	$179,788,144			$26,942,154		$27,009,771	$13,998,131		$6,397,121	$17,832,063				$3,105,305	$27,872,063	$15,900,276	
Crash Reduction	$28,787,503			$13,113,235		$0	$0		$16,319,317	$33,947,443				$131,000	$0	$24,044,287	
Total Benefits	$254,639,646			$58,407,389		$33,826,771	$20,493,131		$29,856,439	$62,068,506				$5,536,305	$34,872,063	$49,344,563	
Remaining Capital Value	-$25,750,000			-$7,215,456		-$3,606,041	-$2,199,955		-$6,250,000	-$7,767,473				-$2,500,000	-$8,580,550	-$7,000,000	
Construction & ROW Cost (Dollars)	$114,500,000			$43,292,738		$21,636,247	$12,994,542		$37,500,000	$46,604,838				$10,000,000	$42,322,200	$37,950,000	
Total Costs	$88,750,000			$36,077,282		$18,030,205	$10,794,588		$31,250,000	$38,837,365				$7,500,000	$33,741,650	$30,950,000	
BENEFIT-COST RATIO/NPV	2.9/166 M			1.6/22.3 M		1.9/15.8 M	1.9/9.7 M		1.0	1.6/23.2 M				0.7/-2.0 M	1.0/1.1 M	1.6/18.3 M	
Project and Factors	**I-494**	**Anderson Lks. Pkwy.**	**Pioneer Trail**	**CSAH 69**	**TH 41**	**CSAH 14**	**CR 65**	**TH 21**	**TH 282**	**CR 59**	**CR 66**	**CR 6/CR 64**	**TH 25**	**Le Sueur Hill**	**St. Peter Bypass**	**Lind/Webster**	**CSAH 33/TH 68**
Needed for Minimum Target	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
Needed for Vision	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N
Safety	5	5	5	4	5	4	4	3	5	3	2	4	4	1	4	4	4
Performance	5	5	5	5	5	4	4	4	5	3	3	3	3	2	3	3	1
Signal Risk	5	5	5	5	5	4	4	1	5	4	3	5	4	3	5	5	3
Local and Regional Connectivity	5	5	5	3	5	4	3	4	5	4	4	4	4	3	5	3	4
Cultural and Environmental Impacts	3	3	5	4	3	3	2	5	3	3	3	3	4	4	1	3	3
Socio-Economic Impacts	3	4	5	4	2	3	4	5	2	3	4	3	3	4	1	4	2
Benefit -Cost Ratio / NPV	4	5	5	3	4	3	3	3	1	4	4	4	4	1	2	3	3
Total Score	30	32	35	28	29	25	24	25	26	24	23	26	26	18	21	25	20
PRIORITY [10]	A	a1	a1	b4	b1	b5	b6	b2	b2	c	c	b3	b5	c	c	b5	c

[A] Benefits and costs were refined based on adjustments to benefits for fatal versus injury crashes and applying a congestion penalty to percentage of daily traffic. Side street and operations benefits were also added.
[1] I-494/TH 169 interchange reconfiguration (including Highwood Drive) and interchanges at Anderson Lakes Parkway and Pioneer Trail. (Freeway) Assume 50% project costs are ROW for Anderson Lakes and Pioneer Trail. Assume 10% for I-494.
[2] Interchange at TH 41, overpass at CR 69 and frontage roads. (Freeway) Assume 50% project costs are ROW.
[3] Interchange at CSAH 14 and frontage roads. (Freeway) Assume 50% project costs are ROW.
[4] Interchange at CR 65, frontage road system to Jordan. (Freeway) Closure of median at TH 21, frontage road improvements. Assume 50% project costs are ROW.
[5] Interchange at TH 282, freeway through Jordan, frontage roads to the south. (Freeway) Assume 50% project costs are ROW.
[6] CR 59 interchange, CR 66 overpass, interchange at CR 6/CR 64, interchange at TH 25, and frontage roads to interchanges. (Freeway) Assume 50% project costs are ROW.
[7] LeSueur Hill interchange and frontage road system. Assume 50% project costs are ROW.
[8] Bypass St. Peter. (Expressway) ROW costs based on two times assessed parcel evaluation.
[9] Remove signals and construct interchanges at Webster Avenue and Lind Street, interchange at TH 68/CSAH 33, and frontage roads to interchanges. (Freeway) Assume 50% ROW cost for TH 68/33 and 10% ROW costs for Lind/Webster.
[10] A - Mega Project (large capital investment), a - First Tier Priority, b - Second Tier Priority, c - Third Tier Priority

Costs are estimated. Once numbers are obtained from Mn/DOT, they will be refined.

Based on the above rankings, projects would generally be pursued in order of priority (i.e., a, b, then c). However, the priority of projects within each tier may change depending upon growth pressures, available funding, completed environmental work, local support and other factors. In addition, Partners should be open to some adjustment in priorities to leverage other work being done in the corridor that could positively impact lower priority improvements.

It is important to recognize that most of the major projects identified and other improvements identified in section three, do not have any funding. Therefore, it is impossible to predict when these improvements will be implemented.

In addition to the priorities established on the preceding page, the corridor guidelines required that improvements be grouped into three categories based on funding availability and whether the project was needed to meet the minimum performance targets or address significant safety concerns. The following lists show the improvements for each of these categories.

Fiscally Constrained Improvements: Programmed or planned projects that are funded or are expected to be funded over the next 20 years. Funds are fiscally constrained and projects must demonstrate a positive impact on corridor performance or safety. Improvements with an * are needed for safety reasons only.

- TH 19 Interchange*
- Interchange at Anderson Lakes Parkway
- Interchange at Pioneer Trail
- Interchange at CSAH 6/64 in Belle Plaine*

Total Costs: $61.8 million

Strategic Improvements: Projects are needed to maintain or reach minimum performance targets over the next 20+ years. Projects in this category can also address serious safety concerns, even if they do little to enhance performance. Improvements in this category cannot be implemented without additional funding resources. Improvements with an * are needed for safety reasons only.

- Interchanges at I-494 and TH 169
- Overpass at CSAH 69
- Interchange at TH 41
- Interchange at CR 65
- Interchange at TH 282
- Interchange at TH 25*
- Interchange at Lind/Webster*
- Interchange at CSAH 33/TH 68*

Total Costs: $250 million

Unconstrained Improvements: Improvements in this category are identified in the corridor management plan, but they are not needed to maintain the minimum levels of corridor performance. No funding is allocated for these improvements.

- Interchange at CSAH 59
- Overpass at CR 66
- St. Peter Bypass

Total Costs: $64 million

4.2 Study Prioritization

Because the corridor study was not able to provide an in-depth evaluation of a number of critical issues, additional studies will be required to identify preferred concepts/alignments and/or to advance projects in the environmental process. In order to prioritize these studies, two criteria were developed.

1. Studies should focus on high-priority projects that need to advance into design phase, and/or

2. Studies should focus on areas that have a significant amount of development potential, where early identification of right-of-way needs can provide input into land use and zoning ordinance modifications or protective buying.

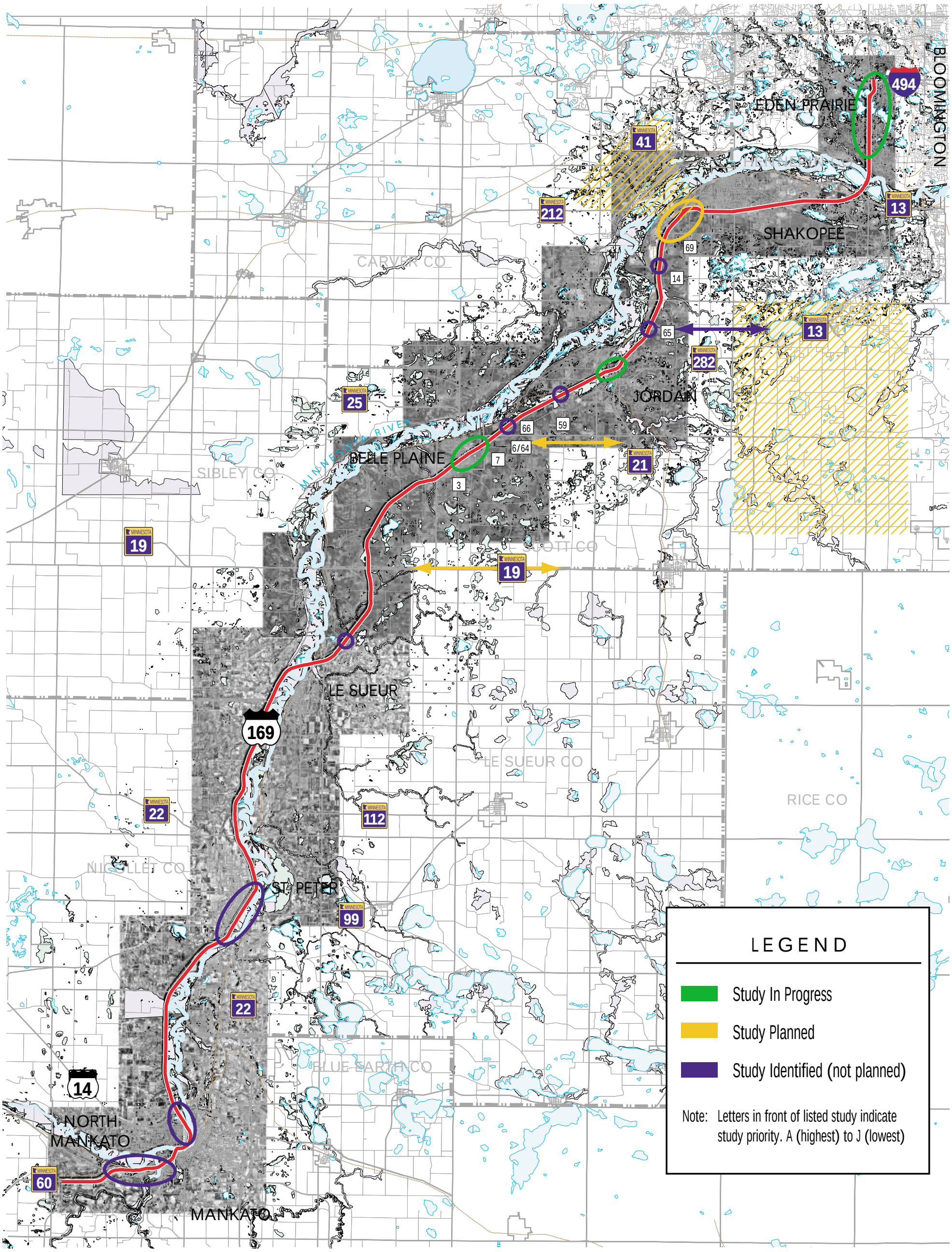
Based on these criteria, a potential list of studies was prioritized. This list was then reviewed and approved by the study's TAC. This list is shown in Table 4-2. Figure 4-1 shows the location of the proposed studies.

TABLE 4-2
ADDITIONAL TRANSPORTATION AND ENVIRONMENTAL STUDIES

Study Priority [1]	Location	Rationale [2]	Study Type	Status	Notes
A	Pioneer Trail Anderson Lakes I-494	1 1 1	EA EA EA	In Progress In Progress In Progress	Study in progress. Concepts near completion; EA to be complete by Summer 2002. Most of the right-of-way for Anderson Lakes Parkway and Pioneer Trail is either preserved or is in the process of being acquired. Some additional right-of-way needs are likely for the I-494 interchange.
B	New River Crossing between CSAH 69 and TH 41	1 & 2	EIS	RFP being put together	RFP to be released shortly. Some right-of-way near CSAH 69 has been secured; however, most of the area between CSAH 69 and TH 41 has a high potential for development. Plan is needed for regional traffic traveling between TH 169 and TH 212.
C	CSAH 69 TH 41	1 & 2 1 & 2	EA EA	None None	Area developing; right-of-way at TH 41 developed; right-of-way at CSAH 69 is mostly secured. Need to preserve frontage/backage road locations and provide adequate offset from frontage roads to TH 169.
G	CSAH 14 CR 65	1 & 2 1 & 2	EA EA	None None	Plan needed as area develops. East-west minor arterial connection needed in Scott County. Need to preserve frontage/backage road locations and provide adequate offsets from frontage roads to TH 169.
D	TH 21/TH 282	1	Sub-Area EA	In Progress None	Sub-area study in progress; concept under discussion. Limited right-of-way risk in impacted areas.
J	CSAH 59	2	EA	None	Area in long-term growth area; non-immediate need; however, area should be preserved through planning/right-of-way activities.
J	CR 66		EA	None	This area has been identified for an overpass; however, Scott County will be evaluating whether or not this roadway could serve as an east-west arterial. If the county pursues this roadway as an arterial, it is likely that an interchange will be needed instead of an overpass.
E	CSAH 6/64 TH 25	2 2	Sub-Area EA	In Progress None	Area is urbanizing; high potential for additional development. Need to preserve frontage/backage road locations and provide adequate offsets from frontage roads to TH 169. Concept at CSAH 6/64 near completion. Right-of-way to be preserved by 2004 for CSAH 6/64.
F	Le Sueur Hill	2	Sub-Area	None	Potential long-term growth area for Le Sueur. Need to plan connecting streets and preserve right-of-way through land use/right-of-way activities.
I	St. Peter	--	Scoping	None	Majority of area is fully developed for in-town bypass. The current corridor does not exhibit significant safety or operational problems.
F	TH 14 Mankato	1	EA	None	Concept developed for TH 14 area. Low potential for development due to bluff and floodplain areas.
H	Lind/Webster	1	EA	None	Concept for Lind/Webster under consideration by North Mankato. Area identified as need from safety and corridor consistency.
H	CR 33/TH 68	1	EA	None	Concepts for area were developed in TH 169 intersections study. Changes to DM&E Line may affect alternatives and local connections. Low potential for significant growth.
	Scott County Land Use Study				This study is a County initiated project, and is not ranked. Scott County will be evaluating future land use in the area just south of Shakopee.
	Scott County East-West Arterial Study				This study is a County initiated project, and is not ranked. Scott County will be evaluating future east-west roadway alignments for potential new arterials.
	Metro Area East-West Arterial Study				This study will be brought forward by Mn/DOT at a later date, it is not ranked at this time. Mn/DOT will be working with local and regional agencies to evaluate a new east-west principal arterial route.

[1] Study priorities are ranked alphabetically highest to lowest (A – J).

[2] Rationale 1 includes studies that should focus on high-priority projects needed to advance into design phase. Rationale 2 includes studies in areas that have a high risk of development, where early identification of right-of-way needs can provide input into land use and zoning ordinances or protective buying.



Moving Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION

HIGHWAY 169 CORRIDOR PLAN

5.0 STUDY FINDINGS AND RECOMMENDATIONS

This section of the report summarizes the study findings and recommendations. These findings and recommendations were developed with input from the study's TAC.

5.1 Study Findings

1. State Highway 169 is an important corridor that provides essential transportation connections between numerous communities, the entire southwest Minnesota region and the Twin Cities. It provides commuter-type services to larger metropolitan areas, serves as a conduit for moving commercial, agricultural and manufacturing products, and provides regional access to recreational facilities such as Valley Fair, Renaissance Festival, Minnesota Valley Wildlife Refuge and Canterbury Park. It serves major businesses, institutional facilities as well as smaller trade centers along TH 169.

2. The TH 169 corridor follows the Minnesota River valley south from the Twin Cities through Mankato. As a result, the terrain encountered includes rolling hills, wooded ravines and river bluffs, and shallow marshes/floodplain areas.

3. The majority of population and employment growth is expected to occur in the northern study area counties and cities. As more people and jobs continue to cluster around the Twin Cities Metropolitan Area, traffic will continue to grow on the system of roads that support this area, particularly on river crossing links such as Highway 41 and State Highway 169, and on other corridors linking this area to outlying regional trade centers.

4. Projected growth rates in the southern study area (south of Scott County) indicate a stable population and labor force. Greater levels of growth are expected around the larger centers such as Mankato/North Mankato and the City of St. Peter. This suggests that the issues facing the northern study area will be different in magnitude and scope than those that communities may face in the southern portion of the corridor.

5. Counties and cities within the corridor have jurisdiction over local land use changes in the corridor. Most of the Counties have fairly restrictive policies that focus growth towards urbanized areas. Counties have indicated that this policy is expected to continue.

6. On average, approximately 600 crashes occur each year along the corridor. Of these crashes, 1 percent are fatal, 29 percent are injury and 70 percent are property damage. This translates to six (6) fatalities, 174 injuries and 420 property damage crashes each year, which is estimated to cost citizens over $31 million.

7. Traffic volumes and facility characteristics play a significant role in how well the corridor functions from a safety and mobility perspective. Year 2000 daily traffic volumes in the corridor range from 56,000 vehicles per day in the Eden Prairie/Bloomington area to 11,000 vehicles per day between Mankato and St. Peter. Volumes in the northern part of the corridor exceed the capacity of TH 169 as evident by long queues and congestion at I-494 ramps, Highwood Drive, Anderson Lakes, Pioneer Trail and Trunk Highway 41. These locations have long traffic queues, higher rear-end crashes and significant vehicle/motorist delays.

8. In the future, traffic volumes are expected to increase substantially in the northern portion of the corridor. By the year 2025, it is anticipated that traffic volumes near Interstate 494 will be over 100,000. It is also anticipated that traffic volumes from Trunk Highway 41 to Interstate 494 will range from approximately 58,000 to 84,000. In the southern end of the corridor, traffic volumes will range from approximately 16,000 trips to 35,000 trips. The higher traffic volumes in the southern portion of the corridor are associated with the Cities of Mankato and North Mankato.

9. At-grade access in the northern portion of the corridor has very few acceptable gaps in the mainline flow during the peak hours. The number of gaps will continue to decrease as the volume on the corridor increases.

10. River bridges in the northern portion of the corridor are prone to flooding. This causes extensive detours and delays. In the southern portion of the corridor, significant portions of TH 169 are prone to flooding causing significant delays and detours.

11. State Highway 169 is an important route for the movement of freight and commodities. It is one of the main access routes to the Savage Ports for the movement of grain and other bulk commodities. In addition, it provides access to local industrial parks, aggregate quarries and also serves as one of the main routes for refuse hauling. About 12 percent of the daily volume is heavy commercial traffic.

12. The Union Pacific has a major rail facility that follows the Minnesota River valley and for some of its length is adjacent to TH 169. There were few issues that were brought forth that involved railroad and the railroad did not respond to numerous inquires.

13. There is very little transit use in the corridor. There are two park-n-ride lots within the corridor and no fixed route service. The corridor does serve inter-city buses and also serves private shuttle services from Mankato to Twin Cities' airport.

14. The performance results indicated that overall, State Highway 169 is performing at 61 mph. The High Priority section of the corridor (I-494 to Highway 19) is currently performing near the minimum performance target at 60 mph. The southern portion of the corridor, currently performing at 62 mph, well above the minimum targets for its Medium Priority designation.

15. Future performance in the High Priority area of the corridor is anticipated to decline from 60 mph to 50 mph and the Medium Priority area will decline from 63 mph to 56 mph. Much of the decline in corridor performance can be attributed to the increase in traffic volumes and the addition of more traffic signals along the corridor. In addition, the volume levels in the northern part of the corridor suggest that congestion will continue to spread into off-peak hours. (Problems will occur over more hours of the day).

16. Generally, local agencies have done a good job of managing access in the corridor. There are a total of 480 access points onto State Highway 169 in the 73-mile corridor. About half of the access points are public street intersections, the other half are private driveways and field entrances. While a majority of access points do have turn lanes a number of them do not. This is a safety concern given the higher speeds in the corridor.

5.2 Study Recommendations

1. The Corridor Partners should review and adopt the TH 169 Corridor Management Plan through a formal resolution and/or endorsement. As part of this approval, it is expected that they would work to incorporate the pertinent parts of the Corridor Plan and its recommendations into local planning documents, policies and ordinances. In addition, regional and state agencies should incorporate important elements in regional, district and state plans and policies.

2. Mn/DOT should establish an ongoing corridor management team and formalize its organizational structure, purpose and role in decision-making by June of 2002.

3. Corridor partners should establish TH 169 Corridor Coalition by September of 2003. This coalition would be responsible for keeping policy-makers informed of corridor needs.

4. Mn/DOT should continue to monitor crash records, corridor volumes, access changes, and performance over time to determine how the corridor is changing. It is recommended that these changes be communicated to the Corridor Partners on an annual basis and that these changes as well as improvement priorities, funding availability, additional planning studies and development issues be discussed.

5. State Highway 169 is an important corridor to the state, region, and local communities. In order to preserve and/or enhance the safe and efficient movement of goods and people and protect the function of the corridor over the long-term, it is essential that all of the Corridor Partners work together toward a common performance-based "vision". The corridor vision for TH 169 requires that communities plan for the following:

   A. Transition to a Freeway-type Facility

   It is recommended that rural expressway areas transition to controlled-access freeway type facilities where volumes approach capacity levels of the rural expressway, the risk for additional traffic signals is high, and/or transition to controlled-access would present a safer and more consistent design type in comparison with adjacent sections of the corridor. Transition areas include I-494 to Belle Plaine and one-half mile north of TH 14 in Mankato to TH 68 through Mankato.

   To facilitate this transition, it is recommended that Mn/DOT reclassify these areas to a 1AF access category. In addition is recommended that local, regional and state agencies manage land use and access along the corridor in accordance with the recommended *TH 169 Land Use and Access Management Strategies* outlined in this report.

B. Manage Existing Access

In rural areas where volumes are not expected to approach capacity and side street demand is low, it is recommended that the rural expressway and access characteristics be managed in accordance with the *Land Use and Access Management Strategies* identified in this report and categories 2A and 2B of *Mn/DOT's Access Management Guidelines*. The basic thrust of this strategy is to allow current access to remain and minimize changes and/or additional access points in these areas. It is recommended that these strategies be targeted for Belle Plaine to St. Peter, St. Peter to Mankato, and from TH 68 to the junction of TH 60.

C. Consider St. Peter By-pass

A majority of the rural communities along TH 169 have been by-passed including the cities of Shakopee, Jordan, Belle Plaine, and Le Sueur and Mankato. The City of St. Peter throughout the planning process has been in favor of an *In-Town Bypass*. Many citizens in the City feel that the heavy traffic volumes through the historic portion of downtown divides the community, and will become a significant deterrent to conducting business in the downtown. While need for a by-pass is not universally shared and has the potential for significant environmental issues, it is consistent with the performance vision identified by the study partners.

The City of St. Peter has shown a preference for a bypass alignment one-block east of the current TH 169, near the river. No preference or recommendation is made by this study for any potential bypass alignment. If a by-pass were pursued, the next logical next step is to conduct a scoping study. This study would identify feasible alternatives, establish a basis for purpose and need and identify likely issues to be addressed in additional environmental studies. This study is relatively low on the priority list when compared to other studies in the corridor. The priorities are included in a subsequent recommendation.

6. To accomplish the overall corridor vision it is recommended that the agencies within the corridor work together in the following areas:

A. Major Capital Projects

A number of major improvements will be needed to address capacity and safety issues in the corridor. Major capital investments in the corridor were evaluated based on their ability to address issues such as safety, capacity, signal proliferation, system connectivity, modal conflicts, environmental impacts and benefit cost. Based on this comparison, the following priorities or groupings were established:

Mega Projects

Priority A	**Reconfiguration of I-494/TH 169 Interchange** [12]
Priority B	TH 41 River Crossing [13]

Major Capital Projects

Priority a	**Pioneer Trail Interchange** [14] **Anderson Lakes Parkway Interchange** [15]
Priority b	**TH 41 Interchange** [16] **CSAH 69 Overpass** [17] **TH 282 Interchange (Jordan)** [18] *CSAH 6/64 Interchange (Belle Plaine) [19] *TH 14/Lind/Webster Interchange (Mankato/North Mankato) **CSAH 14 Interchange** *TH 25 Interchange (Belle Plaine) **CR 65 Interchange** [20]
Priority c	CSAH 59 Interchange St. Peter By-pass CR 66 Overpass[21] *CSAH 33/TH 68 Interchange [22] Le Sueur Interchange [23]

Bold font indicates a project is needed for minimum mobility performance targets.
(*) Indicates a project is needed for safety reasons only.

It should be noted that the above improvement list does not include the planned interchange at the TH 169/TH 19 intersection (Scott County line). This is scheduled for construction in 2002.

[12] An Environmental Assessment will be completed by June of 2002. The environmental documentation will include analysis for six-lanes on TH 169 between I-494 and Bloomington Ferry Bridge.

[13] The TH 41 river crossing has been identified as a regional river crossing issue in the Twin Cities Metropolitan area. The susceptibility to flooding, amount of truck traffic, and proximity to downtown Chaska suggest that the current facility has limited use as a regional crossing route. Mn/DOT is moving ahead with a TH 41 river crossing scoping study to investigate this issue.

