NORTHEAST WRIGHT COUNTY SUB-AREA TRANSPORTATION STUDY

Prepared For:

WRIGHT COUNTY

CITY OF ALBERTVILLE

CITY OF OTSEGO

CITY OF ST. MICHAEL

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1.0 INTRODUCTION

Wright County adopted its first comprehensive transportation plan in 1994. This plan was developed to provide a better understanding of transportation and growth issues that the county was experiencing and is anticipated to experience over the next 20 plus years. Since 1994, the county has seen significantly more growth than was projected by the state demographer. Much of this growth has occurred along the county's eastern and northern borders in communities such as Delano, Rockford, Hanover, St. Michael, Otsego, and Monticello. In fact, in six years (year 2000) Wright County surpassed the 2015 population projections that were projected in the 1994 plan by the state demographer. This unexpected growth has led to significant increases in traffic and transportation issues. All of the agencies in the area have struggled to develop needed infrastructure improvements as funding levels have stagnated and/or decreased in real terms.

In addition to local transportation issues, the Minnesota Department of Transportation (Mn/DOT) identified safety and mobility problems facing statewide corridors. As a result, Mn/DOT developed the Interregional Corridor (IRC) system and completed a number of Corridor Management Plans (CMPs) for these roadways. The intent of the CMPs was to communicate the long-term transportation needs on these corridors and facilitate coordination and cooperation at the local, regional and state levels. Two of the IRC corridors which have Corridor Management Plans (CMPs) completed, Interstate (I)-94 and Trunk Highway (TH) 101, are within Wright County.

Due to all of the transportation issues and concerns at both the state and local levels, the Northeast Wright County Sub-Area Study was initiated by Wright County and the Cities of Albertville, Otsego and St. Michael to further define the long-term transportation system for the area, including access to I-94. The study is coordinated with Mn/DOT, the Federal Highway Administration (FHWA) and other local communities within the area. This group is commonly referred to as "partners" or "study partners" throughout the report and is represented by the following agencies:

- Wright County
- City of Albertville
- City of Otsego
- City of St. Michael
- Hennepin County
- Mn/DOT
- City of Rogers
- FHWA

By defining the long-term system plan for the area, local, regional and state agencies can better plan for ongoing development and the needed infrastructure changes on both the local and regional systems.

To help define and guide the study, the study partners established the following goals:

GOAL 1: *Improve the north-south and east-west arterial systems to provide better mobility, continuity, and connectivity in urbanizing areas.*

This goal responds to the need to better connect urbanizing areas. Current physical constraints (rivers, railroad, freeway, parks, and existing development) cause

concentrations of traffic that will lead to bottlenecks and congestion as the area grows.

GOAL 2: *Use existing arterials or collectors where design and access are consistent with desired function.*

This goal responds to the desire to minimize impacts to property owners and utilize existing resources (infrastructure) in developing the future system.

GOAL 3: *Encourage planning, design and implementation of local arterial and collector systems that support and provide alternatives to I-94 and TH 101 (IRCs), as well as provide support for planned land uses and economic development.*

This goal responds to the need to protect important statewide corridors that provide economic benefits to this area as well as all of Minnesota by developing a good supporting arterial network. The plan will balance statewide needs with need to support planned land uses.

GOAL 4: *Encourage preservation of right-of-way for future transportation corridors through the planning processes, right-of-way dedication, and direct purchase.*

Due to development pressures, locations for future transportation corridors will be lost and the ability to develop a well-coordinated system will be put at risk. This goal responds to the need to actively preserve future transportation options by protecting right-of-way for local collector and arterial facilities.

GOAL 5: *Increase safety to the public through a variety of measures including:*

- *Access management*
- *Safe design practices and standards*
- *Providing an off-street network of trails for pedestrians and bicyclists*
- *Matching trip types to facility types (i.e., short trips on the collector system and medium to long trips on the arterial systems)*

One of the key responsibilities for transportation officials is to provide a safe network of roadways. There are key components, practices and policies that will enhance safety. Agencies need to focus on safety in the various aspects of their work.

GOAL 6: *Improve interagency coordination and cooperation in developing future transportation infrastructure in the Northeast Wright County area.*

Transportation through the study area is a concern to all of the communities and agencies. Since actions by one community have ramifications to adjacent ones, it is important that there be a coordinated plan that all are working towards.

1.1 STUDY LOCATION

The study area is located in the northeast part of Wright County, approximately 20 miles northwest of the Twin Cities metropolitan area (Figure 1). This area is within commuting distance of Twin Cities employment centers as well as those in St. Cloud.

The northeastern part of Wright County is bounded by the Mississippi River on the north and the Crow River on the east. The landscape of the area is characterized by rolling farmlands, rivers and lakes. While the rolling terrain, rivers and lakes add to the area's views and charm, they also lead to significant transportation challenges due to the physical barriers they create. In addition to these natural barriers, I-94 and TH 101 are major transportation facilities that have limited access and limited crossings. These facilities also serve as barriers to movements in the area.

A detailed study area was established by the study partners. The primary study area is focused on the area that is bounded by the outer limits of the Cities of Otsego and St. Michael. The City of Albertville is contained within this area. While the study focuses on this area, it is recognized that transportation issues within the study area are influenced by factors outside the detailed study area. Therefore, a larger area denoted as the "area of influence" was considered when developing the overall plan and when conducting analysis of key plan elements.

1.2 PUBLIC PARTICIPATION

Public participation for the Northeast Wright County Sub-Area Study was primarily obtained through the participation of the study partners as part of the Technical Advisory Committee (TAC). However, other input was sought at key stages of the plan from the public and from businesses. The following paragraphs outline the public participation process used in the study:

- A TAC was established by the partners to actively guide the development of the transportation plan. The TAC included engineering and/or planning staff from each of the study partners. This group met monthly throughout the development of the plan to review technical analysis and provide input into the study process. Active participation in the TAC sessions ensured that the study addressed particular concerns and issues raised by each of the partners.
- A sub-group of the TAC consisting of engineers and planners from Mn/DOT, Wright County and the Cities of Albertville, Otsego and St. Michael met between TAC meetings to identify issues and/or concerns during the development of the future roadway classification plan, the traffic forecasting process, and alternative evaluation (five meetings).
- A public official meeting was held with the members of the three city councils and the Wright County Transportation Committee Board. In addition to providing them with information on the study, the meeting provided a chance for public officials from various agencies to express their comments and/or concerns about the study.
- One joint open house meeting was held to obtain input on the transportation issues early in the study process. In addition, individual cities held open houses to obtain input from the public. The cities also held public meetings to adopt the plan.

Figure 1
Study Area

1.3 ISSUES

Transportation issues in the study area were identified based on input from the study partners and the public. These issues are shown in Figure 2 and are described below:

Lack of Arterial Roadways

There is a lack of arterial roadways in the study area. There are only two continuous north-south roadways (TH 101) and County State Aid Highway (CSAH) 19) within the study area. As growth continues, the shortage of north-south arterial roadways will put increasing pressure on the existing routes to carry more traffic. This is likely to result in more backups and delays and more cut-through traffic on residential streets. Residents mentioned cut-through traffic on local streets near the TH 241/CSAH 19 intersection. In addition, residents mentioned existing backups at the CSAH 19/CSAH 18 intersection.

Lack of River Crossings/Freeway Crossings

There are a number of significant natural and man made barriers that restrict traffic movements. These barriers serve to concentrate traffic flows at crossing points. Traffic concentrations at these points can lead to capacity and safety problems. The Mississippi River is a barrier to continuous north-south travel. Currently, TH 101, CSAH 42 and TH 25 are the only routes that cross the Mississippi River. Regional traffic models have shown that a new river crossing between Elk River and Monticello will have a significant impact on future traffic volumes on TH 101. The Crow River, located in the south-eastern portion of the study area, has been noted as a barrier to east-west travel. Once again, it has been suggested that an additional crossing would help ease congestion on existing routes and provide better east-west connections.

Congestion

The public was quick to note that congestion is becoming an issue on the arterial and collector roadways throughout the study area. Some of the key areas that were mentioned were the CSAH 19/TH 241 intersection in St. Michael, CSAH 19 near I-94 and the Albertville Outlet Mall, TH 101 near Rogers, and I-94 near the TH 101 interchange. The study partners recognize that the shortage of arterial roadways will lead to more congestion on the existing arterials.

Safety

The public and study partners identified general safety issues. Concerns include too many access points on arterial routes, traffic speeds, lack of sidewalks or trails to accommodate pedestrian activities, lack of pedestrian crossings, inability to find adequate gaps on busy roadways and a lack of turn lanes. Many of the safety concerns involved through traffic on Main Street and other local streets in Albertville as people used the local streets to avoid traffic on CSAH 19.

Figure 2
Transportation Issues

Access

Some of the study partners indicated that there were too many private driveways, commercial entrances and public street access locations on the limited number of arterial roadways within the study area. The partners expressed concern that mobility on the arterial roadways is threatened by the high number of access points. Another concern is access to I-94. Current access to I-94 was established in early 1970s when area was entirely rural. As area urbanizes, access points need to be looked at closely to spread the trips adequately, but not create freeway operational problems.

Funding

All of the study partners indicated that limited transportation funding has resulted in a lack of improvements to address growing transportation needs. While the county has borrowed ahead on future funding allotments to develop a number of projects, the state has prioritized investments to primarily address improvements on IRC routes. This has resulted in lack of adequate funds and in agencies not being able to develop timely improvements on local facilities. Significant discussion has occurred with respect to development fees to capture additional dollars, bonding, and other financing strategies.

2.0 EXISTING CONDITIONS

Land use, population and traffic growth trends, along with safety concerns and capacity deficiencies, were investigated as part of this study. Information gathered from these investigations helped define existing conditions and established a base from which to evaluate future transportation needs in the study area.

2.1 LAND USE

Existing and future land use for the area was reviewed to gain a better understanding of potential land use densities and concentrations of major trip generators. The 2040 land use scenario was approached from the standpoint of a near build-out scenario for all three cities. This 2040 scenario assumed a future Wright County population approaching 200,000. The three cities are briefly described below.

The City of Albertville is surrounded by both the City of St. Michael and the City of Otsego. As a result, the city has a limited amount of open space left for development. At its present pace of development, the city projects that it will be fully-developed by the year 2010. The most significant development in Albertville is the Outlet Mall located north of I-94 on CSAH 19. This site has been expanded twice and construction is underway on a new addition. The area adjacent to CSAH 19 in Albertville is zoned as commercial and in addition to the Outlet Mall, several other parcels have been developed or are planned for development in the near future. This growth in commercial development and the residential growth experienced by the city have resulted in significant traffic volume increases in the city and specifically in the CSAH 19 area. Due to this the City of Albertville has expressed interest in modifying the access to I-94 to include a full access interchange at CSAH 19. The City of Albertville's future land use plan is shown in Appendix A. The city provided estimates of population, households and employment for each of the Transportation Assignment Zones (TAZs) for use in the regional model.

The City of Otsego became a city in 1990. Growth in the city, to date, has been primarily residential. However, more commercial and industrial nodes are being planned along TH 101 and along CSAH 19 north of the Albertville Outlet Mall. The city expects to grow at a fairly rapid rate of 800 dwelling units per year. At full-development Otsego will be at approximately 60,000 people. The future land use plan for the City of Otsego is shown in Appendix A.

The City of St. Michael has grown rapidly since it merged with Frankfort Township in the mid 1990s to form the present city limits. The future land use plan (see Appendix A) shows commercial development focused along TH 241 (an east-west facility between CSAH 19 and I-94), a commercial/industrial node near Naber/I-94, and a business/office park west of town along CSAH 35. Most of the remaining parts of the city are proposed to be residential type uses. The city expects to grow at approximately 400-500 dwelling units per year.

2.2 POPULATION

Traffic growth and growth in other transportation modes and services generally result from changes in population, land use changes and changes in travel patterns. One of the first steps in estimating the future traffic growth for the region is to examine historic population trends for the area. Over the past 15 to 20 years, statewide trends suggest that significant growth is occurring in all counties surrounding the Twin Cities metropolitan area. Due to its proximity to the Twin Cities metropolitan area, Wright County is now one of the fastest growing counties in the state.

Population projections from the Minnesota State Demographic Center expect Wright County to grow by 54 percent between 2000 and 2030. In absolute numbers, the county is expected to grow from a population of approximately 90,000 people to 139,000 people. However, based on recent discussions with the three cities, a population nearing 200,000 by 2040 is possible. Albertville, Otsego and St. Michael alone expect their populations to increase by nearly 90,000 people by 2040. This population increase is approximately equal to the existing population of Wright County today. Table 1 identifies historic growth trends and future population projections.

Table 1
Historic Population Growth and Future Population Projections

Area	Historic Population					Population Projections[1,2]		Annual Growth Rate[3]	
	1960	1970	1980	1990	2000	2025	2040	1960 to 2000	2000 to 2040
Albertville	279	451	564	1,251	3,621	5,063	7,900	1.07	1.02
Frankfort Township	944	1,372	2,170	2,935	-	-	-	-	-
St. Michael	707	1,021	1,519	2,506	9,099	31,089	45,000	1.07	1.04
Otsego	1,080	1,526	4,769	5,219	6,346	44,865	59,045	1.05	1.06
Study Area	**3,010**	**4,370**	**9,022**	**11,911**	**19,066**	**81,017**	**111,945**	**1.05**	**1.05**
Wright County	29,935	38,933	58,681	69,443	89,986	150,000	195,000	1.03	1.02

[1] Population growth projections were based on discussions with cities and review of recent building permits. Socio-economic data estimates at the rate of 2.85 per household for population and 2 employees per thousand square feet (0.13 Floor Area Ratio) were used for population projections.
[2] Year 2000 populations were used for the purpose of this study. According to the State Demographer, the populations of Albertville, Otsego and St. Michael as of April 1, 2002 are 4,517, 8,210 and 11,197 respectively.
[3] Growth in population can also be expressed in percent per year. For example, if the study area at 9,000 adds 3,000 people over 10 years, we can say that its growth rate was 1.03 per year or approximately three percent per year.

The following observations have been noted about growth trends in the area:

- The study area experienced steady growth from 1960-1990, with growth being the highest in the 1970s (1.08 annual growth rate). Much of the growth during this period is attributed to the movement away from traditional farming activities, the decline of townships and the movement of people to larger cities.
- Between 1980 and 1990 the study area added approximately 3,000 people, at an annual growth rate of approximately 1.03.
- A rising economy and growth in regional trade centers in the 1990s led to increased commercial and retail growth in the study area, especially along I-94. Population grew at an annual growth rate of 1.05 during these years.
- Development policies in the Twin Cities metropolitan area have resulted in residential development "leap frogging" over the Metropolitan Urban Services Area (MUSA) ring into Wright County.
- Over the next 40 years, population in the study area is projected to grow at an annual growth rate of 1.05. This results in a population of approximately 111,945 within the study area.
- The study area will continue to serve as a regional trade center for retail and recreational services activities. Continued growth in these areas will draw more traffic into the area.
- Business growth and expansion are anticipated to continue at a moderate pace within the study area. Areas along the I-94 and TH 101 corridors have shown significant retail growth and industrial development, and additional plans are being formulated for more commercial areas.

2.3 TRAFFIC VOLUMES

Annual average daily traffic volumes (AADTs) on major highways and road segments in the study area were collected using 2000 Mn/DOT traffic volumes maps. These volumes are shown in Figure 3. In general, traffic volumes tend to increase as they approach larger population centers such as Cities of St. Michael and Albertville. Additionally, volumes on the major routes that extend to the south-east and north (toward the Twin Cities and Elk River, respectively) have higher volumes than routes that extend to the north-west and south.

2.4 INTERSECTION LEVEL OF SERVICE

By identifying operational problems, improvement options can be investigated and planned (i.e., roadway improvements, intersection control changes, alternative routes, setback requirements, etc.). In addition, access controls and other management tools can be targeted for these corridors to improve their traffic operations until major improvements are completed.

An analysis of peak hour traffic volumes was conducted to determine the existing level of service of key intersections in the study area. The level of service provides an indication of how

Figure 3
Existing Traffic Volumes

traffic currently operates within the study area. By identifying intersections with existing operational problems, better planning decisions can be made to improve traffic operations until major improvements are planned.

Capacity analysis results identify a Level of Service (LOS) which indicates the quality of traffic flow through an intersection. Intersections are given a ranking from LOS A through LOS F. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS F indicates an intersection where demand exceeds capacity, or a breakdown of traffic flow. LOS A through D are generally considered acceptable by drivers. LOS E indicates that an intersection is operating at, or very near its capacity and that vehicles experience substantial delays. Unsignalized intersections were analyzed using the Highway Capacity Software and signalized intersections were analyzed using the Synchro/SimTraffic software.

The operational analysis of existing traffic conditions at key intersections along CSAH 19 and CSAH 37 in the City of Albertville was provided by SEH, Inc. The 2002 counts conducted by SEH at these intersections were increased by 5 percent for the existing analysis. The geometry used for the analysis assumed the CSAH 19 reconstruction to a four-lane roadway had not occurred. The LOS was calculated using methods from the Highway Capacity Manual (HCM). Figure 4 shows existing geometrics, traffic controls and peak hour traffic volumes for these intersections. Table 2 shows the LOS for these intersections.

Table 2
Existing Intersection Level of Service (CSAH 19 and CSAH 37)

Intersection	Level of Service	
	A.M. Peak	P.M. Peak
CSAH 19/Outlet Mall Entrance	A	B
CSAH 19/EB I-94 Ramp *	B	B
CSAH 19/CSAH 37	C	C
CSAH 19/57th Street [1]*	B	C
CSAH 19/53rd Street *	B	B
CSAH 19/50th Street *	B	D
CSAH 37/WB I-94 Ramps [2]*	B	**F**
CSAH 37/EB I-94 Ramps *	A	C
CSAH 37/Main Avenue *	B	B

* Indicates an unsignalized intersection.
[1] This intersection was signalized in 2003.
[2] A signal is planned to be installed at this ramp by fall 2004.

