

# Transportation Planning Study

*Detroit Lakes, Minnesota*

**By**

*Minnesota Department of Transportation, District 4  
City of Detroit Lakes  
Becker County*

**In Cooperation With**

*Pelican River Watershed District  
Minnesota Department of Natural Resources  
Minnesota Pollution Control Agency  
Becker County Soil and Water Conservation District  
West Central Initiative*

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## **1.0 Executive Summary**

### **1.0 Study History**

Detroit Lakes is the county seat of Becker County and as a regional center serving local and recreational traffic demands, more than 16,000 vehicles a day travel through Detroit Lakes on Highway 10. With a growing commercial and residential area developing west of Highway 59, the possible expansion of the airport and increased traffic needing improved access to the growth areas, and desire for better linkages for all modes of ground travel between the established and growing areas of the community, it became apparent to State and local transportation providers that a coordinated transportation system study would be needed to identify State, County, and City transportation system needs and potential solutions for further development. In addition, the recent completion of Highway 10 through the majority of the community represents a substantial safety, mobility, capacity, and economic development investment that the transportation agencies agreed needs to be preserved, protected – and complemented - over time. Therefore, the Minnesota Department of Transportation, the City of Detroit Lakes, and Becker County agreed to begin a comprehensive look at potential solutions to area transportation issues in summer 2009. The general study area is illustrated in *Exhibit 1*.

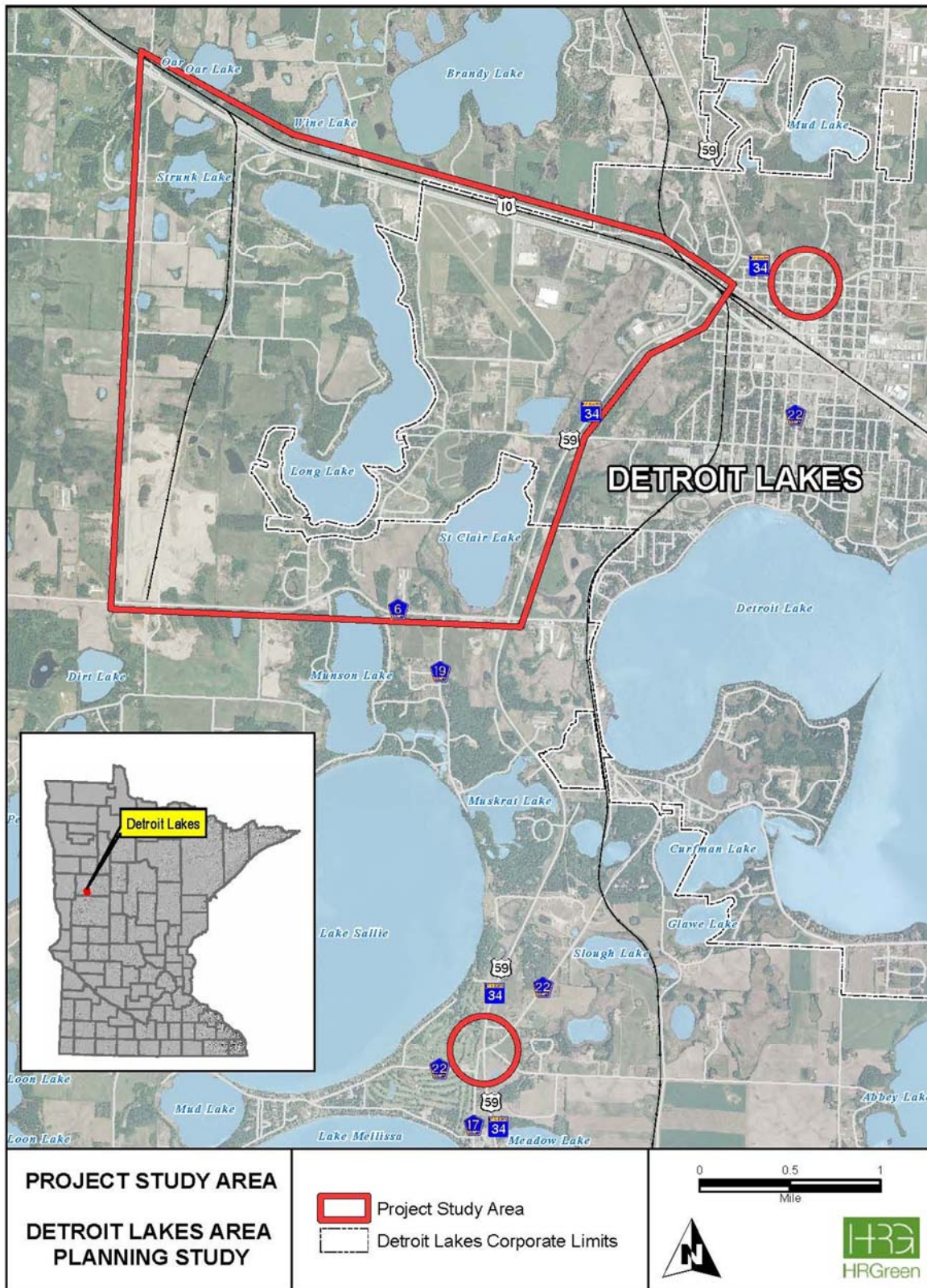


Exhibit 1

## 1.1 *Development of a Problem Statement*

The development of a comprehensive problem statement for the areas to be studied was approached by engaging the study committees, stakeholders, and members of the public through an outreach exercise involving an open house. The problem statement has two primary purposes:

- 1) To help agency long-range transportation planners and engineers systematically document decision-making data used to complete a long-range transportation planning study; and,
- 2) To help choose the level of detail and the data needed to support the foundation for the development of “Purpose and Need” documentation when projects are programmed and move to preliminary design and environmental analysis.

The development of a comprehensive problem statement was initiated by identifying issues and concerns in the study area that corresponded to three unique community-based perspectives:

### ***Technical***

The Technical part of the problem statement focuses on solutions that meet established design standards or guidelines, and add safety, capacity, or mobility improvements to a proposed solution. An example would be designing a typical section of roadway according to its capacity to accommodate forecasted traffic and surrounding future land uses.