[14] An Environmental Assessment will be completed by June of 2002.

[15] An Environmental Assessment will be completed by June of 2002.

[16] The current TH 41 intersection operates at LOS F. Even with a new TH 41 river crossing, the current crossing is anticipated to have sufficient traffic, similar to current levels, to generate the need for an interchange. Mn/DOT is working on some interim improvements to improve operations and limit access.

[17] The City of Shakopee has indicated its opposition to a change in access at this location. Mn/DOT has agreed to study this access along with the TH 41 river crossing to determine an appropriate solution.

[18] Mn/DOT is working with Jordan to identify a preferred interchange concept.

[19] Mn/DOT is nearing completion of an interchange/access study. Mn/DOT is pursuing acquisition of right-of-way in 2002.

[20] Scott County has shown need for future east-west arterial connection in this area. This should be considered as long-term access is planned in this area.

[21] Project may be converted to an interchange if Scott County pursues an east-west arterial route in this location.

[22] Mn/DOT is pursuing interim improvements for 2002. Long-term access concepts identified in TH 169 intersections study (1998).

[23] Le Sueur County is reconstructing CSAH 28 in the area. Need to identify future access location and local road connections.

B. Other Improvements

There is no funding, based on present funding levels, for most of the major improvements identified above. As a result, a number of smaller projects may be needed to address short-term needs and safety issues. The following types of projects are recommended to improve safety and make the corridor function better.

a) Mn/DOT should install longitudinal rumble strips to reduce the number of run-off the road crashes. Before and after studies have shown that run-off road crashes are reduced by up to 65 percent where these devices are in place. Longitudinal rumble strips are lacking in the Scott County portion of the corridor (primarily on outside shoulder).

b) Mn/DOT should add left turn lanes at all access points in high-speed areas or restrict access points to right-in/right-out. Modifications should be done as time and funding permit and/or as resurfacing or other projects arise.

c) Mn/DOT should pursue, as funding allows, the development of living snow fences in areas where blowing snow limits visibility and affects operations of TH 169 during winter snow events. It is recommended that Mn/DOT work with the DNR in these areas to determine if there may be mutual benefits in terms of developing wildlife habitat.

d) Mn/DOT should pursue modification of TH 169 roadway elevations and/or installation of flap gates or other barriers to limit flooding areas and number of days TH 169 is out of service. It is recommended that Mn/DOT evaluate current pavement conditions (remaining structural life) and prioritize areas based on flood frequency and detour length. It is also recommended that Mn/DOT pursue funds that may be available to assist it in reducing future flood events and damage.

e) It is recommended that Mn/DOT pursue interim improvements at the intersection of TH 41 to reduce the delays at this intersection. This improvement is scheduled for 2004.

f) Interim improvements to intersections south of Mankato near Le Hillier should be completed to improve safety at CSAH 69, CSAH 33 and TH 68 intersections. This is scheduled for 2002.

g) Local agencies should ensure that adequate frontage and/or backage roads are developed along TH 169 in the transition to freeway areas. The majority of these roadways should be constructed as development occurs. Municipal agreement funding and/or Mn/DOT funding should only be used to address hardship cases and/or to address timing problems.

h) Mn/DOT and local agencies should consider providing park-and-pool facilities near major access roadways to TH 169. While a formal busway is not planned for this corridor these facilities can provide choices for users.

i) Consideration should be given to providing additional east-west arterial capacity. Interstate-494 north of the Minnesota River will be begin construction for upgrading to six-lanes between Highway 212 and Highway 100 beginning in 2002; however, this will operate at capacity in the long-term, TH 13 south of the river between TH 169 and I-35W currently operates at capacity. Highway 13 acts as a major access to the Savage ports and is one of the major modal shipping terminals in Minnesota. In addition, there is a concern that the southbound TH 169 exit to eastbound TH 13 could function at capacity (long-term) and some backups could occur onto TH 169.

j) Consideration should be given to implementing ITS improvements at existing traffic signals. These improvements should provide additional green-time to large trucks as they approach signalized intersections. Additional recommendations for making interim signalized intersections function better can be found in the Mn/DOT report, "Truck Priority at Traffic Signals", February 2002.

C. Land Use and Access Management Policies

Based on the corridor vision and present and future land use, it is recommended that the communities adopt the recommended land use and access policies and strategies and incorporate them into their local ordinances and regulations. Mn/DOT should work with local agencies to incorporate land use and access policies into local ordinances by March of 2003. This should include presentations and/or working sessions with local planning commissions. The following list outlines the general types of land use and access policies that are recommended for the corridor.

a) Direct property access to TH 169 should be prohibited, making these uses legal non-conforming. Existing access may continue as long as alternative access is not feasible; however, the existing use may not expand or reestablish.

b) Left-turn lanes should be provided at all high-speed areas or access should be restricted to right-in/right-out to enhance safety and mobility.

c) Right-turn lanes should be provided at commercial and public street access points.

d) As conditional use permits are issued or modified, access to the sites will be reviewed for conformance with the plan.

e) Rezoning of properties should not precede the availability of the local road network.

f) Temporary access may be granted to TH 169 if no other feasible alternative is available; these accesses will be removed/shifted to the local street network as it becomes available or they may be limited to right-in/right-out.

g) Access in freeway transition areas will be converted to frontage/backage roads over time.

h) Local units of government are encouraged to develop and adopt interchange access circulation plans.

i) New development should be limited to identified growth areas.

j) New development should have its access from local street networks (no direct access off of TH 169) with connections to identified full-access intersections/interchanges.

7. On an ongoing basis, it is recommended that Mn/DOT provide support for corridor policies and recommendations by attending local planning commission meetings to answer questions and provide background information on the purpose of the policies.

8. It is recommended that Partners continue to monitor land use trends and development pressures to assess potential risks for loss of critical right-of-way parcels (areas designated for future interchanges or improvements). Partners should implement land use strategies identified in the report so that development can assist in delivering portions of the needed improvements.

9. Mn/DOT and Partners should complete current scoping and environmental studies in the corridor including EAW for I-494/Anderson Lakes/Pioneer Trail, Belle Plaine Interchange Study, and Jordan Interchange Study.

10. Mn/DOT and Partners should pursue additional scoping and environmental studies on projects so that access and design issues can be resolved, local agencies can assist Mn/DOT with right-of-way preservation and local agencies can require necessary frontage road development. In addition, these studies should be used by the Corridor Partners to address environmental concerns such as:

- Disruption to the function of natural systems in and/or adjacent to the corridor;
- Avoidance of wetlands, floodplains and habitat of state- and federally-listed threatened and endangered species;
- Storm water management;
- Restoration of degraded natural systems, and
- Maintenance of natural habitat corridors and patches

The scoping and environmental studies should include involvement from the Department of Natural Resources and the Pollution Control Agency.

Additional scooping and environmental studies should be undertaken in the following areas:

- *I-494, Anderson Lakes Parkway and Pioneer Trail study
- TH 41 Minnesota River crossing study [24]
- TH 41 and CSAH 69 interchange, overpass and access study [25]
- *TH 282/TH 21 access study
- *CSAH 6/64 and TH 25 interchange and access study
- Le Sueur Hill interchange and access study [26]
- CSAH 14 and CR 65 interchange study
- TH 14 and Lind/Webster interchange study
- St. Peter bypass scoping study
- CSAH 59 interchange and CR 66 overpass study
- Shakopee/Jackson Township frontage roads [27]
- Southern Metro area east-west arterial study [28]
- Scott County east-west arterial study [29]
- Scott County land use study [30]

(*) Studies in progress

Partners should continue to anticipate future local, regional and private projects and leverage funds to develop the vision one piece at a time.

11. The Partners recommend that local, regional and state agencies investigate and actively pursue solutions to river crossing problems in the TH 41 area. As the region continues to grow, river-crossing activities will continue to increase. The TH 41 and TH 101 bridges are near capacity and are susceptible to flooding causing extensive detours and delays for the entire southwest metro area.

[24] Mn/DOT is planning to start this study in the summer of 2002.
[25] May be included in the TH 41 Minnesota River crossing study.
[26] Le Sueur County improving CSAH 27 connection in 2005.
[27] City of Shakopee and Scott County responsibility.
[28] Study is scheduled to begin in 2002. Mn/DOT is leading the effort.
[29] Scott County is in the process of prioritizing east-west corridor studies within the county.
[30] Study will investigate future urbanization of agricultural area land east of Jordan and south of Shakopee.

12. Given the limited amount of funds for this corridor and other corridors, it is recommended that the Partners continue to educate citizens and businesses about the long-term vision, the necessary funding required to achieve the vision over time, and interim improvements and/or actions that could be utilized to mitigate issues/concerns. The Partners should continue to pursue a variety of funding sources including federal, state, local, public/private, partnerships, development agreements and other special grants or loan funds. In addition, they should continue to explore ways to reduce/spread peak hour demands so that capacities of facilities are utilized more efficiently.

APPENDICES

A IRC Principles

B TH 169 Open House Comment Summary

C Small Group Meetings Issue Identification

D TH 169 Access Types and Locations

E Fatal Crashes

F Traffic Volume Changes

G Peak Hour Directional Split

H Performance

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K Benefit-Cost Methodology

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APPENDIX A

IRC Principles

The IRC principles were developed as a part of, "Interregional Corridors: A Guide for Plan Development and Corridor Management." This document provided the background philosophy and principles in developing corridor management plans. The following page outlines the philosophy and principles that were followed as part of the TH 169 Corridor Management Plan process.

Mn/DOT Smart Growth Principles

Land Use Stewardship: Promote responsible and integrated environmental, land use, access, and transportation planning decisions along transportation corridors. Work cooperatively with local units of government to ensure orderly development and protect the safety, mobility and function of transportation corridors, while considering the corridors' cultural and environmental setting and context.

Efficiency: Maximize the use of existing transportation facilities and services. Focus resources to enhance the state's economic vitality and provide the greatest long-term benefits at the lowest long-term costs, while maintaining a commitment to the statewide transportation network.

Choice: Provide customers with transportation options and modal access choices. Maintain flexibility to account for variations in local conditions. Ensure early, continuous, and meaningful involvement of citizens and stakeholders in the transportation decision-making process.

Accountability: Hold both the public and private sectors accountable for the impacts of their land use and access decisions. Link transportation investments to responsible land use and access planning. Encourage shared investments and responsibilities to achieve desired transportation outcomes that fit within the broad community and regional context.

APPENDIX B

TH 169 Open House Comments Summary

Along with numerous TAC, PAC, small-group and other individual issue meetings, two open houses were held to gather input from the public. Comments collected at the open houses were used in the development and refinement of the plan. The following pages contain a summary of these comments.

TH 169 Interregional Corridor Study Open House

Scott County Government Center
December 11, 2001

Attendees:

159 individuals signed the attendance sheet.

Meeting Purpose:

The purpose of the open house was to present the work completed to date on the TH 169 Corridor Management Plan and to receive comments on the draft study recommendations, including concept alternatives developed in response to corridor issues identified earlier in the study process. Input from this meeting was used to make changes to the draft recommendations.

Meeting Format:

Attendees were directed to boards displayed throughout the room that described study policies, issues, and constraints. Some of the boards depicted concept alternatives of proposed improvements along the corridor. Mn/DOT project staff and consultant staff were available to discuss the study recommendations, answer questions, take suggestions and explain the overall project development process and anticipated implementation timeline.

Public Comment:

Comment cards were provided. A total of 53 comment cards were received and are summarized as follows:

1. TH 169 and CSAH 69 Area

   The vast majority of comments received were in response to the proposed overpass at CSAH 69. A total of 43 comments expressed opposition to this concept. Reasons stated for opposing the overpass included the following:

   - Concerns over the safety of potential increases in traffic on CR 15 near Sweeney School. Other concerns revolved around the safety of additional traffic near recreational areas.

   - Concerns regarding impacts to the quality of life that would result from potentially higher levels of traffic near a residential area adjoining CR 15.

- Concerns regarding decreased traffic to businesses located in Downtown Shakopee and along the First Avenue Corridor.

- Concerns regarding the costs, and potential difficulties due to topographical issues, of constructing frontage roads connecting TH 41 and CSAH 69. Many of the comments reflected the thought that it would be less expensive to have an interchange at CSAH 69 and not build as an extensive as a frontage road system between TH 41 and CSAH 69.

- Concerns regarding impacts to travelers that would have to exit on TH 41 and "backtrack" on the frontage road system to get to Downtown Shakopee.

- Concerns regarding impacts to commercial and industrial businesses in the area that contribute large amounts of truck traffic presently using the intersection at CSAH 69. Additional concerns about truck traffic were expressed with regard to their potential use of CR 15 as an alternate route. Residents felt that additional truck traffic on CR 15 would decrease quality of life.

- Concerns regarding the purchase of right-of-way near the CSAH 69 intersection. Some respondents indicated that the land was originally purchased for the development of an interchange rather than an overpass.

In addition to the comments summarized above from residents, business owners, and private citizens, the City of Shakopee and Jackson Township submitted letters opposing an overpass at CSAH 69. Letters in opposition to the overpass were also received from the Shakopee Area Chamber of Commerce and Vision Shakopee, both concerned with adverse impacts on business viability.

2. General Comments

- Three comment letters were received expressing gratitude for holding a public open house and explaining the study purpose, outcome and alternatives.

- Comments were received concerning noise impacts to residences along the corridor due to high levels of traffic on TH 169.

- A comment was received concerning the need to consider biking along TH 169 in any highway redesign or improvement.

- A concern was expressed regarding the speed of motorists traveling on TH 169. The commenter indicated that vehicle speeds are already too fast on the corridor, and that any improvements would make traffic move even faster.

TH 169 Interregional Corridor Study Open House

Nicollet County Government Center
December 13, 2001

Attendees:

76 individuals signed the attendance sheet.

Meeting Purpose:

The purpose of the open house was to present the work completed to date on the TH 169 Corridor Management Plan and to receive comments on the draft study recommendations, including concept alternatives developed in response to corridor issues identified earlier in the study process. Input from this meeting was used to make changes to the draft recommendations.

Meeting Format:

Attendees were directed to boards displayed throughout the room that described study policies, issues, and constraints. Some of the boards depicted concept alternatives of proposed improvements along the corridor. Mn/DOT project staff and consultant staff were available to discuss the study recommendations, answer questions, take suggestions and explain the overall project development process and anticipated implementation timeline.

Public Comment:

Comment cards were provided. A total of 17 comment cards were received and are summarized as follows:

1. St. Peter Bypass

   A total of 12 of the 17 comments submitted had as their subject the potential bypass of St. Peter of TH 169. Comments on a potential bypass included the following:

   - One comment was submitted from the St. Peter Area Chamber of Commerce expressing support for the plan proposed by the Minnesota Design Team and emphasizing the importance of a St. Peter bypass.

   - Two comments stated that the bypass of St. Peter should be moved into a higher priority category than that proposed in the Draft Corridor Plan.

- Three comments supported an eastern bypass of St. Peter.

- One comment was in favor of a western bypass of St. Peter.

- One comment stated that TH 169 should be left in place and that larger problems for TH 169 in the Twin Cities area should be a priority.

- One comment stated that it was important to save the houses on Front Street in St. Peter due to their historic significance.

- One comment was favorable to a bypass route, but stated that it was important to do so in conjunction with comprehensive planning and zoning in order to discourage urban sprawl.

2. General Comments

- One comment was in favor of a formal Park-and-Ride lot at the proposed interchange at TH 19/TH 169. Currently an informal lot is used – this lot will be removed when the interchange is constructed in 2002.

- One comment was in support of the Highway 169 draft recommendations as displayed at the open house.

- One comment, from a Nicollet County Commissioner, expressed a desire for Mn/DOT to focus on connecting state trunk highways to Interstate Freeways (TH 14 to I-35 and TH 169/TH 60 to I-90).

- One comment expressed a need to move TH 169 in the vicinity of Nicollet CR 20 and CR 26 due to floodplain issues.

APPENDIX C

Small Group Meetings
Issue Identification

At the beginning of the study process, a series of small group meetings was held. The meetings involved key community leaders, select business owners, state and regional agency representatives, and local officials. Attendees of these meetings commented and provided input on the development of the corridor vision and implementation plan. The meetings solicited input on key issues and set the stage for the process that was followed in the development of the plan. The following pages contain a detailed description of the issues identified through the public involvement process.

TH 169 Small Group Meetings Ð Major Issues

Meeting 1 – Shakopee Area

- Concerned about long-term capacity at existing interchanges.
- Concerned about the development of a reliever roadway in southern Shakopee. CR 16 right-of-way is in dispute with the Mdewakanton Sioux.
- Would like to see an interchange at Highway 69.
- Would like to see an interchange at Highway 41 and decrease accesses/driveways.
- Trucks making left turns onto 169 need a larger median spacing to cross the Highway.
- Concerned about the development of an amphitheater and the traffic it will generate.
- Seasonal attractions can cause significant back-ups along the highway.
- Concerned with pedestrian crossings. Highway 169 often splits communities in half.
- Growth in township areas needs to include transportation improvements.
- Need interchanges at Anderson Lakes, Pioneer Trail and 169/494.
- St. Peter should stay the same – it is a historic part of the corridor.
- Significant development pressure south of Highway 169 along the corridor through Highway 41.

Meeting 2 – Highway 41 Area

- Would like to see an interchange at Highway 41. Traffic does not work at the existing intersection.
- Would like to see a decrease or a consolidation of access points/driveways in the area.
- Concerned about the development of an amphitheater and the traffic it will generate.
- Growth in the township areas needs to include transportation improvements. Scott County plans to study the extension of CR 70 into 173rd street or Bluff Drive. This study will not occur for some time.
- Concerned about adequate river crossings – you have to use the Bloomington Ferry Bridge or go to Belle Plaine during the spring floods.

Meeting 3 – Jordan Area

- Interested in the development of an interchange at 282 and possibly at CSAH 59 to the south.
- Concerned about pedestrians crossing 169 near 282 and near Highway 21 in town.
- Concerned about the development of an amphitheater and the traffic it will generate.
- Plans are in place to improve Township Road 57 to a 9-ton roadway. This will help consolidate access for some of the industrial areas in the township.
- Concerned about farm equipment crossing the highway – the medians are not large enough to stop in the middle. Have to watch farming hours.

Meeting 4 – Belle Plaine Area

- Concept plans are being developed for an interchange at 169 and 6/64. As part of that plan a frontage/backage road system is being planned.
- Would like to see a second interchange at Highway 25.
- Growth in the township area is contiguous with the City of Belle Plaine. Land will be annexed as it is ready for development.
- Concerned about farm equipment crossing the highway – the medians are not large enough to stop in the middle. Have to watch farming hours.
- In favor of the interchange at Highway 19 – many safety issues at that location.

Meeting 5 – Eden Prairie/Bloomington Area

- Get rid of the signals at 494 and 169, Anderson Lakes Parkway, and Pioneer Trail.
- The 494 EIS does not improve the 494/169 interchange. It also does not include improvements for an interchange at Prairie Center Drive.
- Pioneer Trail will be improved to a four-lane facility by Hennepin County.
- Old Shakopee Road has a tremendous amount of traffic because it is the only east-west alternate to 494.

Meeting 6 – State Agencies

- DTED has several commercial revitalization projects along the corridor – Shakopee, Jordan, Belle Plaine and St. Peter. DTED projects are most concerned with job creation; transportation impacts are not included in grant requirements. The Minnesota River bride in Le Sueur will need to be replaced in 2010.
- PCA is working on a major wastewater facility project in St. Peter and Le Sueur.
- EA is working on developing an eco-industrial park in St. Peter
- Fish and Wildlife service is in the process of finalizing its 15-year plan for the Minnesota River Valley Refuge. They have general areas for expansion upstream. Concerned about bluff erosion between Henderson and St. Peter.
- DNR is concerned about floodplain, shore land areas, protected waters, aggregate resources and remnant prairies. Traffic going to the Renaissance festival blocks access to the wildlife refuge. Approximately 100,000 people access the site near CSAH 14.
- Scenic Byways is interested in preserving the view. Currently in the process for applying for a National Scenic Byway grant to bring bicycle traffic to the area.
- MN Planning does not have any projects in the area, but is willing to provide assistance.

Meeting 7 – Mn/DOT Modal Groups

- Bikeways. There are no planned bikeways along the corridor. Willing to work with communities to develop transportation oriented bikeways.
- Freight. Would like to see the incorporation of ITS strategies to help improve drivers with just-in-time deliveries. Traffic on the Union Pacific is likely to increase; improvements are being made to their facilities.
- Aviation. There are two major airport facilities close to the corridor – Eden Prairie and Mankato. There is a potential for a new airport in Belle Plaine. Eden Prairie airport handles mostly corporate trips. Mankato handles cargo trips. Approximately $30 million will be invested in the two airports.

Meeting 8 – Le Sueur Area

- Pleased about the interchange improvement at 169/19. Would like Highway 19 improved to provide a better connection to Henderson. The roadway is only 5-ton and occasionally floods.
- Growth in the area will be at the top of the hill in Le Sueur.
- Concerned about the three access points near Cambria, the Wayside rest and CSAH 28.
- Industrial uses in the southern part of Le Sueur travel through the City to access 169 – weight restrictions prohibit further development in this part of the City.
- No new additional traffic signals. Would like to see the signal at Highway 41 removed.
- Signal in St. Peter should be at Highway 22, not Jefferson. Jefferson is a gravel road.
- Le Sueur is interested in expanding its airport, but there are many constraints. Currently have a 3,000-foot runway.
- Train traffic is increasing.

Meeting 9 – St. Peter Area

- Growth in St. Peter is planned to the north and to the west.
- Worst traffic is from 7:45 am to 8:30 am and from 4:45 pm to 5:15 pm.
- Want a realignment of 169 closer to the river. Concepts have been developed.
- Pedestrian access is a concern.
- St. Peter is the worst part of the corridor. Highway 41 is nothing compared to here.
- Traffic north of Belle Plaine is not a problem except at Anderson Lakes Parkway and Pioneer Trail and the connection to I-494.
- Some would like to see Highway 41, Anderson Lakes Parkway, Pioneer Trail and the 169/494 connections improved. It would be a shame to see $40 million in St. Peter only to be slowed after the Bloomington Ferry Bridge.
- Jefferson is the appropriate spot for a traffic signal, not Highway 22.
- Concerned about differences in traffic counts/volumes between Mn/DOT maps and other estimates.

Meeting 10 – North Mankato/Mankato Area

- Keep implementing the MATAPS plan. It is working well.
- Future growth along Highway 14 and Highway 22. Zoning working in other parts to protect the corridor.
- Some concern with flooding/drainage on the North Star bridge.
- North Mankato has concerns with closing access at Webster – MATAPS concept.
- Fix the signals at Highway 41 and Highway 69.
- Finish the four-lane improvements on Highway 60.
- Highway 14 improvements to Rochester are also important to the Mankato area.

APPENDIX D

TH 169 Access Types and Locations

As part of the TH 169 Corridor Management Plan a detailed access inventory was completed. This inventory categorized access into five different groups (freeway ramps, public road, business, private residential and field entrances). Additional information was collected with respect to the type of movement permitted (i.e., right-in/right-out, full, etc.) and the presence of turn lanes.

The following pages contain figures that identify all access points along TH 169 as of April 1, 2001. Access locations are identified by type (i.e., residential, commercial, field, etc.).