Peak hour turning movement counts were collected by Hakanson-Anderson Associates in March/April 2003 at the remaining key intersections along TH 241 and TH 101, except the intersection at TH 241 and CSAH 19. Level of Service for this intersection was obtained from the 2002 St. Michael Downtown/Town Center Traffic Study. Because the turning movement counts were collected on different days, the traffic volumes were conservatively balanced to account for daily traffic variations. Existing geometrics, traffic controls and peak hour traffic volumes for these key intersections are shown in Figure 5. Table 3 shows the LOS for these intersections.

Figure 4
Existing Peak Hour Traffic Volumes - CSAH 19 and CSAH 37

Figure 5
Existing Peak Hour Traffic Volumes - TH 241, TH 101 and CSAH 116

Table 3
Existing Intersection Level of Service (TH 241, TH 101 and CSAH 116)

Intersection	Level of Service	
	A.M. Peak	P.M. Peak
TH 241/Naber Avenue	B	B
TH 241/EB I-94 Ramp *	A/D	A/E
TH 241/WB I-94 Ramp	A	D
TH 241/CSAH 19 **	C	D
TH 101/CSAH 37 *	D/F	A/F
TH 101/CSAH 36	**F**	D
TH 101/CSAH 144	**F**	**E**
TH 101/CSAH 49	C	D
TH 101/I-94 North Ramp	C	**F**
TH 101/I-94 South Ramp	B	B
TH 101/CSAH 81	C	C
CSAH 116/CSAH 150 *	A/C	A/B
CSAH 116/CSAH 144 *	A/A	A/A

* Indicates an unsignalized intersection. The overall LOS is shown followed by the worst approach LOS.
** LOS was obtained from 2002 St. Michael Downtown/Town Center Traffic Study.

All key intersections currently operate at an acceptable overall LOS D or better, with the exception of the intersections along TH 101 at CSAH 36, CSAH 144, the I-94 Northbound Ramp, and CSAH 37 at the I-94 Westbound Ramp. Motorists on the side-street approach of CSAH 37 at TH 101 are also experiencing significant delays during the peak periods. It is important to note that existing signal timing, obtained from Hennepin County and Mn/DOT, was used for the analysis of the signalized intersections.

2.5 CRASHES

The safety of the roadway network is a high priority for the study partners, as well as for agencies that are responsible for improving and maintaining transportation facilities. To evaluate potential safety problems within the study area, a crash analysis was performed using Wright County crash records from 1998 through 2002. The crash records database was imported into a Geographic Information System (GIS) format so that the data could be displaced on a map of the study area.

Segment Crash Analysis

The intent of conducting a segment safety analysis is to identify abnormally high-crash segments. While numerous factors (i.e., geometric or cross-section deficiencies, sight distance problems, excessive access, etc.) contribute to crashes, a segment analysis can help identify potential problems so that further investigations and analysis can be done. In addition, segments can be targeted for safety improvements and investments.

Average crash rates for similar roadway facilities from Hennepin County (1999-2000) were used for the segment crash analysis. Over 40 segments were identified in the study area and crash rates were calculated for each of these segments. Each segment was attributed to a crash evaluation category which was based on the following roadway facility types: R1 – Four-lane divided freeway, R2 – Four-lane divided minor arterial and R4 – Two-lane undivided local/collector roadway. The crash rates for each individual segment were then compared to the average crash rates for the facility type (Hennepin County data). This was done by dividing the crash rate for each segment by the average crash rate of the roadway facility type. Based on this comparison, crash segments were divided into three categories:

Category 1 – Segments with crash ratios less than 0.85 were placed in this category. Crash rates for segments in this category were lower than crash rates for similar roadways.

Category 2 – Segments with crash ratios between 0.86 and 1.15 were places in this category. Crash rates for these segments were comparable to crash rates for similar roadway facility types.

Category 3 – Segments with crash ratios greater than 1.16 were identified as high-crash segments. Crash rates for segments in this category were higher than crash rates for similar facility types.

Figure 6 shows the segments by crash category. Study partners should focus safety improvements in Category 3 areas. Prior to making any safety improvements, partners should review the actual crash reports for the study segments to identify appropriate improvements.

2.6 MULTIMODAL TRANSPORTATION ELEMENTS

The transportation system is made up of various elements. These include trucking, railroads, transit, aviation and bicycle/pedestrians. The existing multimodal elements are summarized below:

Trucking

The study area currently does not have major generators of heavy commercial type traffic. There are some minor sand and gravel operations along the Crow River south of TH 241 and along CSAH 19 south of downtown St. Michael. In addition, there are a couple of industrial park areas that generate a modest amount of truck traffic. TH 241 has approximately 4 percent trucks and TH 101 has approximately 7 percent trucks. These numbers are near the state average for trucks on all roadways.

Interstate 94 is one of the major sources of trucking movements in the state. Recent heavy commercial average daily traffic (HCADT) volumes obtained from Mn/DOT show that approximately 12.5 percent of the traffic along I-94 in the study area is heavy commercial vehicles (6,250 vehicles per day). Generally, trucks using I-94 primarily travel through the area and are a consideration with respect to operational and access issues on I-94.

Figure 6
High Crash Segments

Railroads

The study area is affected by one railroad. The Burlington Northern Santa Fe operates a semi-active spur line alongside I-94. This spur line operates one train per year at speeds between 25 mph and 50 mph. This line primarily serves the Xcel Energy nuclear plant in Monticello. Although the current operating license expires in 2010, Xcel Energy is in the process of renewing the license for the next 20 years. This may have a bearing on the long-term use of this rail facility. The county should consider taking the necessary steps to obtain this railroad right-of-way if it goes through the abandonment process.

Transit

Limited transit services are available in the study area. Wright County Human Services provides a volunteer driver program, where volunteers pick up qualified people to take them to medical or other necessary trips. To qualify for this program, a person must be at least 60 years old or be client of Wright County Human Services.

Another transit service provided by the county is called RiverRider Transit System. RiverRider used to provide dial-a-ride services from the City of St. Michael to Buffalo and Elk River, but was cancelled in 2003 due to low ridership.

Aviation

There are no airports within the study area; however, Wright County has two municipal airports which are located in Buffalo and Maple Lake. These airports primarily serve private air services and charters. Additional air transit is accessible from nearby St. Cloud Regional Airport as well as several airports in the Twin Cities metro area.

Bicycle/Pedestrians

Information was gathered on existing bicycle and pedestrian trails in the study area. Wright County adopted its latest County Bikeway Plan in October 2002. This plan adds approximately 174 miles of trail and paved shoulders along county highways over the next 20 years.

Existing bike facilities in the study area include bike paths on paved shoulders and off-road paths along major roadways such as CSAH 19, CSAH 18 and CSAH 35. Growth in traffic on roadways in the study area is causing safety concerns to bicyclists and pedestrians, thus increasing the need for more designated off-road bicycle paths. Study partners should focus efforts on identifying and developing an integrated and coordinated trail system throughout the study area by giving special consideration to addressing bicycle and pedestrian needs along routes when planning future transportation improvements.

3.0 ROADWAY SYSTEM PLAN

3.1 FUNCTIONAL CLASSIFICATION

A functional classification plan defines the roadway hierarchy used by agencies and planning officials to manage access, setbacks and other design related features of the roadway. The designated function of a roadway is defined by the role it plays in serving the flow of trips through the highway network (i.e., the primary function of some facilities is to provide mobility, while others provide access and collect traffic from locations). A formal process for determining functional classification is outlined in the Federal Highway Association's manual, Highway Functional Classification – Concepts, Criteria and Practices, March 1989.

3.1.1 Existing Functional Classification

The existing functional classification plan for the study area was last updated in 1995 (Figure 7). It was established assuming some urbanization around existing cities, but not nearly the degree of long-term growth that is anticipated under this 2040 plan. The Mississippi River in the north and the Crow River in the south-east create natural barriers in the study area. Currently, the area is served by two key regional transportation facilities: Interstate 94 (I-94) and Trunk Highway 101 (TH 101).

Interstate 94 is a high-speed, four-lane controlled access freeway that connects major regional trade centers in western Minnesota and North Dakota to the Twin Cities metropolitan area. It is a principal arterial and is designated a High-Priority Interregional Corridor. As part of the interstate system, this facility carries the highest level of importance with respect to serving long through trips. Within the study area, I-94 travels diagonally and provides selective access to the regional transportation system.

Trunk Highway 101 is designated as a minor arterial; however, previous plans have recommended that it be upgraded to a principal arterial from I-94 to TH 10. This facility is designated as a High-Priority Interregional Corridor and is part of the National Highway System (NHS). Trunk Highway 101 is currently a four-lane rural expressway; however, the Highway 101/169 Corridor Management Plan identified this facility as a future four-lane controlled access freeway.

Both I-94 and TH 101 routes carry significant amounts of commuter traffic and recreational traffic and both have corridor management plans that have identified future access locations. As a result, the future access points will affect the configuration of the supporting minor arterial system. Other key facilities in the study area include:

Minor Arterials

The minor arterial roadways play an important role in the study area by connecting population centers to one another, connecting centers to other areas in the county, and connecting centers to the roadway system. In addition to TH 101, there are five minor arterial roadways within the

Figure 7
Existing Functional Classification

study area:

- County Road 121 (CR 121) from TH 241 in Wright County, connecting to CSAH 116 in Hennepin County
- CSAH 19 from CSAH 39 in the City of Otsego to the bridge over the Crow River in Hennepin County
- CSAH 35 and TH 241 which connect the City of Buffalo to I-94 in the City of St. Michael
- CSAH 39 which connects the City of Monticello to the City of Otsego at TH 101
- CSAH 42 from TH 101 to Wright and Hennepin County border at Dayton

Major Collectors

The major collector system connects local roads to the minor arterial system. Unlike the principal and minor arterial systems which emphasize mobility, the major collector system places an equal emphasis on both mobility and access. In general, this means that there are more driveways and public street accesses to the major collector system than there are to the minor and principal arterial systems. Major collector roadways within this study area include:

- CSAH 18 which runs parallel to I-94 from the City of Monticello to the City of Albertville
- CSAH 20 near the southern boundary of the study area
- CSAH 33/CR 144 near the southern boundary of the study area
- CSAH 36 which runs parallel to the Crow River from I-94 to TH 101
- CSAH 37 from I-94 to TH 101 in the City of Otsego
- CSAH 42 from Wright and Sherburne County border to TH 101
- Odean Avenue NE in the City of Otsego

Minor Collectors

The minor collector system provides important connections to the major collector and minor arterial systems. The minor collector system places a heavier emphasis on access than mobility. As a result, there are more driveways and public street connections on this type of roadway than on the others previously described. Minor collectors within the study area include:

- CSAH 34 from western boundary of the study area to CSAH 19
- CR 117 which runs north-south from TH 25 to CSAH 33
- CR 119 from CSAH 37 to CSAH 35 in City of St. Michael
- CR 120 from CSAH 34 to CR 144 in City of St. Michael and Rockford Township
- CR 121 from TH 241 to Naber Avenue NE in City of St. Michael

- 77th Street NE from McAllister Avenue NE to Nashua Avenue NE in City of Otsego
- Farmington Avenue NE from CSAH 34 to CSAH 33 in Buffalo and Rockford Townships
- Fenning Avenue NE from CSAH 18 to CSAH 37 in City of Monticello
- McAllister Avenue NE from 77th Street NE to 55th Street NE in City of Otsego
- Naber Avenue NE from I-94 to TH 241 in City of St. Michael
- Nashua Avenue NE from CSAH 39 to 77th Street NE in City of Otsego

3.1.2 Future Functional Classification

A key element of this study involved creating a future functional classification plan for the roadways in the study area. According to the 2040 forecasts, the study area is expected to be fully urbanized by 2040 (the level of urbanization will be similar to the present Cities of Plymouth and Maple Grove). This urbanization will add more people and traffic to the study area and the existing functional classification plan will not be able to handle this growth. Therefore, an integrated roadway network with a closer spacing of minor arterial and collector routes was designed as a part of the future functional classification plan to serve future growth patterns in the study area. Another goal of the future functional classification plan was to improve mobility and continuity in the study area. This was achieved by improving access to I-94, providing four-lane minor arterials, and continuous north-south and east-west roadway connections in the study area.

In addition to this, there are a number of significant physical barriers that restrict traffic movements in the area. The Mississippi River is a barrier to continuous north-south travel. The Crow River, located along the south-eastern border of the study area, has been noted as a barrier to east-west travel. Both these rivers have an inadequate number of river crossings which is leading to congestion on existing routes. Additional river crossings across the Mississippi and Crow Rivers were recommended to address this issue. The following guidelines were considered in developing the future functional classification plan:

- Full urbanization of the study area was assumed by 2040; therefore, urban spacing criteria was used to identify proper spacing of routes to achieve a balanced distribution of traffic (need to provide access and mobility functions for entire area).
- Ability of the route to provide continuity through individual travelsheds or between travelsheds, including connectivity with river crossing and to freeway and/or IRC access locations.
- Ability of the route to serve regional population centers, regional activity centers and major traffic generators.
- Relationship of the route to adjacent land uses (location of growth areas, industrial areas, and neighborhoods).
- Trip length characteristics of the route as indicated by route length, type and size of traffic generators served, and route continuity.

- Ability of the route to provide mobility or land access function based on number of accesses, access spacing, speed, parking and traffic control.

Using these guidelines, the study partners recommended a closer spacing for arterial and collector systems to serve future growth patterns in the study area. The future functional classification map shows appropriate location and spacing of future arterial and collector facilities (Figure 8). The changes to the system represent a desire to achieve a better arterial grid system, and promote the use of local arterials for shorter inter-city type trips. The key changes to the system are described as follows:

Key Arterial Changes

- TH 101 is recommended to be changed from a minor arterial roadway to a principal arterial from I-94 to TH 10. This change is proposed to provide a north-south principal arterial connection between Rogers and Elk River.
- A new roadway to the west of Jamison Avenue NE in the City of St. Michael, in combination with Kadler Avenue NE in the City of Otsego, is proposed as a future north-south alternative roadway to CSAH 19 in the study area. Kadler Avenue NE is recommended to be changed from a local roadway to a minor arterial. The proposed minor arterial roadway should run along Jaber Avenue NE to connect to CSAH 33/ CR 144 in the south. A northerly extension of Kadler Avenue NE over the Mississippi River to connect with TH 10 in Sherburne County should be considered as a long-term river crossing reliever to TH 101.
- CSAH 33/CR 144 is recommended to be changed from a major collector to a minor arterial. A future river crossing over the Crow River is proposed to connect CSAH 33/ CR 144 to Hennepin County CSAH 30. This will provide a continuous east-west connection between Wright and Hennepin Counties.
- CSAH 37 in the City of Otsego is recommended to be changed from a major collector to a minor arterial roadway. CSAH 37 should be extended to the west to connect with Jamison Avenue NE and Kadler Avenue NE through a future interchange at I-94.
- Naber Avenue NE in the City of St. Michael is recommended to be changed from a minor collector to a minor arterial. This facility in combination with Nashua Avenue NE in the City of Otsego will provide a north-south arterial facility and a potential access to I-94. Nashua Avenue NE is recommended to be changed from a minor collector to a minor arterial. This proposed roadway alignment from CSAH 39 to TH 241 will provide a continuous north-south connection between CSAH 19 and TH 101 in the study area.
- 85th Street NE in the City of Otsego should be extended to serve as an east-west connection between Kadler Avenue NE and CSAH 42 and should be changed from a local roadway to a minor arterial.
- CSAH 42 in the City of Otsego is recommended to be changed from a major collector to a minor arterial between TH 101 and Highway 10. This change is recommended to provide an arterial roadway along TH 101.

Figure 8
Future Functional Classification

- CSAH 36 in the City of St. Michael is recommended to be changed from a major collector to a minor arterial between TH 241 and TH 101. This change is recommended to provide a continuous minor arterial connection from the City of Buffalo to TH 101.
- CSAH 18 in combination with 50th Street NE in the City of St. Michael is recommended to be upgraded to a minor arterial. These changes are recommended to provide a parallel route to I-94.

Key Collector Changes

- Maciver Avenue NE is recommended to be changed from a local roadway to a collector facility paralleling CSAH 19 to the east. This facility should be extended to CSAH 39 in the north and connected to 55th Street NE in the south to provide continuity.
- Jamison Avenue NE is recommended to be changed from a local roadway to a collector from CSAH 18 to Jaber Avenue NE. This roadway will provide a continuous collector roadway to the minor arterial roadway proposed to the west of Jamison Avenue NE.
- Oakwood Avenue NE in the City of Otsego should be connected to Ogren Avenue NE in the City of St. Michael. This proposed roadway alignment is expected to provide a continuous connection between CSAH 37 and CSAH 36. Oakwood Avenue NE should be changed from a local roadway to a collector.
- 85th Street NE is proposed to be further extended to the west of Kadler Avenue NE to connect to Harding Avenue NE and is recommended to be changed from a local roadway to a collector from Kadler Avenue NE to Harding Avenue NE.
- 78th Street NE in the City of Otsego is proposed to be extended west to CSAH 19 to serve as continuous east-west roadway between CSAH 37 and 85th Street NE. It is recommended to be upgraded to a collector.
- Frankfort Parkway in the City of St. Michael is recommended to be upgraded from a local roadway to a collector. This proposed roadway alignment will provide a continuous east-west connection from CSAH 19 to Naber Avenue NE.

In addition to the above changes, other functional classification modifications in the study area were made. These changes are listed in Appendix B.

The arterial and collector systems shown in the future system plan are not all of the roadways needed; these are just the key facilities. Frontage or backage roadways will be needed to attain desired access spacing on the key facilities. Study partners should use the future system plan when making decisions and recommendations for proposed developments.

3.2 FUNCTIONAL CLASSIFICATION IMPLEMENTATION

One of the goals of this study was to encourage planning, design and implementation of an arterial and collector system that will support and provide alternatives to I-94 and TH 101 as well as serve future land use. Existing facilities (infrastructure) were utilized as much as possible in

developing the future classification plan. All of the proposed changes in the functional classification plan cannot be implemented at once due to system mileage limitations (as regulated by federal guidelines). However, agencies should track system mileage and designate new facilities as local street system mileage is added. Even though a route may not be officially designated due to mileage restrictions, identifying it as part of the long-range system plan provides opportunities for agencies to preserve right-of-way and access[1]. Identifying the changes also puts property owners and future developers on notice of long-term transportation system changes.