### ***Regulatory***

The Regulatory part of the problem statement focuses on the external agency reviews, permits, and approvals that are required to uphold local, state, and federal laws and regulations that may be affected by the proposed roadway. An example would be a permitting agency reviewing wetland impacts associated with a proposed roadway and requesting that avoidance alternatives be examined in addition to the alternative that solves a technical problem.

### ***Community***

The Community part of the problem statement pertains to the effects of a roadway solution on residents, commuters, and commercial /freight operators. An example would be how well the roadway functions to deliver users to its destination, and how compatible it is for activities within neighborhoods, both residential and commercial, that it passes through.



## **1.2 Study Input**

The project was organized to include working committees comprised of the project partners, regulatory agencies, and local stakeholders including businesses and institutions, as well as members of the general public. A Technical Advisory Committee (TAC), a Steering Committee, groups of stakeholders including businesses and permitting agencies, and the general public were engaged in a multilevel process at assigned frequencies of participation during the study. These committees formed the basis of the main operating committees of the study.

### ***Technical Advisory Committee***

The TAC was comprised of administrative, planning and/or engineering staff from Mn/DOT, the City of Detroit Lakes, and Becker County. The TAC met monthly to discuss the tasks of the project and guide the development of study area alternatives and recommendations.

### ***Steering Committee***

The Steering Committee met approximately quarterly and was comprised of staff from local and state regulatory agencies with interests pertaining to future transportation system plans within the study area. This group provided feedback and suggestions for improvements to the recommendations of the TAC. Members invited to participate on the Steering Committee included the following individuals:

### ***Other Stakeholders***

Meetings with affected businesses, individuals, and regulatory staff were held during the study. Three public meetings were also held during the study to engage the public. A project website was hosted by Mn/DOT and periodically updated with a project study area survey, study information, and opportunities to submit questions and comments.

## **1.3 Goals and Objectives**

The Detroit Lakes Transportation Planning Study process and implementation outcomes were founded on the “smart growth” partnership goals adopted by the US Department of Transportation, Environmental Protection Agency, and Department of Housing and Urban Development. On June 16, 2009, EPA joined with the U.S. Department of Housing and Urban Development (HUD) and the U. S. Department of Transportation (DOT) to help improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide. Through a set of guiding livability principles and a partnership agreement that will guide the agencies' efforts, this partnership will coordinate federal housing, transportation, and other infrastructure investments to protect the environment, promote equitable development, and help to address the challenges of climate change.

**Goal 1: Provide more transportation choices.** *Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**

- Promote safe access for all ages and abilities.
- Provide adequate mobility along and across travel corridors (highways, streets, sidewalks, trails)
- Determine multimodal transportation system needs in the transportation planning area and affected populations by mode.
- Provide opportunities to link multi-modal transportation system users and needs with future transportation system implementation plans.
- Develop opportunities for new trails along planned roadways and connections between existing and future trails.

**Goal 2: Promote Equitable, Affordable Housing.** *Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**

- Compare long range housing and land use plans with future transportation system linkages to determine where mobility could or should be increased and greater efficiencies between planned residential and transportation systems could be attained.
- Identify locations where more efficient means of mobility could or should be provided. For example, higher density residential areas in some cases could be efficiently served with more bicycle, pedestrian, and transit facilities than lower density residential developments.

**Goal 3: Enhance Economic Competitiveness.** *Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**

- Plan the future roadway system to improve connections between trade and employment centers along TH 10 and US 59/CSAH 34.
- Provide for additional land development opportunities by developing future roadway access for underserved or land-locked parcels.
- Complement the recommendations of the Detroit Lakes Comprehensive Plan and efforts of area business development groups in targeting

- roadway improvements to areas that would otherwise not be developable due to inadequate property access.
- Accommodate suburban economic with downtown economic development opportunities.

**Goal 4: Support Existing Communities.** *Target federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - Provide roadway and multimodal facility plans that complement existing plans for land use and development, and existing and future annexation activities.
  - Discourage roadway and multimodal facility plans that promote sprawling development and inefficient connections of utilities and higher than average costs to provide services and maintain infrastructure.

**Goal 5: Coordinate and Leverage Federal Policies and Investment.** *Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - FAA, water quality, and county housing authority (HUD) – how are they synergistic
  - Avoid wetlands, encourage biodiversity, discourage invasive species.
  - Develop transportation system plans that are a product of an ongoing collaborative effort between Federal, State, and Local agencies that have mutual interests in the study areas.
  - As transportation system concepts are explored, study methods to solve mutual problems between agencies and respond with solutions that provide opportunities and benefits for affected stakeholders. For example, it may be possible to construct transportation facilities that will provide benefits to improve water quality of area lakes.

**Goal 6: Value Communities and Neighborhoods.** *Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - Quality of life and livability – follow new Mn/DOT initiatives for Context Sensitive Solutions and Return on Investment Strategies.
  - Outside of the developed, compact urbanized areas of Detroit Lakes, encourage the development and connection of trails for bicyclists and

- pedestrians, especially where gathering areas such as community facilities, parks, etc. will serve as focal points.
- Improve bicycle and pedestrian facility connectivity between developing and developed areas of the community.
- With area residents and property owners, develop solutions that address the appropriate facilities for the types of needs of area residents and tourists. (i.e. sidewalks, trails, wide shoulders, and safety features at specified crossings).

## 1.4 System Analysis

Traffic studies were prepared for the planning study and included collection of updated traffic counts to obtain volumes at designated locations, intersection traffic capacity analyses, and access management review, and a safety assessment. Highways 10 and 59 within the study area are undergoing a transition from rural to urban highways. Development of adjacent properties has led to an increased demand for access. The following traffic studies can be found in Appendix B.

- Traffic data collection*
- Existing capacity analysis*
- Access management*
- Safety*
- Conclusions*

### Existing Capacity Analysis

Roads within the study area have acceptable capacity to carry traffic. Highway 10, east of Airport Road, carries the highest traffic volumes in the study area at 18,500 vehicles per day. Based on November counts and updated with 2010 seasonal data compiled during the summer months, the intersections within the study are generally operating well; however, at some of the non-signalized intersections, left turning vehicles are beginning to experience higher delays.