LEGEND

Access Types

- Interchange Ramp
- Public Road
- Business
- Private Res
- Field

Source: Field Inventory Spring 2001

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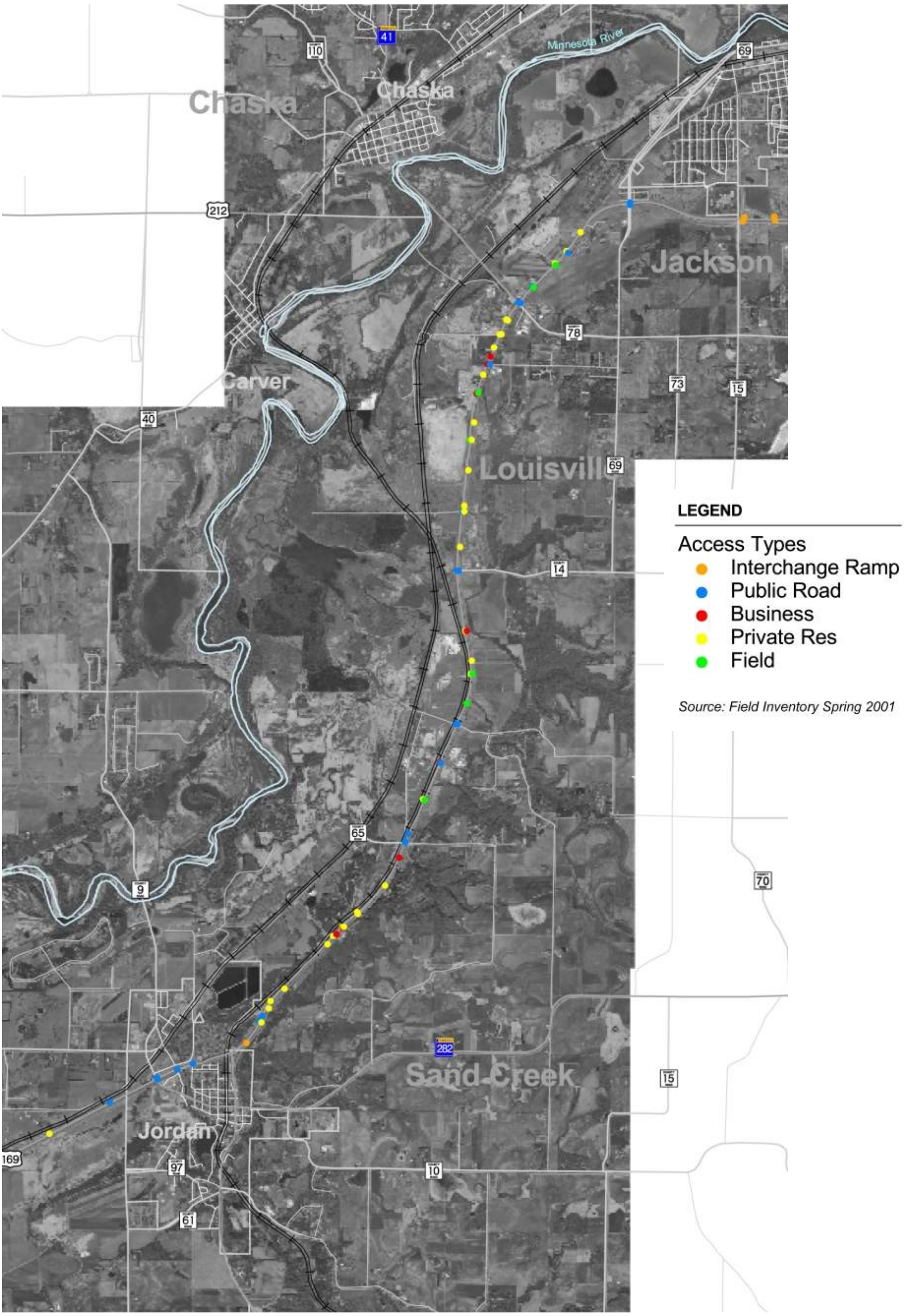
HIGHWAY 169 CORRIDOR PLAN



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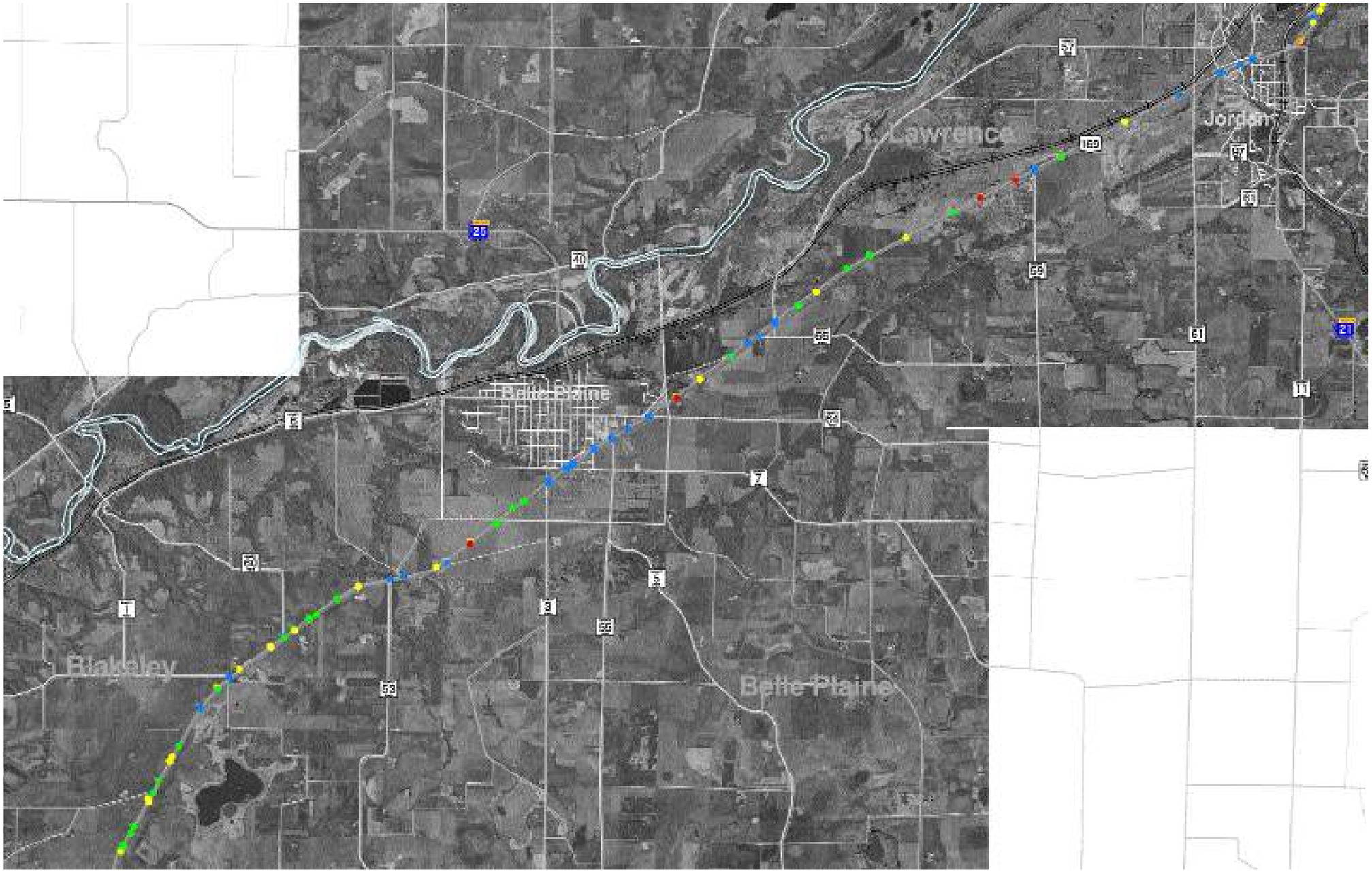

LEGEND

Access Types

- Interchange Ramp
- Public Road
- Business
- Private Res
- Field

Source: Field Inventory Spring 2001

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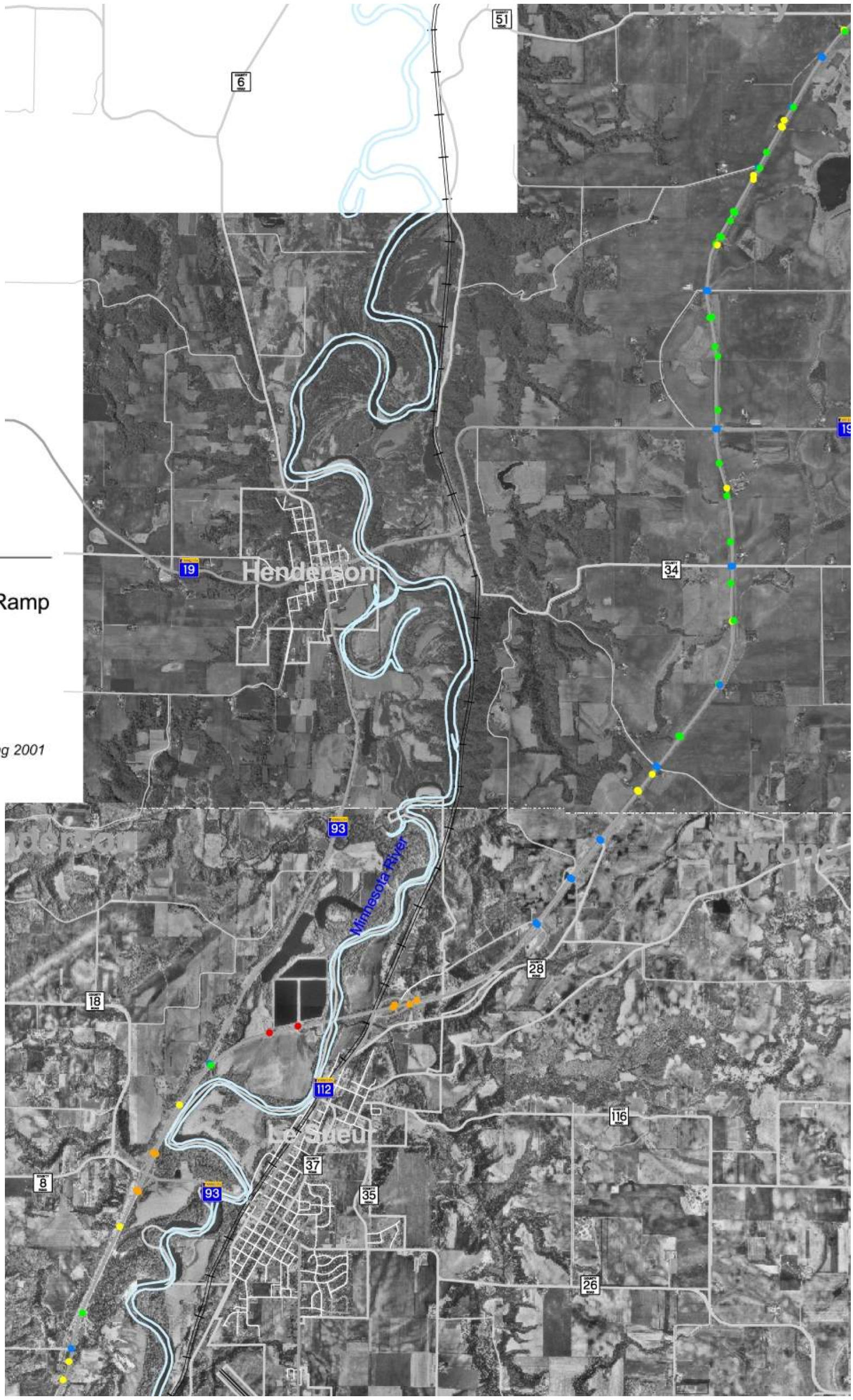

LEGEND

Access Types

- Interchange Ramp
- Public Road
- Business
- Private Res
- Field

Source: Field Inventory Spring 2001

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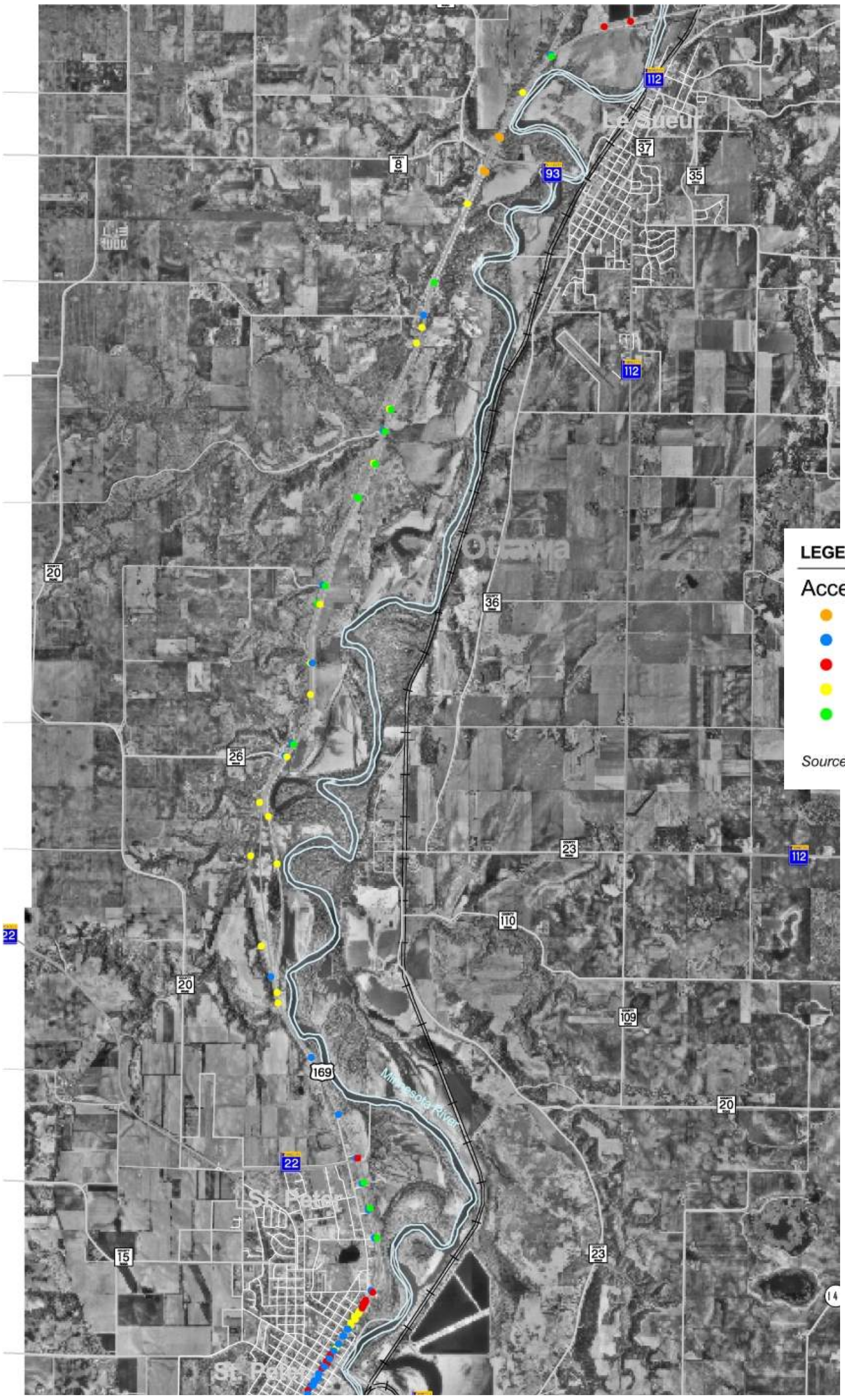

LEGEND

Access Types

- Interchange Ramp
- Public Road
- Business
- Private Res
- Field

Source: Field Inventory Spring 2001

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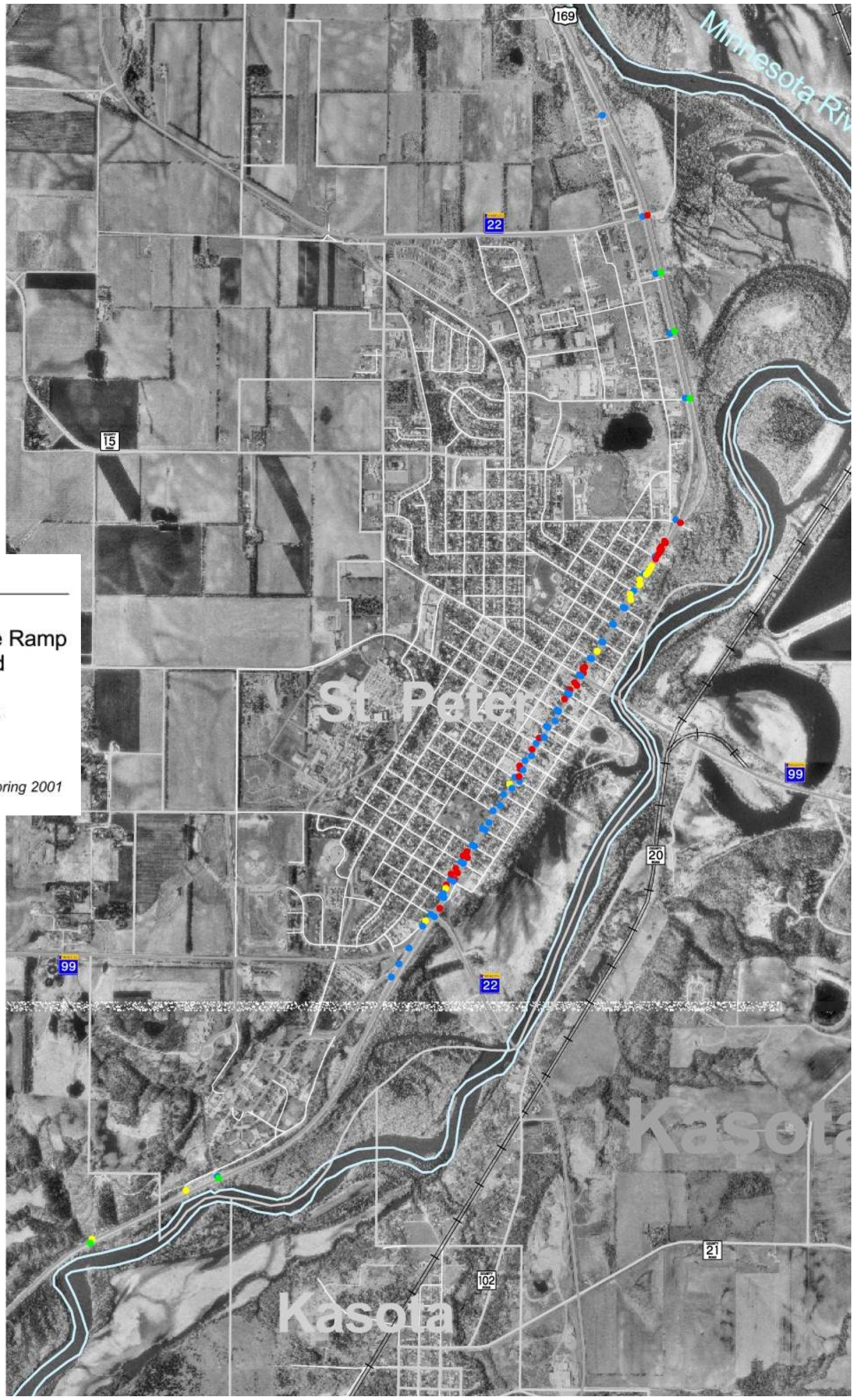

LEGEND

Access Types

- Interchange Ramp
- Public Road
- Business
- Private Res
- Field

Source: Field Inventory Spring 2001

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HIGHWAY 169 CORRIDOR PLAN

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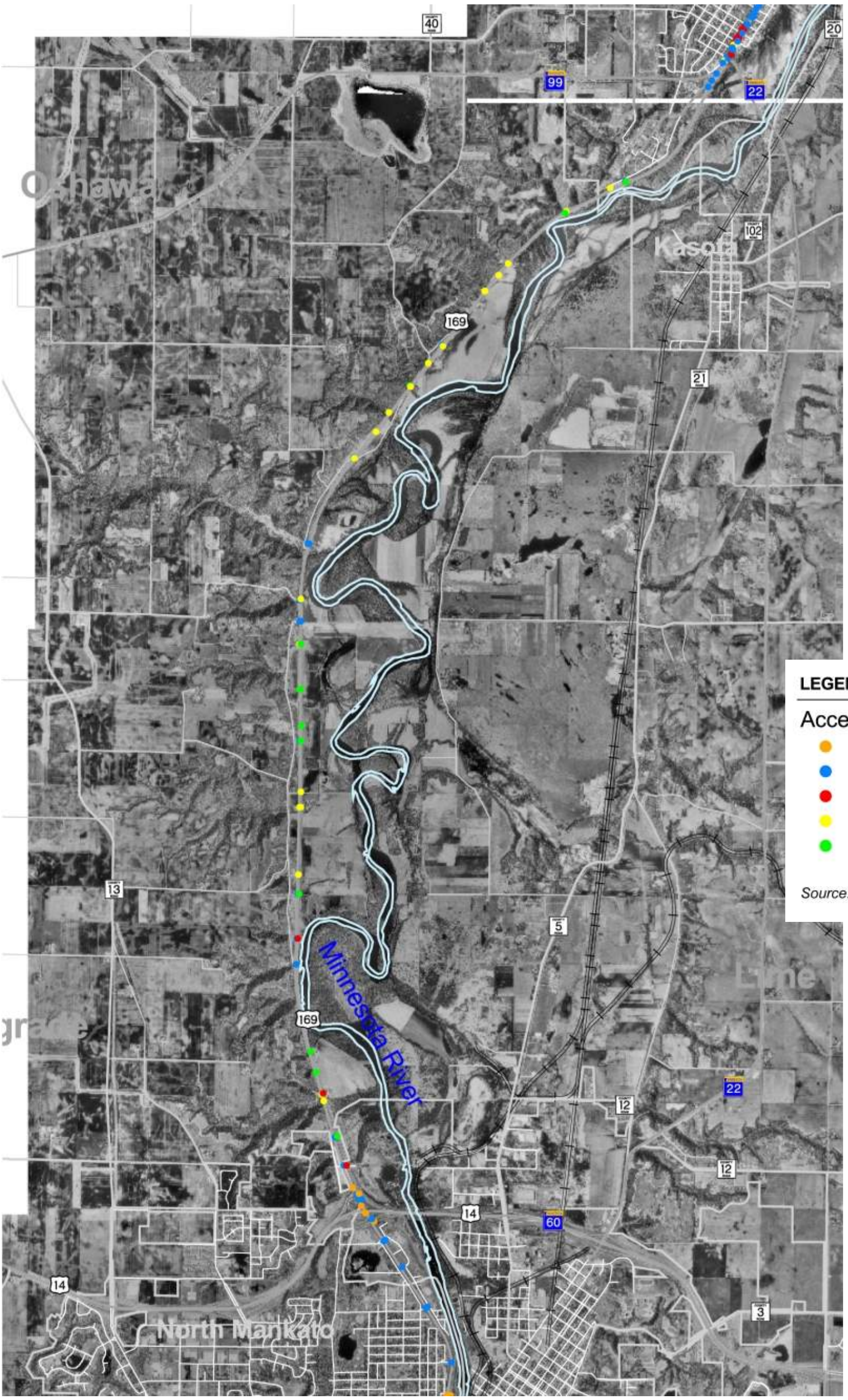

LEGEND

Access Types

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- Public Road
- Business
- Private Res
- Field

Source: Field Inventory Spring 2001

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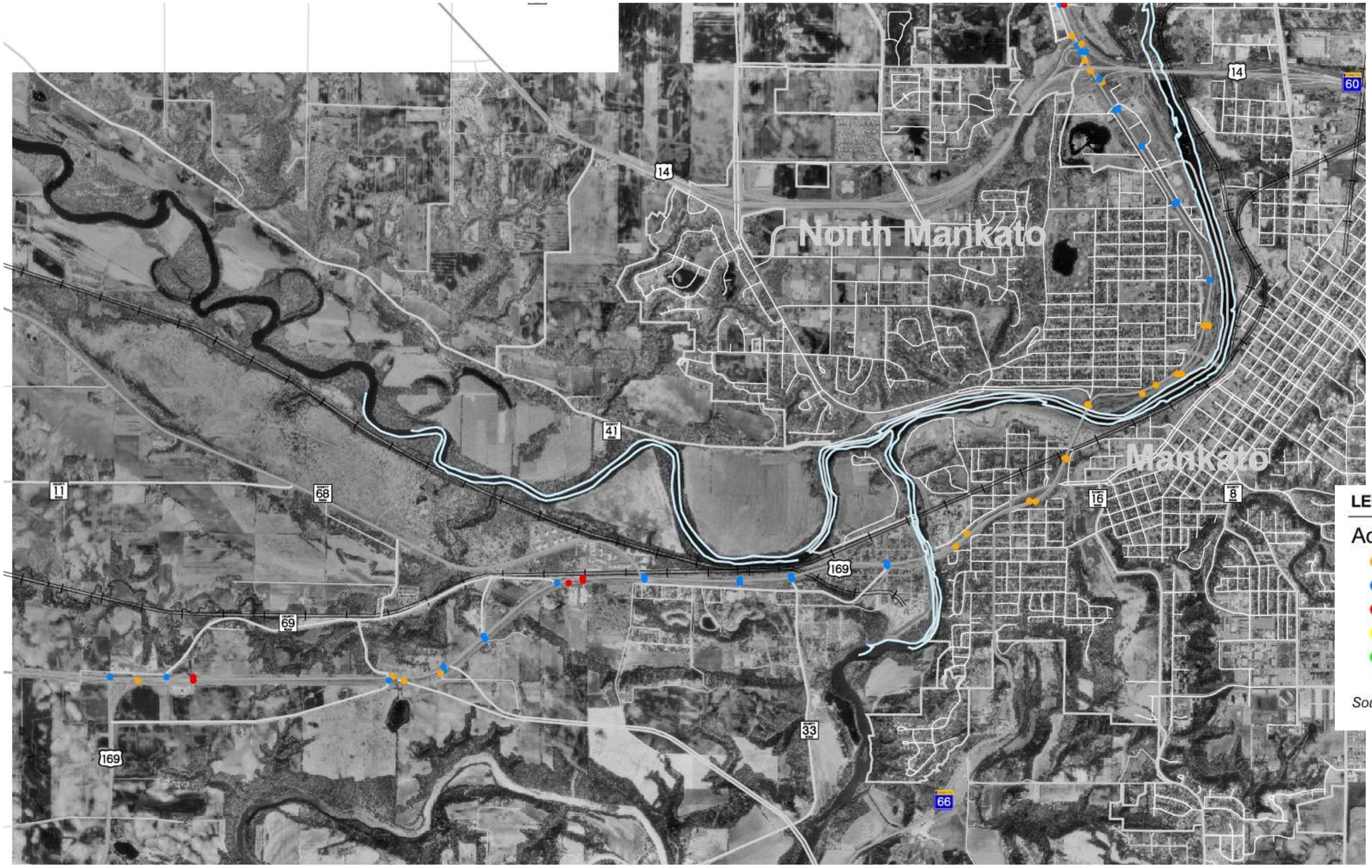