3.3 JURISDICTIONAL CHANGES

After the development of the future functional classification plan, the existing roadway jurisdiction was reviewed and candidates for potential jurisdictional transfers were identified. Roadway jurisdiction is an important element because it affects a number of critical organizational functions and obligations (regulatory, maintenance, construction and financial). The primary goal in reviewing jurisdiction is to match the function of the roadway with the organization level that is best suited to manage the roadway.

The jurisdiction process used to identify jurisdictional transfer candidates is outlined as follows:

a. A functional classification plan was developed for the study area.

b. Jurisdictional transfer candidates were identified through the initial partnership meetings, small group meetings and the functional classification study.

c. Guidelines were developed for route jurisdiction (Appendix C).

d. Jurisdictional transfer candidates were reviewed against the jurisdictional guidelines, and reasons for and against the jurisdictional changes were noted.

e. Jurisdictional transfer candidates were rated according to how well they met the jurisdictional transfer guidelines. These rankings and their rationale were discussed with the partners. The transfer ratings were defined as follows:

   Rating 1: Transfer candidate **definitely meets** transfer guidelines.

   Rating 2: Transfer candidate **substantially meets** transfer guidelines.

   Rating 3: Transfer candidate **marginally meets** transfer guidelines **or** the transfer candidate is dependent on future growth and development of area.

   Rating 4: Transfer candidate **does not meet** transfer guidelines and therefore is not recommended as a future transfer.

[1] Right-of-way footprints for typical roadway cross sections are shown in Appendix G.

f. Based on the personal potential jurisdictional transfers discussed by the partners, a summary of the mileage impacts for each jurisdiction was developed.

Candidates for potential jurisdictional changes were divided into the following categories:

Jurisdictional Transfers from County to Cities

Potential roadway candidates for transfer from county to city jurisdiction include roadways that no longer provide direct connections between major areas of the county, have been replaced by other county or state roads or are simply redundant as county roads. Most of the roads identified for transfer are relatively short in length and their primary function is to provide local access.

A part of CSAH 37 (from west junction of CSAH 18 to 70th Street NE) is recommended to be turned from county to city jurisdiction due to the proposed realignment of CSAH 37 along 70th Street NE. Other roadways in this category include CR 119 and CSAH 18. CSAH 35 (now CSAH 18) was identified as a potential transfer candidate in the 1994 Wright County Transportation Plan. CR 121 (40th Street NE) is also recommended to be turned from county to city jurisdiction. This change has already been incorporated into a county/city agreement.

Jurisdictional Transfers from Cities to County

Several roadways currently under city jurisdiction were identified as facilities that provide direct connections between major areas in the county and connect areas where county routes do not currently exist. Roadways of this nature are recommended as potential candidates for transfer from city jurisdiction to county jurisdiction. Roadways in this category include 70th Street NE, Nashua Avenue NE, Naber Avenue NE and 50th Street NE.

70th Street NE is recommended to be transferred from city to county jurisdiction due to the proposed realignment of CSAH 37. Nashua Avenue NE in the City of Otsego and Naber Avenue NE in the City of St. Michael are recommended to be transferred from city to county jurisdiction due to the new north-south arterial proposed in the study area. Nashua Avenue NE and Naber Avenue NE are also recommended to be transferred to county jurisdiction in the 1994 Wright County Transportation Plan. 50th Street NE is proposed as an east-west arterial roadway in the study area and is recommended to be transferred from city to county jurisdiction.

Jurisdictional Transfers from State to County

TH 241 is recommended for turnback from state to county jurisdiction. It is short in length (less than four miles) and does not satisfy the criteria for being under state jurisdiction. This roadway jurisdiction change is consistent with the recommendations made in the 1994 Wright County Transportation Plan.

The candidates for potential jurisdictional transfers are discussed in detail in Table 4. Table 5 provides the mileage summary for each jurisdiction.

Table 4
Potential Jurisdictional Transfers

Table 4 Continued

Table 4 Continued

Table 5
Jurisdictional Transfer Mileage Summary

4.0 ANALYSIS OF FUTURE TRANSPORTATION NEEDS

4.1 TRAFFIC FORECASTS

Traffic forecasts for the year 2040 were prepared for the sub-area study to identify future capacity deficiencies and to provide traffic information that will assist state, county and city staff, and officials, in making important transportation decisions. The traffic forecasts for this study were built on the regional transportation model developed for the *2003 Mississippi River Cumulative Impact Study*. This large regional model was further refined to include more detailed Traffic Assignment Zone (TAZ) breaks throughout the study area, revised demographic assumptions, and a refined local arterial and collector network. The detailed model assumptions are provided in Appendix D of this report.

The traffic forecasts for the study area assumed a build-out scenario for the City of Albertville, and a near build-out scenario for the City of Otsego and St. Michael. Demographic assumptions for other communities in the model are consistent with the assumptions used in the *Mississippi River Cumulative Impact Study* (these are also referenced in the Appendix D).

The regional model was revised as indicated above and a calibration process was done to ensure that the model was within allowable tolerances with respect to 2000 volumes. The model was then run to determine future traffic forecasts for routes within the study area for a Base Condition. The Base Condition assumed no additional access changes to I-94 (Base Condition did assume two new overpasses at Jaber/Kadler Avenue NE and Naber Avenue NE). This was done both to provide a baseline scenario to evaluate access alternatives against, and to validate trip generation and ADT growth rates that were produced by the model against other studies and expectations. The Base Condition also assumed all minor arterial roadways to be four-lane and all collector roadways to be two/three-lane roadways. In addition to the Base Condition, different access alternatives to I-94 were also identified and analyzed. The analysis of these access alternatives is provided in Chapter 5. The 2040 volumes for the Alternative A – Base Condition are shown in Figure 9.

4.2 CAPACITY/ISSUE AREAS

An analysis was done to identify future transportation capacity deficiencies. This information is normally used to either plan additional capacity improvements or to manage facilities more effectively through access controls, right-of-way preservation, setback requirements, and/or land use and development controls. Year 2040 peak hour traffic volumes derived from the model for the Base Condition were compared with the daily volume thresholds.

The analysis showed that CSAH 37 and its connector roadways between CSAH 19 and I-94 were congested. In this area, CSAH 37 operated at an overall LOS E. I-94 ramps near TH 241 were identified as congested areas with a LOS E. TH 241 from CSAH 19 to I-94 was operating at a near congestion level (LOS D). Ogren Avenue NE between 55th Street NE and 45th Street NE was also identified as a congested segment. This segment had a LOS E. Another area which was identified as congested was the Mississippi River crossing on TH 101 operating at a LOS E.

Figure 9
2040 Traffic Volumes

Capacity analysis is a planning-level tool that identifies potential problems based on the facility type and future volume projections. It is also important to remember that a segment may be shown as congested or near congestion, but this is only an indication of potential problem. Some segments may have little to no access and relatively little cross traffic, which can result in the ability of the facility to accommodate higher volumes. As long as access remains limited, it is likely that the roadways will operate better than the analysis would indicate. While the capacity analysis identifies potential problem area, it is recommended that additional traffic information be reviewed to confirm operational problems as specific improvements or operational changes are being considered for implementation. This would include the evaluation of peak hour volumes, directional splits, and a review of actual development and growth patterns for the area.

Following the analysis of the future base condition, additional modifications were made to the study network to analyze different access scenarios (alternatives) to I-94 and their resulting traffic impacts to the local system (ability to better distribute volumes, overall efficiency of system (VMT/VHT)). These alternatives are discussed in detail in the following chapter.

5.0 ANALYSIS OF ALTERNATIVES

The primary goal of the sub-area study was to identify a long-term system plan that provides a solid framework for future growth of the area as well as maintaining mobility for the key arterial systems that serve a broader statewide function. An arterial system plan was developed to promote better east-west and north-south movement throughout the area, and provide alternatives or options to I-94 for shorter local trips. However, this system plan can't be complete without developing consensus on the future long-term access locations to I-94 (access to TH 101, the other major regional highway in the area, was determined as part of the TH 101 CMP). Access to I-94 has a significant impact to the local supporting system and will affect how connections are made as well as the size and type of interchanges that should be planned. Local agencies would like to resolve the access and system issues so that proper space can be reserved for the needed infrastructure and appropriate land uses and utilities can be planned.

5.1 DESCRIPTION OF ALTERNATIVES

Based on input from the TAC members, six access alternatives along I-94 were selected for analysis and evaluation. These alternatives are described below and shown in Figures 10 to 18.

Alternative	Description
A	This alternative represents the "Base Condition" because it maintains the existing access configuration to I-94 while constructing additional overpasses at Jaber/Kadler Avenue and at Naber Avenue. All of the other access alternatives were compared to this alternative.
B	Provides full-interchange access at CSAH 19 and TH 241; half-interchange access to the east at CSAH 37; and overpasses at Jaber/Kadler Avenue and Naber Avenue.
C2	Provides full-interchange access at CSAH 19 and CSAH 37 using Collector-Distributor (CD) system; full-interchange access at Naber Avenue and TH 241; and overpass at Jaber/Kadler.
D	Provides full-interchange access at CSAH 19, Naber Avenue and TH 241; and it provides overpasses at CSAH 37 and Jaber/Kadler Avenue.
D1	Provides full-interchange access at CSAH 19, Naber Avenue, and TH 241; half-interchange access to the east at CSAH 37, and an overpass at Jaber/Kadler Avenue.
E	Provides full-interchange access at Kadler Avenue, Naber Avenue and TH 241; and it provides full-interchange access at CSAH 19 and CSAH 37 using CD system.

Figure 10
Existing Conditions

Figure 11
Access Alternative A

Figure 12
Access Alternative B

Figure 13
Access Alternative C2

Figure 14
Access Alternative C2 – CD Road Detail

Figure 15
Access Alternative D

Figure 16
Access Alternative D1

Figure 17
Access Alternative E

Figure 18
Access Alternative E – CD Road Detail

5.2 EVALUATION CRITERIA

Once the alternatives were identified, they were evaluated in an initial screening process to determine which alternatives should be carried forward for further analysis in a formal interstate access modification request. Prior to the evaluation, seven transportation objectives, related to I-94 access, were developed and discussed with the TAC. These objectives are listed below, and support the overall transportation goals of the plan.

- providing a good overall local supporting arterial network,
- equitably distributing existing and future transportation demand to the arterial system,
- supporting the designated highway system functions (arterial, collector, local),
- promoting safety,
- promoting system efficiency, and
- minimizing the operations impacts to I-94.

Based on these objectives the following evaluation factors were developed to assess the different access alternatives:

1. Consistency with the proposed system plan
2. Ability to balance ramp movements
3. Ability to minimize local trips on the freeway system
4. System efficiency in vehicle miles and vehicle hours of travel (VMT and VHT)
5. Ability to maintain or improve safety
6. Ability to reduce system overloads on supporting arterial network
7. Impacts to I-94 capacity and operations

Information for this analysis was derived from a regional transportation forecasting model that was developed to analyze Mn/DOT's *I-94/TH 10 Regional River Crossing*, and *Mississippi River Cumulative Impact* study. This model was updated to reflect greater zone density and land use changes that had been identified by the cities of Albertville, Otsego, and St. Michael. In addition, network modifications were made to include more local collector and arterial roadways. Calibration runs were made to verify accuracy of model in the study area. In addition to the model, several meetings were held with local agencies to develop a local arterial and major collector grid system plan. This plan was used as a base network in all of the forecasting and evaluation work.

As previously explained, the alternatives were first evaluated on seven different criteria using a rating of "good", "fair" or "poor". The results of the analysis for each of the individual factors are shown on Tables 6-11 and 13. These tables provide an explanation of each evaluation factor and indicate the rating for each alternative in this evaluation category.

Table 6
System Plan Consistency

Alternative	Rating
A Existing I-94 Access with overpasses at Kadler and Naber Avenue.	○
B Full access at CSAH 19, half access to east of CSAH 37, full access at TH 241.	○
C2 Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue.	⊙
D Full access at CSAH 19, overpass at CSAH 37, full access at Naber Avenue overpass at Kadler Avenue.	●
D1 Overpass at Kadler Avenue, full access at CSAH 19, half access at CSAH 37, full access at Naber Avenue.	⊙
E Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue, full access at Kadler Avenue.	⊙
● Good ⊙ Fair ○ Poor	

Analysis

A general comparison was made with respect to how the access alternatives connected to the future roadway system. Alternatives that promoted connections to arterials versus collectors, and promoted higher volumes and use of the arterial grid system were evaluated more favorably than alternatives that pushed volumes on to collector or local roadways.

Based on this criterion, Alternatives A and B were rated "poor" because they provide restricted access to future arterial system (Jaber/Kadler and Naber) and they continue to provide access to CSAH 37 a collector route.

Alternatives C2 and D1 provided improved connectivity to the arterial grid system, (better utility of CSAH 19 and new Naber interchange), but had continued connections to CSAH 37 (a collector), and no connections to Kadler/Jaber. These were rated "fair". Alternative E while providing complete access to the four minor arterials, it also continues to provide access to a collector (CSAH 37). Therefore it was rated as "fair".

Alternative D provides connections to three of the four arterial grid routes and no collector routes. When compared to the other alternatives, the group felt that this was a balanced approach to providing good system connectivity and continuity through balanced system of overpasses and interchanges. Alternative D was rated as "good".

Table 7
Ramp Movement Balance

Alternative	Rating
A Existing I-94 Access with overpasses at Kadler and Naber Avenue.	○
B Full access at CSAH 19, half access to east of CSAH 37, full access at TH 241.	⊙
C2 Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue.	○
D Full access at CSAH 19, overpass at CSAH 37, full access at Naber Avenue overpass at Kadler Avenue.	●
D1 Overpass at Kadler Avenue, full access at CSAH 19, half access at CSAH 37, full access at Naber Avenue.	●
E Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue, full access at Kadler Avenue.	●
● Good ⊙ Fair ○ Poor	

Analysis

One of the potential problems the study area faces is the over loading of interchange ramps due to growth in the area and limited freeway access points. As a result, a key objective of the study is to reduce interchange and ramp merge/diverge problems by better distributing traffic to the various access points along I-94.

An analysis of 2040 volumes on interchange ramps was conducted to see how well each alternative balanced P.M. peak hour traffic volumes on the different ramps throughout the corridor. Alternatives that had any ramp exceeding a volume of 1700 vph were rated as "poor", and volumes between 1,300 and 1,700 were rated as "fair" and volumes less than 1,300 were rated as "good".

Alternative A shows volumes over 1,700 on TH 241 and at CSAH 37; Alternative C2 shows volumes over 1,700 at the CD system.

Alternative B shows volumes approaching 1,600 at TH 241.

Alternatives D, D1 and E show volumes less than 1,300 on most of the ramps and provide balanced ramp movements throughout the system.

Table 8
Ability to Minimize Local Trips on the Freeway System

Alternative	Rating
A Existing I-94 Access with overpasses at Kadler and Naber Avenue.	●
B Full access at CSAH 19, half access to east of CSAH 37, full access at TH 241.	●
C2 Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue.	⦿
D Full access at CSAH 19, overpass at CSAH 37, full access at Naber Avenue overpass at Kadler Avenue.	⦿
D1 Overpass at Kadler Avenue, full access at CSAH 19, half access at CSAH 37, full access at Naber Avenue.	⦿
E Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue, full access at Kadler Avenue.	○

● Good
⦿ Fair
○ Poor

Analysis

Another objective of the long-term system and access plan was to protect the integrity of the freeway system by minimizing the number of short trips using I-94. These short trips should be accommodated on the local arterial and collector systems. While any additional I-94 access will account for some increase in local activity on the freeway, an analysis was done to identify the quantity of short trips using I-94 as compared to the "Base Condition" Alternative A.

The number of short trips was captured by using the regional model. A short trip was considered to be a trip that accessed I-94 and then got off I-94 between TH 241 and one of the other interchanges (Naber, Kadler, CSAH 37, CSAH 19 and/or Jaber/Kadler). Evaluation of local trips at Kadler Avenue is provided in Appendix E.

Alternatives A and B show the fewest number of new short trips on I-94 and are rated as "good". Alternatives C2, D and D1 were higher than A and B. All were in similar magnitude and were rated as "fair". Alternative E showed the highest number of short trips on I-94 (more than double the magnitude of the group rated fair). Alternative E is rated as "poor".

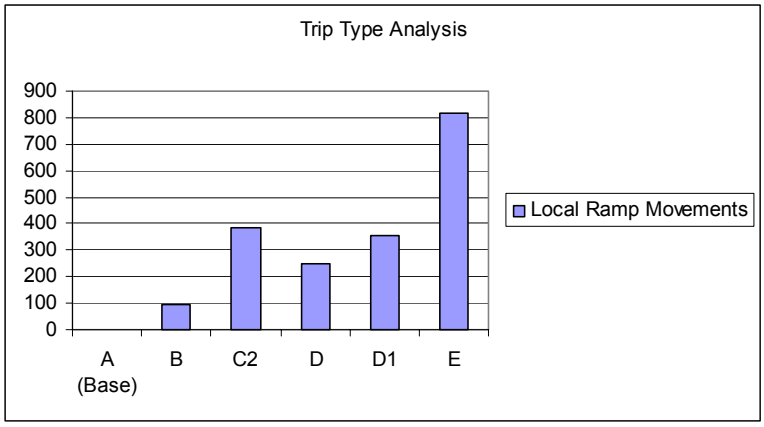


Table 9
Vehicle Miles and Vehicle Hours of Travel (VMT and VHT)

Alternative	Rating
A Existing I-94 Access with overpasses at Kadler and Naber Avenue.	○
B Full access at CSAH 19, half access to east of CSAH 37, full access at TH 241.	○
C2 Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue.	⊙
D Full access at CSAH 19, overpass at CSAH 37, full access at Naber Avenue overpass at Kadler Avenue.	⊙
D1 Overpass at Kadler Avenue, full access at CSAH 19, half access at CSAH 37, full access at Naber Avenue.	⊙
E Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue, full access at Kadler Avenue.	●
● Good ⊙ Fair ○ Poor	

Analysis

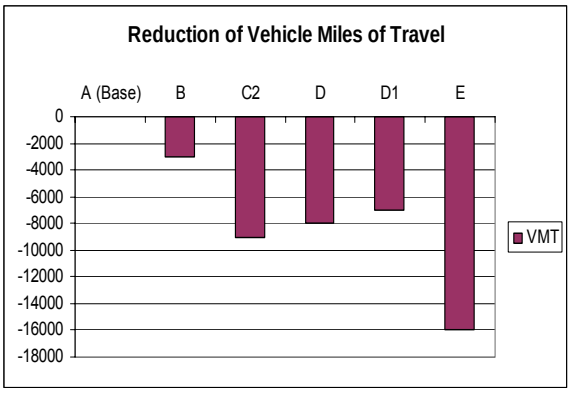
Reduction in VHT and VMT was analyzed to assess the impact of the alternatives on overall system efficiency as measured by vehicle hours traveled (VHT) and vehicle miles traveled. Information for VHT and VMT was obtained from the regional travel forecasting model. The VHT and VMT values for the alternatives were compared to the "Base Condition" Alternative A. Alternatives were rated based on their ability to reduce the VHT and VMT. Thresholds for the three ratings were established using natural breaks in the data.