### Traffic Safety

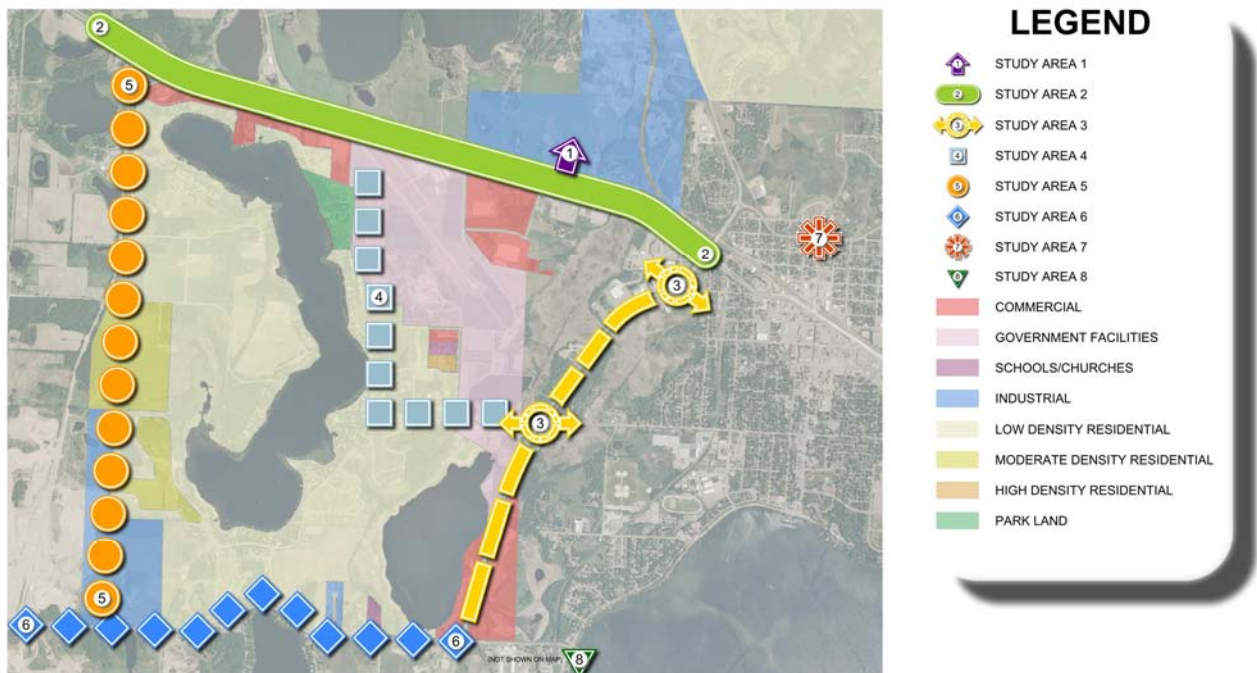
Access to the high speed highway can become more difficult as the traffic volumes grow, specifically for travelers attempting to turn left onto the highway. As gaps become fewer, drivers take more chances to enter the highway and this contributes to a higher probability of several types of crashes, including potentially fatal crashes. An example of this can be seen at the Highway 59 intersection with Willow Street, which has experienced a safety problem and as a result a four-way stop has now been installed to address the safety concern. While this interim change is prudent to address the current safety condition, the mobility impacts on Highway 59 then become incompatible with the mobility goal (i.e. expected travel speed) for this State highway.

The analysis of crash data for US-10 and US-59 for the years 2003-2007 did not raise any serious concerns. Only one intersection, US-59 at Morrow Avenue/Main St. has a crash history that indicates corrective measures should be evaluated. All the study intersections have a severity rate below the Mn/DOT average severity rate with the exception of Highway 34 and County Road 22.

### 1.5 Definition of Subareas

With the classification of issues and concerns according to technical, regulatory, and community problem statements, the overall study area was divided into eight subareas for more detailed study. The subareas were defined as follows:

- Sub Area 1 – Access North of Highway 10
- Sub Area 2 – Highway 10 Frontage Road
- Sub Area 3 – Highway 59
- Sub Area 4 – East Parkway
- Sub Area 5 – West Parkway
- Sub Area 6 – County Road 6 (Munson Lake Road)
- Sub Area 7 – Washington Avenue and Highway 34 intersection
- Sub Area 8 – Highway 59 and County Road 22 intersection



## 1.6 Alternatives and Screening Analysis


Alternatives were developed for each study subarea. The alternatives developed ranged from “typical” solutions that would be appropriate for application based on approved review and evaluation procedures, established safety and cost-effectiveness benefits, to more innovative solutions involving more multidimensional thinking. In some cases, the development of potential alternatives hinge on the advancement of other local projects in the same geographic area.

The alternatives developed, and their descriptions, are described in the following paragraphs. Potential solutions were introduced by the study consultant and members of the public, and refined by the study committees. Using the Measures of Effectiveness (Project’s Measures of Effectiveness) described in Section 3.3, the TAC collaborated on a screening analysis to rate study area alternatives according to ability to achieve goals and objectives, and resulted in the selection of a set of preferred solutions for further development by study subarea.

## 1.7 Recommended Projects


*Recommendation: Study Area 1 – Access North of Highway 10*

Using the Project’s Measures of Effectiveness, the TAC rated the **1C - offset frontage road to the north** as most likely to be clearly beneficial - or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
							
Study Area 1A		+	+	+	+	O	+
Bridge Over RR							
Study Area 1B							
Upgrade Existing Crossing		-	O	O	O	-	-
Study Area 1C		+	+	+	+	+	O
Offset Frontage Road to North		+	+	+	+	+	O


*Recommendation: Study Area 2 – Highway 10 and Highway 10 Frontage Road*

Using the Project’s Measures of Effectiveness, the TAC rated the **2C - urban 4-lane Highway 10 roadway section**, with curb and gutter with paved shoulders, and 2E - a two-way traffic frontage road with separate bike and pedestrian trail as most likely to be clearly beneficial – or have potential to be beneficial - to best achieve the goals and objectives among the conceptual alternatives studied. The narrowed section on Highway 10 and the frontage road could be extended past the airport and provide the flexibility to cross the runway safety areas without obstructions and grading to meet the aviation criteria. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
							
Study Area 2A		-	-	-	-	0	-
Existing TH 10 Section		-	-	-	-	-	-
Study Area 2B		-	-	-	-	-	-
Urban 4-Lane		-	-	-	-	-	-
Study Area 2C		+	-	0	0	0	0
Urban 4-Lane with Shoulders		+	-	0	0	0	0
Study Area 2D		+	0	+	0	+	+
Frontage Road with Bike Lanes		+	0	+	0	+	+
Study Area 2E		+	+	+	+	+	+
Frontage Road with Trail		+	+	+	+	+	+