LEGEND

Access Types

- Interchange Ramp
- Public Road
- Business
- Private Res
- Field

Source: Field Inventory Spring 2001

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HIGHWAY 169 CORRIDOR PLAN IRC

APPENDIX E

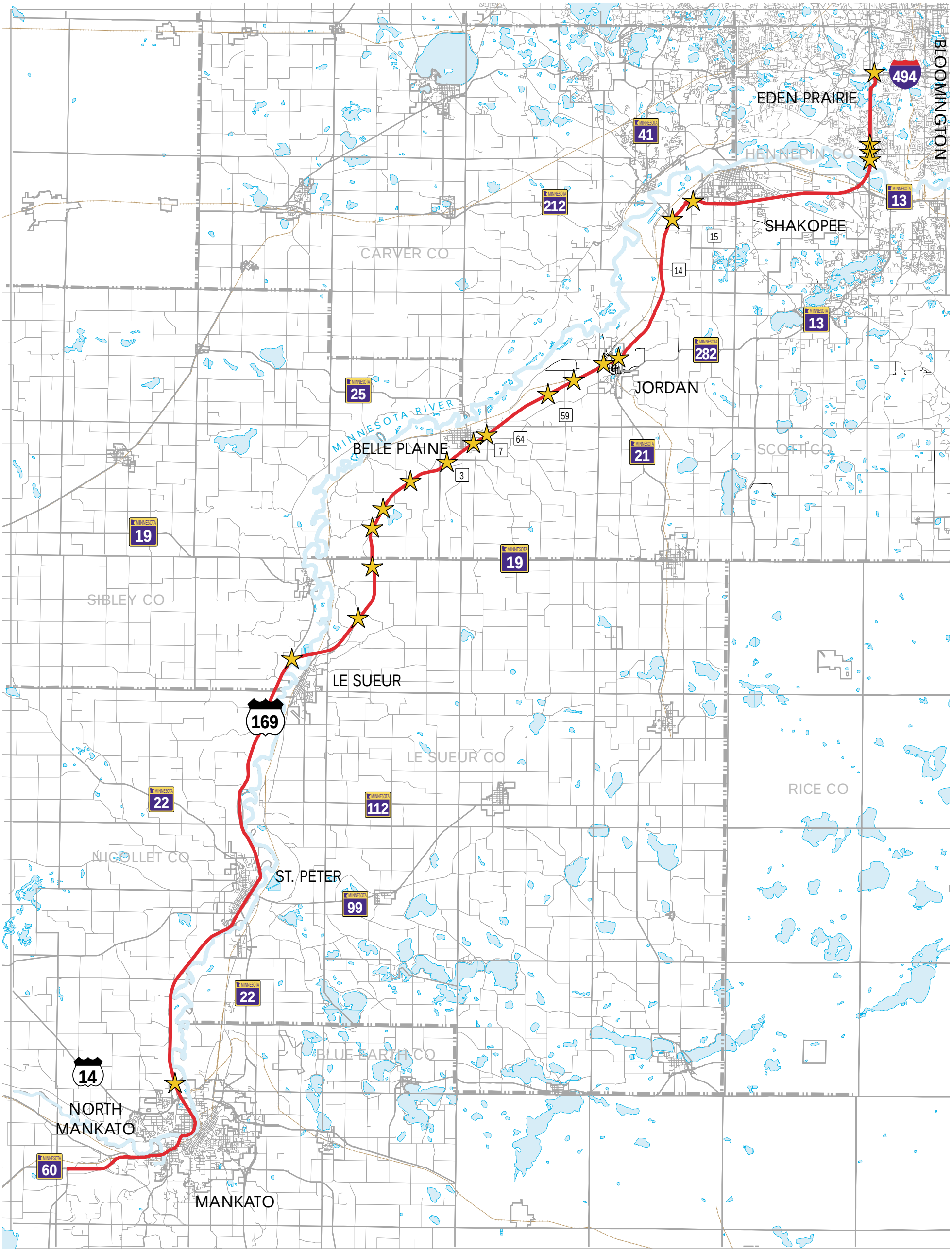
Fatal Crashes

Fatal crashes are a concern in the TH 169 Corridor Study. The following summary lists and describes all of the fatal crashes that occurred over a four-year period from January 1, 1997 to December 31, 2000. This summary was developed from Department of Public Safety (DPS) crash listings by decoding reports. Additionally, Figure E-1 shows the locations of the fatal crashes.

FATAL CRASH SUMMARY [1]
HIGHWAY 169 FROM I-494 TO MANKATO

Segment	Total Fatal Crashes	Causes
A	2	One of the crashes occurred at 3:00am with a driver under the influence, and the other driver disregarded traffic control devices. Both occurred in the same location between Anderson Lakes Pkwy EB LT and WB LT.
B	1	This crash occurred as the driver changed lanes at an unsafe speed in good weather conditions.
C	3	These crashes all involved drivers whose actions contributed to the crash: under the influence, disobeying traffic signals, and driving at an unsafe speed. None of the crashes happened in bad weather, but one occurred in the dark with no streetlights.
E	1	This crash had no clear contributing factor. It involved two vehicles and a pedestrian at 1:00am in an area with streetlights and a traffic signal.
F	1	This crash occurred in good driving conditions as the driver made a lane change at an unsafe speed.
H	1	This crash occurred in good driving conditions as the driver disregarded traffic signals and drove at an unsafe speed.
I	2	One of the crashes in the segment occurred near the same area as the crash in segment H. This crash had no contributing factors and happened when the roadway was wet and it was raining. The driver in the second crash was traveling at unsafe speeds on an ice/snow packed roadway.
J	2	These crashes occurred during the day in good driving conditions. One involved a driver who failed to yield at a stop sign, and no contributing factor was found for the second crash.
K2	5	Two of these crashes were head-on collisions. One occurred as the driver drove the wrong way into imposing traffic at an unsafe speed, and no contributing factor was found for the second, although the road was wet and it was raining. The other three crashes occurred in dry conditions during the day. One involved improper lane changes, and the other two were due to the driver driving left of the roadway center. One of these drivers was asleep.
L	1	This crash occurred with snow/ice blowing and on the road. The inexperience of the driver was a factor as they drove at an unsafe speed into opposing traffic.
M	1	This crash occurred in good conditions and was attributed to the driver's failure to yield due to inattention.
O	1	This crash occurred when the driver on the road sideswiped a car parked on the shoulder. This happened in the dark in an area with no streetlights.
S	1	This crash was attributed to the driver's failure to yield due to inattention. It occurred at 7:00am in good driving conditions.
Total	22	

(1) Crash data is for the time period between January 1, 1997 and December 31, 2000.



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APPENDIX F

Traffic Volume Changes

The following table shows volume changes over time for the various segments along TH 169. Volume growth in the northern portion of the corridor is significantly greater than in other parts of the corridor.

TH 169 Historic Volumes

Segment	From	To	1980	1990	2000
A	I-494	Old Shakopee Road	28,200	25,000	56,000
B	Old Shakopee Road	TH 13	22,500	21,000	54,000
C	TH 13	TH 69	22,500	22,000	31,000
D	TH 69	TH 41	22,500	22,000	34,000
E	TH 41	150th Street	22,500	19,000	27,500
F	150th Street	North Jordan City Limits	13,900	17,500	25,500
G	North Jordan City Limits	TH 282	13,900	17,500	25,000
H	TH 282	South Jordan City Limits	13,900	17,500	18,400
I	South Jordan City Limits	CSAH 6/64	9,700	13,700	18,400
J	CSAH 6/64	So. Limits of Belle Plaine	9,700	11,500	18,400
K	So. Limits Belle Plaine	TH 19	9,400	10,100	13,600
L	TH 19	Le Sueur Hill (DQ)	8,900	11,000	12,700
M	Le Sueur Hill (DQ)	Le Sueur Rest Area	8,900	12,500	12,700
N	Le Sueur Rest Area	Le Sueur River Crossing	8,900	12,500	12,700
O	Le Sueur River Crossing	North Growth Area of St. Peter	9,100	12,100	13,700
P	North Growth Area of St. Peter	North Urban Area of St. Peter	9,650	12,800	14,800*
Q	North Urban Area of St. Peter	State Hospital Access	8,550	12,800	13,000*
R	State Hospital Access	Just North of TH 14	8,750	12,500	12,600
S	Just North of TH 14	TH 14	8,550	14,500	12,600
T	TH 14	Belgrade Avenue	14,800	14,500	23,000
U	Belgrade Avenue	Minnesota River	14,800	10,600	23,000
V	Minnesota River	Blue Earth River	18,000	14,500	21,800
W	Blue Earth River	TH 68	9,300	11,200	18,800
X	TH 68	CSAH 90	7,800	11,200	13,500
Y	CSAH 90	TH 60	7,800	11,200	13,500

(*) Traffic volumes in the downtown area of St. Peter are probably higher than indicated by the counts shown in the table. Mn/DOT collects traffic counts every two years along its system. Traffic volumes are averaged through many of the small communities along the roadway; this can lead to some underreporting of traffic in core downtowns. In order to be consistent along the corridor, traffic volumes from Mn/DOT were used for reporting purposes.

APPENDIX G

Peak Hour Directional Splits

Table G-1 provides additional information on peak hour traffic. This table indicates the directional split of traffic on TH 169 during the peak hour at selected locations.

TABLE G-1
TH 169 VOLUME COMPARISON

Location	Peak Hour Volume		% Peak Hour		Directional Split	
	AM	PM	AM	PM	AM	PM
Old Shakopee Rd	4,906	5,438	6.8%	7.5%	74/26	63/37
TH 41	2,327	2,620	6.6%	7.5%	63/37	63/37
Jordan	1,754	1,896	6.8%	7.4%	69/31	66/34
Belle Plaine	1,178	1,497	5.9%	7.5%	61/39	58/42
St. Peter	894	1,280	5.5%	7.9%	53/47	51/49
Mankato	1,070	1,300	6.4%	7.7%	53/47	64/36

APPENDIX H

Performance

The following pages contain the methodology that was used to assess the performance of the individual corridor segments for each of the future performance scenarios. The methodology incorporates delay due to congestion and traffic signal installation.

Existing Performance

Each interregional corridor plan should initially conduct a field performance test to confirm the overall corridor performance as well as determine the performance of each of the corridor's growth areas. This will provide a basis for discussing potential problems and solutions for both the overall corridor and for individual growth areas. The steps for constructing the performance analysis are as follows:

Step 1: Use individual growth area segments identified in the corridor segmentation section.

Step 2: Conduct travel-time runs during the two-hour a.m. and p.m. peak periods. Travel time and distance, intersection delays, and delays in congested mainline segments should be recorded for all growth area segments using standard travel time collection methodology. A minimum of four morning and four evening runs is recommended to obtain results that are within plus or minus three miles per hour at the 95 percent confidence level. Table H-1 shows minimum sample size requirements. Note that for the eight peak period speed runs recommended, the average range in travel speed can be as high as 15 mph.

TABLE H-1
MINIMUM SAMPLE SIZE REQUIREMENTS

Average Range in Travel Speed (mph)	Minimum Number of Runs for Specified Permitted Error				
	± 1.0 mph	± 2.0 mph	**± 3.0 mph**	± 4.0 mph	± 5.0 mph
2.5	4	2	**2**	2	2
5.0	8	4	**3**	2	2
10.0	21	8	**5**	4	3
15.0	**38**	**14**	**8**	6	5
20.0	59	21	12	8	6

Source: Report No. FHWA 80-2 Planning and Field Data Collection, Volume III in a Series on Positive Guidance

Step 3: Compute average travel speeds and average range in travel speed for each growth area, and aggregate speeds for the entire corridor. Compare the overall corridor speed and individual growth area travel speeds to the performance targets to gauge the level of performance. In addition, the average range in travel speeds for the eight samples should be compared to the maximum range of 15 mph to determine corridor and segment travel speed predictability. If the average range in travel speed is over 15 mph, the travel speed for the corridor or for the individual growth area will be considered unpredictable.

Categorize corridor and growth area performance with respect to target speed levels as follows:

TABLE H-2
PERFORMANCE TARGETS

Performance Category	Interregional Corridor Priority Level	
	High-Priority	**Medium-Priority**
Above	≥ 66 mph	≥ 61 mph
At	61-65 mph	56-60 mph
Below	≤ 60 mph	≤ 55 mph

Future Performance

The above methodology only applies to current performance analysis. How a facility will perform in the future must be estimated based on anticipated changes in the corridor. These anticipated changes include the potential for additional signals, as well as increased congestion due to additional traffic demand. The steps below describe how future travel times should be calculated.

Step 1: Assess the Impact of Additional Traffic and Congestion

A. Review the projected growth and total traffic volume for each segment and compare it to the capacity of the facility type. This comparison can be done using available computer programs or, if not available, the following thresholds can be used to determine if the growth area is one of three categories of congestion: (1) uncongested, (2) moderate congestion, or (3) severe congestion (Table H-3).

B. Add additional travel time to the individual growth area measured travel time if traffic growth in the corridor changes the congestion level. For example (Table H-3), as a facility moves from the uncongested into the moderate congestion category, a congestion penalty from 0 to 30 percent is added (the penalty gradually increases from 0 to 30 percent as the threshold moves from uncongested to the high end of the moderate congestion category). The congestion penalty is calculated by multiplying the percent of congestion delay (0 to 30 percent) times the base travel time. This time is then added to the base travel speed. If it moves into the severe category, add a 50 percent travel time penalty.

TABLE H-3
CONGESTION THRESHOLDS

Type of Facility	Volume Threshold (1) (AADT per Lane)	Congestion Index Risk	Added Delay Penalty Level (2)
Freeway	≤ 15,000	Low	0%
Freeway	15,000 – 20,000	Moderate	(Traffic volume-15,000/5,000)*.3
Freeway	> 20,000	Severe	50%
Rural Expressway	≤ 8,000	Low	0%
Rural Expressway	8,000 – 11,000	Moderate	(Traffic volume-8,000/3,000)*.3
Rural Expressway	> 11,000	Severe	50%
Urban Expressway	≤ 5,000	Low	0%
Urban Expressway	5,000 – 7,000	Moderate	(Traffic volume-5,000/2,000)*.3
Urban Expressway	> 7,000	Severe	50%
Two-lane	≤ 4,500	Low	0%
Two-lane	4,500 – 7,500	Moderate	(Traffic volume-4,500/3,000)*.3
Two-lane	> 7,500	Severe	50%

(1) Volume thresholds developed based on experience and values developed by Texas Transportation Institute for the FHWA-sponsored Urban Mobility Study.

(2) Percentage of Base Travel Time component that should be added to the overall travel-time to account for congestion.

Step 2: Assess Potential for Additional Signals

A. Identify the highest-volume unsignalized intersections in the corridor, identify future growth trends, and assess the level of impact this growth will have on the potential for a signal warrant at these intersections. As a starting point, use the signal-risk thresholds shown in Table H-4.

B. Evaluate the likelihood of these intersections to be signalized based on anticipated growth trends in the IRC and its cross-streets. Remember that signal justification is not necessarily based on AADT. Often counts are taken on normal weekdays during peak seasonal periods. Categorize each of the intersections into groups with a high to medium potential for future signals or those with a low potential for future signals. For each intersection with high or moderate signal potential, add the following delay time to the current travel time for future signal delay (Table H-5).

TABLE H-4
SIGNAL RISK THRESHOLDS

Type of Facility	Volume Threshold (Two-way AADT)	Signal Risk Index	
Rural Expressway	≤ 10,000	1	Low
Rural Expressway	10,000 – 20,000	2	Medium
Rural Expressway	> 20,000	3	High
Two-Lane	≤ 8,000	1	Low
Two-Lane	8,000 – 14,000	2	Medium
Two-Lane	> 14,000	3	High

TABLE H-5
FUTURE SIGNAL TIME PENALTY

Location	**Low Congestion (3)**	**Moderate Congestion (3)**	**Severe Congestion (3)**
Greater Minnesota (1)	11 seconds	17 seconds	20 seconds
Metro Areas (2)	15 seconds	24 seconds	29 seconds

(1) Based on a 75-second cycle length, average acceleration and deceleration time, assumes 10 percent trucks, and 40 percent stops.

(2) Based on a 120-second cycle length, average acceleration and deceleration time, assumes 10 percent trucks, and 40 percent stops.

(3) Level of congestion as defined by volume thresholds in Table H-3.

Step 3: Recalculate Future Performance

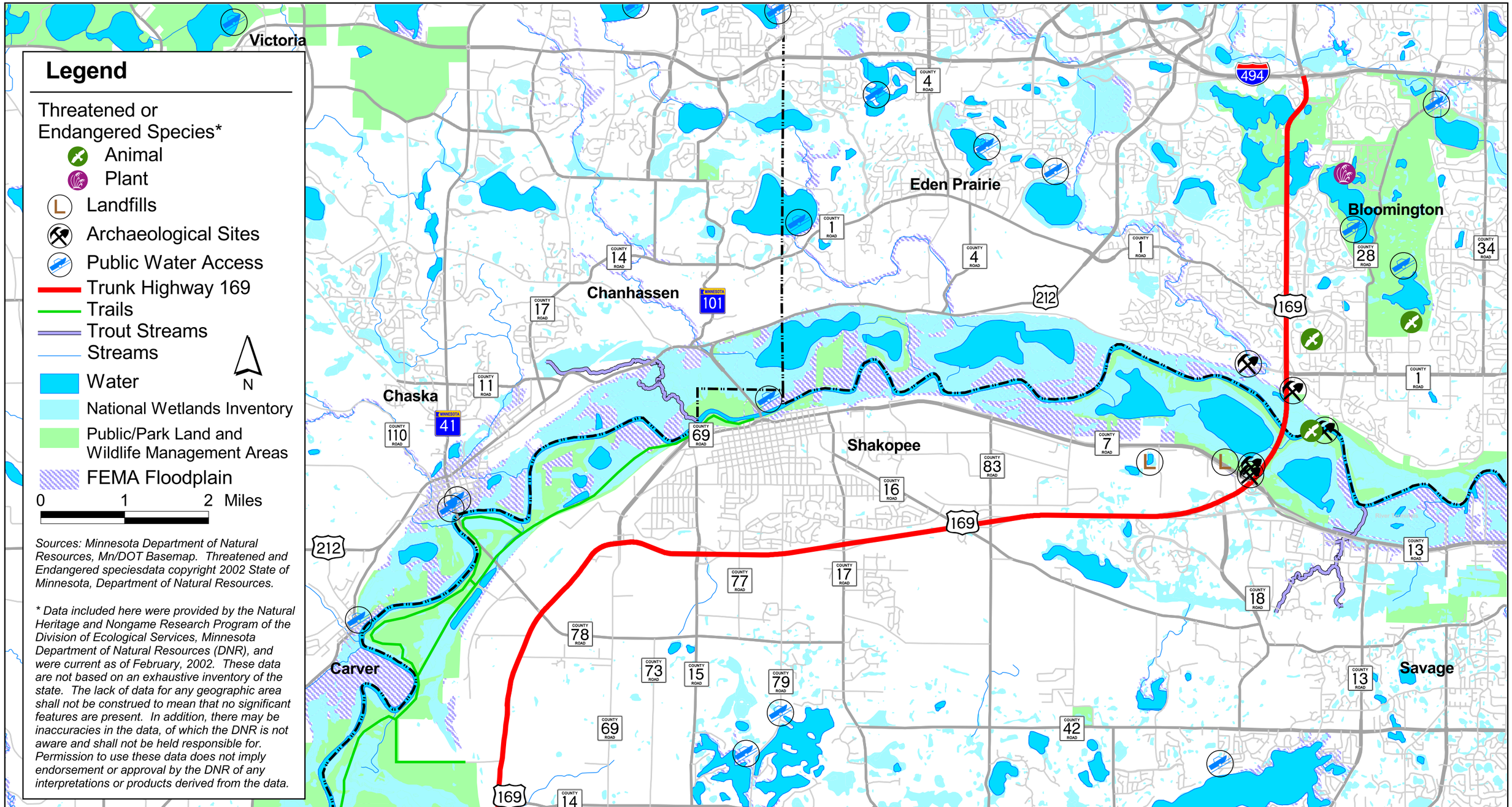
Sum the additional delay times for capacity-related and signal-related delay and add them to the existing travel time for the corridor. Compute the overall corridor performance based on the revised, overall travel time.

APPENDIX I

Major Capital Project Concepts

The following pages contain preliminary and developmental concepts for the major projects identified in the Corridor Management Plan. Most of the concepts were developed to generate discussion on proposed access locations and potential types of access. The concepts vary considerably in terms of local and state agreement with the proposed concepts. For each project there is a brief write-up describing the proposed concepts and the level of agreement for a particular concept. A significant amount of additional work, including public involvement, environmental documentation and preliminary design will need to be completed before construction can occur. It should be noted that all overpass and interchange projects include pedestrian and bicycle accommodations.

In addition to providing potential concepts, pages I-2 through I-6 show natural resource issues that were identified along the corridor. Information from these maps was used to develop the concepts in an attempt to avoid or mitigate impacts to the natural environment. Table I-1 on page I-7 lists specific concerns for potential project areas in the northern half of the corridor.