Alternative E, which reduces VMT and VHT the most over the Base Alternative, is rated as "good".

Alternatives C2, D and D1 which show significant reduction in VMT and VHT are rated as "fair".

Alternatives A and B show the lowest reduction in VMT and VHT compared to the other alternatives and are rated as "poor".

The graph below shows alternatives' ability to reduce the daily VMT and VHT.



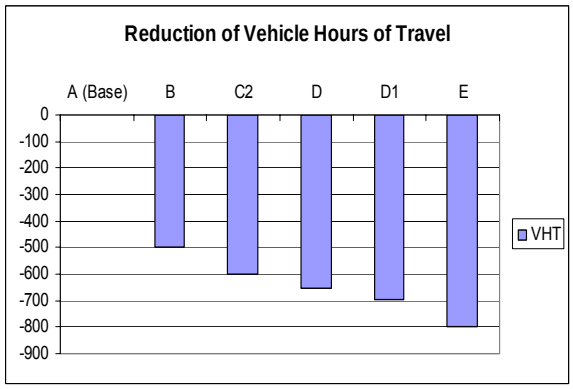


Table 10
Safety

Alternative	Rating
A Existing I-94 Access with overpasses at Kadler and Naber Avenue.	○
B Full access at CSAH 19, half access to east of CSAH 37, full access at TH 241.	○
C2 Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue.	⊙
D Full access at CSAH 19, overpass at CSAH 37, full access at Naber Avenue overpass at Kadler Avenue.	⊙
D1 Overpass at Kadler Avenue, full access at CSAH 19, half access at CSAH 37, full access at Naber Avenue.	⊙
E Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue, full access at Kadler Avenue.	●
● Good ⊙ Fair ○ Poor	

Analysis

Alternatives that improve the overall safety of the system would be rated higher in comparison to those that maintained the status quo. Based on access modifications, trip patterns change to reflect shorter paths and more convenient access. Based on current average crash rates for the different systems (freeway, divided arterial, undivided arterial, and two-lane) and VMT changes to these systems, net crash reductions were calculated for each alternative as compared to the "Base Condition" Alternative A.

The net reduction in crash rates for each alternative show that Alternatives E has the highest reduction in crash rates.

Alternatives C2, D and D1 show a moderate reduction in net crashes and are rated as "fair".

Alternatives A and B show the least reduction in net crashes and have been rated as "poor".

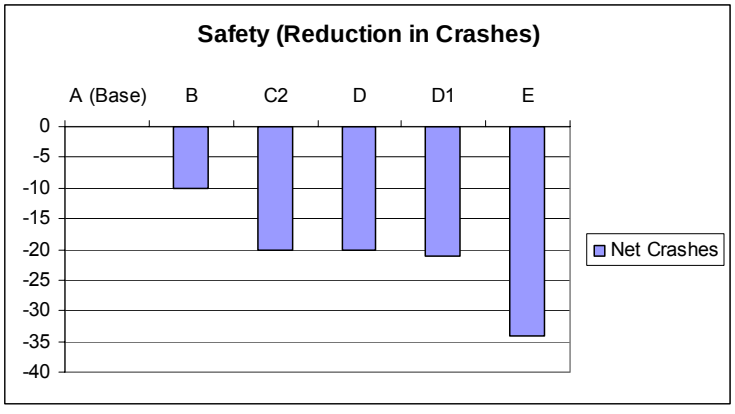


Table 11
Arterial System Overload

Alternative	Rating
A Existing I-94 Access with overpasses at Kadler and Naber Avenue.	○
B Full access at CSAH 19, half access to east of CSAH 37, full access at TH 241.	⊙
C2 Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue.	●
D Full access at CSAH 19, overpass at CSAH 37, full access at Naber Avenue overpass at Kadler Avenue.	●
D1 Overpass at Kadler Avenue, full access at CSAH 19, half access at CSAH 37, full access at Naber Avenue.	●
E Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue, full access at Kadler Avenue.	●
● Good ⊙ Fair ○ Poor	

Analysis

Another important consideration in evaluating the different access alternatives is their impact on the local supporting highway network. Interchange access points focus traffic on facilities going to and from interchange locations. The fewer the number of access points the greater potential there is in concentrating traffic and overloading linkages.

An analysis was done by comparing 2040 ADTs to threshold capacities on the local supporting arterial and collector system. This was done at roughly a dozen key points throughout the network (Table 12).

Based on this analysis, volume to capacity problems were noted (bold numbers). If more than three locations were noted to have volume to capacity problems a "poor" rating was given. If one to two areas were found then a "fair" rating was given, and if none were found a "good" rating was given.

Based on this criteria, Alternative A showed three areas for potential capacity problems and was rated "poor". Alternative B showed two areas for potential capacity problems and was rated "fair". The remaining alternatives showed none and were rated "good".

This rating does not include evaluation of I-94. This was addressed as part of operations factor (factor seven).

Table 12
Supporting Arterial and Collector Average Daily Volumes

Table 13
Impacts to I-94 Capacity and Operations

Alternative	Rating
A Existing I-94 Access with overpasses at Kadler and Naber Avenue.	○
B Full access at CSAH 19, half access to east of CSAH 37, full access at TH 241.	○
C2 Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue.	⊙
D Full access at CSAH 19, overpass at CSAH 37, full access at Naber Avenue overpass at Kadler Avenue.	⊙
D1 Overpass at Kadler Avenue, full access at CSAH 19, half access at CSAH 37, full access at Naber Avenue.	⊙
E Full access at CSAH 19, full access at CSAH 37 with CD system, full access at Naber Avenue, full access at Kadler Avenue.	⊙
● Good ⊙ Fair ○ Poor	

Analysis

One of the key objectives of the plan is to develop future system improvements that can support future growth with minimal impacts to the operations of I-94. As part of the analysis, improvements of I-94 were assumed (consistent with I-94 IRC CMP). The I-94 CMP assumed that I-94 would be improved to four travel lanes in each direction in this section of the corridor. As part of an initial analysis, a HCM planning-level, level of service analysis was completed for the 2040 P.M. peak hour (Tables 14 and 15).

Based on this planning level analysis the mainline and most ramps operate at LOS D or better. However, the analysis showed a problem with all alternatives for the mainline east of TH 241 and for the TH 241 off-ramp. However, there were significant differences between the magnitude of failure at the off-ramp location, and this difference was used to rate the alternatives.

The TH 241 off-ramp for Alternatives A and B exceeded the threshold of 4400 by 300 passenger cars per hour, where the other alternatives failed by 20 to 40 passenger cars per hour. Based on this result, Alternatives A and B were rated “poor” and the other alternatives were rated “fair”.

Tables 14 and 15
2040 I-94 Westbound and Eastbound Level of Service – PM Peak Hour

5.3 SUMMARY OF INITIAL EVALUATION

To compare alternatives, the number of "good", "fair" and "poor" ratings was tallied to provide a sense of the effectiveness of each alternative in meeting the objectives. Table 16 shows the summary of alternative ratings. This matrix shows that Alternatives A and B are the lowest rated alternatives (fewest good and fair ratings). Alternative C2 has an average rating (only one good, one poor and the rest fair). The remaining three alternatives, alternatives D, D1, and E rate the highest (highest number of good and fair ratings).

Table 16
Alternative Ratings Summary[1]

Alternative	Good	Fair	Poor
A	1	0	6
B	1	1	5
C2	1	5	1
D	3	4	0
D1	2	5	0
E	4	2	1

[1] Number of "Good", "Fair", or "Poor" ratings.

However, there are a couple of caveats to the evaluation of two of these alternatives that should be considered. These are as follows:

- Alternative D1 includes a non-standard interchange type (half-diamond at CSAH 37). Federal guidelines promote full-movement interchanges over partial access interchanges; therefore, this alternative may not be acceptable to FHWA.

- Alternative E, based on the analysis methodology, has the highest number of local trips on I-94. As a result, this factor was rated "poor" for Alternative E. This factor may be considered by Mn/DOT and FHWA as a higher weighted factor due to the function of I-94. The role of I-94 is to serve primarily longer regional trips. Alternatives that are inconsistent with this role may be undesirable to these agencies. Additional analysis was done on the origin-destination patterns for the trips using Jaber/Kadler interchange. This evaluation is included in Appendix E. The analysis indicated that the local trip issue may be less significant than first thought.

5.4 ALTERNATIVE SELECTION

Based on the initial evaluation of alternatives, the TAC members discussed the selection of a preferred system alternative to be carried forward into a formal FHWA Access Modification Request. This discussion focused around three alternatives.

Alternative E1 provides the most access; however, it is done through a Collector-Distributor (CD) system. While Alternative E1 performed well on most criteria, the TAC determined that it was less feasible from a cost and/or environmental perspective. SEH had investigated the feasibility and environmental issues in the CSAH 19/37 area and had come to conclusion that the CD system would require too wide of a highway section. This section resulted in significant fill into adjacent lake (undesirable environmental impacts). In addition, the PM peak hour WB I-94 exit volumes to the CD system were above the desirable ramp volumes for a single lane ramp. This concentrated exit volume introduces complications into design elements. As a result, E1 was eliminated.

Both of the remaining two alternatives, D and D1 were supported by the TAC; however, local agencies preferred alternative D1 because it preserves ramps to and from the east at CSAH 37[2]. For both of these alternatives, agencies were concerned about the staging of access changes along I-94 (want to ensure that the area maintains at least the same level of access to the region).[3] It was suggested that the staging issues be resolved when additional detail is developed as part of the FHWA Access Modification Request.

As part of the discussion of alternatives D and D1, an additional concern was expressed with respect to the ability of CSAH 19 to accommodate long-term growth. The 2040 volumes projected near the I-94/CSAH 19 interchange were near the capacity of a five-lane section. A concern was expressed about the ability to improve CSAH 19 to the level identified in the plan. The potential new north-south arterial, Jaber/Kadler, to the west of CSAH 19 would function as a reliever to CSAH 19 and potentially connect to a future Mississippi River crossing to the north and Crow River crossing to the south (Wright County CSAH 33/CR 144 and Hennepin County CSAH 30). This would have the potential of providing significant benefits to the entire region[4]. The TAC saw this facility as a good option to have in the long-term plan.

As such the TAC recommended that a potential interchange at Jaber/Kadler be kept in the plan as a long-term option. The timing of this improvement would be reevaluated based on the transportation needs of the area and changing conditions such as:

a. Advancement of a future Mississippi River crossing. This connection and crossing could provide significant relief to TH 101 and TH 10 in Elk River area, as well as other major routes. A regional connection of this type would increase the justification for access to I-94.

b. Growth in congestion and/or operational issues of CSAH 19. The projected volumes on CSAH 19 in Albertville, without the Jaber/Kadler interchange, will approach the capacity of a four-lane divided arterial. It will be a significant challenge to maintain/transition CSAH 19 to a limited access arterial to accommodate this anticipated volume. The inclusion of a future Jaber/Kadler interchange would provide flexibility to the overall system and potentially serve to relieve future congestion on CSAH 19.

[2] The City of Albertville (city council) has indicated that they strongly support full access at CSAH 37.
[3] Concern about loss of CSAH 37 access occurring before other access is developed at Naber Avenue.
[4] See Appendix E for discussion about Mississippi River crossing trip origins and destinations.

Two hybrid alternatives (H1 and H2) that combine the improvements in D and D1 with a Jaber/Kadler interchange are described below and shown in Figures 19 and 20.[5]

Alternative	Description
H1	This alternative provides full-interchange access at CSAH 19, Naber Avenue, Jaber/Kadler Avenue and TH 241; and it provides an overpass at CSAH 37.
H2	Provides full-interchange access at CSAH 19, Naber Avenue, Jaber/Kadler Avenue and TH 241; and provides half-interchange access to the east at CSAH 37.

Traffic forecasts for the year 2040 were developed for the hybrid alternatives and were reviewed by the TAC. The TAC agreed that Alternatives H1 and/or H2 should be considered in future planning decisions and those agencies should preserve the ability for these infrastructure improvements at some future point in time (exact timing is indeterminable; timing will be dictated by growth and development, development of future river crossing, and/or the ability of CSAH 19 to function). This would provide flexibility to address changing conditions and react to future needs.

[5] Alternatives F and G were analyzed as sub-alternatives during the initial screening process (sensitivity tests); however they are not included in this report as alternatives.

Figure 19
Access Alternative H1

Figure 20
Access Alternative H2

6.0 IMPLEMENTATION PLAN

The previous sections of this report have examined the existing and future transportation needs for the northeast Wright County study area. These needs were developed based on technical analysis and extensive staff and public input. While the study provides guidance to agencies on important long-term transportation system issues, it must be flexible enough to be responsive to the current short-term needs in the study area. This section of the report concentrates on examining the steps necessary to implement this long-term plan.

6.1 TRANSPORTATION PLAN ADOPTION

The first step in implementing the plan is for all partners to formally adopt it. Wright County and the three Cities of Albertville, Otsego and St. Michael should use this study as a guide for developing future transportation improvements and they should integrate the key elements of the study into their comprehensive plans. Formally adopting the plan will provide the partners the basis for improved cooperation between adjacent jurisdictions, moving forward system changes (i.e., functional classification jurisdiction, state aid designation), and setting forth improvement needs and access requirements.

The results of the study should be publicized to residents and the business community so that they are aware of the opportunities or limitations that it provides. This will enable all affected groups to plan with full knowledge of the partners' transportation goals. In addition to the partners, copies of the study should be disseminated to cities, townships and public libraries in the area so that it is available to the greatest number of people.

The partners should periodically review the assumptions under which the sub-area study was developed, including estimates of future development, population trends, changing financial resources, and citizen and local government input. These assumptions should be kept in mind when updating transportation or comprehensive plans.

6.2 SYSTEM PLAN MODIFICATIONS

Based on the analysis conducted in other sections of this report, a number of changes are recommended to the existing system plan to address current and future transportation needs within the study area. The changes include modifications to the functional classification plan, potential jurisdictional transfers and state aid designation changes. The implementation of these modifications is described in more detail below:

6.2.1 Functional Classification

A number of functional classification changes are recommended as part of this study to enhance the network and accommodate future urbanization of the area. The partners should implement the functional classification recommendations by formally requesting the changes through the

Mn/DOT District 3 State Aid Engineer. It is recommended that the county take the lead on these changes because most of the major changes affect county facilities. If mileage constraints are encountered, arterials should be added to the system in short to mid-term growth areas before adding arterials in growth areas beyond the 20-year timeframe. Arterials in growth areas beyond this timeframe should be identified as future arterials and added as mileage becomes available.

6.2.2 Jurisdictional Realignment Process

A number of jurisdictional transfers have also been recommended as part of this study. These jurisdictional transfers are based on future functional classification, system continuity, length of route, access and future traffic volumes. To plan for potential jurisdictional changes, the partners should develop a memorandum of understanding (MOU) outlining the negotiation process. The memorandum should address issues such as:

1. Schedule or Timeframe of Proposed Transfers

    - Non-binding schedule (goal) for the jurisdictional transfer of initial routes within the next 10 years provided that designation, maintenance and liability issues can be worked out as outlined below:

2. System Issues and Legal Requirements

    - The ability to transfer mileage to the state aid system versus local road system (e.g., Screening Board approval is needed to designate some new CSAH routes.

    - The receiving agency's ability to use funding from turnback accounts and/or other sources for maintenance and improvements.

    - Further limitations on establishment, alteration, vacation or revocation of county highways as described in Minnesota Statutes Section 163.11.

3. Planning and Programming Issues

    - The allocation of funds that will be available from the transferring agency to the receiving agency.

4. Project Development, Design and Construction Issues

    - The process for development of projects, studies, right-of-way acquisition, design and construction of transferred routes.

    - The design and construction standards to be used for projects.

    - The process and framework for cost-sharing agreements.

5. Operational and Maintenance Issues

- Responsibilities for utility permits, driveway access permits, changes to traffic controls and signing, and level of routine regular maintenance.