*Recommendation: Study Area 3 – Highway 59*

Using the Project’s Measures of Effectiveness, Steering Committee member and neighborhood input, the TAC rated the **3D - Highway 59 Roundabout at Willow Street**, and the **3C - Highway 59 Frontage Road connection 3G3 - Holmes Street Extension to a new Main Street/Morrow Avenue Highway 59 Underpass** would be clearly beneficial – or have potential to be beneficial - to best achieve the goals and objectives among the conceptual alternatives studied. The City has also proposed to negotiate with the Canadian Pacific Railroad to minimize the duration of the closures of Main, Holmes and Willow Streets. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
							
Study Area 3A		-	-	-	-	-	-
Existing TH 69 Section		-	-	-	-	-	-
Study Area 3B		-	0	0	0	0	0
Rural 3-Lane Section		-	0	0	0	0	0
Study Area 3C		+	+	+	+	+	+
Frontage Road		+	+	+	+	+	+
Study Area 3D		+	+	+	0	+	+
Roundabout (Willow)		+	+	+	0	+	+
Study Area 3E		0	+	0	0	0	0
Stop Light		0	+	0	0	0	0
Study Area 3F		+	+	+	0	+	+
Holmes Street Extension		+	+	+	0	+	+
Study Area 3G		+	+	+	0	0	+
Main Street Extension Underpass		+	+	+	0	0	+

Detroit Lakes Transportation Planning Study  
FINAL REPORT

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Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 3G1							
Holmes Street Extension		+	+	O	+	O	+
Study Area 3G2							
West Avenue/Union Street Underpass		+	O	+	O	O	-
Study Area 3G3							
Holmes Street Extension to Main/Morrow Underpass		+	+	+	+	+	+
Study Area 3G4							
Main Street Underpass w/ Main Street		+	+	+	O	O	O
Study Area 3G5							
Parallel Frontage Road to Intersection South (without underpass)		O	O	O	O	O	O
Study Area 3G6							
Highway 10 Pedestrian and Bicyclist Improvements		SAFETY GOAL NOT ACHIEVED					

*Recommendation: Study Area 4 – East Parkway*

Of the alternatives presented, the TAC selected the **4B - new two-lane parkway** as best achieving the project's Measures of Effectiveness. If the long term planning for the airport cannot accommodate a local road for travel between Long Lake Road and Highway 10, the improvements to Highway 59 can accommodate the diverted traffic. Ultimately, the TAC decided to defer the location of this recommended concept for further development pending the results of the airport's long-range planning studies. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 4A		-	+	+	O	O	-
32' Road							
Study Area 4B	<b>4</b>	+	+	+	+	+	+
Parkway							
Study Area 4C		-	O	O	O	O	+
Tunnel Under Runway							

*Recommendation: Study Area 5 – West Parkway*


Using the project's Measures of Effectiveness, the TAC concluded that the **5B - new two-lane parkway** would be clearly beneficial – or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 5A		-	+	+	+	+	-
32' Road							
Study Area 5B	<b>5</b>	+	+	+	+	+	+
Parkway							




*Recommendation: Study Area 6 – Becker County Road 6 (Munson Lake Road)*

Using the project’s Measures of Effectiveness, the TAC concluded that the **6C - new two-lane roadway with turn lanes and bicycle/pedestrian** would be clearly beneficial – or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. Planning for the corridor could include staging the improvements such as adding turn lanes with an overlay project and construction of the trail at a later date. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
 Study Area 6A Rural 3-Lane Section		+	+	+	+	O	+
Study Area 6B Parkway		+	+	+	+	O	+
Study Area 6C 2-Lane with Turn Lanes & Trail		+	+	+	+	+	+


*Recommendation: Study Area 7 – Washington Avenue and Highway 34*

A safety study is needed to determine the appropriate traffic control design for this intersection. For study purposes and using the project’s Measures of Effectiveness, the TAC concluded that a **7A - signalized intersection** would be clearly beneficial – or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
 Study Area 7A Signalized Intersection		+	+	+	+	+	+
Study Area 7B Roundabout		O	O	O	O	O	O

*Recommendation: Study Area 8 – Highway 59 and County Road 22*

Using the project’s Measures of Effectiveness, the TAC concluded that a 8A - separated right turn lane (as a short-term solution) and a **roundabout, 8C** would be clearly beneficial – or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. With the TAC recommendation, a safety study is needed to determine the appropriate traffic control design for this intersection. The following chart indicates the results of the Technical Advisory Committee evaluation.

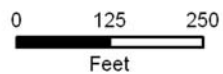
Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
							
Study Area 8A Separated Right Turn		-	-	-	-	-	-
Study Area 8B All Way Stop		-	-	-	-	0	-
Study Area 8C TH 59 Roundabout		0	+	0	0	0	-
Study Area 8D Signalized Intersection		0	+	-	0	0	-
Study Area 8E Realign CR 22		0	+	0	0	-	0
Study Area 8F Offset Intersection		0	0	-	0	-	-