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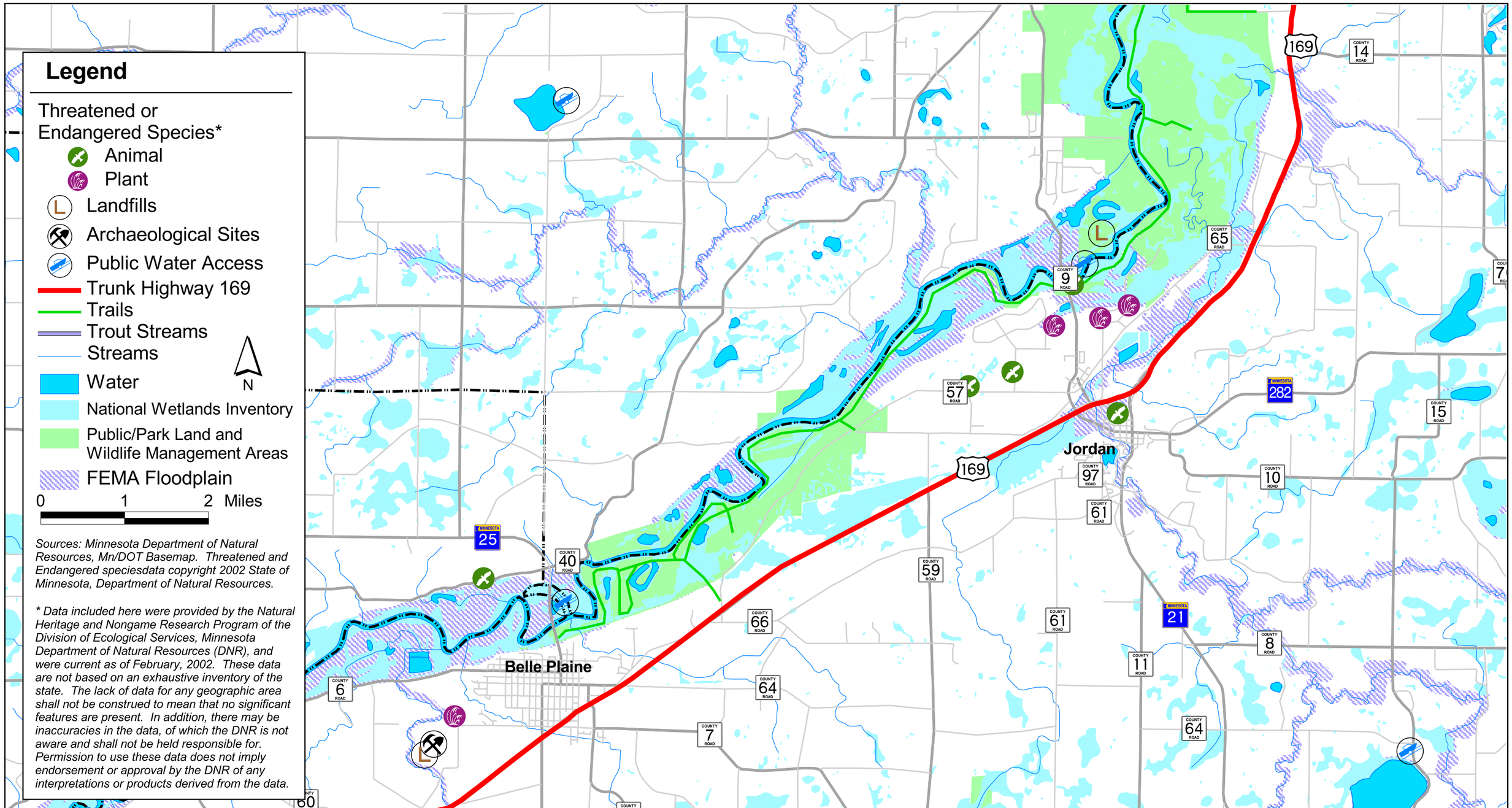
NATURAL RESOURCE ISSUES

Highway 169 Interregional Corridor

Figure I-1



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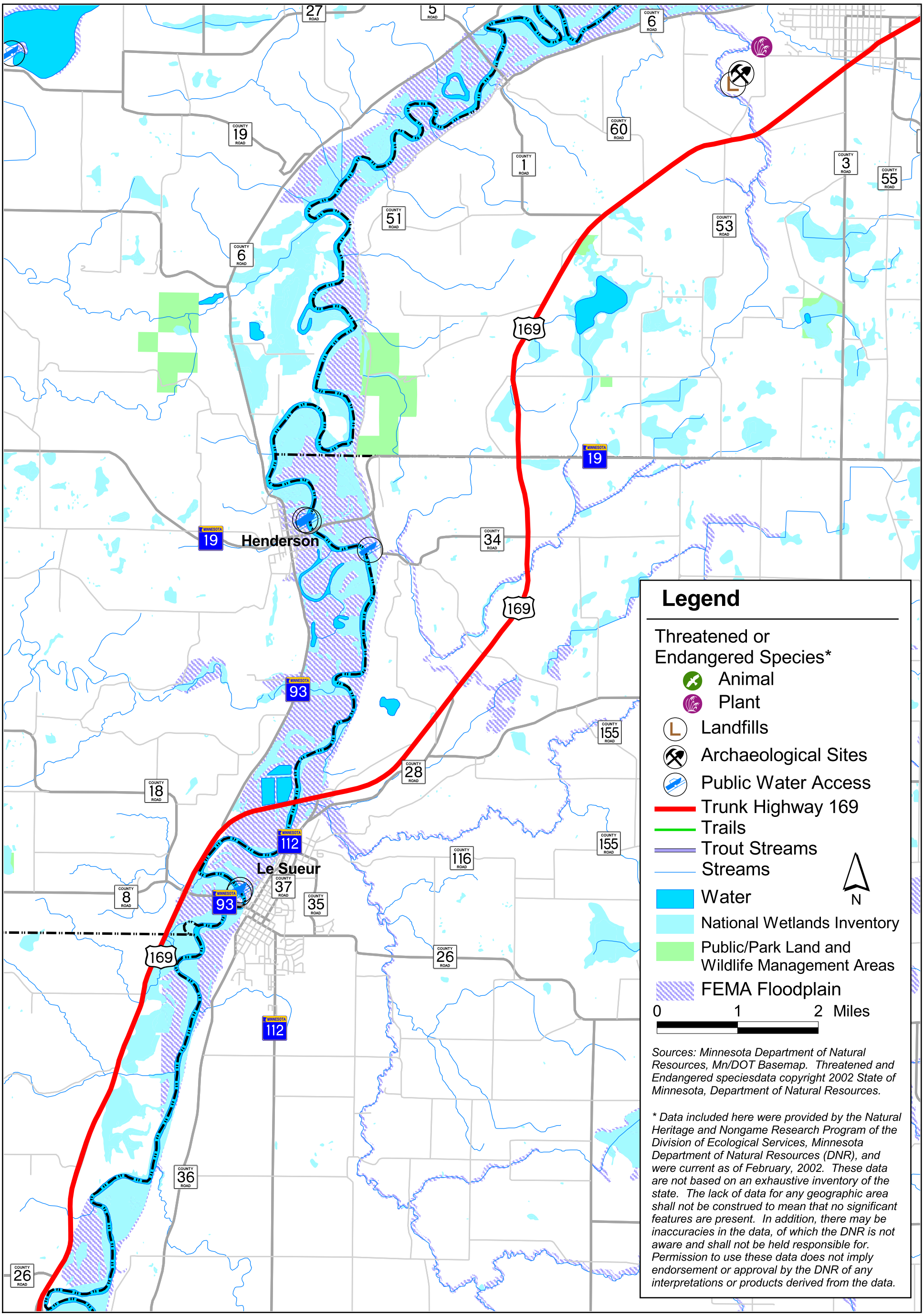
NATURAL RESOURCE ISSUES

Highway 169 Interregional Corridor

Figure I-2

HIGHWAY 169 CORRIDOR PLAN IRC



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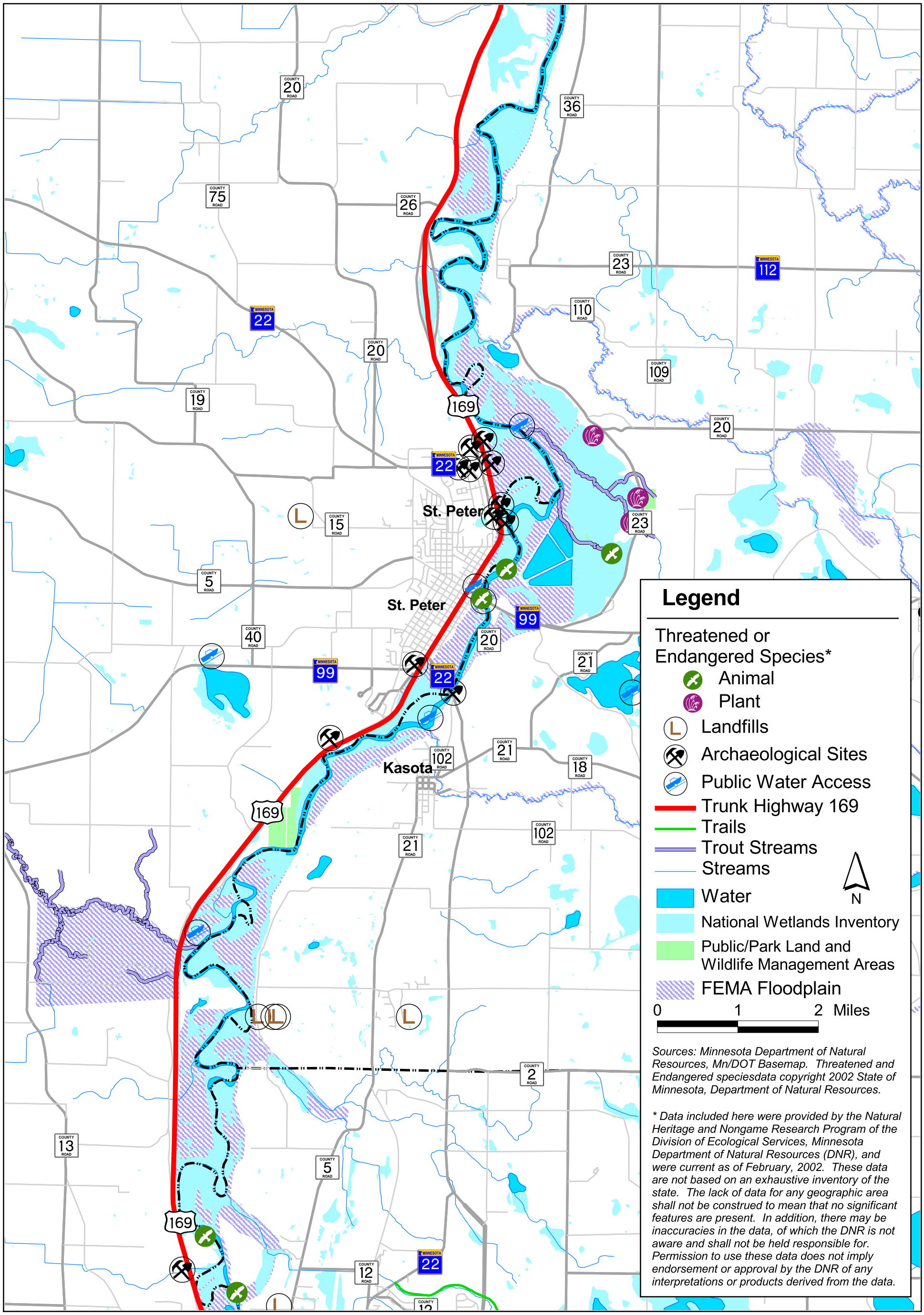
NATURAL RESOURCE ISSUES

Highway 169 Interregional Corridor

Figure I-3

HIGHWAY 169 CORRIDOR PLAN IRC



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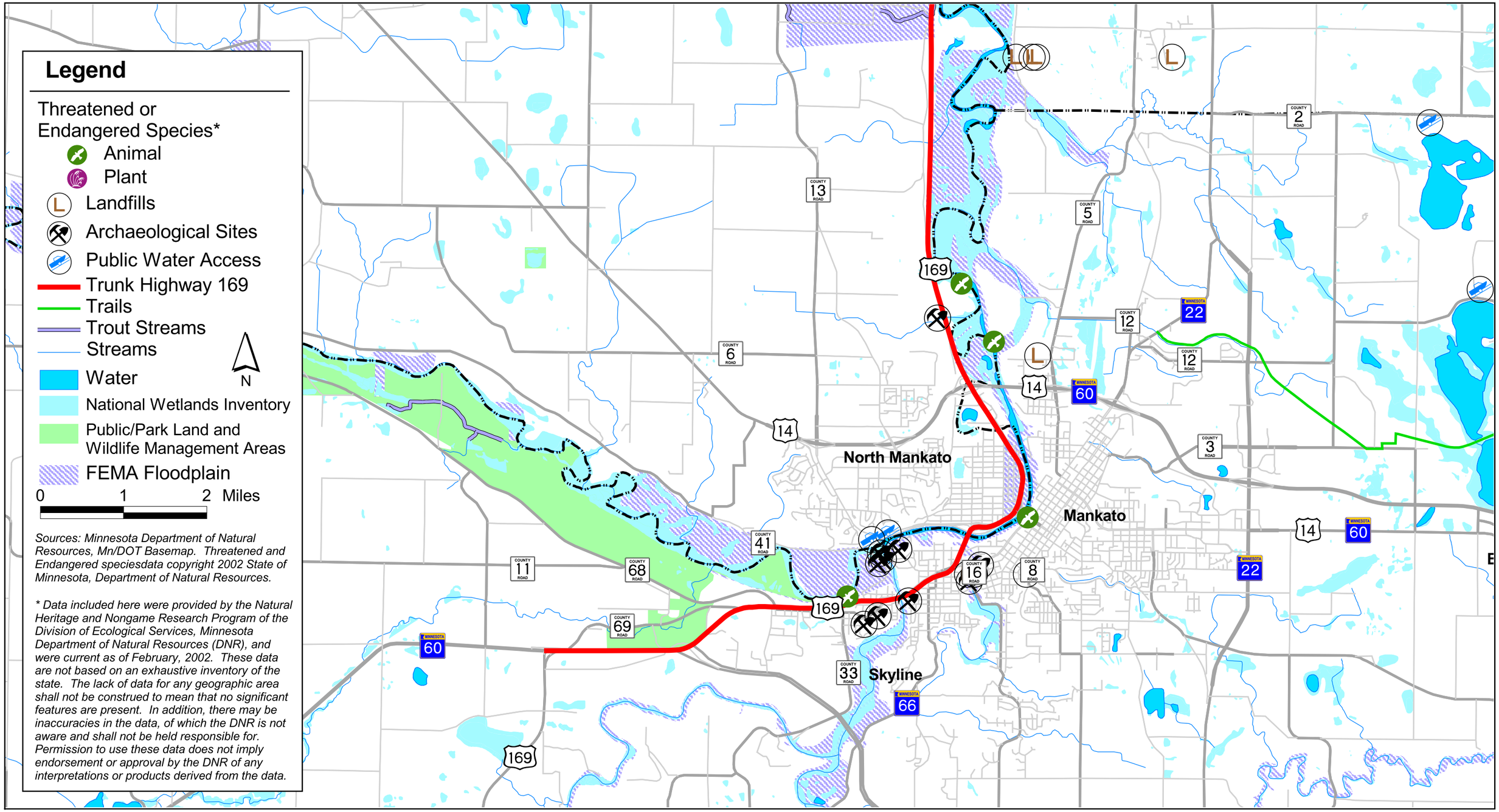
NATURAL RESOURCE ISSUES

Highway 169 Interregional Corridor

Figure I-4

HIGHWAY 169 CORRIDOR PLAN IRC



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NATURAL RESOURCE ISSUES

Highway 169 Interregional Corridor

Figure I-5

TABLE I-1
NATURAL AND CULTURAL RESOURCE ISSUES

Project Area		Project Need/ Description	Project Magnitude	Compatibility with Land Use Plans	Heritage Elements and Wildlife Habitat	Floodplain	Wetlands	Contaminated Sites	Cultural Resources	R-O-W and Relocation Impacts	Other
1	Connection to CSAH 16	Overlay existing dirt road	~3,000 ft	Project is within Shakopee municipality - Consultant does not have comprehensive plan and the plan is not available online. Based on aerial, area is utilized for agricultural purposes.	No issues.	No issues	No issues	Site 4769 (VIC) - police firing range north of gravel road. Leak site listed in Shakopee - Bulk Plant (ID # 4042), but location is not known from current information.	No SHPO sites. MnModel - No data for area. Based on aerial, location unlikely to contain items that would require investigation.	No structures impacted.	
2	CR 69	CSAH 69 Overpass along existing alignment. Frontage roads	Bridge and main line ~ 4,000 ft Frontage/county road ~ 1,500 ft	Current county plan indicates Urban Business, Rural Industrial, and General Commercial Districts. From aerial - primarily ag., some commercial.	No issues.	No issues	No issues	Site 2917 (VIC) near the proposed SE frontage road. LUST site 6551 near the NW frontage road - conditionally closed in 1995.	SHPO - an archeological site by proposed connections at Chestnut Blvd. MnModel - Moderate potential for archeological sites.	No structures acquired. Project located next to trailer parks, but no changes in alignment.	Increased speed through area - impacts to trailer parks and recreational parkland. Potential gravel truck traffic heading north on CR 69 impact to trailer park.
3	CR 78 / TH 41	Interchange and frontage/county roads	TH 41 ~ 2,500 ft, total project area ~ 0.9 square miles	Zoned commercail/industrial, no known issues	No issues.	No issues	No issues	Lust site 7887 near frontage road SW of 41, NW of 169 - conditionaly closed in 1996. Lust sites 4755 and 8096 on 169 N of proposed interchange - conditionally closed in 1992 and 1996. LUST site 7549 near proposed eastern frontage road at 133rd St. - conditionally closed in 1994. Site 5064 (SWPERM) W of proposed SW frontage road.	No SHPO sites. MnModel - no data for east side, moderate potential for west side. Area appears to be in commercial/industrial area with previous agricultural and other disturbance likely.	One business acquired. Trailer courts impacted by new frontage roads. Increased speed impacts trailer courts. Frontage roads closer to several residences.	
4	CSAH 14 / 145th Street	Interchange and frontage/county roads	TH 169 ~ 4,000 ft, Total project area ~ 0.5 square miles	Zoned commercial/industrial, no known issues	Bessey bullii (kitten tails) - state threatened species, and Speyeria idalia (regal frittilary) - special concern species near proposed interchange. Colongial waterbird nesting site within the Minnesota Valley Recreation Area near proposed SW frontage road.	No issues	No issues	LUST site 11241 on 169 north of proposed ramps - conditionally closed in 1995.	SHPO -archeological site in T114N R24W Section 28. MnMODEL - moderate to high potential. Area appears to be primarily agricultural with some commercial and industrial.	Three buildings razed, it appears that two businesses may be impacted.	
5	173rd Street / CR 65	Interchange and frontage/county roads	173rd Street ~ 3,000 ft, Railroad ~3,500 ft, Frontage ~ 11,000 ft	Proposed zoning: Urban Business Reserve, General Commercial District. 2020 Comp. Plan: Urban Expansion Area, Commercial Reserve	Maple-Basswood Forest, Cypripedium candidum (small white lady's slipper) These are both state listed species.	173rd Street ~ 1,000 ft in floodplain, Railroad ~ 2,000 ft in floodplain, Frontage ~ 6,500 ft in floodplain	173rd Street ~ 1,000 ft in wetland, Railroad ~ 1,000 ft in wetland, West Frontage ~ 2,000 ft in wetland	No sites identified, area is partially off MPCA map. No sites visible from aerial photo, all agricultural land use.	SHPO - archeological site on farmstead off of Jordan Ave. MnMODEL - Medium to high potential.	No homes or businesses acquired. Agricultural land acquired.	
6	TH 21	Change at-grade access to grade-separated access by building C4 2 ramps to exit south onto TH 21 and to enter TH 169 N-bound from N TH 21. Adding short frontage road NW of N ramp.	Approx. 0.12 square mile area. Elevated Ramp access	Existing zoning - Urban Expansion Reserve. Proposed land use: Urban expansion.	Threatened species- Tiger Beetle (Cicindela Lepida) Special concern - Big Tick-Trefoil	Floodplain just south of interchange. Potential impacts.	No issues	Site 4502 (VIC site) - No listed information.	No SHPO sites. MnMODEL- Low to high potential.	New frontage road to come closer to residence on NW side. Ramp closer to buildings NW of interchange.	Location on NE border of City of Jordan.
7	CSAH 59	Change at-grade access to grade-separated access. Proposed frontage road south and north of interchange.	Approx. 0.6 square miles. Elevated roadway with ramp access for S-bound traffic, ramp/loop access for N-bound.	Existing zoning - Urban Expansion Reserve District. Commercial parcel just west. Proposed land use: Urban expansion, nearby commercial.	Special concern species - Pituphis catenifer (gopher snake)	No issues	Close proximity of N ramps to wetlands and potential impacts on south side of TH 169, just east and west of interchange.	No sites identified.	No SHPO sites. MnMODEL - Low probability of cultural resources.	Frontage road closer to residences SW of interchange and residents just north of railroad. Relocation of resident in NW quadrant of interchange for ramp construction.	
8	CR 66	CR 66 Access to TH 169 eliminated. Extension of CR 57 (Park Road) into Belle Plaine. Two other interchanges planned in Belle Plaine, all other access closed.	Approx. 2,000 ft of roadway. Approx. 400 ft bridge over TH 169.	Existing zoning: Urban Expansion Reserve District. Proposed Land Use: Urban Expansion.	Special concern species - Pituphis catenifer (gopher snake) found north of proposed overpass.	No issues	Small area of wetlands south of existing CR 66 where proposed roadway would connect.	No sites identified.	SHPO - numerous historical/architectural sites listed within the city of Belle Plaine. MnMODEL - Low probability of cultural resources.	none	CR 57 (Park Road) is managed by DNR. MN Valley State Rec. Area 0.5 mile north of interchange bordering river. This is one of two main roadways into the Recreational area. This access will still remain, but will only be accessible by driving into the City of Belle Plaine.

TH 169/I-494 Interchange

Two concepts were prepared for a reconfigured interchange at the junction of TH 169 and Interstate 494. These concepts were developed as part of the Environmental Assessment process to evaluate improvements at I-494, Anderson Lakes Parkway and Pioneer Trail.

The Cities of Bloomington, Eden Prairie and Edina, along with the Minnesota Department of Transportation and Hennepin County met for several months to develop and refine the concepts. The figures shown in this report are the concepts developed for an open house held in March of 2002. It is anticipated that minor changes will be made following the public comment period; however, Eden Prairie, Bloomington, Edina and Hennepin County are in general agreement with the concepts.

The primary objective of the design is to improve safety and capacity of the interchange by removing the at-grade traffic signals. Due to funding limitations, a phased approach to fully developing the improvements may be required. Concept 1 shows the interchange under the interim design. Concept 2 shows the interchange after full improvements.

Concepts 1 and 2 were drafted in March of 2002.

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Anderson Lakes Parkway

One concept was prepared for the intersection of TH 169 and Anderson Lakes Parkway. This concept was developed as part of the Environmental Assessment process to evaluate improvements at I-494, Anderson Lakes Parkway and Pioneer Trail. The Cities of Bloomington and Eden Prairie, along with Hennepin County and the Minnesota Department of Transportation, met for several months to develop and refine the concept. The figure shown in this report is the concept developed for an open house held in March of 2002. It is anticipated that minor changes will be made following the public comment period; however, Eden Prairie, Bloomington and Hennepin County are in general agreement with the concepts.

The intersection at Anderson Lakes Parkway was originally designed to accommodate an interchange. In the interim, the intersection was designed with traffic signals. Modifications to the original interchange concept were made as the project went through the Environmental Assessment process.

Concept 1 shows the proposed improvements at the Anderson Lakes Parkway intersection.

Concept 1 was drafted in March of 2002.

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Pioneer Trail

One concept was prepared for the intersection of TH 169 and Pioneer Trail. This concept was developed as part of the Environmental Assessment process to evaluate improvements at I-494, Anderson Lakes Parkway and Pioneer Trail. The Cities of Bloomington and Eden Prairie, along with Hennepin County and the Minnesota Department of Transportation, met for several months to develop and refine the concept. The figure shown in this report is the concept developed for an open house held in March of 2002. It is anticipated that minor changes will be made following the public comment period; however, Eden Prairie, Bloomington and Hennepin County are in general agreement with the concepts.

The intersection at Pioneer Trail was originally designed to accommodate an interchange. In the interim, the intersection was designed with traffic signals. Modifications to the original interchange concept were made as the project went through the Environmental Assessment process. Modifications to the original interchange concept were made as the project went through the Environmental Assessment process.

Concept 1 shows the proposed improvements at the Pioneer Trail intersection.

Concept 1 was drafted in March of 2002.

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CSAH 69 and TH 41

CSAH 69

This intersection is located just south and west of the City of Shakopee. One concept was developed for this intersection as a way to generate discussion about future development, access and frontage/backage roads. This concept is presented in the report only for the purpose of documenting what was discussed. There is little agreement on this concept; therefore, it should not be used to make future decisions without additional analysis and study. The concept for this intersection shows an overpass with a series of frontage roads connecting to the proposed interchange at existing TH 41. The City of Shakopee does not favor this concept. The City would prefer to see a full interchange at this location.

CSAH 69 and TH 41 Concept 1 shows the overpass alignment developed for CSAH 69.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Frontage/backage roads shown in the concepts are in place to show one potential connection between access points. Actual alignments may vary depending upon development.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.
- Mn/DOT plans to conduct a TH 41 River Crossing Study. The findings and recommendations from this study will likely influence how and where the CSAH 69 intersection is redesigned and constructed.

Concept 1 was drafted in the fall of 2001.

TH 41

Three concepts were developed for the existing TH 41 intersection. No consensus was reached on a preferred concept for this location. Concept 1 had attributes that were preferred by Scott County and Concept 2 was preferred by Jackson Township. It is anticipated that Mn/DOT will work with Jackson Township, Scott County and the City of Shakopee as part of the TH 41 River Crossing Study to determine the potential long-term alignment/configuration changes to existing TH 41.

CSAH 69 and TH 41 Concept 1 shows a folded diamond interchange just north of the existing TH 41 intersection. A series of frontage and backage roads connect to CSAH 69 and CSAH 14.

CSAH 69 and TH 41 Concept 2 shows a folded diamond interchange at the existing TH 41 intersection. A series of frontage and backage roads connect to CSAH 69 and CSAH 14.

CSAH 69 and TH 41 Concept 3 depicts a full diamond interchange at the existing TH 41 intersection. A series of frontage and backage roads connect to CSAH 69 and CSAH 14.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Frontage/backage roads shown in the concepts are in place to show one potential connection between access points. Actual alignments may vary depending upon development.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.
- Mn/DOT plans to conduct a TH 41 River Crossing Study. The findings and recommendations from this study will likely influence how and where the TH 41 intersection is redesigned and constructed.

Concept 1 was drafted in the fall of 2001. Concepts 2 and 3 were drafted in January 2002.

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CSAH 14

Six concepts were developed for the CSAH 14 intersection. Scott County and Louisville Township indicated a preference for Concepts 2, 5 and 6. It should be noted that environmental documentation and input from the public would be required before any concept would move to the design and construction stage.