6.2.3 State Aid System Changes

Based on the future system plan and traffic forecasts, State Aid System changes are also recommended to provide route consistency and to help fund major system improvements. The State Aid System changes focus on establishing an arterial grid system that will support long-term urbanization of the area. When implementing the state aid changes, the following are recommended:

- Agencies should pursue realignment of the current State Aid System as shown in Table 17; realignment provides a framework for designating highest volume arterials as County State Aid Highways (CSAH) routes and recommends turnback of collector CSAH routes to Municipal State Aid Streets (MSAS). The county should lead this effort in getting these changes approved by Mn/DOT's District 3 State Aid Engineer (DSAE).
- It is recommended that the agencies work with the DSAE to utilize excess state aid mileage from system changes (accomplish as many changes as possible) before going to the Screening Board for an additional mileage request (go to the Screening Board with the fewest number of changes possible).
- Prior to going to the Screening Board for any mileage requests, it is recommended that Wright County conduct a cursory review of the county system to ensure that the mileage subcommittee will have all of the information from which to make a favorable recommendation.
- A preliminary look at the needs for recommended state aid routes in the study area was conducted by Ken Hoeschen, former Mn/DOT County State Aid Needs Manager. Based on the future forecast volumes and using an urban design for the facilities rather than a rural design, Ken assessed changes in state aid needs. The additional needs are shown for each corridor segment in Table 17 (far right column). Based on his assessment, approximately $80 million in additional state aid needs was generated in the study area. This value assumes an additional 15 miles of CSAH routes. Two-thirds of this additional mileage is the western north-south arterial route (Kadler-Jaber Avenue). This new route accounted for $20 million of the additional $80 million in state aid needs. Based on a comparison of annual state aid allotment dollars to state aid needs, every $1,000 in needs generates $20-22 in annual allotment. Therefore, realigning the state aid system as recommended would generate an additional $1.6 million annually in CSAH allotment[6]. It is recommended that this additional increase in revenues to the county be used towards constructing the arterial framework in the study area.

[6] Conservatively, if one discounts or does not include the western arterial route, the allotment would decrease by 25 percent or $400,000. This would result in an increase of $1.2 million in state aid needs.

Table 17
System Designation Summary – MSA and CSAH Mileage

Table 17 Continued

6.3 ACCESS MANAGEMENT

Access guidelines are important because they define a starting point for balancing property access, safety and mobility concerns. Transportation agencies regularly receive requests for additional access (e.g., new public streets, commercial driveways, residential and field accesses), which are evaluated by numerous agencies and committees. Because of the number of individuals and agencies involved, it is easy to have inconsistent application of access policies. This can result in confusion between agencies, developers and property owners, as well as long-term safety and mobility problems. Standard access guidelines can be used to improve communication, enhance safety, and maintain the capacity and mobility of important transportation corridors. In addition, access guidelines may be used to respond to access requests and to promote good access practices such as:

- Aligning access with other existing access points
- Providing adequate spacing to separate and reduce conflicts
- Encouraging indirect access rather than direct access on high-speed, high-volume arterial routes

Providing access management in some form, whether it is through grade-separated crossings, frontage roads or right-in/right-out access, reduces the number of conflicts resulting in improved safety. A number of studies have demonstrated a direct relationship between the number of full access points and the rate of crashes, including FHWA Access Research Report No. FHWA - RD-91-044. Figure 21 shows this relationship.

Public road authorities have been directed by Minnesota State Statues to provide "reasonable, convenient, and suitable" access to property unless these access rights have been purchased. Courts have interpreted this to:

- Allow restrictions of access to right-in/right-out
- Allow redirection of access to another public roadway that meets the definition of reasonable, convenient and suitable

In special circumstances, broader authority (police power) has been given to public agencies if the situation is deemed to jeopardize public safety. However, this is a very high standard to meet and is seldom used by public agencies.

In addition to the above, land use authorities may exercise additional authority in limiting access through their development rules and regulations. Land use authorities can require:

- Dedication of public rights-of-way
- Construction of public roadways
- Mitigation measures of traffic and/or other impacts
- Changes in and/or development of new access points

Figure 21
Access/Crash Relationship

These types of access controls are processed through local elected officials (e.g., planning commissions, town boards, city councils and county commissions).

Since stronger land use and access controls are available at the county and city level, and these units of government are usually involved at the planning stages, access guidelines and corridor management practices should be focused at this level.

Access spacing guidelines for roadways in the study area are shown in Table 18. Figure 22 shows the access categories as they have been assigned to the roadway network. The access management guidelines promote coordination between land use and transportation strategies, the same issues that affect decisions on the local city and county level. Establishing the appropriate spacing between public streets and private driveways is an important step toward maintaining the safety and mobility of the traveling public without sacrificing the accessibility needs of local residents. These guidelines were selected because they are:

- Very similar to the spacing criteria in the 1994 Wright County Transportation Plan and recent Mn/DOT access guidelines;

- Based on functional classification rather than traffic volumes. Having access recommendations based on future functional classification enables partners to protect access on roadways based on their intended long-term function;

- Assigned to specific routes, therefore eliminating any confusion about what category or access classification is being used.

As with any policy, there will be a need to deal with special circumstances. Procedures have been developed to address these problems (Appendix F explains the conditions, exceptions and deviations for private access on roadways that are not a part of the trunk highway system). For specific information on private access points along trunk highways, please refer to Mn/DOT's access management guidelines in Technical Memorandum No. 02-10-IM-01.

The implementation of the guidelines can be done through a number of different methods (e.g., land use regulations, subdivision regulations, access permit processes and access/transportation advisory committees). These processes should be developed so that they can deal with situations that either are outside the guidelines or are hardship cases. In existing corridors where significant development has occurred, the number of existing access points are likely to exceed the access guidelines. Unless these areas are undergoing redevelopment, their access must be addressed or approached differently. The proposed access management strategy in these areas is to aggressively minimize any new accesses while consolidating/reducing existing access points as redevelopment occurs.

In addition to establishing spacing guidelines, it is important to consider the following points when applying the guidelines and addressing access issues:

- The guidelines apply primarily to routes with a collector functional classification or above; however, partners may also use the guidelines on some local streets.

Table 18
Recommended Access Spacing

Category	Area or Facility Type	Typical Functional Class	Intersection Spacing		Signal Spacing	Private Access
			Primary Full Movement Intersection	Conditional Secondary Intersection		
1	**High Priority Interregional Corridors**					
1F	Freeway	Principal Arterials	Interchange Access Only			
1A-F	Full Grade Separation		Interchange Access Only			
1A	Rural, Exurban & Bypass		1 mile	1/2 mile	INTERIM ONLY By Deviation Only	By Deviation Only
2	**Medium Priority Interregional Corridors**					
2A-F	Full Grade Separation	Principal Arterials	Interchange Access Only			
2A	Rural, Exurban & Bypass		1 mile	1/2 mile	STRONGLY DISCOURAGED By Deviation Only	By Exception or Deviation Only
2B	Urban Urbanizing		1/2 mile	1/4 mile	STRONGLY DISCOURAGED By Deviation Only	By Exception or Deviation Only
2C	Urban Core		300 – 600 feet dependent upon block length		1/4 mile	Permitted Subject to Conditions
3	**High Priority Regional Corridors**					
	Access Category Not Applicable for Study Area					
4	**Principal Arterials in Primary Trade Centers**					
	Access Category Not Applicable for Study Area					
5	**Minor Arterials**					
5A	Urban Mobility Corridor	Minor Arterials	1/2 mile	1/4 mile	1/2 mile	Permitted Subject to Conditions
5B	Urbanizing Arterial		1/4 mile	1/8 mile	1/4 mile	By Exception or Deviation Only
5C	Urban Core Arterial		300 – 600 feet dependent upon block length		1/4 mile	Permitted Subject to Conditions
6	**Collectors**					
6A	Rural Collector	Collectors	1/2 mile	1/4 mile	1/2 mile	Permitted Subject to Conditions
6B1	Rural/Urbanizing Collector		1/4 mile	1/8 mile	1/4 mile	
6B2	Local Collector		1/8 mile	NA	1/4 mile	
6C	Urban Core Collector		300 – 600 feet dependent upon block length		1/8 mile	
7	**Specific Access Plan**					
7	All	All	By Adopted Plan			

Figure 22
Access Spacing for the Study Area Roadway Network

- The guidelines should be used as long-term goals, not as absolute rules.

- Maintaining some flexibility is important in promoting access consolidation.

- Approach to implementation is as important as the guidelines themselves.

- Existing physical barriers or constraints need to be considered.

The following access suggestions provide some alternatives for minimizing access and access problems in areas where the guidelines cannot be met:

- **Encourage shared driveways and internal circulation plans:** If indirect access cannot be achieved during plat reviews, promote internal site circulation using shared access points.

- **Restrict turning movements to reduce conflicts:** If access points cannot be eliminated, consider turning movement restrictions (e.g., left-in only or right-in/right-out only) through installation of raised median or other channelization or signing. Eliminating a single turning movement can significantly reduce vehicle conflicts and potential crashes.

- **Develop good parallel street systems for carrying local traffic:** Make sure that important arterial routes have a good parallel street system to provide the local access function and to carry shorter local trips.

- **Develop proper setbacks for future frontage roads:** If frontage roads cannot be justified (benefits do not outweigh costs), make sure that proper building and parking lot setbacks are established so that future frontage roads can be installed with minimal impacts.

- **Develop proper secondary street spacing:** When reviewing plats and new development proposals, be sure that they provide proper intersection spacing for future signals. As a guideline, signalized intersections should be limited depending upon the type of street. Collector streets should provide some continuity and connectivity with other street systems.

- **Encourage proper lot layout to minimize access points:** Promote direct residential access points onto local routes, not arterials or major collectors. Direct residential access to arterial or collector routes can result in complaints when traffic levels increase. In rural areas, where farms have one access point per 40-acre entitlement and where they cluster lots in one portion of the farmstead, access should be encouraged off local roads, not high-speed, high-volume state or county highways.

- **Encourage connectivity between developments:** Individual developments should align streets to provide access to existing developments or reserve right-of-way to provide for future connections to adjacent developments. This promotes neighborhood connectivity,

good emergency services and more efficient travel for mail, garbage and bus services, as well as street maintenance activities.

6.4 PROJECT DEVELOPMENT AND ENVIRONMENTAL PROCESS

Implementation of transportation improvements identified in the study may require additional public participation and environmental review depending upon the size and type of project. The northeast Wright County area does have some environmentally sensitive areas due to its proximity to the Crow and Mississippi Rivers. The close proximity to these historic waterways means that these areas could include cultural resource, historical resource, archeological resource sites and protected wildlife species. Because of the high potential for cultural resource sites and/or species, attention to possible environmental impacts early in the project development process is recommended to avoid or minimize impacts. If federal funding is involved in a project, then a federal environmental document must be prepared. The type of document depends on the size of the project. If no federal funding is involved, state environmental review requirements may apply. Local ordinances or guidelines could also apply, as well as a variety of local, state and federal permits that regulate wetlands, water quality, air quality, noise and other environmental resources. Early coordination with local and state agencies can reduce delays in the project development process and in acquiring applicable permits.

6.5 RIGHT-OF-WAY PRESERVATION

When future expansion or realignment of a roadway is proposed but not immediately programmed, agencies should consider right-of-way (ROW) preservation strategies that will reduce long-term costs and maintain the feasibility of the proposed improvement. There are several different strategies that can be used to preserve ROW needed for future construction including advance purchase, zoning and subdivision techniques and official mapping. As part of implementing ROW preservation strategies, local agencies should weigh the risks of proceeding with ROW preservation without environmental documentation. (Note: Mn/DOT policy requires environmental documentation prior to purchase.) If environmental documentation has not been completed, agencies may be taking some risk in preserving a corridor or parcel that has some associated environmental issues. The following are ways to preserve future right-of-way:

- **Direct Purchase:** One of the best ways to preserve ROW is to purchase it. However, in most cases agencies do not have the necessary funds to expend for advance ROW and most of the public benefit of purchasing it does not occur until a roadway or transportation facility is built. In addition, many agencies will only proceed with larger projects if they have received environmental clearance (need to have funding identified and/or have significant funds for environmental documentation).

- **Planning and Zoning Authority:** Local agencies have the authority to regulate existing and future land use. Under this authority, agencies have a number of tools that they can use to help preserve ROW for transportation projects. These tools include:

Zoning
If the property is in an area that has a very low density (e.g., agricultural district), local agencies should try to maintain this zoning classification. The lower zoning classification will limit the risk for significant development until such time that funding may be available for roadway construction.

Platting and Subdivision Regulations
Local platting and subdivision regulations provide agencies with the authority to fully consider future roadway alignments during the platting process. Before most land is developed, it must be platted. Because cities and counties have the authority to regulate land development, they can influence the plat configuration, including the location of proposed roadways. In most instances, planning and engineering staff work with developers to develop a plat that accommodates the landowners/developers, but also conforms to the long-term community vision and/or plans. In addition, local agencies can require ROW dedication as part of the platting and subdivision process.

Transfer of Development Rights
In addition to the above strategies, some agencies have negotiated with property owners to transfer ROW dedication for future roadways for increased development densities on remaining portions of the parcel. This enables the developer to get the same number of lots or units and also enables the agency to obtain the needed ROW.

Official Mapping
A final strategy to preserve ROW is to adopt an Official Map. The Official Map is developed by the local governmental unit by identifying the centerline and ROW needed for a future roadway. The local agency holds a public hearing showing the location of the future roadway and incorporates the map into their thoroughfare or community facilities plan. The Official Map process allows agencies to control proposed development within the area that is identified, as well as influence development on adjacent parcels. However, if the directly affected property owner requests to develop the property, agencies have six months to initiate acquisition of the property to prevent development of the parcel. If the parcel is not purchased, the owner would be allowed to develop it in conformance with current zoning and subdivision regulations. As a result, the official mapping process should only be used for preserving key corridors in areas that are subject to significant growth pressures.

Additional information on the tools and techniques listed above can be found in Appendix J of Mn/DOT's *Interregional Corridors: A Guide for Plan Development and Corridor Management.* Also included is information on the environmental review and documentation process as it relates to right-of-way preservation. Guidelines have been established with respect to cross-sectional footprint[7] to assist the agencies in right-of-way decisions (Appendix G). In addition, existing roadway lane configurations should be revised to accommodate future traffic volumes. Figure 23 provides recommended roadway lane configuration for year 2040 (assumes full build scenario) for roadways in the study area.

[7] Right-of-way footprints for key arterial and collector roadways in the study area are provided in Table G2 in Appendix G.

Figure 23
Roadway Lane Configuration

6.6 INTELLIGENT TRANSPORTATION SYSTEM (ITS) TECHNOLOGY

The use of Intelligent Transportation Systems (ITS) technology is becoming a more popular strategy in the management of transportation networks. ITS uses electronic communications equipment and other electronic technologies to improve mobility and safety on roadways. ITS can also be used to mitigate some negative impacts to the environment.

One ITS effort that affects the Northeast Wright County study area is Mn/DOT's TIGER (Travel Information Guidance and Evacuation Routing) project. This project focuses on the primary roadway connections between the Twin Cities metropolitan area and St. Cloud metropolitan area. One of the primary goals of the project is to balance traffic flow along I-94, TH 10 and TH 55 facilities to ensure safe and efficient travel for roadway users. This plan supports ITS efforts, such as TIGER, by developing a supporting network of arterial and collector roadways. These roadways not only provide alternative routes to these main arterial facilities, but also serve to inter-connect them. In addition, the Northeast Wright County Sub-Area plan supports access modifications on I-94 that more evenly distributes traffic in an effort to reduce the potential overloading of interchanges. The plan also supports an additional Mississippi River crossing and two additional Crow River crossings. These additional river crossings will provide congestion relief to existing crossings as well as provide options for users if existing crossings are blocked or out of service. The river crossings on existing arterials and future connecting routes are key in reaching the goals of balancing traffic movements.

In addition to using ITS technology to improve the flow of mainline traffic (I-94, TH 10 and TH 55), vehicle detection, surveillance systems, dynamic message signs and other technologies will be deployed as a part of TIGER goals to achieve better performance on key supporting arterial system and to address emergency response issues. Activities may include re-timing of traffic signals to accommodate traffic volume increases on arterials and mainlines and installation of Emergency Vehicle Preemption (EVP). EVP allows emergency response vehicles (ambulances, police, fire trucks, etc.) to interrupt the traffic signal cycle so that they can get a "green" light to proceed through the signal. This in turn enables emergency response vehicles to reach their destination more quickly, and possibly save a life that they would not have been able to if they arrived later. Study partners should consider ITS technology on an individual project basis as a tool to facilitate mobility and safety on the roadway network and they should incorporate these larger ITS system goals into overall planning strategies.

6.7 DEVELOPMENT FEES

A traffic impact study allows decision-makers to identify the transportation implications of site-generated traffic associated with a proposed development. In this time of growing financial constraints and budget issues, many cities and counties are no longer able to completely fund the infrastructure or improvements needed to address the traffic impacts generated by the new developments. Development fees can provide the cities and counties with a portion of the costs for improving existing roadways or creating new roadways.

The purpose of the traffic impact study is to identify the impacts on roadway capacity, level of service and safety which are likely to be created by a proposed development. The traffic studies should identify the needed improvements to:

- Ensure safe ingress to and egress from a site;
- Maintain adequate street capacity on public streets serving the development;
- Ensure safe and reasonable traffic operating conditions on streets and at intersections in the vicinity of a proposed development;
- Avoid creation of or mitigate hazardous traffic conditions;
- Minimize the impact of non-residential traffic on residential neighborhoods in the community; and
- Protect the substantial public investment in the existing street system.

The basic procedures Wright County and the Cities of Albertville, Otsego and St. Michael could follow to establish a development fee for roadway infrastructure are as follows:

1. Select a local government "control" tool or method (e.g., access permit, building permit, zoning approval, etc.).
2. Establish a development threshold (e.g. number of units, trips generated, and acres to be developed) which will trigger a more comprehensive traffic analysis, negotiation process, and possibly provide a waiver procedure when the process is not required.
3. Establish the purpose and content of the traffic study (e.g., traffic operations, access spacing, circulation, pedestrian/bicycle facilities, street layout and design parameters, traffic volumes/flows, impact to public streets/intersections, roadway capacity, safety improvements, costs of public infrastructure improvements needed to accommodate development); and who complete/pays for the study (e.g., professional traffic engineering firm hired by or approved by the city and paid by the developer).
4. Explain the local review process and timeframe, and identify the appropriate county department personnel that will negotiate with the developer.
5. Identify the approval process for the negotiated development fee (e.g., city arterial approval of terms), and the approval mechanism (e.g., execution of developer's agreement between the city and the developer, with subsequent issuance of a permit to proceed).