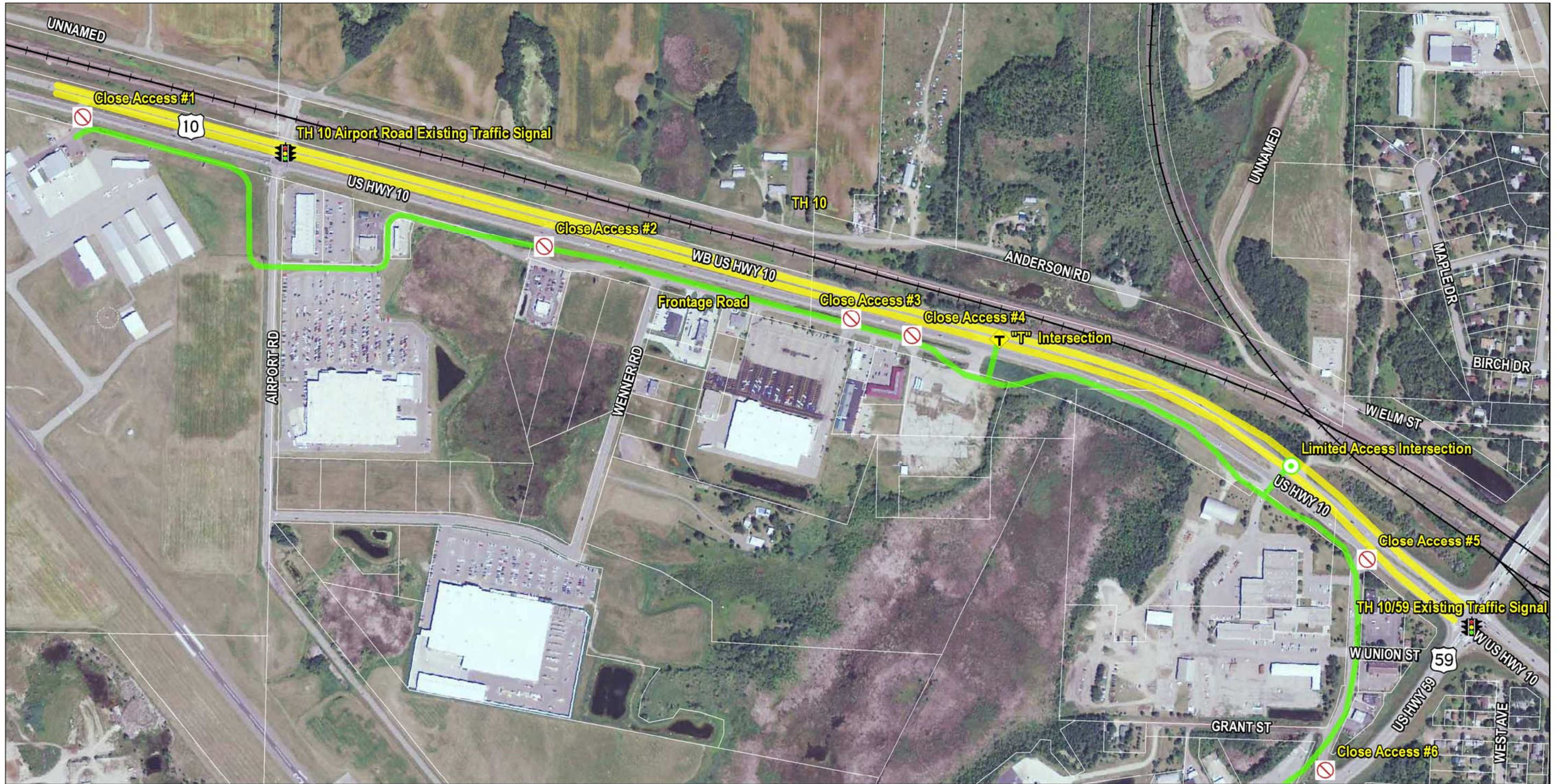


**STUDY AREA #1**

TH10 & AIRPORT RD

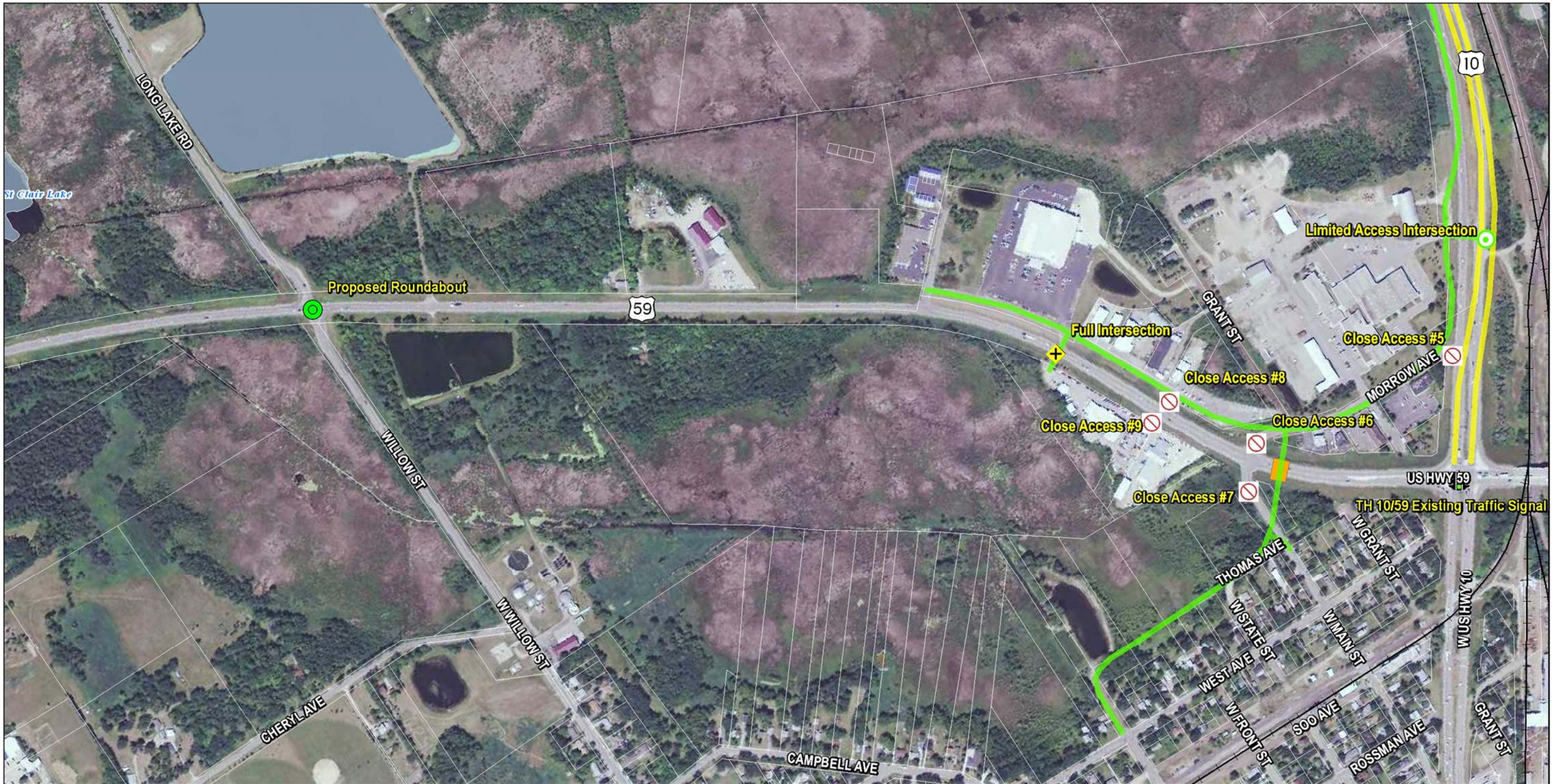
DETROIT LAKES AREA  