Concept 1 shows a folded diamond interchange with frontage road connections that tie into the TH 41 interchange and CR 65. The concept significantly realigns CSAH 14 to the north, going through the bluff.

Concepts 2 – 6 utilize more of the existing CSAH 14 alignment than Concept 1.

Concept 2 shows a folded diamond interchange with frontage road connections that tie into the TH 41 and CR 65 interchanges. The concept realigns CSAH 14 slightly to the north. The frontage roads on the eastern side of the interchange are closer to the railroad than the frontage roads depicted in Concept 1. Additionally, the alignment of the frontage roads on the western side of the interchange are different than those shown in Concept 1.

Concept 3 is similar to Concept 2. This concept shows a full diamond interchange with frontage road connections to TH 41 and CR 65. County State Aid Highway 14 is realigned slightly to north. Frontage roads on the eastern side of the interchange are the same as in Concept 2 and the frontage roads on the western side of the interchange are slightly different due to the change in the interchange configuration.

Concept 4 utilizes much of the existing CSAH 14 alignment. This concept incorporates a full diamond interchange with frontage roads; it also extends CSAH further to the west and south. Frontage roads are provided as part of this concept.

Concept 5 is similar to Concept 2. This concept shows a folded diamond interchange with frontage road connections to TH 41 and CR 65. County State Aid Highway 14 is realigned slightly to the north (a little less north than in Concept 2). Frontage road connections are similar to those shown in Concept 2.

Concept 6 is similar to Concept 5. Concept 6 shows a full diamond interchange with frontage road connections to TH 41 and CR 65. County State Aid Highway is realigned slightly to the north, with frontage roads much like the ones shown in Concept 5.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Frontage/backage roads shown in the concepts are in place to show one potential connection between access points. Actual alignments may vary depending upon development.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.

Concept 1 was drafted in the fall of 2001. Concepts 2-6 were drafted in January of 2002.

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CR 65

Two concepts were developed for the CR 65 intersection. Concept 1 shows an overpass and Concept 2 shows a folded diamond interchange. Accommodating an interchange in this area is particularly difficult due to the proximity to the spur line, bluff area, and floodplain. Sand Creek Township indicated that it would prefer to have an interchange rather than an overpass at this location, given the spacing with CSAH 14 and TH 21. Scott County also indicated that CR 65 has potential to serve as an arterial route to the east, if it does, the County would prefer an interchange at this location.

Concept 1 shows an overpass at the existing CR 65 intersection. It also shows a set of frontage roads that connect to the interchange located at CSAH 14.

Concept 2 shows a folded diamond interchange with a bridge over the spur line of the Union Pacific Railroad. This concept also shows a set of frontage roads that connect to CSAH 14. It should be noted that the location of the spur line of the Union Pacific Railroad will be a significant factor if an interchange is pursued. Due to uncertainties with the railroad, costs shown in the report for an interchange at this location were based on the cost estimates for Concept 1. Additional costs associated with the spur line will need to be factored into total project costs if an interchange is pursued.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Frontage/backage roads shown in the concepts are in place to show one potential connection between access points. Actual alignments may vary depending upon development.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.

Concept 1 was drafted in the fall of 2001. Concept 2 was drafted in January of 2002.

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TH 282

At the time of publication for the TH 169 Corridor Management Plan, the City of Jordan and the Minnesota Department of Transportation were engaged in a sub-area study to develop a concept for an interchange at the intersection of TH 282 and TH 169. Because the sub-area study was not completed, there are no concepts at this time.

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CSAH 59

One concept was developed for the CSAH 59 intersection. Saint Lawrence Township and Mn/DOT agreed that the concept was feasible, and met the transportation needs of the area. In addition, the City of Jordan sees this interchange as serving the southern access to their city. The concept for this location shows a folded diamond interchange with limited frontage roads. Additional frontage roads could be incorporated as development occurs if the existing transportation network (Park Boulevard and CR 66) does not meet future needs.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Frontage/backage roads shown in the concepts are in place to show one potential connection between access points. Actual alignments may vary depending upon development.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.

Concept 1 was drafted in January of 2002.

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CR 66

Three different concepts were developed for the CR 66 intersection. One of the concepts provides an overpass at CR 66, the other two concepts show a full diamond interchange and a folded diamond interchange. The TH 169 Corridor Management Plan recommends that an overpass be developed for this area, unless Scott County decides to pursue an east-west arterial alignment in this location. If an east-west arterial alignment is pursued, the TH 169 Corridor Management Plan supports an interchange. It should be noted that the costs shown for improvements to this intersection are based off of the overpass concept.

Scott County and Saint Lawrence Township agree with the Corridor Management Plan recommendations. Neither Scott County nor Saint Lawrence Township expressed any preference for either interchange concept (if an interchange is developed).

Concept 1 shows an overpass at CR 66 with a frontage road system that connects to the proposed interchange at CSAH 6/64 in Belle Plaine.

Concept 2 shows a full diamond interchange at CR 66 with the same frontage road system as shown in Concept 1.

Concept 3 shows a folded diamond interchange at CR 66 with a slightly different frontage/backage road configuration. This frontage/backage road system connects to the proposed interchange at CSAH 6/64 in Belle Plaine.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Frontage/backage roads shown in the concepts are in place to show one potential connection between access points. Actual alignments may vary depending upon development.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.

Concept 1 was drafted in the fall of 2001. Concepts 2 and 3 were drafted in January 2002.

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CSAH 6/64

One concept is shown for a proposed interchange at CSAH 6/64 in Belle Plaine. The concept shown in this plan was developed as part of a sub-area study conducted by Mn/DOT with the cooperation of the City of Belle Plaine and Scott County. It is anticipated that minor changes will be made; however, the concept reflects the basic design approved by the Belle Plaine City Council in December 2001. The City's approval was contingent upon access modifications along CSAH 6 west of TH 169 and those contingencies are currently under appeal. As part of the concept development, there was disagreement between Mn/DOT and the City on the adequacy of intersection spacing between ramp intersections and the frontage road intersections. Mn/DOT is proceeding with right-of-way acquisition for this design and plans to have all right-of-way acquired early in 2003.

Concept 1 was drafted in December of 2001.

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Le Sueur Hill

Four potential concepts were developed for the Le Sueur Hill area. These concepts were developed to address future growth within the City and to coordinate land use and transportation decisions. In addition, Le Sueur County is planning to reconstruct CSAH 28 in 2005, an east-west county highway that approaches TH 169 from the east. All of the concepts show some type of interchange with connections to CSAH 28. Meetings between the City of Le Sueur, Le Sueur County and Mn/DOT resulted in a preference for Concept 2.

Concept 1 shows a folded diamond interchange north of the existing businesses on the hill. This concept requires a significant realignment of CSAH 28. Frontage roads are included as part of this concept. Due to the terrain and slopes west of TH 169, it is thought that the only feasible concept for the CSAH 28 alignment is to go under TH 169.

Concept 2 shows a folded diamond interchange that is slightly further to the south than Concept 1. This concept also requires a realignment of CSAH 28 with a bridge over TH 169. In addition to showing a frontage road alignment, this concept also shows an optional backage road alignment.

Concept 3 shows a full diamond interchange just north of the Cambria site. This concept connects into CSAH 28. Frontage roads run north and south of the interchange location.

Concept 4 shows a folded diamond interchange that is the same as in Concept 2. This concept also realigns CSAH 28, but not as far north and east as Concept 2. In addition to showing a frontage road alignment, this concept also shows an optional backage road alignment.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Frontage/backage roads shown in the concepts are in place to show one potential connection between access points. Actual alignments may vary depending upon development.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.

Concepts 1-4 were drafted in January of 2002.

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St. Peter

Three different concepts for a bypass in St. Peter were developed prior to the start of the TH 169 Corridor Study. These concepts were put forth by the City to be considered in the development of the TH 169 Corridor Management Plan. The City is willing to consider all of the concepts.

Concept 1 shows a bypass that goes west beyond the City limits. This concept provides interchange access to the City via TH 22 and TH 99.

Concept 2 shows a bypass on the eastern side of the City limits. This concept crosses over the Minnesota River. Interchange access to the City is provided by via TH 22.

Concept 3 shows an in-town bypass (alignment is on Front Street). This concept has interchange access to the City via TH 22. It also has a traffic signal at TH 99.

While there was no official preference by the City, Concept 2 underwent a higher-level environmental screening process to identify potential issues that would need to be further investigated if more environmental studies are undertaken. In addition, an origin-destination study was done to investigate traffic patterns through the City of St. Peter.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.

- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.

Concepts 1-3 were submitted to the TH 169 Corridor Study in the spring of 2001.

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Lind/Webster

A concept for the Lind and Webster intersections was taken from the Mankato Area Transportation and Planning (MATAPs) Study, which was completed in 1996. As part of this study, the City of North Mankato expressed some concern over the original concept developed as part of the MATAPs Plan. As a result, another concept was developed as part of the TH 169 Corridor Management Plan. The City of North Mankato has indicated that, at the present time, it does not support either concept, while the City of Mankato continues to support the original MATAPs concept. The two concepts are very similar, with the exception of the location of the underpass.

Concept 1 shows the original design from the Mankato Area Transportation Study. Under this concept, improvements are made to the existing TH 14 interchange and a new interchange is developed between the Lind and Webster intersections. Frontage roads run parallel to TH 169.

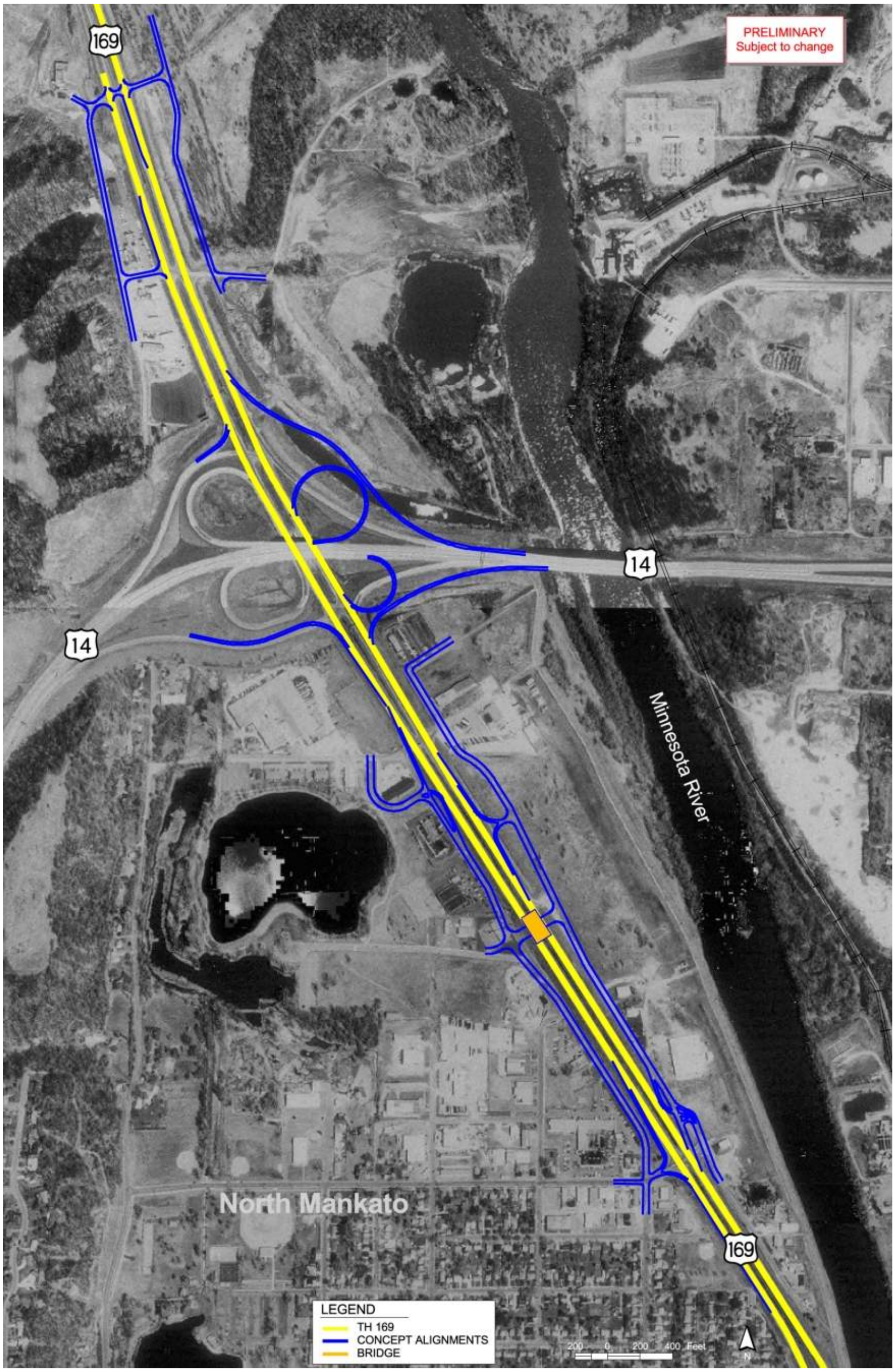
Concept 2 shows a slightly modified design. In this concept, the new interchange is closer to the Webster intersection.

Both concepts allow for improvements to the existing TH 14 interchange.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.

Concept 1 was completed in 1996. Concept 2 was developed in the fall of 2001.



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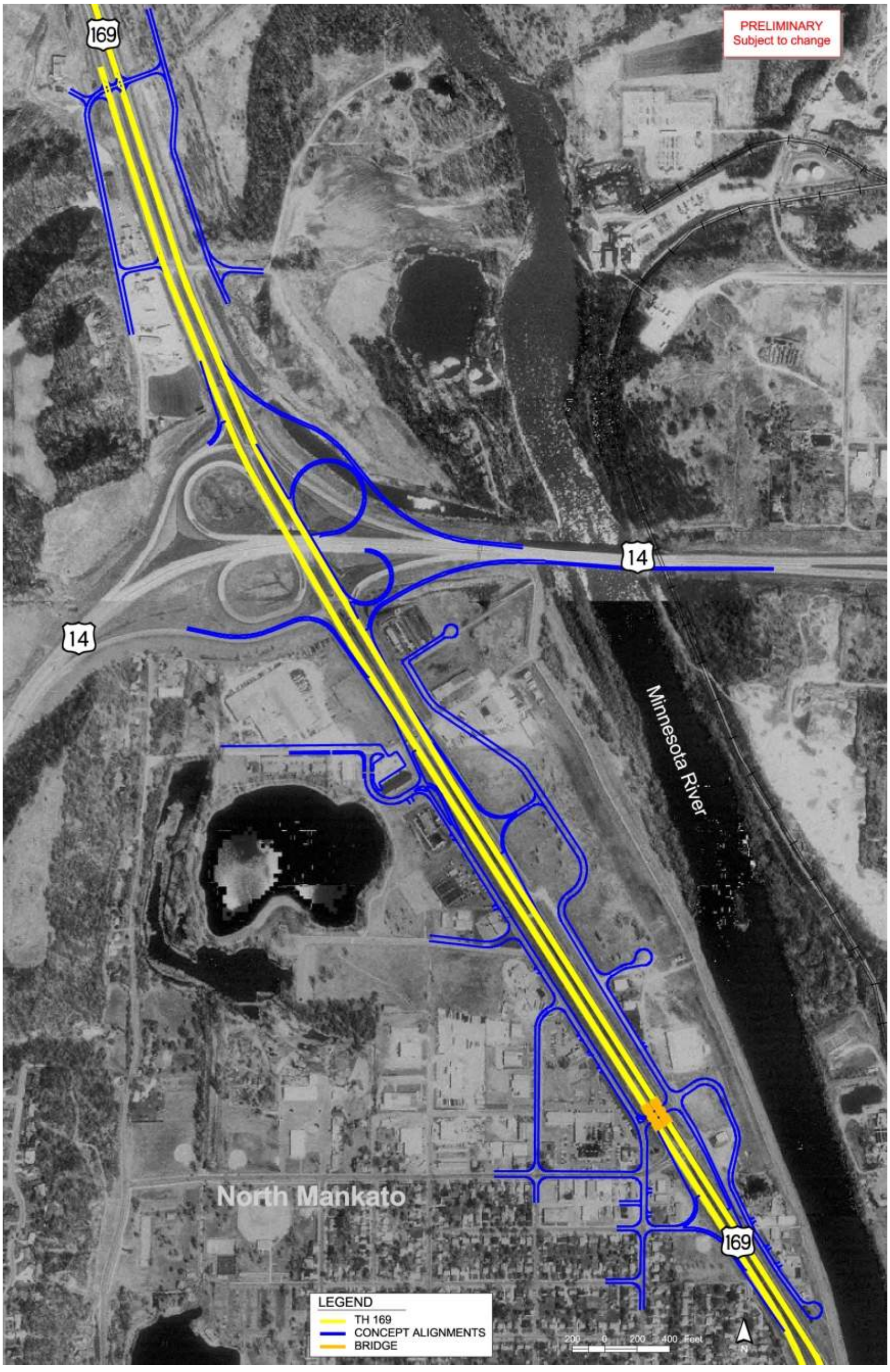

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Le Hillier

A total of four concepts for the Le Hillier area have been incorporated into the TH 169 Corridor Management Plan. The concepts were originally developed as part of an intersection study conducted by Mn/DOT in 1999 ("State Highway 169 Intersections Study"). The intersection study recommended advancing two long-term alternatives into the environmental process for the area near Hawley Street, as well as for the area between CSAH 33 and TH 68.

Concept 1 improves the Hawley Street intersection by reconfiguring the intersection to a right-in/right-out alignment. In addition, this concept provides an underpass that connects to the local road system so that local traffic can safely cross under TH 169.

Concept 2 improves the Hawley Street intersection by moving the existing intersection to the west. As part of the improvement, an overpass is constructed.

Concept 3 improves the area between CSAH 33 and TH 68 by removing the at-grade access at the existing intersections. These at-grade intersections are replaced with overpasses and a series of button-hook ramps that provide access to TH 169 from frontage roads.

Concept 4 improves the area between CSAH 33 and TH 68 by closing the existing at-grade intersections. At TH 68, the intersection is replaced with an overpass that directs traffic to a new interchange with ramps and button-hooks. CSAH 33 is realigned to join into the interchange with ramps and button-hooks. Access to TH 169 is provided by the ramps and button-hooks.

Additional Notes:

- Environmental documentation and input from the public are needed before any concept would move through the design stage into the construction stage.
- Desired spacing from interchange terminals where there is a trunk highway connection or a major county road connection is one-quarter of a mile. For lesser roadways, minimum spacing should be at least 750 feet.

Concepts 1-4 were completed in 1999.

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APPENDIX J

Land Use and Access Policies

The following pages contain specific strategies for access management along TH 169.

Detailed Land Use and Access Management Strategies By Area

The physical improvements identified for the TH 169 corridor will be implemented incrementally over the next 20 to 60 years depending upon funding availability and development near the corridor. Over this time period, many of the adjacent communities will be experiencing significant change in terms of land development and redevelopment. To ensure the long-term safety and performance of the corridor, each local community corridor partner will need to guide and manage its development to conform to the long-range vision and planned improvements. This section identifies in more detail the land use and access management policies and strategies that are recommended to promote a smooth transition over time as changes are made to both the highway and the land use in the corridor. These strategies will require close coordination among all the corridor partners---cities, counties, townships, and Mn/DOT to ensure full implementation.

The strategies are geared to six major sub-areas of the corridor reflecting the differing character of both the planned land use and the identified corridor strategy:

Area	Location	Future Land Use	Corridor Strategy
1	Interstate 494 to Belle Plaine	Urbanizing	Transition to a freeway
2	Belle Plaine to St. Peter	Long-term rural with isolated development	Manage existing access
3	St. Peter	Urban	Potential bypass
4	St. Peter to North Mankato	Long-term rural	Manage existing access
5	Mankato/North Mankato to Highway 68	Urban	Transition to a freeway
6	Highway 68 to Highway 60	Long-term rural with isolated development	Manage existing access

Area 1 I-494 to Belle Plaine (TH 25)

Segments: A – K_1
Corridor Plan Vision: Full Grade Separation
Access Category Assignment: 1 AF

Local Land Use Authorities

Agency	Local Road Authority	Planning and Zoning Authority
Bloomington	Yes	Yes
Shakopee	Yes	Yes
Jackson Township	Yes	No (Scott County)
Louisville Township	Yes	No (Scott County)
Sand Creek Township	Yes	No (Scott County)
Jordan	Yes	Yes
Belle Plaine	Yes	Yes
Lawrence Township	Yes	No (Scott County)
Belle Plaine Township	Yes	No (Scott County)
Scott County	Yes – County Roads and County State Aid Highways	Yes

Existing and Future Land Use

Area	Existing Land Use	Future Land Use
Bloomington	Developed, developing	Long-term urbanization
Shakopee	Developed, developing	
Shakopee to Jordan	Limited development, reserved for future urbanization	
Jordan	Developed, developing	
Jordan to Belle Plaine	Limited development, reserved for future urbanization	
Belle Plaine	Developed, developing	

Existing Access Conditions

Access is generally provided by city, county and township roads with at-grade intersections connecting to TH 169. Direct private access is generally comprised of residential driveways, field entrances, and limited commercial entrances.

Future Access Conditions

Public Street intersections with TH 169 will be reduced and converted to full grade-separated interchanges. All direct private access will be converted to alternate access (frontage/backage roads) or be phased out long term. Future access points were identified at the following locations:

Location	Existing Interchange	Future Interchange [1]	Future Overpass	New Development Potential
I-494	✓	✓		Low
Highwood Drive (included in I-494 improvements)		✓		Low
Anderson Lakes Parkway		✓		Low
Pioneer Trail		✓		Low
Old Shakopee Road	✓			Low
TH 13/CSAH 101	✓			Low
CR 7 (Shakopee)	✓			Low
CSAH 83 (Shakopee)	✓			Low
CSAH 17	✓			Low
CSAH 69/CR 78 [2]			✓	Low/Medium
TH 41 (Jackson Twp)		✓		High
CSAH 14		✓		Medium
CR 65 (Sand Creek)		✓		Low
TH 282 (Jordan)		✓		Medium/High
New local street (Jordan) [3]			✓	Low/Medium
CSAH 59 (St. Lawrence Township)		✓		Low
CR 66			✓	Low
CSAH 6/CR 64 (Belle Plaine)		✓		Medium
TH 25 (Belle Plaine)		✓		Low/Medium

[1] Future interchange indicates that a new or a reconstructed interchange is recommended.
[2] Access at CSAH 69/CR 78 will be determined by more detailed analysis which takes into account a new TH 41 River Crossing Study, location of existing TH 41 (future interchange) and future land use/frontage and backage roads. Mn/DOT has right-of-way at this location.
[3] Part of a local roadway connection plan identified by the City of Jordan.

Strategy I: Transition to Freeway Facility – I-494 to Belle Plaine (TH 25)

Situation	Policy	Implementation Responsibility
Access to Existing Development (All)	Zoning ordinance should prohibit direct property access to TH 169, making these legal non-conforming accesses. May continue but not expand or reestablish per non-conforming provisions.	Local land use authority – place requirement in zoning ordinance.
Existing Parcels - Farmsteads and Field Entrances	May remain in use unless land is converted to some other use. However, given the high speed, high volume nature of traffic on TH 169, farmers should be advised to seek alternate paths of access.	Local land use authority.
Existing Parcels - Residential driveways	▪ May remain in use until alternate access is provided via local street network. ▪ May be converted to right-in/right-out only driveways if analysis indicates high conflict risk potential or increased crash rates.	Local land use authority and/or Mn/DOT.
Existing Parcels - Commercial Entrances (Zoned Commercial)	▪ May remain in use until alternate access is provided via local street network. ▪ Any expansion or reestablishment will trigger an access review per non-conforming provisions. ▪ If a conditional use permit governs development, expansion modification, and/or renewal of the permit should trigger review of access. ▪ May be converted to right-in/right-out entrance if analysis indicates high conflict risk potential and/or safety problems exist.	Local land use authority – place requirement in zoning ordinance. Mn/DOT

Situation	Policy	Implementation Responsibility
Existing Public Road Intersections **not planned** as a future interchange or overpass	Should remain in use until interchanges/overpasses are constructed or alternative connections are established. May be converted to right-in/right-out only intersections if analysis indicates high conflict risk potential or increased crash rates. Once an interchange is constructed, public street intersections located within one mile of the new interchange should be closed and redirected to the local street network and/or frontage and backage roads.	Mn/DOT in coordination with local land use and road authority.
Existing Public Road Intersections planned as a future interchange or overpass	Should remain in use until reconstructed. At some future date, interim signal improvements may be warranted due to safety problems. Prior to signal installation, all other avenues to resolve problems should be exhausted and plans for signal removal should be developed.	Mn/ DOT in coordination with local land use and road authority.
Access for New Development		
Existing Vacant Parcels	Local zoning ordinances should specify that all new development within the TH 169 corridor should be designed with access from the local supporting street. If local access is not feasible, direct access to TH 169 may be allowed on an interim basis only, provided the site is designed to accommodate a shift in access to the local street network when it is available.	Local land use authority-place requirement in zoning ordinances.
Rezonings	Rezoning for urban residential, commercial or industrial uses should not precede the availability of the local road network to provide access.	Local land use authority-place policy in comprehensive plan, also findings for approval of subdivisions.
Conditional Use Permits	Local zoning ordinances should specify that conditional uses (e.g., commercial use in Agricultural zone) be allowed only if access is provided from the local street network.	Local land use authority-place requirement in zoning ordinance.