6.8 REGIONAL PRIORITIES AND FINANCING

While a significant portion of the study involved developing the long-term transportation system needs, the study also developed implementation goals by identifying improvement priorities and funding issues.

At the present time, the overall transportation funding picture is quite discouraging. The State of Minnesota had a large funding deficit in 2003 and, as a result, cut significant monies to many programs. These cuts have impacted state programs as well as trickled down to local agencies. For example, Wright County's local highway construction budget was $1.5 to $2 million per year in the early to mid-1990s. Today it is $300,000 annually. In addition, there has been no increase in the state gas tax for over 15 years. While gas tax revenues have increased due to the increase in number of vehicles using the highways, the increase has not been able to keep pace with the increase in vehicle-miles traveled and the loss of purchasing power due to inflation (see Appendix H for additional information). Also, recent reports indicate that federal gas tax revenues are down since 911 terrorist attacks. This is expected to have an ongoing impact to federal revenue sources coming back to Minnesota.

The Wright County transportation funding picture is also gloomy. In their most recent Five-Year Transportation Capital Improvement Plan, Wright County has advanced state aid construction monies (used state aid allotment dollars from future years) to cover existing/past projects. This has reduced their ability to advance other projects and/or program new projects in future years. For example, the Plan did not include any new projects in the northeast Wright County area even though this area had the greatest level of growth in Wright County. Even with these funding challenges, some progress is being made. The following improvements are scheduled over the next five to seven years. The improvements to TH 101 are scheduled using one-time bonding money appropriated by the Minnesota Legislature in 2003.

Planned County and State Improvements

- Improvement of intersection of TH 241/CSAH 19 (2005)
- Reconstruction of TH 241 from St. Michael urban core to I-94 (2005/2006)
- Replacement of Berning's Mill Bridge (Crow River)
- Construction of interchange at TH 101/CSAH 39 (2008)
- Construction of interchange at TH 101/CSAH 37 (2008)
- Construction of interchange at TH 101/CSAH 36 (2008)
- Construction of overpass at TH 101/CSAH 42 (2008)

Planned Local Improvements (Short-term)

- Maciver Avenue NE from 80th Street to 60th Street (2 miles) in City of Otsego (2004)
- 70th Street NE from CSAH 19 to Maciver Avenue NE (1 mile) in City of Otsego/Albertville (2008)

- Quaday Avenue from 70th Street to CSAH 37 (0.78 miles) in City of Otsego (2004)

While these improvements will help address the growing needs, there are many more key improvements that need to be made to accommodate future growth. Additional improvements have been organized by major corridor and bridge/interchanges. The approximate timeframes of improvements were established based on the transportation need and growth trends in the study area; however, they do not account for funding availability. The priorities were established based on their ability to:

- Improve system connectivity to provide better east-west and north-south flow in immediate growth areas;
- Address I-94 access issues to better balance access to I-94; and reduce overload issues at CSAH 37 and TH 241 interchanges;
- Leverage funding of federal, state, local and private funds to the fullest extent.

Using the above principles, the projects were prioritized into the following:

1. **Short-term (2004 to 2015)** – Projects in this category address the transportation needs in the most immediate developing areas of the study area. These include improvements to portions of major arterial roadways located in the development core of the study area to address congestion and access issues along I-94 and its supporting arterial network.

2. **Mid-term (2015-2025)** – The next category of projects includes expansion of the key arterial roadway grid to support potential growth areas around the core development areas and improvement of north-south and east west connections.

3. **Long-term (2025-2040)** - This category includes roadway projects that further expand the arterial roadway network to accommodate the full-build development and growth in the study area. This category addresses the long-term needs of the study area e.g., a continuous north-south corridor with a potential Mississippi River crossing.

4. **ROW Preservation (2004 – 2040)** – Right-of-way along all key arterial roadways should be preserved by local jurisdictions. Identification of these corridors will help local jurisdictions to take immediate or long-term measures to preserve right-of-way.

The projects are shown in Figure 24 and are listed in Table 19, 20 and 21 with planning-level estimates to provide agencies with a sense of their costs. The timeframes and cost estimates should be reviewed and updated periodically, as better information becomes available. It should be noted that the improvement list of key corridors and interchanges does not include improvements on the collector system, nor does it include spot improvements such as signals, turn lanes and/or other safety improvements.

Improvement Strategies

Implementation strategies should consider present funding constraints; however, the funding picture will likely fluctuate many times over the next 20-40 years. Therefore, agencies need to employ a number of funding and implementation strategies aimed at building the infrastructure

Figure 24
Recommended Staging of Major Improvement Projects

Table 19
Short-term Improvements

Table 20
Mid-term Improvements

Table 21
Long-term Improvements

that will support their long-term growth strategies.

In general, this means:

- Public-private partnerships should be considered for every project as a way to fairly distribute construction or reconstruction costs of routes that can be shown to provide improved transportation benefits to selected areas, businesses or both.

- Agencies may have to partner, pool resources and jointly lobby for outside funding assistance to fund costly interchange type projects that could provide significant long-term benefits to the region.

- Pursue identified changes to State Aid system and transportation needs analysis to increase annual funding allotments.

- Consider non-traditional funding for major system projects, such as, bonding.

It should also be noted that Mn/DOT and Wright County have transportation responsibilities that go beyond the limits of the study. Therefore, these agencies have to weigh transportation priorities and needs developed in the study area to other needs and priorities outside of the study area. In addition to needs outside of the area, funding within the area has to go to maintenance and preservation activities, as well as new projects. Therefore, not all of the funding allocated to the study area will be used for new or expansion projects.

Specific recommendations include the following:

1. Pursue System Changes

   Agencies should pursue and implement state aid system changes that can generate additional state aid revenues for this area. The county should lead this effort and first pursue mileage changes that require no Screening Board approval, and then it should pursue additional mileage through a request to the State Aid Screening Board. In addition, Wright County and each City should update their CSAH and MSAS needs to reflect long-term growth levels and future street sections.

2. Manage Access

   All agencies should aggressively manage access along arterial corridors to preserve mobility and maintain safety. Access guidelines have been identified and agencies should work together to support these guidelines. In addition, cities should adjust subdivision ordinances to minimize traffic-related issues (e.g., noise, safety). For example in other areas, developments are required to berm to minimize noise; back up lots to arterial; and provide trails for pedestrian safety.

3. Preserve Right of Way

   All agencies, especially cities should preserve right-of-way for the key arterial and collector corridors. Agencies should pay special attention to intersections of major facilities (i.e., provide additional width for potential turn lanes, bus stops). Agencies should first attempt to have right-of-way designated as part of the platting process. In other instances, agencies may consider official mapping, and/or direct purchase.

4. Environmental Documentation

   Even though funding may not be available, agencies should pursue environmental documentation for selected key projects that have a significant need. This will better position the project for future funding. Past history has shown that projects with completed environmental work and public support often receive funding when new funding is approved.

5. Construction Funding Approaches

   The study area has transportation needs that substantially exceed current local agency funding revenue sources. This suggests that agencies will need to be creative and more aggressive in seeking funds. The following are examples of strategies that the agencies could pursue to obtain funds for developing the needed infrastructure. It is suggested that agencies will need to pursue all of these strategies.

   Special Federal Funds
   There are a couple of projects in the northeast Wright County area that lend themselves to consideration of special federal funding. These projects tend to be large capital projects that affect the greater region. Examples of this would be the Kadler/Jaber Mississippi bridge crossing which impacts Wright and Sherburne Counties, as well as, provides benefits to major state highways. Another example would be the CSAH 33/CR 144 Crow River crossing and extension of Hennepin County CSAH 30. In addition to this, funding should be investigated for the Crow River bridge crossing south of I-94. This crossing has the potential to remove local trips from the I-94 and TH 101 interchange.

   ATP Federal Funds
   Most of the larger corridors (e.g., CSAH 37, CSAH 39, Naber Avenue NE and Nashua Avenue NE) should rate well in terms of need in the ATP area. Agencies should aggressively pursue these funds by documenting the transportation needs, level of support, environmental work, and right-of-way preservation activities.

   State Aid Funds
   State Aid funds, while presently committed, can be used to fund future corridor improvements. Redesignating corridors and increasing number of lanes to meet future traffic needs will raise allotment levels and these funds should be used for developing the key arterial projects in the study area.

Local Funds

Local contributions through local taxes (city and county) can generate revenues for smaller projects and for project development, access management and right-of-way preservation. The magnitude of these funds is unlikely to be able to fund the major improvements identified; however, they can contribute a portion for local amenities and fund smaller projects.

Bonding

During the most recent Wright County Five-Year Plan discussion, bonding was mentioned as a potential source of revenue for major projects. The county and the cities should investigate this to determine the level of bonding that could be captured and paid by the increased property valuations (growth) that is occurring and/or revenues generated by any additional state aid allotments. Essentially, the growth would finance repayment of the bonds.

Private Sources

One of the reasons for the substantial infrastructure needs is the growth that is occurring with the three communities. Therefore, it is a reasonable expectation that cities should capture revenues from these developments to help fund the infrastructure needs. Cities should be aggressive in their negotiations with developers to ensure that revenues are obtained to fund necessary improvements, and/or the developers make the improvements as part of the development.

7.0 STUDY FINDINGS AND RECOMMENDATIONS

Many of the partners' transportation goals for the study were accomplished through the development of the sub-area study. For example, a better understanding of local transportation issues was achieved by meeting with various agencies, local business groups and the general public. In addition, individual relationships among the partners were enhanced through the discussion of local and regional transportation issues, and the development of criteria or guidelines to resolve contentious issues. However, the study must also provide direction to the partners in resolving transportation issues that affect the operations of the system on a daily basis. In response to this, the following findings and recommendations are made:

7.1 FINDINGS

1. The study area historically has grown at a rate of approximately 1.05 per year for the last 40 years. Over the next 40 plus years, population in the study area is projected to grow at an annual growth rate of 1.05 to approximately 111,945. As the population increases, there will be a need for more transportation facilities and infrastructure.

2. Areas along the I-94 corridor have shown significant growth in retail and some industrial development; additional plans are being formulated for more commercial areas.

3. Traffic volume growth on most roadways in the overall study area has been moderate. Most roadways currently have little or no congestion (based on daily traffic volumes and the roadway's capacity – this does not mean that there is not some congestion during peak periods or during events such as concerts, holiday shopping, etc.). However, some segments have experienced significant increases; such as CSAH 19 near Albertville Premium Outlets, CSAH 37 through Albertville, and CSAH 19/TH 241 intersection.

4. The area has many natural and physical barriers including the Mississippi River, Crow River, BNSF rail spur, I-94, TH 101, Crow Hassan Park Reserve, and Minnesota Road Research Project (Mn/ROAD) facility. These features limit continuity of the transportation system in the area and result in concentration of traffic at the limited river crossing and interchange access locations.

5. I-94 is part of the Interregional Corridor (IRC) system, National Highway System (NHS), the Strategic Highway Network (STRAHNET) system, and the Travel Information Guidance and Evacuation Routing (TIGER) project.

6. The I-94/TH 10 corridor is the fastest growth corridor in the state and one of the fastest growth corridors in the nation. For example, I-94 volumes near the Crow River are anticipated to increase from 60,000 to 125,000 by 2025, and 208,000 by 2040. This facility will require significant upgrades to maintain safety and mobility.

7. I-94 capacity problems frequently occur near the TH 101 interchange due to a lane drop. Capacity problems on I-94 extend beyond the City of Rogers to the City of Monticello on Fridays and Sundays during recreational season and on holidays.

8. Significant increases in traffic volumes are anticipated to occur between now and 2040. The increase in volumes on I-94 will lead to significant delays, backups, bottlenecks and safety issues on many roads throughout the study area. The existing county highway system will not be able to handle this anticipated growth.

9. The current system of interchange areas is inadequate to support the future growth of the area. Without changes, existing interchange ramps at CSAH 19 and TH 241 will become overloaded; and the CSAH 37 interchange will force high-volume traffic to use a collector route (CSAH 37).

10. As more growth occurs along the I-94 corridor, an arterial and collector roadway network with closer spacing will be needed in the study area to evenly distribute traffic. This will reduce traffic in the congested areas and provide alternative routes through a denser arterial/collector grid.

11. More north-south and east-west arterial routes (including freeway and river crossings) will be needed to serve traffic demands, and to support I-94 and TH 101. These were identified as part of the functional classification system review of the study area in Chapter 3.

12. A number of jurisdictional changes were identified to better place ownership and operational responsibilities that are more consistent with route function. These changes were identified in Chapter 3.

13. In addition, potential interchanges on I-94 were tested as a part of the future transportation system analysis. The results of the analysis indicated the following:

    - The minimum interchange spacing criteria (one mile spacing) is not met between CSAH 19 and CSAH 37; however, very little use is currently made of CSAH 37 ramps to and from the west.

    - Overpasses of I-94 will play a significant role in reducing volumes on CSAH 19 and TH 241. The modeling of additional overpasses at Jaber/Kadler and at Naber Avenues significantly reduced the volumes on current interchange segments.

14. Additional river crossings also will play a significant role in better distributing trips through the transportation system. These additional river crossings were tested and the results indicated the following:

    - Kadler Area – The river crossing on Mississippi River would reduce volumes through Elk River, Monticello and trips in TH 101/Rogers bottleneck area.

    - I-94/Crow River – The Crow River crossing would reduce trips onto I-94 and provide better local interaction between the Cities of St. Michael and Rogers.

    - CSAH 33/CR 144-Crow River – The CSAH 33/CR 144 Crow River Crossing would reduce trips on CSAH 19 and CSAH 35; and provide alternative connection to I-94 and the Twin Cities metro area.

15. Significant additional state aid needs ($80 million) could be obtained based on traffic forecasts and recommended system changes.

7.2 RECOMMENDATIONS

1. The partners should formally adopt the plan and integrate the key elements of the study into their comprehensive plans. Doing this will provide the partners the basis for improved cooperation between adjacent jurisdictions, moving forward system changes, and setting forth improvement needs and access requirements.

2. The plan should be publicized to residents and the business community so that they are aware of the opportunities or limitations that it provides. This will provide all affected groups with full knowledge of the partners' transportation goals.

3. The planning partners should continue the dialogue and open communication that has occurred throughout the Northeast Wright County Sub-Area Study process by meeting with the planning partners at least once per year to monitor progress on implementation of the plan, to review regional transportation issues in the study area, and to discuss coordination and partnering opportunities.

4. Each of the planning partners should continue to internally review and address the safety, maintenance and operation issues on their system as identified through the sub-area study (i.e., additional studies, enforcement programs, education programs, maintenance/signage changes, capital improvements, etc.).

5. The planning partners should pursue identified changes to the functional classification system as development occurs and as federal classification thresholds allow. Wright County should take the lead on these functional classification changes and lead discussions with Mn/DOT State Aid within the next six months.

6. The planning partners should develop a Memorandum of Understanding (MOU) that will outline jurisdictional changes as identified and prioritized. Wright County should lead this process. This may require discussions with legal staff regarding liability issues.

7. The partners should actively pursue system designation changes through the Mn/DOT District 3 State Aid Engineer, in the next six months before going to the Screening Board to approve additional mileage. Wright County should also conduct an overall system review, prior to the Screening Board, to ensure that the mileage sub-committee has information from which to make favorable recommendation to the Screening Board.

8. Wright County should also conduct a formal state aid needs update within the next six months to make sure that it is capturing all of the revenue that it is entitled to under the state aid rules.

9. The additional state aid revenues generated in the project area should be encouraged to be dedicated to develop arterial corridors in the Cities of Albertville, Otsego and St. Michael.

10. The study partners should pursue the recommended I-94 access alternatives by submitting an Access Modification Request to Mn/DOT. This process will solidify the system framework plan, and it will allow communities, as well as private landowners, to move forward with a single long-term option. Individual cities should take the lead on these requests.

11. The partners should incorporate the access management guidelines, as contained in the plan, for collector, arterial and IRC roadways into their subdivision ordinances and administrative procedures. They should meet with their planning commissions and public officials to review and discuss the access guidelines and implementation issues.

12. The partners should implement strategies to protect important future transportation corridors through land use and zoning ordinances, access management strategies and/or the official mapping process. Typical cross-sections have been identified and provided in Appendix G showing the footprint for different facilities. Agencies should seek approval of access from other jurisdictions that are listed as future owners of that facility.

13. Agencies should actively seek funding from all potential sources; improvement goals should be visible to all public officials at local, state and national levels, and be visible to private businesses and citizens.

14. Wright County should update the remaining portion of this transportation plan as soon as their budget allows it; at a minimum this update should include a review of system elements and traffic forecasts. This will support the county's efforts to updating its state aid needs (it will also provide an improved transportation framework for fast growth areas).

APPENDIX A

FUTURE LAND USE

FIGURE A1
CITY OF ALBERTVILLE – FUTURE LAND USE (8.5 X 11 PORTRAIT)

FIGURE A2
CITY OF OTSEGO – FUTURE LAND USE (8.5 X 11 LANDSCAPE)

FIGURE A3
CITY OF OTSEGO – FUTURE LAND USE (DETAIL OF INSET, 8.5 X 11 LANDSCAPE)

FIGURE A4
CITY OF ST. MICHAEL – FUTURE LAND USE (11 X 17 Landscape)

APPENDIX B

FUNCTIONAL CLASSIFICATION CHANGES

TABLE B.1 ROADWAY FUNCTIONAL CLASSIFICATION CHANGES

Table B1 Continued

Table B1 Continued

APPENDIX C

JURISDICTIONAL CHANGES

C.1 GUIDELINES FOR ROUTE JURISDICTIONAL DESIGNATION

Many issues and factors must be considered when determining potential jurisdictional changes. These include historical practices, type of trips served (purpose and length), traffic volumes, access controls, functional classification, legal requirements, and funding and maintenance issues. The following guidelines were developed to provide a basis to review the routes in the study area for potential jurisdictional transfers. These guidelines will not determine if the jurisdictional transfers are feasible or politically acceptable, nor do they establish a timeframe under which transfers may occur. Instead, the guidelines define a common-sense approach for arriving at logical jurisdictional designations. Once there is agreement on how the jurisdictional designations should be established, an ongoing jurisdictional transfer process will need to be developed. This process should address issues such as the financial implications for construction and maintenance of the facility, operational implications (perceived level of service, ability to maintain), perceived fairness in the distribution of route responsibilities and timing of transfer.