PLANNING STUDY





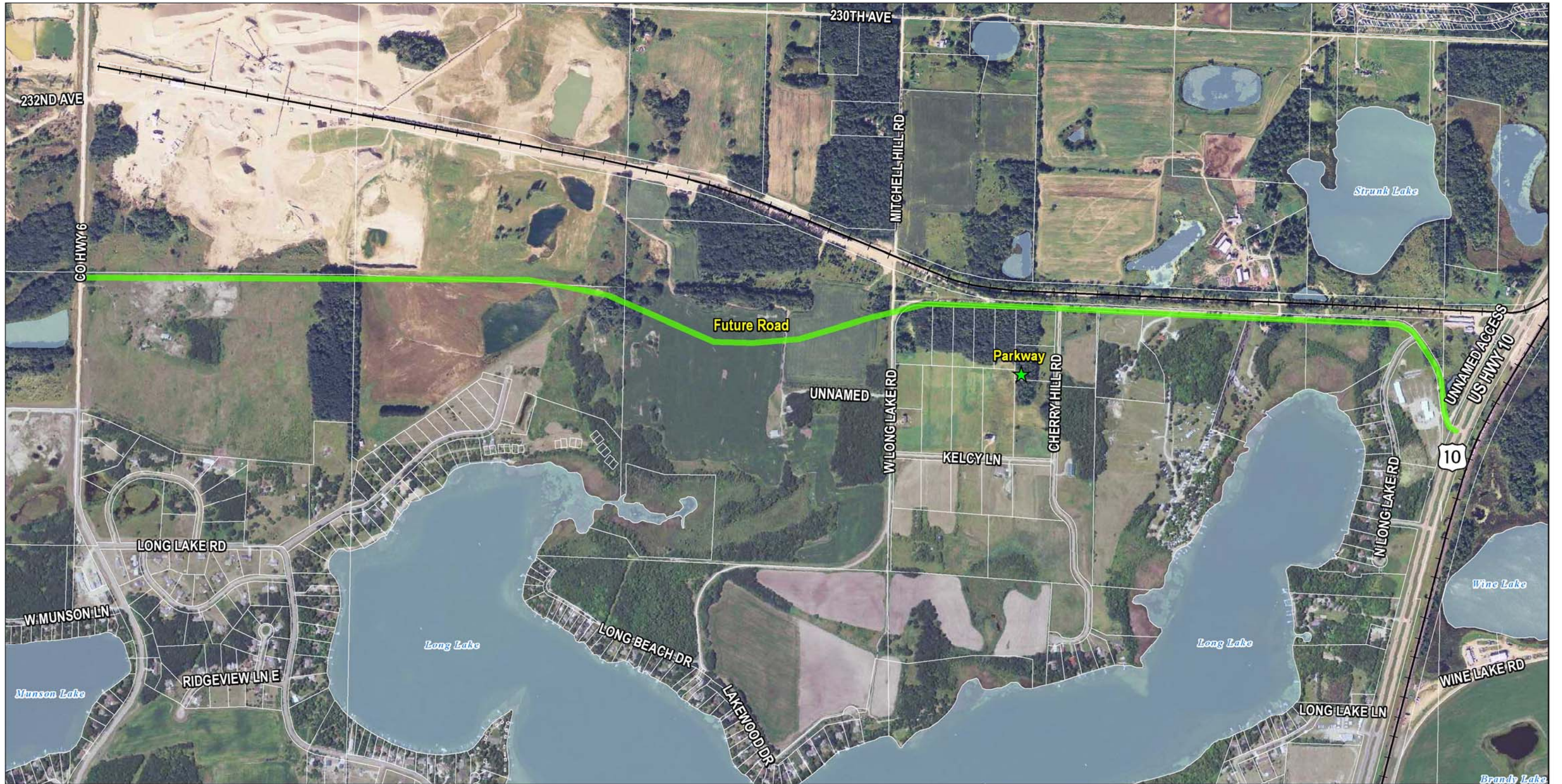
**STUDY AREA #2**  
TH10 & HIGHWAY 10 FRONTAGE ROAD  
DETROIT LAKES AREA  
PLANNING STUDY