Situation	Policy	Implementation Responsibility
New Parcels - Lot Splits and Plats	Local ordinances should require that all new parcels be designed with access provided from the local street network, connecting to Highway 169 at identified future interchanges. If access from the local street is not feasible, direct access from TH 169 may be allowed on an interim basis provided the site is designed to accommodate a shift in access to the local street network when it is available.	Local land use authority-place requirement in subdivision ordinance. Amend comp plan to identify future intersection connections to TH 169 for new development and future growth.
Local Support for TH 169 Improvements		
Interchange Right-of-Way Preservation	▪ Adopt an official map to identify future interchange right-of-way needs if the area is at high risk for development. ▪ If area is currently zoned agricultural or rural preservation, avoid rezoning for urban uses until right-of-way is acquired.	Local land use authority with technical support from Mn/DOT or Scott County. EAWs should be completed using general footprint layouts prior to official map adoption.
Interchange Area Access Management	Adopt a land use, circulation and access management plan for each new interchange area that provides access to planned land uses while protecting the safety and operation of the interchange.	Local land use authority in cooperation with Mn/DOT and road authorities.
Local Supporting Access Roads	▪ Develop a local road network to provide access and connectivity to TH 169 at planned interchanges. Design new road system to provide access to existing parcels currently taking access from TH 169. ▪ Gaps in the local network resulting from previously subdivided and developed property should be corrected over time by locally initiated projects. These projects may be eligible cost sharing with Mn/DOT under the cooperative agreement program.	Local land use authority should require the construction and dedication of these roadways as part of their subdivision requirements. Local land use authority in cooperation with Mn/DOT.

Area 2 Belle Plaine (TH 25) to St. Peter (TH 22/Dodd Road)

Segments: $K_2 - O$
Corridor Plan Vision: Manage Current Access – Consider isolated grade-separations at TH 25 and in the Le Sueur Hill area.
Access Category Assignment: 1A and 2A

Local Land Use Authorities

Agency	Local Road Authority	Planning and Zoning Authority
Scott County	Yes – County Roads and County State Aid Highways	Yes
Blakely Township	Yes	No (Scott County)
Le Sueur County	Yes – County Roads and County State Aid Highways	Yes [(1)]
Tyrone Township	Yes	No
Le Sueur	Yes	Yes
Sibley County	Yes – County Roads and County State Aid Highways	Yes
Henderson Township	Yes	No
Nicollet County	Yes – County Roads and County State Aid Highways	Yes
Lake Prairie Township	Yes	No
Traverse Township	Yes	No

[(1)] City of Le Sueur has subdivision review rights of parcels within 2 miles of city boundaries. Right-of-Review ability according to Minnesota State Statutes.

Existing and Future Land Use

Area	Existing Land Use	Future Land Use
Scott County	Rural, with the exception of Belle Plaine	Rural, with the exception of Belle Plaine
Le Sueur County	Rural, with the exception of the Le Sueur Hill area	Rural, with the exception of the Le Sueur Hill area
Sibley County	Rural	Rural
Nicollet County	Rural	Rural

In reviewing the comprehensive plans submitted by the counties and cities in this area, it is anticipated that most of the land will remain in agricultural production. If new plans are developed in the future that expand urbanization, the recommendations and policies in this section will need to be reevaluated.

Existing Access Conditions

Public access is generally at-grade local, county and/or township road access. Direct private access is generally comprised of occasional residential driveways or field entrances. There are no commercial properties with direct access to TH 169.

Future Access Conditions

Existing public road access locations should remain in place as long as safety problems do not develop. At a few selected locations, existing access may be converted to full grade-separated interchanges (TH 19, TH 25 and Le Sueur Hill area). At these locations, frontage/backage roads should be developed if new growth occurs. Existing direct private access locations are anticipated to remain in place as long as they do not become a safety problem. Additional private access points will be discouraged.

Strategy II: Manage Existing Access

Situation	Policy	Implementation Responsibility
Access to Existing Development (All)	Zoning ordinance should prohibit direct property access to TH 169, making these legal non-conforming accesses. Existing access may continue but not expand or reestablish per non-conforming provisions.	Local land use authority – place requirement in zoning ordinance.
All Existing Private Access – Residential	Current access will be allowed to remain as is; however, if expansion, change of use, and/or safety problems arise, more stringent access conditions may be required - including modification to right-in/right-out.	Local land use authority – place requirement in zoning ordinance.
Existing Parcels – Commercial Entrances	No direct commercial access exists and none should be planned.	Local land use authority and Mn/DOT.
Existing Public Road Intersections **not planned** as a future interchange or overpass	▪ There are no plans to close or consolidate most local access points; however, if safety problems arise, more stringent access conditions may be required, including right-in/right-out. ▪ In the Le Sueur Hill area and near TH 25, access consolidation may occur due to development. Consolidation should work towards identified access at these locations. ▪ If any isolated interchanges are constructed (TH 25, TH 19 and Le Sueur Hill area), public street intersections located within one mile of the new interchanges should be considered for closure and redirected to the local street network.	Mn/DOT in coordination with local land use and road authority.
Existing Public Road Intersections **planned** as a future interchange or overpass	Should remain in use until reconstructed. At some future date, interim signal improvements may be warranted due to safety problems. Prior to signal installation, all other avenues to resolve problems should be exhausted and plans for signal removal should be developed.	Mn/DOT in coordination with local land use and road authority.
Access for New Development	New development should be directed to identified growth areas. In general, the rural character of the area is to remain in place for the next 20+ years. If the area is not going to be rural in nature the strategy for this area should be revisited.	

Situation	Policy	Implementation Responsibility
Existing Vacant Parcels	Local zoning ordinances should specify that all new development within the TH 169 corridor should be designed with access from the local supporting street or a shared driveway. If local access is not feasible, interim direct access to TH 169 will be limited to right-in/right-out.	Local land use authority – place requirement in zoning ordinances.
Rezonings	Rezoning of property is not encouraged. Rezoning for urban residential, commercial or industrial uses should not precede the availability of a local road network to provide access. Rezonings should only occur within identified growth areas (orderly development).	Local land use authority – place policy in comprehensive plan, also findings for approval of subdivisions.
Conditional Use Permits	Local zoning ordinances should specify that conditional uses (e.g., commercial use in an agricultural zone) are allowed only if access is provided from the local street network.	Local land use authority – place requirement in zoning ordinance.
New Parcels – Lot Splits and Plats	▪ Local ordinances should require that all new parcels be designed with access provided from the local street network, connecting to Highway 169 at identified intersections. If connections to the local street network are not feasible for a residential lot split, a shared driveway should be used as the access point to Highway 169. ▪ In the Le Sueur Hill area and near TH 25 where commercial and residential growth has been identified, local ordinances should require that all new parcels be designed with access provided from the local street network. If access from the local street network is not feasible, direct access from TH 169 may be allowed on an interim basis provided the site is designed to accommodate a shift in access to the local street network as the area develops. ▪ Platting agency and/or land use authority should consult with affected road authorities regarding increases in traffic on local road systems. Road authorities may require improvement to the local road system as developments are approved.	Local land use authority-place requirement in subdivision ordinance. Amend comp plan to identify future intersection connections to TH 169, and provide concept map of local supporting collector system that should be developed as land is subdivided. The local land use authority will also contact the local road authority to address supporting road network needs. Mn/DOT

Situation	Policy	Implementation Responsibility
Local Support for TH 169 Improvements		
Interchange Right-of-Way Preservation	▪ If area is currently zoned agricultural or rural preservation, avoid rezoning for urban uses until right-of-way is acquired. ▪ Adopt an official map to identify future interchange right-of-way if a development threat exists.	Local land use authority with technical support from Mn/DOT or County. EAWs should be completed using general footprint layouts prior to official map adoption.
Interchange Area Access Management	Adopt a land use, circulation and access management plan for each new interchange area that protects the safety and operation of the interchange.	Local land use authority in cooperation with Mn/DOT and road authorities.
Local Supporting Access Roads	▪ Develop a local road network to provide access and connectivity to TH 169 at identified intersections and planned interchanges. Design new road system to provide access to developed parcels currently taking access from TH 169. ▪ Gaps in the local network resulting from previously subdivided and developed property should be corrected over time by locally initiated improvement projects. These projects may be eligible cost sharing with Mn/DOT under the cooperative agreement program.	Local land use authority should require the construction and dedication of these roadways as part of their subdivision requirements. Local land use authority in cooperation with Mn/DOT.

Area 3 St. Peter

Segments: O – Q
Corridor Plan Vision: Potential Bypass
Access Category Assignment: 2B and 2C

Local Land Use Authorities

Agency	Local Road Authority	Planning and Zoning Authority
St. Peter	Yes	Yes
Nicollet County	Yes – County Roads and County State Aid Highways	Yes
Traverse Township	Yes	No
Oshawa Township	Yes	No

Existing and Future Land Use

Area	Existing Land Use	Future Land Use
St. Peter	Developed, developing	Developed, developing
Nicollet County	Rural	Rural

Existing Access Conditions:
Highway 169 passes through the core of downtown St. Peter. City streets are space an average 600 feet through this portion of the City. There are also a number of entrances and private driveways to commercial and residential locations.

Future Access Conditions:
Some of the public street intersections with Highway 169 will remain as they currently exist. Many other public street access points will be modified to right-in/right-out entrances in the core downtown due to the placement of a centerline median. Areas outside of the core downtown should have access spacing that reflects Mn/DOT's access category 2B. Areas inside the core downtown should have access spacing that reflects Mn/DOT's access category 2C.

Strategy III: Potential Bypass

Because the bypass was identified as a potential long-term improvement and this improvement was ranked as a low priority for the corridor [(1)], the following strategy focuses on access and land use issues for the existing alignment. If a bypass alignment is determined in the future, the strategy for this area will have to be revisited. Because bypasses are intended to encourage through movement and limit side street access, strategies for the bypass area would be similar to the ones identified for Area 1.

Situation	Policy	Implementation Responsibility
Access to Existing Development (All)		
All Existing Private Access – Residential and Commercial	▪ In areas where there are planned medians, existing access points will be converted to right-in/right-out. ▪ In other areas, existing access may remain in use unless land use intensifies or converts to another use or if safety problems arise. If land use changes occur, access to Highway 169 will be reviewed and more stringent access conditions, including conversion to right-in/right-out may be required.	Local land use authority and Mn/DOT.
Existing Public Road Intersections	▪ In areas where there are planned medians, existing streets will be converted to right-in/right-out entrances. ▪ Remaining full access intersections will either remain unsignalized or may be signalized if they meet warrants and can be coordinated to minimize delay for through traffic.	Mn/DOT in coordination with local land use and road authority.
Access for New Development		
Existing Vacant Parcels	▪ Parcels will be permitted to have one access point. If the parcel is on a corner lot, the access point should be directed to a side street. ▪ Direct access to Highway 169 may be limited to right-in/right-out.	Local land use authority and Mn/DOT.

(1) A bypass is not needed to meet minimum performance targets. Environmental documentation has not been completed indicating the feasibility of a bypass nor a preferred alignment.

Situation	Policy	Implementation Responsibility
New Parcels – Lot Splits and Plats	▪ New parcels should be designed with access provided from the local street network or a shared driveway. If local access is not feasible, direct access to Highway169 may be limited to right-in/right-out. ▪ In areas where there are planned or existing medians, any direct access (only in cases were there is no feasible access to the local street network or a shared driveway) to Highway 169 will be limited to right-in/right-out.	Local land use authority and Mn/DOT.
Local Support for TH 169 Improvements		
Local Supporting Access Roads	Develop a local road network to provide access and connectivity to TH 169 at identified intersections.	Local land use authority in cooperation with Mn/DOT.

Area 4 St. Peter (TH 295 – Regional Treatment Center) just north of Highway 14

Segments: R – S
Corridor Plan Vision: Manage Current Access
Access Category Assignment: 2A

Local Land Use Authorities

Agency	Local Road Authority	Planning and Zoning Authority
St. Peter	Yes	Yes
Nicollet County	Yes – County Roads and County State Aid Highways	Yes
Oshawa Township	Yes	No
Belgrade Township	Yes	No
Mankato	Yes	Yes
North Mankato	Yes	Yes

Existing and Future Land Use

Area	Existing Land Use	Future Land Use
St. Peter to Mankato and North Mankato	Rural	Rural, developing near Mankato and North Mankato
Mankato/North Mankato	Developed, developing	Developed, developing

In reviewing the comprehensive plans submitted by the counties and cities in this area, it is anticipated that most of the land will remain in agricultural production. If new plans are developed in the future that expand urbanization into the more rural areas, the recommendations and policies in this section will need to be reevaluated.

Existing Access Conditions:
Public access is generally at-grade local, county and/or township road access. Direct private access is generally comprised of occasional residential driveways or field entrances. There are a limited number of existing commercial entrances. Recent improvement projects consolidated many access points and provided right and left turn lanes.

Future Access Conditions:

This area is expected to remain rural in character and no change in access is expected with the exception of the area just north of the Trunk Highway 14 interchange. Access in this area should transition towards the concept identified in the MATAPs study.

Strategy II: Manage Existing Access

Situation	Policy	Implementation Responsibility
Access to Existing Development (All)	Zoning ordinance should prohibit direct property access to TH 169, making these legal non-conforming accesses. Existing access may continue but not expand or reestablish per non-conforming provisions.	Local land use authority – place requirement in zoning ordinance.
All Existing Private Access – Residential	Current access will be allowed to remain as is; however, if expansion, change of use, and/or safety problems arise, more stringent access conditions may be required - including modification to right-in/right-out.	Local land use authority – place requirement in zoning ordinance.
Existing Parcels-Commercial Entrances	Current access will be allowed to remain as is; however, if expansion, change of use, and/or safety problems arise, more stringent access conditions may be required – including modification to right-in/right-out.	Local land use authority and Mn/DOT.
Existing Public Road Intersections **not planned** as a future interchange or overpass	▪ There are no plans to close or consolidate most local access points; however, if safety problems arise, more stringent access conditions may be required, including right-in/right-out. ▪ Just north of TH 14, access consolidation may occur due to development. Consolidation in this area should work towards identified access at TH 14. ▪ If any isolated interchanges are constructed public street intersections located within one mile of the new interchange should be closed and redirected to the local street network.	Mn/DOT in coordination with local land use and road authority.
Access for New Development	New development should be directed to identified growth areas (area just north of TH 14). In general, the rural character of the area is to remain in place for the next 20+ years. If the area is not going to be rural in nature the strategy for this area should be revisited.	
Existing Vacant Parcels	Local zoning ordinances should specify that all new development within the TH 169 corridor should be designed with access from the local supporting street or a shared driveway. If local access is not feasible, interim direct access to TH 169 will be limited to right-in/right-out.	Local land use authority–place requirement in zoning ordinances.

Situation	Policy	Implementation Responsibility
Rezonings	Rezoning of property is not encouraged. Rezoning for urban residential, commercial or industrial uses should not precede the availability of a local road network to provide access. Rezonings should only occur within identified growth areas (area just north of TH 14).	Local land use authority–place policy in comprehensive plan, also findings for approval of subdivisions.
Conditional Use Permits	Local zoning ordinances should specify that conditional uses (e.g., commercial use in Agricultural zone) be allowed only if access is provided from the local street network.	Local land use authority-place requirement in zoning ordinance.
New Parcels – Lot Splits and Plats	▪ Local ordinances should require that all new parcels be designed with access provided from the local street network, connecting to Highway 169 at identified intersections. If connections to the local street network are not feasible for a residential lot split, a shared driveway should be used as the access point to Highway 169. If local access is not feasible for commercial plats, direct access may be allowed on an interim basis until a local street connection is made. All new plats should be limited to identified growth areas (area just north of TH 14). ▪ Platting agency and/or land use authority should consult with affected road authorities regarding increases in traffic on local road systems. Road authorities may require improvement to the local road system as developments are approved.	Local land use authority-place requirement in subdivision ordinance. Amend comp plan to identify future intersection connections to TH 169, and provide concept map of local supporting collector system that should be developed as land is subdivided. The local land use authority will also contact the local road authority to address supporting road network needs. Mn/DOT

Situation	Policy	Implementation Responsibility
Local Support for TH 169 Improvements		
Local Supporting Access Roads	▪ Develop a local road network to provide access and connectivity to TH 169 at identified intersections. Design new road system to provide access to developed parcels currently taking access from TH 169. ▪ Gaps in the local network resulting from previously subdivided and developed property should be corrected over time by locally initiated improvement projects. These projects may be eligible cost sharing with Mn/DOT under the cooperative agreement program.	Local land use authority should require the construction and dedication of these roadways as part of their subdivision requirements. Local land use authority in cooperation with Mn/DOT.

Area 5 Mankato/North Mankato to TH 68

Segments: S-W
Corridor Plan Vision: Full Grade Separation
Access Category Assignment: 2AF

Local Land Use Authorities

Agency	Local Road Authority	Planning and Zoning Authority
Mankato	Yes	Yes
North Mankato	Yes	Yes
Blue Earth County	Yes – County Roads and County State Aid Highways	Yes
South Bend Township	Yes	No

Existing and Future Land Use

Area	Existing Land Use	Future Land Use
Mankato/North Mankato	Developed, developing	Developed, developing
South Bend Township	Rural, with isolated urban areas	Rural, developing

Existing Access Conditions:
Access is generally provided by state, city, county and township roads with a combination of grade-separated interchanges and at-grade intersections.

Future Access Conditions:
Public street intersections with TH 169 will be reduced and converted to full grade separated interchanges. TH 169 will be fully grade separated through the Cities of Mankato and North Mankato.

Strategy I: Transition to Freeway Facility

Situation	Policy	Implementation Responsibility
Existing Development (All)	Zoning ordinance should prohibit direct property access to TH 169, making these legal non-conforming accesses. May continue but not expand or reestablish per non-conforming provisions.	Local land use authority – place requirement in zoning ordinance.
Existing Parcels – Farmsteads and Field Entrances	There are no existing farmstead or field entrances. No new entrances should be allowed.	Local land use authority and Mn/DOT.
Existing Parcels – Residential driveways	There are no existing residential driveways. No new entrances should be allowed.	Local land use authority and Mn/DOT.
Existing Parcels – Commercial Entrances (Zoned Commercial)	▪ May remain in use until alternate access is provided via local street network. ▪ Any expansion or reestablishment will trigger an access review per non-conforming provisions. ▪ If a conditional use permit governs development, expansion modification, and/or renewal of the permit should trigger review of access. ▪ May be converted to right-in/right-out entrance if analysis indicates high conflict risk potential and/or safety problems exist.	Local land use authority – place requirement in zoning ordinance. Mn/DOT
Existing Public Road Intersections **not planned** as a future interchange or overpass	Should remain in use until interchanges/overpasses are constructed or alternative connections are established. May be converted to right-in/right-out only intersections if high conflict risk potential and/or increased crash rates. Once an interchange is constructed, public street intersections located within one mile of the new interchange should be closed and redirected to the local street network and/or frontage and backage roads.	Mn/DOT in coordination with local land use and road authority

Situation	Policy	Implementation Responsibility
Existing Public Road Intersections **planned** as a future interchange or overpass	Should remain in use until reconstructed. At some future date, interim signal improvements may be warranted due to safety problems. Prior to signal installation, all other avenues to resolve problems should be exhausted and plans for signal removal should be developed.	Mn/ DOT in coordination with local land use and road authority.
New Development		
Existing Vacant Parcels	Local zoning ordinances should specify that all new development within the TH 169 corridor should be designed with access from the local supporting street. If local access is not feasible, direct access to TH 169 may be allowed on an interim basis only, provided the site is designed to accommodate a shift in access to the local street network when it is available.	Local land use authority – place requirement in zoning ordinances.
Rezonings	Rezoning for urban residential, commercial or industrial uses should not precede the availability of the local road network to provide access.	Local land use authority – place policy in comprehensive plan, also findings for approval of subdivisions.
Conditional Use Permits	Local zoning ordinances should specify that conditional uses (e.g., commercial use in Agricultural zone) be allowed only if access is provided from the local street network.	Local land use authority – place requirement in zoning ordinance.
New Parcels – Lot Splits and Plats	Local ordinances should require that all new parcels be designed with access provided from the local street network, connecting to Highway 169 at identified future interchanges. If access from the local street is not feasible, direct access from TH 169 may be allowed on an interim basis provided the site is designed to accommodate a shift in access to the local street network when it is available.	Local land use authority – place requirement in subdivision ordinance. Amend comp plan to identify future intersection connections to TH 169 for new development and future growth.

Situation	Policy	Implementation Responsibility
Local Support for TH 169 Improvements		
Interchange Right-of-Way Preservation	▪ Adopt an official map to identify future interchange right-of-way needs if the area is at high risk for development. ▪ If area is currently zoned agricultural or rural preservation, avoid rezoning for urban uses until right-of-way is acquired.	Local land use authority with technical support from Mn/DOT or Blue Earth County. EAWs should be completed using general footprint layouts prior to official map adoption.
Interchange Area Access Management	Adopt a land use, circulation and access management plan for each new interchange area that provides access to planned land uses while protecting the safety and operation of the interchange.	Local land use authority in cooperation with Mn/DOT and road authorities.
Local Supporting Access Roads	▪ Develop a local road network to provide access and connectivity to TH 169 at planned interchanges. Design new road system to provide access to existing parcels currently taking access from TH 169. ▪ Gaps in the local network resulting from previously subdivided and developed property should be corrected over time by locally initiated projects. These projects may be eligible cost sharing with Mn/DOT under the cooperative agreement program.	Local land use authority should require the construction and dedication of these roadways as part of their subdivision requirements. Local land use authority in cooperation with Mn/DOT.

Area 6 TH 68 to TH 60

Segments: X-Y
Corridor Plan Vision: Manage Current Access
Access Category Assignment: 2B

Local Land Use Authorities

Agency	Local Road Authority	Planning and Zoning Authority
Blue Earth County	Yes – County Roads and County State Aid Highways	Yes
South Bend Township	Yes	No

Existing and Future Land Use

Area	Existing Land Use	Future Land Use
South Bend Township	Rural, with isolated urban areas	Rural, developing

Existing Access Conditions:
Access is generally provided by city, county and township roads with a combination of grade-separated interchanges and at-grade intersections. There are a few private commercial and residential access points.

Future Access Conditions:
Existing public road access locations should remain in place as long as safety problems do not develop. At a few selected locations, existing access may be converted to full grade-separated interchanges – the existing TH 68 intersection is proposed to be made into a grade-separated intersection further to the east and north. Once this improvement is made, the existing at-grade intersection will be closed. Frontage and backage roads should be developed if new growth occurs. Existing direct private access locations are anticipated to remain in place as long as they do not become a safety problem. Additional private access points will be discouraged.

Strategy II: Manage Existing Access

Situation	Policy	Implementation Responsibility
Existing Development (All)	Zoning ordinance should prohibit direct property access to TH 169, making these legal non-conforming accesses. Existing access may continue but not expand or reestablish per non-conforming provisions.	Local land use authority – place requirement in zoning ordinance.
All Existing Private Access – Residential	Current access will be allowed to remain as is; however, if expansion, change of use, and/or safety problems arise, more stringent access conditions may be required - including modification to right-in/right-out.	Local land use authority – place requirement in zoning ordinance.
Existing Parcels – Commercial Entrances	Current access will be allowed to remain as is; however, if expansion, change of use, and/or safety problems arise, more stringent access conditions may be required – including modification to right-in/right-out.	Local land use authority and Mn/DOT.
Existing Public Road Intersections **not planned** as a future interchange or overpass	▪ There are no plans to close or consolidate most local access points; however if safety problems arise, more stringent access conditions may be required, including right-in/right-out. ▪ If any isolated interchanges are constructed (realigned TH 68) public street intersections located within one mile of the new interchange should be closed and redirected to the local street network.	Mn/DOT in coordination with local land use and road authority
Existing Public Road Intersections **planned** as a future interchange or overpass	Should remain in use until reconstructed. At some future date, interim signal improvements may be warranted due to safety problems. Prior to signal installation, all other avenues to resolve problems should be exhausted and plans for signal removal should be developed.	Mn/DOT in coordination with local land use and road authority
New Development	New development should be directed to identified growth areas. In general, the rural character of the area is to remain in place for the next 20+ years. If the area is not going to be rural in nature the strategy for this area should be revisited.	