It is not anticipated that all guidelines must be met in order for a jurisdictional designation to be recommended. However, the more criteria a route meets, the stronger the case for recommending the route designation.

State Jurisdiction

Normally, state jurisdiction is focused on routes that can be characterized as follows:

- They are classified as either a principal arterial or minor arterial.
- They are typically longer routes that provide for statewide and interstate travel, serving longer regional trips that connect larger population and business centers.
- They are spaced at intervals that are consistent with population density, such that all developed areas of the state are within reasonable distance of an arterial. (As a guide, rural arterial routes are considered to "serve" a community if it is within 10 miles or 20 minutes travel time on a minor arterial).
- They typically have higher design features (such as properly spaced access points) that are intended to promote higher travel speeds. They also accommodate more truck movements.
- They typically carry the major portion of trips entering and leaving urban areas, as well as the majority of trips bypassing central cities.

County Jurisdiction

Typically, county jurisdiction is focused on routes that can be characterized as follows:

Rural Areas

- They are functionally classified as a minor arterial, major collectors or minor collectors.
- They provide essential connections and links not served by the principal and other minor arterial routes. They serve adjacent larger towns that are not directly served by principal and minor arterial routes, and they provide service to major traffic generators that have intra-county importance.
- They are spaced at intervals that are consistent with population density so as to provide reasonable access to arterial or collector routes in developed areas.
- They may provide links between local traffic generators and outlying rural areas.

Within Urban Boundaries

- They are classified as either principal arterial or minor arterial routes.
- They carry higher traffic volumes or they provide access to major regional traffic generators (shopping centers, education centers, major industrial complexes).
- They provide connections and continuity to major rural collector routes accessing the urban area and they provide continuity within the urban area, but do not divide homogeneous neighborhoods.
- They emphasize higher mobility features than other local minor arterial routes (i.e., some form of access management or access control).

Local Jurisdiction

Arterial routes, within the urban area, should be considered for city jurisdiction if they can be characterized as follows:

- They are short segments (less than 3 miles) with a moderate volume of traffic (6,000 to 12,000 ADT).
- They have higher local land access needs and close intersection spacing (promotion of local land access over mobility).
- They have close spacing with other arterial routes and shorter trip lengths such as found in Central Business District (CBD) areas.

- They exhibit a lack of continuity between outlying rural areas (connection to rural area and outlying communities) and the urban arterial streets. Routes would tend to have shorter trip lengths.

- They serve small geographic travelsheds.

- They provide on-street parking or other amenities that discourage the use of the route as a regional route (promotion of local access and adjacent land use activities at the street edge).

Collectors and local streets that provide property access and local traffic circulation are normally under local jurisdiction (city). These streets typically constitute 65 to 80 percent of the entire urban system mileage and can be characterized as follows:

- They are shorter in length (less than 1.5 miles) and carry low to medium volumes of traffic (typically less than 8,000 ADT).

- They provide land access and traffic circulation to residential neighborhoods, and to commercial and industrial areas (high access low mobility functions).

- They may divide homogeneous residential neighborhoods to distribute trips to arterial street system or their final trip destination.

APPENDIX D

MODEL ASSUMPTIONS

D.1 MODEL ASSUMPTIONS

A modified version of the Twin Cities regional travel demand model was run to produce 2040 traffic volumes in the study area. The travel demand model is based on the Twin Cities regional model, and has been modified to include the St. Cloud APO area and a corridor between the Twin Cities and St. Cloud through Sherburne and Wright counties, including the study area.

The study area for the purposes of travel demand modeling extends from the Mississippi River to the north, to the CSAH 19 crossing of the Crow River in Hanover, to Beebe Lake and Monticello in the west, and to the Dayton city limits in the east.

Transportation Analysis Zone System Modifications

Based on consultation with city staff from the cities of Albertville, Otsego, and St. Michael, the Transportation Analysis Zone (TAZ) structure was refined from that defined by the I-94 IRC Study and the I-94 / TH 10 Interregional Connection EIS. Additional refinements were made in the zone system in order to provide access to additional network detail that was being added (in general a major roadway splits two zones). This additional detail will provide more ability to investigate access changes as well as the need for additional arterials and/or collector routes. Twenty-six zones from the original model were split into 124 zones for the purposes of this study. Socio-economic data for these TAZs is shown in Tables D3 through D8 at the end of this appendix.

Highway Network Development

The regional network (from the I-94/TH 10 Interregional Connection EIS) was refined to include all arterials and collectors in the study area, and to provide access from the subdivided zone system. Within the study area, a full build-out scenario is assumed for the future roadway network based on the following assumptions:

- All collectors and arterials in the proposed system plan will be in place.
- All arterials will be four lanes.
- TH 101 is assumed to be a 4 lanes freeway.
- Interchanges are assumed to be built in TH 101 at CSAH 49, CSAH 144, CSAH 36, CSAH 37 and CSAH 39.
- All County arterials will be 50mph, all local arterials will be 45 mph, and all local collectors will be 35-40 mph (Some exceptions were assumed where existing conditions/posted limits are in place).

The regional highway network outside the study area is based on the 2000 Metropolitan Council Transportation Policy Plan, with suggested additions from Mn/DOT staff to extend the plan to 2040. This includes the following relevant improvements:

- I-94 will be ten lanes from I-694/494 to TH 101, eight lanes from TH 101 to TH 25, and six lanes to the I-94 / TH 10 Interregional Connection near Clearwater.
- The TH 10 Big Lake Bypass is assumed to be constructed.
- TH 10 will be a six-lane freeway from TH 169 to Round Lake Blvd., and an eight-lane freeway from Round Lake Blvd. to I-35W.
- TH 101/TH 169 will be a four-lane freeway from I-94 through Zimmerman.
- TH 25 will be four lanes from Buffalo to Monticello.
- TH 610 will be completed from I-94 to TH 169.
- CSAH 18/CSAH 75 interchange area modifications in Monticello will be constructed.
- The I-94/TH 10 Interregional Connection will be constructed (assumed Alternative C2).
- The Dayton-Ramsey Crossing will be constructed (assume Alternative 2D).

Socio-Economic Data

The regional model uses socio-economic data (population, households, retail employment, and non-retail employment) as the basis for person-trip generation rates. Full Build land use plans from city staff were used to develop socio-economic data estimates at the following rates

- Population: 2.85 per Household
- Employment: 2 employees per thousand square feet (0.13 Floor Area Ratio)

The 2040 aggregate socio-economic assumptions for study area cities are listed in Table D1.

Table D1
Summary of 2040 Socioeconomic Assumptions

City	Population	Households	Retail Employment	Non-Retail Employment
St. Michael	45,000	15,800	5,300	10,440
Otsego	59,000	21,470	1,500	3,500
Albertville	7,900	2,800	4,900	4,850

The socioeconomic data were allocated among the TAZs within each community based on available land use plans and discussions with the affected communities.

2000 Calibration

The regional model was run for the 2000 highway network and socio-economic data (2000 Census based) in order to compare the assigned daily volumes with ground counts. Absolute differences and distribution pattern discrepancies will be used as adjustment factors for 2040 forecast volumes. These adjustments will be made in the sub-area modeling process, which will be more efficient due to the faster model run times as a result of the smaller model size.

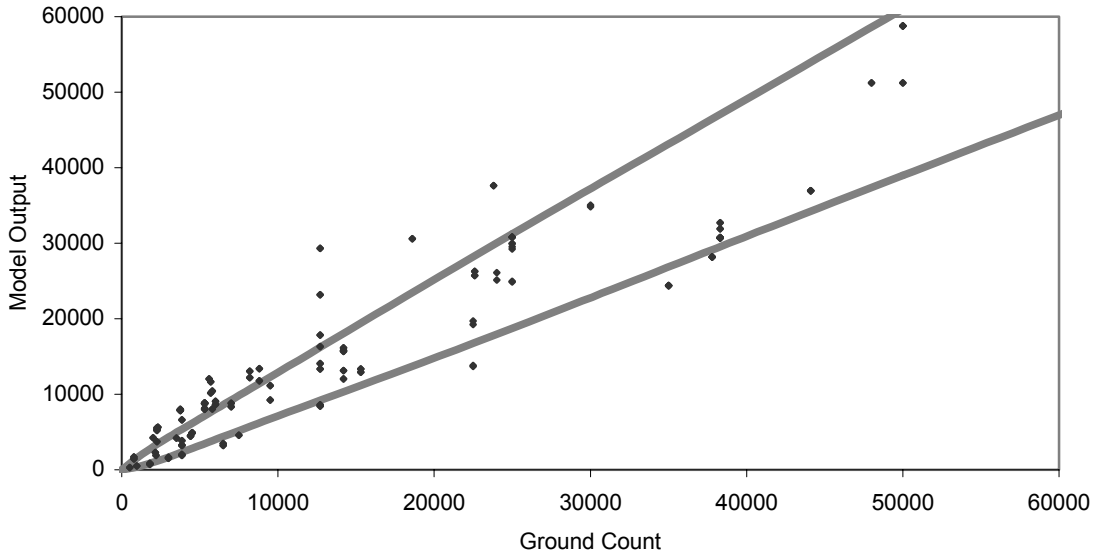
Absolute differences in model results were compared to ground counts to determine the degree of model validity. The acceptable error in a model calibration is determined by the effect the error would have on facility requirements. For example, very low volume roadways can tolerate a large error without affecting the need for a two-lane versus four-lane facility. The results of the calibration are summarized in Table D2 and shown in Figure D1.

Table D2
Root Mean Square Analysis by Facility Type

Facility Type	Number of links with counts	Number of link volumes within error limit (1)	Percent of link volumes within error limit (1)	Root Mean Squared Error
Freeway	32	28	88%	16.6%
Divided Arterial	20	12	60%	29.6%
Undivided Arterial	138	52	38%	43.9%
Collector	12	10	83%	53.7%
Total	202	102	50%	33.0%

(1) Based on the criteria described in FHWA's "Calibration and Adjustment of System Planning Models", page 34

Figure D1
Comparison of Modeled Values and Ground Counts with Upper and Lower Bounds of Acceptable Error



2040 Base Model

The 2040 regional model was run assuming no access changes on I-94 (Baseline did assume two new overpasses: Kadler Avenue, and Naber Avenue). This was done both to provide a baseline scenario to evaluate access alternatives against, and to validate trip generation and ADT growth rates that are produced by the model against other studies and expectations.

The study area will be extracted from the regional process as a "sub-area" model. This model will be approximately 85 percent smaller than the regional model, which will permit rapid turnaround of analysis and testing of alternatives.

Tables D3 through D8 (D3, D4, D5, D6, D7, D8)
Socio Economic Data based on TAZs

APPENDIX E

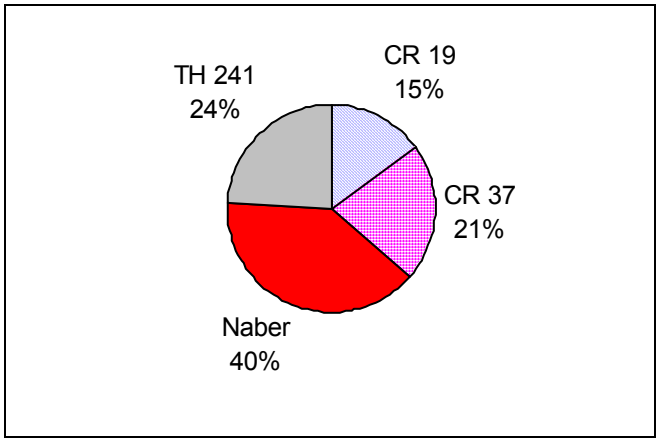
LOCAL TRIPS EVALUATION AT KADLER AVENUE

E.1 LOCAL TRAFFIC

Origin-destination pattern for the Kadler Interchange (Alternative E) was reviewed to better understand the nature of traffic using this I-94 access. Forecasts for the Year 2040 indicate approximately 27,000 daily trips would use a Kadler Avenue interchange. Of these trips, 5,150 (or 19 percent) would also use one of the other local interchanges in the study area (CR 19, CR 37, Naber Avenue or TH 241) and the remaining 81 percent would have a more regional origin-destination.

Figure E1 shows that nearly two-thirds of the 5,150 local interchange trips using Kadler Avenue are to or from the TH 241 or Naber Avenue interchanges, which are over three miles from Kadler Avenue. In the past, Metropolitan Council/Mn/DOT practice in the Twin Cities was to set ramp metering rates to discourage trips from using the freeway system for trips of less than three miles. The nearest interchange, CR 19 would account for 15 percent of the traffic (approximately evenly split between the Albertville Premium Outlets area and areas to the south of I-94).

Figure E1
Distribution of Local Trips using Kadler Avenue



E.2 MISSISSIPPI RIVER CROSSING IMPACT

One of the scenarios tested in the Mississippi River Crossing Cumulative Impacts Study was a local river crossing in the vicinity of Kadler Avenue. A forecast of that scenario for the year 2040 in conjunction with a Kadler Avenue interchange shows a daily volume of 32,000 on the Kadler Avenue river crossing. These trips are comprised of the following:

- 5,000 (16%) former TH 25 river crossing trips
- 1,000 (3%) former CSAH 42 river crossing trips
- 18,000 (56%) former TH 101 river crossing trips
- 8,000 (25%) previously unserved (or "induced") demand

Review of model results shows that the Kadler Avenue river crossing would have origins or destinations in the following traffic markets:

- 5,000 trips (16%) in the Monticello area
- 5,000 trips (16%) to I-94 south of TH 101
- 3,500 trips (11%) would in Wright County or western Hennepin County south of the study area
- 7,000 trips (22%) in Otsego
- 11,500 trips (35%) in the St. Michael/Albertville area

Because of the predominately local nature of the trips, a Kadler Avenue river crossing would have a minimal impact on use of a Kadler Avenue interchange: the 5,000 trips to the I-94 market plus an additional 1,300 that would have destinations near the Naber or TH 241 interchanges. These trips would represent a 23 percent increase in total interchange use (33,300 daily trips compared to 27,000 for the base/no-river-crossing) and a 25 percent increase in trips to local area interchanges (6,450 compared to 5,150 for the base).

APPENDIX F

ACCESS SPACING FOR EXCEPTIONS AND DEVIATIONS

F.1 ACCESS SPACING FOR EXCEPTIONS AND DEVIATIONS

As indicated in Chapter 6, access management guidelines have been incorporated into the sub-area study by the study partners. Table F1 identifies the basic access management guidelines that would be applied to county and city roadways and/or streets. The guidelines are broken into different categories by functional classification and then by area or facility type. For each category, the recommended full-movement intersection spacing is given along with the spacing for a conditional secondary intersection. This secondary intersection typically has restricted movements (e.g., right-in/right-out). In addition, each category identifies the treatment of private access. It should be noted that the guidelines are more restrictive (exception/deviation) of private access in urbanizing areas than in rural and/or urban core areas (subject to conditions). This is due to the fact that planning should be able to limit private access in these developing areas versus areas that have already been developed (core urban area) and/or areas where there is no other supporting street system (rural).

Table F1
Recommended Access Spacing

Category	Area or Facility Type	Typical Functional Class	Intersection Spacing		Signal Spacing	Private Access
			Primary Full Movement Intersection	Conditional Secondary Intersection		
5	**Minor Arterials**					
5A	Urban Mobility Corridor	Minor Arterials	1/2 mile	1/4 mile	1/2 mile	Permitted Subject to Conditions
5B	Urbanizing Arterial		1/4 mile	1/8 mile	1/4 mile	By Exception or Deviation Only
5C	Urban Core Arterial		300 – 600 feet dependent upon block length		1/4 mile	Permitted Subject to Conditions
6	**Collectors**					
6A	Rural/Collector	Collectors	1/2 mile	1/4 mile	1/2 mile	Permitted Subject to Conditions
6B1	Rural/Urbanizing		1/4 mile	1/8 mile	1/4 mile	
6B2	Local Collector		1/8 mile	NA	1/4 mile	
6C	Urban Core Collector		300 – 600 feet dependent upon block length		1/8 mile	
7	**Specific Access Plan**					
7	All	All	By Adopted Plan			

Because there are some instances where the proposed access guidelines cannot be met, agencies will need guidance on how to address these circumstances. Table F2 below defines three types of private access. The types vary from low volume residential/field access to high volume commercial entrances. Agencies should recognize that high-volume access tend to be more problematic and therefore should be given more scrutiny in the review process.

Table F2
Private Access Category

Access Type	Land Use	Access Description
1	Residential/Agricultural/Field Access	For access to single family dwellings, multi-family dwellings of 3 or fewer dwelling units, agricultural land and field entrances.
2	Low volume private entrances	Small commercial, industrial and institutional developments and small residential complexes and subdivisions (less than 100 trips per day).
3	High volume private entrances	Large commercial, industrial and institutional developments, shopping centers, industrial and office parks, colleges and large residential complexes and subdivisions (more than 100 trips per day).

Note: A trip is a one-way movement. Typically 100 trips per day means 50 vehicles are entering an access and 50 vehicles are exiting an access.

The access categories should be used by local agencies when evaluating access that is permitted "Subject to Conditions" and access that is allowed by "Exception and Deviation".

Tables F3 and F4 list additional considerations that should be taken into account when private access is requested that fails to meet the access spacing guidelines for a facility. These considerations should be reviewed by the road authority's engineer and a judgment made as to whether the access meets the conditions specified. If the access request meets the criteria and/or conditions the request should be approved; however, if it does not it should be treated as an exception/deviation and be taken to the local governing agency (city council or county board). It should be noted that in access category 5B, all private access must be treated as a exception and/or deviation and be reviewed by the agencies' engineer and approved by the elected officials that have jurisdiction over the facility.

For facilities that are identified as jurisdictional transfer candidates, it is recommended that agencies obtain concurrence from the "transfer to agency" for all access modifications that fail to meet the proposed guideline.