0 125 250  
Feet

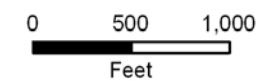


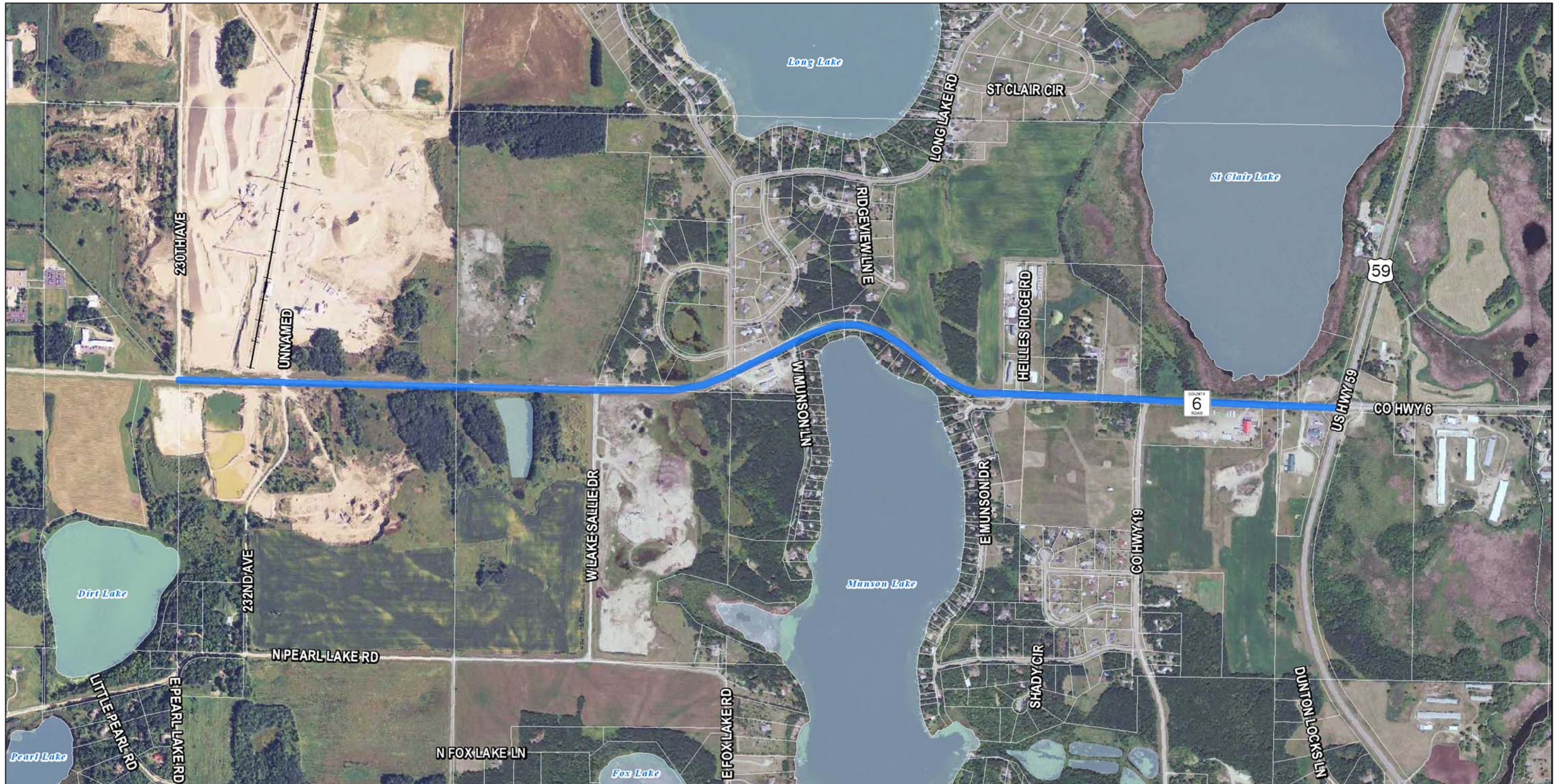
**STUDY AREA #3**  
TH10 & HIGHWAY 10 FRONTAGE ROAD  
DETROIT LAKES AREA  
PLANNING STUDY

0 125 250 500  
Feet

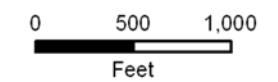


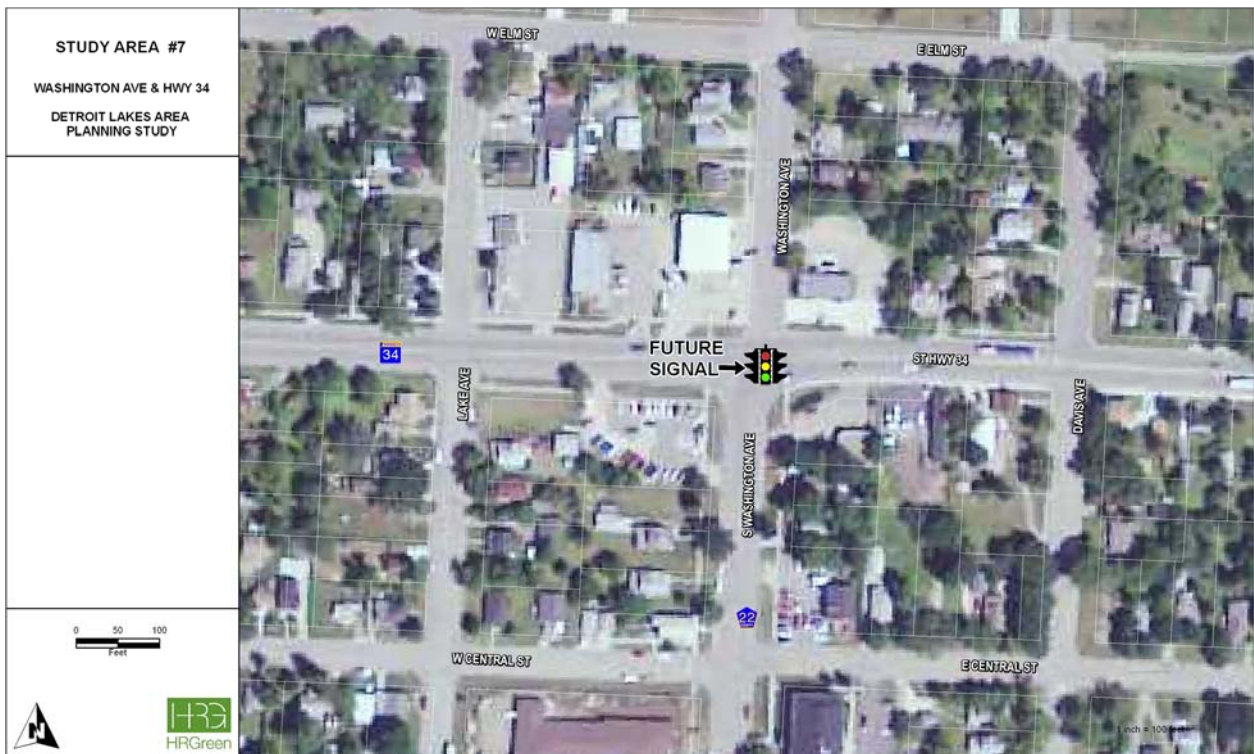
**STUDY AREA #5**  
FUTURE WEST PARKWAY  
DETROIT LAKES AREA  
PLANNING STUDY





**STUDY AREA #6**  
**BECKER COUNTY ROAD 6**  
**DETROIT LAKES AREA**  
**PLANNING STUDY**







## 1.8 *Implementation*

The TAC assembled study-recommended projects from each of the eight study areas into three general sets of priorities. These priorities were established based on available funding to proceed with preliminary/ final design and construction, urgency in correcting safety issues, resolution of outstanding issues, market conditions, and long-term needs (i.e. important but lower immediate priority).