Situation	Policy	Implementation Responsibility
Existing Vacant Parcels	Local zoning ordinances should specify that all new development within the TH 169 corridor should be designed with access from the local supporting street or a shared driveway. If local access is not feasible, direct access to TH 169 will be limited to right-in/right-out	Local land use authority – place requirement in zoning ordinances.
Rezonings	Rezoning of property is not encouraged. Rezoning for urban residential, commercial or industrial uses should not precede the availability of a local road network to provide access. Rezonings should only occur within the identified growth areas (orderly development).	Local land use authority – place policy in comprehensive plan, also findings for approval of subdivisions.
Conditional Use Permits	Local zoning ordinances should specify that conditional uses (e.g., commercial use in Agricultural zone) be allowed only if access is provided from the local street network.	Local land use authority-place requirement in zoning ordinance
New Parcels – Lot Splits and Plats	▪ Local ordinances should require that all new parcels be designed with access provided from the local street network, connecting to Highway 169 at identified intersections. If connections to the local street network are not feasible for a residential lot split, a shared driveway should be used as the access point to Highway 169. If local access is not feasible for commercial plats, direct access may be allowed on an interim basis until a connection is made. All new plats should be limited to identified growth areas. ▪ Platting agency and/or land use authority should consult with affected road authorities regarding increases in traffic on local road systems. Road authorities may require improvement to the local road system as developments are approved.	Local land use authority-place requirement in subdivision ordinance. Amend comp plan to identify future intersection connections to TH 169, and provide concept map of local supporting collector system that should be developed as land is subdivided. The local land use authority will also contact the local road authority to address supporting road network needs. Mn/DOT

Situation	Policy	Implementation Responsibility
Local Support for TH 169 Improvements		
Interchange Right-of-Way Preservation	▪ If area is currently zoned agricultural or rural preservation, avoid rezoning for urban uses until right-of-way is acquired. ▪ Adopt an official map to identify future interchange right-of-way if a development threat exists.	Local land use authority with technical support from Mn/DOT or County. EAWs should be completed using general footprint layouts prior to official map adoption.
Interchange Area Access Management	Adopt a land use, circulation and access management plan for each new interchange area that protects the safety and operation of the interchange.	Local land use authority in cooperation with Mn/DOT and road authorities.
Local Supporting Access Roads	▪ Develop a local road network to provide access and connectivity to TH 169 at identified intersections and planned interchanges. Design new road system to provide access to developed parcels currently taking access from TH 169. ▪ Gaps in the local network resulting from previously subdivided and developed property should be corrected over time by locally initiated improvement projects. These projects may be eligible cost sharing with Mn/DOT under the cooperative agreement program.	Local land use authority should require the construction and dedication of these roadways as part of their subdivision requirements. Local land use authority in cooperation with Mn/DOT.

APPENDIX K

Benefit-Cost Methodology

The following pages contain the methodology that was used to calculate benefit-cost ratios for the major capital projects. The methodology calculated the benefit-cost ratios at the planning level. More detailed analysis will be required as projects move towards the preliminary design stage.

Benefit-Cost Methodology

This appendix is intended to provide direction for evaluating the economic feasibility of optional corridor improvements. These guidelines are for planning-level (not project-level) analysis of corridors. Interregional corridor plans identify potential performance problem areas and optional solutions, but stop short of providing the detailed design and operations analysis information required for more detailed benefit-cost analysis.

These benefit-cost guidelines do not provide instructions for measuring anticipated benefits of transportation projects. Measurements should be made through the application of accepted estimation procedures, which can be as simple as using traffic engineering principles to estimate time savings between alternatives, or using more detailed analysis through the Highway Capacity Manual or other software packages. These guidelines show how benefits can be converted to dollar values and compared to project costs. Information contained in these guidelines can be found in a report produced in December of 1999 by Mn/DOT's Office of Investment Management entitled "Economic Analysis for TRLF Applications."

What Is A Benefit-Cost Analysis?

A benefit-cost analysis is a systematic evaluation of the relevant advantages (benefits) and disadvantages (costs) of a particular investment. The analysis brings all of the direct effects of the investment into a common measure (dollars). The analysis allows benefits and some costs (operations and maintenance) to accrue over a long period, while capital costs are incurred primarily in the initial years. A benefit-cost analysis provides an indication of the economic desirability of an investment. However, the results must be weighed against other factors including socioeconomic, environmental and other community impacts.

As indicated previously, the benefit-cost analysis for interregional corridor plans will be done at a sketch-planning level because detailed (project-level) information is not developed as part of the planning process. Benefits of transportation investments typically are focused in four areas:

- Time savings due to improved speeds and/or reduced travel distances
- Operating cost reductions because of fewer stops or fewer miles traveled
- Decrease in crash risk because of design or speed changes (fewer crashes and/or reduction in severity of crashes)
- Remaining (salvage) value of the investment at the end of the expected life of the project.

Common Framework

In order to conduct an economic evaluation of potential corridor changes, a common framework for analysis must be developed. This common framework consists of:

Timeframe
A 20-year timeframe is generally used for benefit-cost analyses, however, a 25-year timeframe was used for the projects analyzed in the TH 169 Corridor Management Plan. The timeframe should be consistent with that used for other analyses being undertaken for the project, (e.g., travel demand forecasts or lifecycle cost modeling). The timeframe should be long enough to capture most of the useful life of a project, but not so long that it goes beyond the period of time for which reliable estimates are possible. All benefits and costs that can reasonably be estimated based on the study's level of detail should be included in the analysis.

Base Case
Benefit-cost analyses require description of a base case against which proposed alternatives are measured. The base case generally consists of the existing infrastructure and services, and any low capital investments that are expected or planned to be in place to accommodate the anticipated growth and traffic pattern changes over the analysis timeframe. For example, in a high-risk corridor, a number of traffic signals are planned to be installed because of safety and side-street delay considerations. These risks should be identified and acknowledged as part of the base case. Potential improvements that are intended to maintain a desired level of performance are measured against this base case.

Proposed Alternatives
Corridor management plans should identify and measure the ability of proposed optional changes to maintain current performance, mitigate or halt degradation, or improve overall corridor performance. Alternatives should be specified in sufficient detail to estimate the costs and the effect of the alternatives on overall corridor performance and safety. It is recommended that Mn/DOT planning-level cost establishment procedures be followed. Comparing the travel costs to roadway users derives benefits of a project, or other benefits associated with the base case, to those of the alternative scenarios. Planned non-performance-related improvements (e.g., pavement replacement) should be considered if they potentially reduce the costs of performance-enhancing alternatives. For example, adding a lane may be less expensive if the existing pavement needs to be replaced anyway. Only the marginal increase in cost should be included as the cost of the proposed alternative.

Study Area
An appropriate study area should be chosen so that, if possible, all the effects of the project are included. The study area should be the logical geographical area within which travel will be affected, to a material degree, by the investment alternatives.

Level of Detail
The level of detail used in the analysis should be appropriate to the scope of the study and the available data. Thus, planning-stage studies should use general estimates of costs and benefits.

Base Year
All costs and benefits should be in constant dollars (no inflation), as if all costs and benefits occurred in the base year. The base year is usually the current year or the year in which the first cost associated with the alternative is incurred. In an economic analysis, all costs and benefits are discounted (discussed below) to the base year.

Costs

The cost of a transportation investment in economic terms is the value of the resources that must be consumed to bring about the project. What must be estimated includes the total value of the construction costs and any additional operating and maintenance costs. It is important to note that the analysis does not distinguish between who incurs the cost, but rather aims to include any and all costs that are involved in bringing about the project.

Capital Costs
Capital costs include the cost of construction or the purchase of a long-term asset. Capital costs of the project tend to be the most important and largest component of all costs. These cost estimates should be as refined as appropriate for the stage of the development of the project under consideration. At the planning stage, costs may be identified as a cost per mile of improvement, cost per interchange, or cost per signal, etc.

Future Costs
With a major transportation investment and an analysis period of 20 to 25 years, there will typically be future investments needed to maintain serviceability of the facility (other than normal operations and maintenance costs). The cost of these future investments are not considered at this planning-level analysis.

Operations and Maintenance Costs
Roads and highways must be maintained; they also have ongoing operation costs (i.e., traffic signal and lighting expenditures). The maintenance and ongoing operation costs can represent a significant investment. When evaluating transportation investments, it is important to estimate what the future operating and maintenance costs of the facility will be. In the case of an upgraded roadway, what must be estimated are the incremental or additional maintenance costs that would be required for the base case and/or the alternative. For a brand-new facility, the entire additional maintenance costs should be included as the incremental increase in costs.

After discussions with Mn/DOT, it was decided that maintenance costs would not be included in the benefit-cost analysis for the projects included in the TH 169 Corridor Management Plan.

Benefits

The benefits of a transportation investment are the intended positive effects of a project on performance and safety. In a benefit-cost analysis, benefits should first be estimated in physical terms, and then valued in economic terms.

The benefits of a transportation investment are typically estimated by comparing the amount of travel time, vehicle miles traveled, and expected number of crashes for the alternative to the base case. The first step in estimating benefits, which is the physical projection of the change brought about by each alternative, is usually accomplished by traditional engineering appraisal methodology.

Travel Time

Travel time savings are typically the most important benefits of a transportation investment. The general approach to estimating changes in travel time is to forecast the amount of travel time for four scenarios:

1. Existing conditions

2. Base condition at the end of the analysis period

3. Proposed alternative (current year)

4. Proposed alternative at the end of the analysis period

Because traffic volumes change over the analysis period, the potential savings may change as well, due to capacity issues. Savings can be estimated using a travel demand model, measuring existing times with adjustments for the alternative, or using the IRC methodology.

Regardless of the method used, the differences in forecasts of travel time between the alternative and the base case are the starting point for the estimation of travel time benefits. Converting travel-time savings to dollar values requires consideration of a number of additional factors and costs. The key factors are listed below, standard values for travel time savings by vehicle type, are listed at the end of this Appendix.

The key factors are the type of vehicles (percentage of autos or trucks), the time of day (such as peak or off-peak), and seasonal, holiday, or recreational period travel. While it is useful to be able to forecast based on these differing categories of travel, reasonable estimates can be made even with only basic forecasts or simply auto and truck travel time.

The other issue with passenger transportation is that, in many cases, the vehicle occupancy rate will differ between alternatives in ways that significantly affect the value of benefits. The passengers in the vehicle also value their travel time savings and this should be accounted for through use of a vehicle occupancy rate.

Crashes

The economic cost associated with motor vehicle crashes and other transportation crashes can be substantial. One of the principal benefits that results from many transportation improvements is that the expected likelihood of crashes is lower when facilities are improved or reconstructed because they have new safety features or they are constructed with better geometry for the volumes that are using them.

The general approach to valuing these changes is to estimate the expected level of crashes for the alternative and then compare it to the expected level of crashes for the base case. The difference is the net reduction in crashes or safety improvement. Estimates of future crashes for the base case are typically derived from historical data based on specific facility and intersection geometry, or analysis that estimates the net reduction in conflicts for specific problem movements.

Mn/DOT has developed a standard set of economic values based on the severity of the crash. The monetary value for fatalities is high and can significantly influence the reliability of the analysis if used improperly. Therefore, the full value for fatalities should only be used if it is justified based on past crash history and it is proven that the alternative would eliminate this type of crash. Otherwise, fatal crashes (single-event type scenarios) should be evaluated as an injury type A crash.

The benefits from a reduction in crashes and the severity of crashes can be calculated from the estimates of changes in the likelihood of crashes occurring. Estimates of changes in crash rates should then be valued using the standard values (found at the end of this appendix) and included in the benefit calculations.

Vehicle Operating Cost Savings

When transportation improvements are made, the cost of operating vehicles along a particular facility or set of facilities can change. These costs can change either because the number of miles driven falls significantly as in the case of a shorter bypass or because vehicle operation changes in such a way as to more efficiently use fuel or oil, or to reduce some other operating cost.

The most important variable affecting vehicle operation costs is the number of miles traveled in the alternative versus the base case. The number of miles traveled should be forecast using the usual range of engineering tools and methodologies, most likely similar to what is used to estimate travel time savings. Estimates of miles traveled should also be broken down into categories if possible (see discussion of travel time savings). The most important categories are the percentage of automobiles and trucks.

Quite often the value of vehicle operating cost changes is calculated simply using standardized cost-per-mile figures. However, if significant benefits are expected from other changes in travel characteristics such as the number of stops, those cost changes should also be converted to dollar values.

Remaining Capital Value
For transportation investments, it is not unusual to have one or more components of a project retain some useful life and value beyond the analysis period. At the end of 20 or 30 years, the infrastructure that has been put in place generally is not worn out, and will continue to provide benefits to drivers and travelers. Thus, it is important to reflect this remaining capital value in the analysis. The allowance for remaining capital value is allocated by estimating a remaining capital value for each major component with remaining useful life. The remaining capital value is calculated by determining the percentage of useful life remaining and multiplying that percentage by the construction cost for that component. The estimate of the remaining capital value at the end of the analysis period is counted as a benefit.

Steps for Conducting a Benefit-Cost Analysis

The basic steps for conducting a benefit-cost analysis are listed below. These steps apply directly to highway improvement projects and, with slight modification, to other types of transportation investments.

Highway improvement projects generally increase the capacity of existing facilities, improve the safety of existing facilities, or construct new roads. Analyzing these types of projects involves monetizing benefits, aggregating monetized benefits for the analysis period, calculating remaining capital value, and comparing those numbers to the costs. The basic steps for accomplishing this analysis are:

- Develop estimates for travel time, travel distance, and crashes. Estimates should be developed for both the base case and the proposed alternative.
- Calculate user costs by multiplying the travel time, distance, and crashes by the appropriate dollar values per unit of time, distance, or crash.
- Sum the user costs for each scenario for each year of the analysis period. Subtract the annual user costs for the proposed alternative from the base case user costs for each year. The result is the annual benefits of the proposed alternative.
- Discount the annual benefits back to the base year.
- Construction costs for the proposed alternative should be estimated and allocated to the appropriate year of the construction period. Discount the annual construction costs to the base year. If the base case involves incurring construction costs as well, those should be allocated to the year of expected expenditure and discounted as well.
- Calculate the remaining capital value for the useful life of the subject infrastructure at the end of the analysis period.

- Add the discounted annual benefits and remaining capital value to obtain total benefits. Add the discounted construction and ongoing maintenance and operation costs to obtain total costs.

- Divide the total benefits by the total costs. The result is the benefit-cost ratio for the proposed project.

Discounting - In the case of transportation investments, most of the costs are incurred in the early years, and the benefits from the investments accrue over many years into the future. When assessing the costs and benefits of a project, it is necessary to convert the costs and benefits that take place in different years into a comparable number. This process, known as discounting, converts future costs and benefits into present values. In general, economic analysis of transportation investment uses constant dollars; inflation is not included in the estimates of costs and benefits. Standard discount values are found at the end of this appendix.

Net Present Value - All costs and benefits in future years are discounted back to the base year using the adopted discount rate. The future stream of discounted costs is subtracted from the future stream of discounted benefits. If the sum of the discounted benefits is greater than the sum of the discounted costs, the net present value is positive and the infrastructure improvement is deemed to be economically desirable.

Benefit-Cost Ratio - After the future streams of costs and benefits are discounted, the sum of the discounted benefits is divided by the sum of the discounted cost. If the result is greater than or equal to 1.0, the infrastructure improvement is economically desirable.

TABLE K-1
Standard Values

Assumptions	Standard Values [1] Original Value	Source	2001 Value
Discount rate, real (percent)	7.0%	Based on the Real Interest Rate (market rate less inflation) on 30-year Treasury Notes and Bonds.	4.5%
Auto time value per person hour (dollars per hour)	$8.90	U.S. DOT Guidance (1995 Dollars)	$9.71
Truck driver time value per person hour ($ per hour)	$16.50	U.S. DOT Guidance (1995 Dollars)	$18.00
Auto variable operating costs (dollars per mile)	$0.26	Derived from AAA, Your Driving Costs, 1997 edition (1997 Dollars)	$0.28
Truck variable operating costs (dollars per mile) [2]	$1.34	ATA Trucking Information Services (1997 Dollars)	$1.40
Mn/DOT crash values	**Per crash** [3]		
Fatal	$3,400,000		$3,300,000
Injury Type A only	$260,000		$260,000
Injury Type B only	$56,000		$57,000
Injury Type C only	$27,000		$28,000
Property damage only	$4,000		$4,100
Gross domestic product Implicit price deflator			
1995	98.10	Index assumed at end of year.	
1996	100.00		
1997	101.91		
1998	103.10		
1999	104.99		
2000	106.99		

(1) Source: Minnesota Department of Transportation, Office of Investment Management, June 2001.
(2) Truck variable operating cost excludes tax & license, driver, insurance and depreciation.
(3) Reflects the 1998-2000 crash data and adjusted for inflation.

TABLE K-2
Remaining Capital Value

Assumed Life Expectancy

Investment Area	Expected Life (years)
Preliminary Engineering	0
Right of way	100
Major Structures	60
Grading and Drainage	50
Sub-Base and Base	40
Surface	25

Remaining Capital Value Factors [(1)]

Expected life ->	25	30	35	40	50	60	100
Analysis: 20 years	0.30	0.49	0.62	0.71	0.82	0.89	0.98
Analysis: 25 years	0.00	0.27	0.45	0.58	0.75	0.85	0.98
Analysis: 30 years	0.00	0.00	0.25	0.43	0.66	0.79	0.97

(1) Source: Minnesota Department of Transportation, Office of Investment Management, June 2001. Factors reflect discount rate of 4.5 percent real.

Example Computation:
$10 million spent on structures (60 years) for analysis period of 25 years has salvage value of 0.85 times $10 million in the last year of the analysis period.

APPENDIX L

Evaluation Factors

The following pages contain a description of the factors and rankings that were used as a tool by the Technical Advisory Committee and Mn/DOT to prioritize the major capital projects. Unlike traditional planning methods that prioritize projects based upon the Mn/DOT district/division that they are located in, the TH 169 Corridor Management Plan prioritized projects for the entire length of the corridor.

TH 169 Prioritization Factors

Safety

One of the most important issues surrounding transportation is safety. Over the past three years, crashes on TH 169 have cost the public $31 million annually. The Corridor Partners and Mn/DOT would like to make improvements where they can reduce the most crashes, and save the most money. Most of the identified capital improvements are located in segments that have some safety concerns. The following criteria were used to evaluate safety enhancements:

An improvement was give a score of 5 if it:

- Resolved a significant safety problem – severity or number of crashes
- Contributed to overall corridor safety
- Reduced modal conflicts – usually between pedestrian/bicyclists and motor vehicles
- Was in an area that had high traffic volumes

An improvement was give a score of 3 if it:

- Did not have a significant safety problem – crashes were not serious or there were few crashes
- Contributed to overall corridor safety
- May reduce modal conflicts

An improvement was given a score of 1 if it:

- Did not have a significant safety problem – crashes were not serious or there were few crashes
- Was not expected to contribute to overall corridor safety – conflicts are similar
- Had no impact to modal conflicts
- Was in a lower traffic volume area

Performance

One of the objectives of the TH 169 Corridor Plan is to improve performance along the corridor. Not all improvements enhance corridor performance to the same degree; some improvements can significantly impact performance with little investment, while other improvements a significant amount of investment with little increased performance. In addition to the degree to which specific improvements enhance corridor performance, this factor also considered whether or not the improvement was needed to reach the minimum performance targets outlined by Mn/DOT or if it was needed to reach the performance target of 65 mph selected by the Corridor Partners. The following criteria were used to evaluate performance:

An improvement was given a score of 5 if it:

- Was essential to the achievement of Mn/DOT's minimum performance targets
- Supported achievement or maintenance of Mn/DOT's targets
- Was needed for the corridor vision
- Increased performance in an area that is currently at or below the minimum target

An improvement was given a score of 3 if it:

- Was not essential to the achievement of Mn/DOT's minimum performance targets
- Was needed for the corridor vision
- Was located in an area that is currently performing at or above target

An improvement was given a score of 1 if it:

- Was not essential to the achievement of Mn/DOT's minimum performance targets
- Was not needed for the vision if other improvements are made along the corridor

Traffic Signal Risk

The installation of traffic signals reduces the capacity of a four-lane facility by half. In congested areas this can lead to significant queuing of vehicles during the peak periods. In all cases, traffic signals increase costs to motorists by making them slow down or come to a complete stop. Improvements were judged on their ability to reduce the number of existing traffic signals and their ability to prevent the installation of traffic signals in the future. The following criteria were used to evaluate traffic signal risk:

An improvement was given a score of 5 if it:

- Eliminated at least one existing traffic signal
- Lessened the risk of an additional traffic signal
- Was in an area with high traffic volumes
- Was is in an identified growth area – high growth

An improvement was given a score of 3 if it:

- Did not eliminate an existing traffic signal
- Lessened the risk of an additional traffic signal
- Was in an area with moderate traffic volumes
- Was in an area identified for low to moderate growth

An improvement was given a score of 1 if it:

- Did not eliminate an existing traffic signal
- Did not lessen the risk of an additional traffic signal
- Was in an area with low traffic volumes
- Was in an area with low growth

Local and Regional Connectivity

Connections between regional trade centers were at the heart of the development of the Interregional Corridor System. People travel between these centers for business, recreational and commuting needs. Providing a strong linkage off of TH 169 to the local communities and to the broader region of the Twin Cities and Mankato is the main function of State Highway 169. This factor evaluated potential improvements on their ability to enhance local and regional connections. The following criteria were used to evaluate local and regional connectivity:

An improvement was given a score of 5 if it:

- Separated local traffic from through traffic – provided the framework for supporting local growth areas
- Improved bicycle and pedestrian options to cross the corridor
- Provided or maintained continuity and connectivity of principal and minor arterials

An improvement was given a score of 3 if it:

- Separated local traffic from through traffic – provided the framework for supporting local growth areas
- Pedestrian/bicycle crossings were or were not enhanced
- Provided or maintained continuity and connectivity of collectors or lower level roadways

An improvement was given a score of 1 if it:

- Disrupted continuity of major connections
- Disrupted continuity of the local road network
- Disrupted pedestrian and bicycle crossings

Cultural and Natural Environment Impacts

Depending upon their location, major capital improvements have the potential to negatively impact the cultural and natural resources adjacent to the TH 169 corridor. In order to determine potential impacts to cultural and natural resources, file searches were conducted with the State Historic Preservation Office and the Minnesota Department of Natural Resources. Appendix I shows cultural and natural environment impacts for each of the identified major capital improvements. Projects evaluated under this factor were reviewed for the significance of their impacts on cultural and natural resources. The following criteria were used to evaluate cultural and natural environment impacts:

An improvement was given a score of 5 if it:

- Had a low potential for impacts due to the size of the project and/or the resources impacted

An improvement was given a score of 3 if it:

- Had a moderate potential for impacts due to the size of the project and/or the resources impacted

An improvement was given a score of 1 if it:

- Had a significant potential for impacts due to the size of the project and/or the resources impacted
- Had complex issues

Socio-Economic Impacts

Large-scale improvements often impact the lives of property owners or those living in an area where an improvement is to be made. In some instances, residents or businesses must be relocated against their will. Improvements developed for the TH 169 corridor were evaluated for their impact on residential relocations, commercial relocations, farmland loss and environmental justice concerns. To help mitigate socio-economic impacts, the following criteria were used to evaluate proposed improvements:

An improvement was given a score of 5 if it:

- Had limited or no impacts to the four areas (residential relocation, commercial relocation, farmland loss, and/or environmental justice)

An improvement was given a score of 3 if it:

- Had a probability of impacting two of the four areas

An improvement was given a score of 1 if it:

- Had a probability of impacting 3 or more of the four areas
- Had a high magnitude of impacts (i.e., a large number of residential relocations, etc.)

Benefit-Cost Ratio

Improvements to the corridor need to make economic sense – you must be able to get as much out of the improvement as you put into it. One of the accepted ways to measure how much is gained with the implementation of a project is a benefit-cost analysis. Appendix K explains the benefit-cost methodology used to calculate benefits and costs of the proposed improvements for TH 169. Improvements were evaluated on their benefit-cost ratio and the net present value of the project. The following criteria were used to analyze benefit-cost ratios and net present value:

An improvement was given a score of 5 if it:

- Had a benefit-cost ratio greater than 2.5
- Had a net present value over $100 million

An improvement was given a score of 3 if it:

- Had a benefit-cost ratio between 1.5 and 3
- Had a net present value over $10 million

An improvement was given a score of 1 if it:

- Had a benefit-cost ratio of 1 or less