Table F3
Guidelines for Private Access that are Subject to Conditions for Roadway Categories 5A, 5B and 6A

Roadway Category	Private Access Type 1	Private Access Type 2	Private Access Type 3
5A and 6A	1. Access control has not been acquired and the affected property retains the right of access. 2. Reasonably convenient and suitable access is not available or attainable from the local street network or by shared entrance with an adjacent parcel. If a property abuts two or more public roads, access should be provided from the lower category roadway. 3. An analysis of future traffic conditions indicates the entrance will not create a high-risk conflict condition. 4. Only one entrance per parcel should be provided. An additional entrance may be permitted if it is determined that the property cannot otherwise be reasonably developed or utilized and/or that such access would maintain or improve the safety and operations of the roadway. Multiple entrances should be spaced to meet minimum stopping sight distances. 5. The entrance should not be located within the functional area of an intersection or within the turn lanes to another private entrance. 6. On existing and planned divided roadways, the access should be limited to right-in/right-out. 7. Spacing between Type 2 entrances should be consistent with the stopping sight distances for posted speeds. If possible, the entrances should be located on the property line to promote shared access with adjacent future development. 8. The entrance should meet intersection sight distance requirements. 9. Turn lanes should be provided for Type 2 entrances.	See Type 1	Type 3 entrances are not recommended will be approved only as a Deviation.
5B	Private driveways and entrances are not recommended. Access should be provided from a supporting street network. New or modified entrances will be approved only as an Exception or Deviation.	See Type 1	See Type 1

Table F4
Guidelines for Private Access that are Subject to Condition for Roadway Categories 5C, 6B and 6C

Private Access Type 1	Private Access Type 2	Private Access Type 3
1. Reasonably convenient and suitable access is not available or attainable from the local street network or by shared entrance with an adjacent parcel. If a property abuts two or more public roads, access should be provided from the lower category roadway. 2. Only one entrance per parcel should be provided. An additional entrance may be permitted if it is determined that the property cannot otherwise be reasonably developed or utilized and that such additional access will not negatively impact the safety and operations of the roadway. 3. The entrance should not be located within the functional area of an intersection or within the turn lanes to another private entrance. 4. The entrance should be located on the property to meet intersection sight distances. 5. On existing and planned divided roadways, the access should be limited to right-in/right-out.	1. Reasonably convenient and suitable access is not available or attainable from the local street network or by shared entrance with an adjacent parcel. If a property abuts two or more public roads, access should be provided from the lower category roadway. 2. Only one entrance per parcel should be provided. An additional entrance may be permitted if it is determined that the property cannot otherwise be reasonably developed or utilized and that such additional access will not negatively impact the safety and operations of the roadway. Multiple entrances should be spaced to meet minimum stopping sight distances. 3. The entrance should not be located within the functional area of an intersection or within the turn lanes to another private entrance. 4. On existing and planned divided roadways, the access should be limited to right-in/ right-out. 5. Spacing between entrances should be consistent with the stopping sight distance for the posted speed. 6. The entrance should be located on the property to meet intersection sight distance requirements. 7. The entrance should not create the need for a signal. 8. Turn lanes should be provided.	See Type 2

APPENDIX G

TYPICAL ROADWAY CROSS-SECTIONS

G.1 CROSS SECTIONAL FOOTPRINT

Typical roadway cross sections provide agencies with footprint information to assist them in right-of-way decisions. Agencies should carefully consider future forecast information, operational and safety issues, and state aid requirements when choosing a desired cross-section. Table G1 indicates the relationship between typical sections and the roadway functional classification system. Right-of-way footprints for key arterial and collector facilities in the study area are provided in Table G2.

Table G1
Relationship between Typical Sections and Functional Classification System

Functional Classification Category	Typical Section							
	A	B	C	D	E	F	G	H
Minor Arterial	✓	✓	✓					
Collector			✓	✓	✓	✓	✓	✓

A 5-lane divided CSAH standard; 28' curb-to-curb on one side, 52' curb-to-curb on other side, 150' ROW
B 4-lane urban parkway; 28' curb-to-curb each side, 150' ROW
C 3-lane urban undivided; 44' curb-to-curb, 100' ROW
D 3-lane urban undivided; 52' curb-to-curb, 80' ROW
E 2-lane urban undivided; 40' curb-to-curb, 80'-110' ROW
F 2-lane urban undivided; 40' curb-to-curb, 66' ROW
G 2-lane urban undivided; 32' curb-to-curb, 66' ROW
H 2-lane rural undivided – CSAH or CR facility; 40' curb-to-curb, 110'-120' ROW

Descriptions and figures of roadway cross-sections A through H are provided in the following pages. Figure I shows typical cross section for a trail in an independent corridor.

Table G2
Right-of-Way Footprints for Key Arterial and Collector Facilities

Table G2 Continued

A. FIVE-LANE URBAN – CSAH STANDARD

- Geometry
  - 150 foot right-of-way
  - 28 foot curb-to-curb on one side: two 14 foot lanes
  - 52 foot curb-to-curb on the other side: two 12 foot through lanes, one 14 foot left turn lane at intersections and other selected locations, one 14 foot right turn lane
  - 6 foot raised concrete median
  - 15 foot boulevard on each side
  - 10 foot off-street bituminous trail on each side

- Parking
  - No parking allowed

- Recommended Application
  - Minor arterial in commercial/industrial areas
  - Higher volumes (> 15,000)

Figure A

B. FOUR-LANE URBAN PARKWAY

- Geometry
  - 150 foot right-of-way
  - 28 foot curb-to-curb on each direction: two 14 foot lanes plus turn lanes at major intersections
  - 16-46 foot raised landscaped median
  - 12 foot off-street bituminous trail on one side

- Parking
  - No parking allowed

- Recommended Application
  - Minor arterial in developed areas
  - Higher volumes (10,000 – 20,000)
  - Median provides for left turn lane development where required

Figure B

C. THREE-LANE URBAN UNDIVIDED WITH OFF-STREET TRAIL

- Geometry
  - 100 foot right-of-way
  - 44 foot curb-to-curb: two 14 foot lanes, one 16 foot center turn lane
  - 10 foot off-street bituminous trail on one side

- Parking
  - No parking allowed

- Recommended Application
  - Medium volume arterials and major collectors in developed areas
  - Residential and/or commercial areas with high driveway density

Figure C

D. THREE-LANE URBAN UNDIVIDED WITH ON-STREET TRAIL

- Geometry
  - 80 foot right-of-way
  - 52 foot curb-to-curb: two 12 foot lanes, one 16 foot center turn lane
  - 6 foot on-street bicycle lane on each side

- Parking
  - No parking allowed

- Recommended Application
  - Low to medium volume arterial and/or major collectors in developed areas
  - Residential and/or commercial areas with high driveway density

Figure D

E. TWO-LANE URBAN UNDIVIDED WITH OFF-STREET TRAILS

- Geometry
  - 80 to 110 foot right-of-way
  - 40 foot curb-to-curb: two 12 foot lanes, 8 foot shoulder on each side
  - 10 foot off-street bituminous trail on each side

- Parking
  - No parking allowed

- Recommended Application
  - Medium volume collectors in urban residential district

Figure E

F. TWO-LANE URBAN UNDIVIDED

- Geometry
  - 66 foot right-of-way
  - 40 foot curb-to-curb: two 12 foot lanes
  - 8 foot on-street bicycle lane on each side

- Parking
  - No parking allowed

- Recommended Application
  - Collector in urban residential district
  - Volumes less than 1500 vehicles per day

Figure F

G. TWO-LANE URBAN UNDIVIDED

- Geometry
  - 66 foot right-of-way
  - 32 foot curb-to-curb: two 16 foot vehicle and bicycle lanes

- Parking
  - No parking allowed

- Recommended Application
  - Low volume, low speed (30 mph) collector in urban residential district
  - Volumes less than 1000 vehicles per day

Figure G

H. TWO-LANE RURAL UNDIVIDED – CSAH OR COUNTY ROAD

- Geometry
  - 110 foot right-of-way for county roadways
  - 120 foot right-of-way for CSAH roadways
  - 40 foot curb-to-curb: two 12 foot lanes, 8 foot shoulder on each side

- Parking
  - No parking allowed

- Recommended Application
  - Collector in low-density residential district
  - Use for any functional classification category as interim improvement

Figure H

Figure I

APPENDIX H

TRANSPORTATION FUNDING TRENDS[8]

[8] Excerpt from *2003 Minnesota Road Transportation Needs Assessment Study*, Transportation Policy Institute (March 2003).

Section 1: Key Trends/Causes of the Road and Bridge Funding Shortfall

Due largely to the fact that the typical Minnesota driver is spending more time delayed in traffic than ever before, **most Minnesotans have come to recognize the importance of public investment in transportation infrastructure as an essential function of state government.** At the same time, numerous studies and media reports published recently have documented the demographic, economic, and social trends that will continue to contribute to increasing transportation infrastructure demands now and into the future.

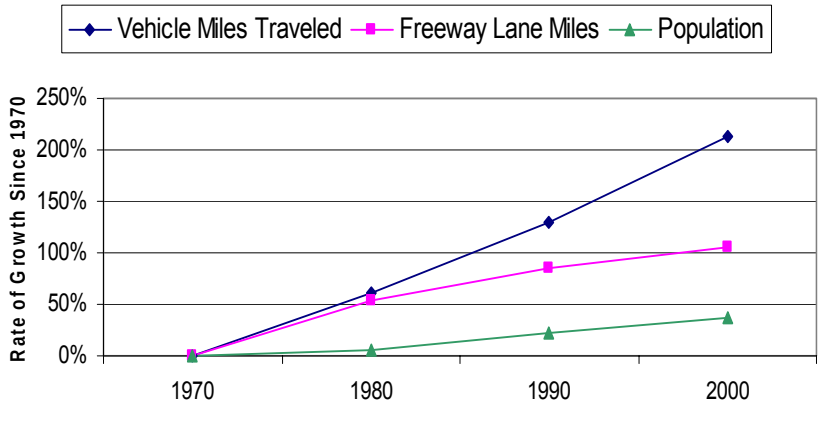
This section of the study will briefly identify and describe some of the key trends that are at the heart of the public policy debate on transportation funding. As indicated above, there is no shortage of written information that admires the causes of the problem, so the reader interested in studying these causes in greater detail should review other materials.[9]

The following factors represent the root causes for the increasing needs for transportation investments:

A. Travel demands are exceeding population growth rates and new highway capacity rates.

Changing demographics and land use development patterns in the state over the last 30 years have contributed substantially to increasing travel demands in Minnesota. These demands, measured in terms of automobile miles

Figure 1
Comparing VMT, Freeway Lane Miles and Population Trends Since 1970



Source: Metro Council

[9] Among the best sources available for the causes of the transportation system demands in Minnesota are the following:
1) *Transportation and Regional Growth – Market Choices and Fair Prices*, Center for Transportation Studies, January 2003; 2) *Moving Minnesota 2003 – Moving People and Freight to 2023*, Minnesota Department of Transportation, July 2002; 3) *Metropolitan Council Twin Cities Transportation System Audit*, 2001; 4) *Funding Street Construction and Maintenance in Minnesota Cities*, Transportation Policy Institute, January 2003.

traveled and commercial vehicle miles traveled, have far outpaced population growth, and have led to a rapid depletion in the supply of uncongested roadway capacity, both in the Twin Cities metropolitan area, and along roadways in Greater Minnesota.

There are a number of causes that explain the rapid increases in vehicle miles traveled in the state. In the metropolitan area, the growth in the number of economic centers has contributed significantly to increased travel demand. Twenty years ago, the region's major employment centers were mostly located within the borders of the largest cities, Minneapolis, St. Paul, and Bloomington. Today, economic centers are located throughout the metropolitan area. Because these businesses are dispersed, the demands on the systems roadways have also become dispersed.

In rural Minnesota, travel demands have increased as the state has come to rely on the transportation system to link rural economic centers to markets in the metropolitan area and consumers and workers in rural locales. The state's emphasis on developing inter-regional corridors is intended to establish an infrastructure in rural Minnesota that ensures that goods get to market (including global markets) and that the work force has convenient access to jobs.

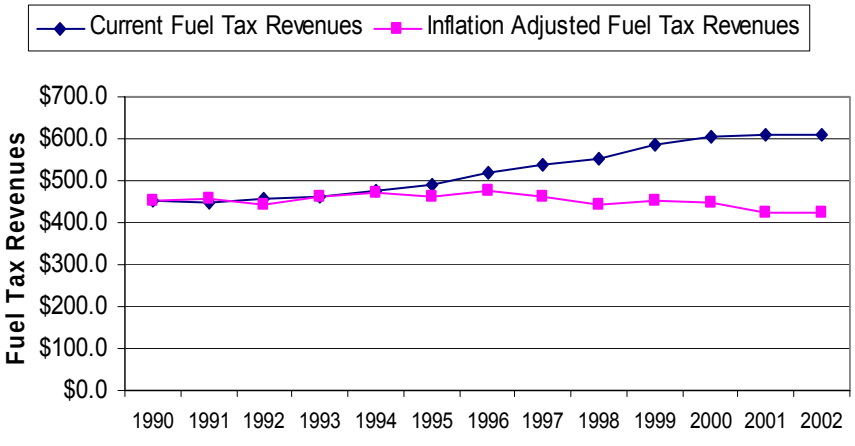
B. Inflation has eroded the real purchasing power of dedicated revenues.

Article XIV of the State Constitution established the State Highway Users Tax Distribution Fund (HUTDF) in 1920 to provide a reliable and growing source of funding for transportation infrastructure, including county and city road systems. The HUTDF is funded primarily with fuel tax revenues and motor vehicle registration fees, and these revenue sources were increased periodically, presumably because policy makers recognized that it was reasonable to finance the substantial and growing needs of the transportation system with a growing revenue source that was provided by users of the transportation system.

In recent years, however, inaction on the part of state policy makers has adversely effected the ability of the HUTDF to meet the increasing demands on the system. Most importantly, there has been no motor fuel tax increase since 1988, in spite of the increasing needs and costs.

Figure 2 at right compares the current annual fuel tax revenues since 1990 with the

Figure 2
Comparing State Fuel Tax Revenues 1990-2002
Current Dollars vs. Inflation Adjusted Dollars ($ millions)

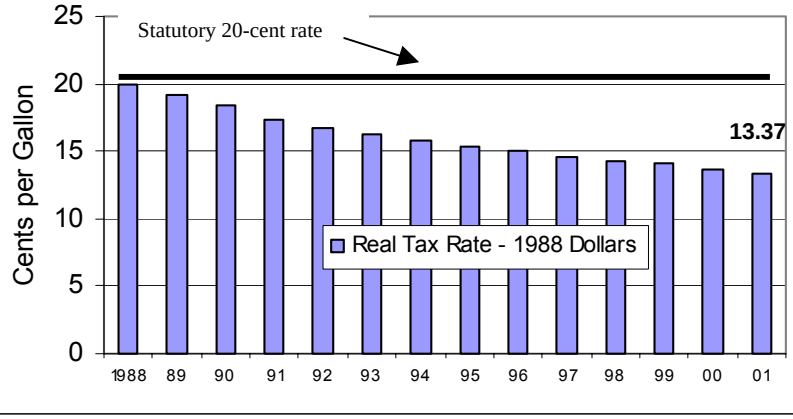


value of those revenues adjusted for inflation using the Minnesota Highway Construction Cost Index, an index measuring the costs associated with road construction. As the chart illustrates, inflation did not have a significant impact on the actual purchasing power of HUTDF revenues early in the 1990s, but beginning in 1995, there has been a steadily growing inflation rate that has eroded much of the purchasing power of the motor fuel tax.

Much of the discussion concerning transportation funding options in recent years at the Minnesota State Legislature has involved discussion over changes to the fuel tax and motor vehicle license tax rates. Fuel taxes, in particular, have been the focus of many transportation funding advocates who have supported a "permanent" new funding source for transportation infrastructure.

Figure 3 illustrates the decline of the value of the gas tax in a different way. In terms of the actual purchasing power of the fuel tax, the twenty-cent per gallon fuel tax has a purchasing power of 13.37 cents in 1988 dollars, so **the value of the gas tax has decreased by 33 percent since 1988 in real terms.** (Another way to make the same point is that if the 20-cent fuel tax had been increased annually since 1988 to adjust for the inflationary effects, the rate in 2001 would be 29.92 cents per gallon.)

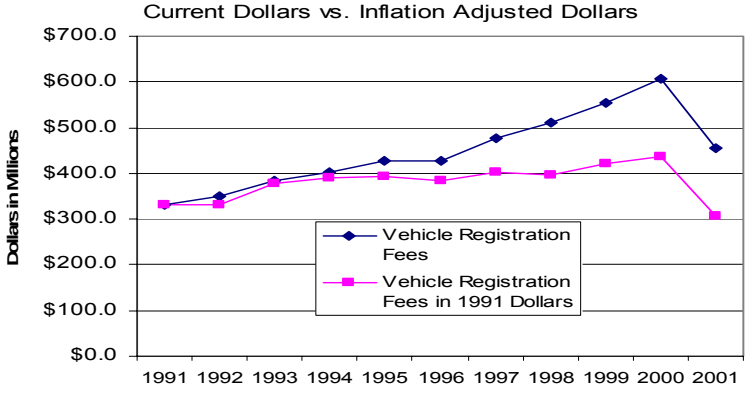
Figure 3
Minnesota Fuel Tax Rate 1988-2001
Comparing 20-cent Statutory Rate to Inflation Adjusted Rate



Source: Transportation Policy Institute

The other primary funding source to the Highway User Tax Distribution Fund is the Motor Vehicle Registration Fee. Figure 4 shows how inflation has eroded revenues from the Motor Vehicle Registration Fee, just as it has eroded gas tax revenues. (The sharp decline in 2001 was a result of a reduction in the Motor Vehicle Registration Fee, which was offset by an increased General Fund contribution to the Highway User Tax Distribution Fund.)

Figure 4
Motor Vehicle Registration Fee Revenues; 1991-2001
Current Dollars vs. Inflation Adjusted Dollars



Source: Transportation Policy Institute

APPENDIX I

RESOLUTIONS OF APPROVAL