*Priority 1: Programmed Projects:* funding substantially in place with planned construction beginning as early as 2013. These projects have been identified in the 10-year Highway Investment Plan (HIP) and have had funding programmed in the 2012-2015 State Transportation Improvement Program (STIP).

*Priority 2: Planned Projects:* fiscally-constrained projects requiring detailed study and construction beginning after 2015. These projects have been identified in the 10-year Highway Investment Plan (HIP) and will be considered in the future as potential projects.

*Priority 3: Potential Projects Dependent on Market Conditions and/or Airport Expansion:* These project needs are dependent on the pace of growth in the community and decisions on constraints such as the proposed airport expansion. These projects will typically occur when market conditions improve or issues can be resolved to avoid selecting a transportation system decision that may need to be changed over time.

# Study-Recommended Projects

## Programmed Projects (Construction beginning in 2012 to 2015)



- Highway 10 Overlay (west of Airport Road)
- CSAH 6 (Overlay with turn lanes)(Study Area 6)
- Highway 10 Urban Four-Lane Section, Access Management Improvements, and East Frontage Road (Study Area 2 & 3)
- CSAH 22/Highway 59 intersection right turn lane safety improvement (Study Area 3)
- Highway 59 Frontage Road and Underpass (Homes Street Extension)(Study Area 3)

## Planned Projects (Construction beginning after 2015)



- CSAH 6 (trail)  
(Study Area 6)
- CSAH 22/Highway 59  
Full Intersection  
Improvement (Study  
Area 8)

## Potential Projects Dependent on Market Conditions and/or Airport Expansion (Future Construction)



- Airport Road/East Parkway (Study Area 4)
- Highway 10 West Improvements (with or without frontage road west of airport road)
- Offset Highway 10 Frontage Road (north of highway) (Study Area 1)
- West Long Lake Parkway (Study Area 5)
- Washington Avenue/TH 34 Intersection Signalized Improvements (Study Area 7)

The next steps for these project priorities were then matched to an implementation schedule on the following Table 8.

**Table 8  
Implementation Schedule and Next Steps**

Study Area Number and Name	Preferred Alternative(s) For Further Development	Implementation Next Steps Prior to Right of Way Acquisition and Construction	Lead Agency/ Other Coordination Agencies	Construction Begins
<b>1 - Access North of Highway 10</b>	Study Area 1C - Offset Frontage Road to North	<ol style="list-style-type: none"> <li>1. Refine conceptual roadway design for comprehensive plan amendment/update for use with developers/others interested in developing property north of the highway.</li> <li>2. Refine Highway 10 intersection design (preliminary design process)</li> <li>3. Coordinate crossing with BNSF Railroad</li> <li>4. Secure intersection funding</li> </ol>	Lead: City of Detroit Lakes Others: Mn/DOT, BNSF Railroad	2015+
<b>2 – Highway 10 with Frontage Road</b>	Study Area 2C – Urban 4-lane with Shoulders Study Area 2E – Frontage Road with Trails	<ol style="list-style-type: none"> <li>1. Coordinate DL planning study outcomes with Mn/DOT ten year plan and program (i.e. preserve ability to add Offset Frontage Road to North).</li> <li>2. Refine conceptual roadway design and coordinate with other study projects (Areas 1, 3, 4, 5).</li> <li>3. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: Mn/DOT Others: City of Detroit Lakes, reviewing/permitting agencies	2015
<b>3 – Highway 59</b>	Study Area 3C – Frontage Road	<ol style="list-style-type: none"> <li>1. Develop concept plan for Highway 59 frontage road and further study with preliminary design process.</li> <li>2. Refine conceptual design by developing preliminary design alternatives.</li> <li>3. Secure funding.</li> <li>4. Complete design/environmental/permitting processes</li> </ol>	Lead: Mn/DOT Others: City of Detroit Lakes, reviewing/permitting agencies	2015
	Study Area 3D - Willow Street/ Highway 59 Intersection Improvements	<ol style="list-style-type: none"> <li>1. Complete safety study and choose preferred alternative.</li> <li>2. Implement long-term project (expected to be a roundabout) from safety study.</li> </ol>	Lead: Mn/DOT Others: City of Detroit Lakes	2014
	Study Area 3G – Holmes Street Connection with Highway 59 Frontage Road	<ol style="list-style-type: none"> <li>1. Refine concept design alternatives to connect Highway 10 frontage road with Holmes Street.</li> <li>2. Coordinate alternatives with Highway 10 design process (Study Area 2).</li> <li>3. Work with regulatory agencies to implement best management practices (BMPs).</li> <li>4. Secure funding.</li> <li>5. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: City of Detroit Lakes Others: Mn/DOT, reviewing/permitting agencies	2015
<b>4 – East Parkway</b>	Study Area 4B – Parkway	<ol style="list-style-type: none"> <li>1. Resolve Airport Layout Plan issues with FAA <ol style="list-style-type: none"> <li>a. Confirm runway extension displacement/threshold.</li> <li>b. Determine if a new roadway extension will be compatible with the ultimate location of a crosswind runway.</li> <li>c. Regulatory issues related to airport expansion (wetlands, WWTP maintenance, etc.)</li> </ol> </li> <li>2. Develop concept design alternatives and establish design standards; consider future Highway 10 access (coordinate with Study Area 1 preliminary design).</li> <li>3. Continue to develop BMPs with regulatory agencies.</li> <li>4. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: City of Detroit Lakes Others: Mn/DOT, Becker County, reviewing/permitting agencies	2011-2015
<b>5 – West Parkway</b>	Study Area 5B – Parkway	<ol style="list-style-type: none"> <li>1. Update comprehensive planning and annexation documents to include this roadway.</li> <li>2. Set design standards and complete conceptual roadway, trail, and intersection designs.</li> <li>3. Work with regulatory agencies to implement BMPs.</li> <li>4. Secure funding.</li> <li>5. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: City of Detroit Lakes Others: Becker County, Mn/DOT, reviewing/permitting agencies	Annexation and Development-driven (Likely 10+ years)
<b>6 - County Road 6</b>	Study Area 6C – Turn lanes and Trail	<ol style="list-style-type: none"> <li>1. Set design standards and complete conceptual roadway, trail, and intersection designs.</li> <li>2. Work with regulatory agencies to implement BMPs.</li> <li>3. Secure funding.</li> <li>4. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: Becker County Others: Mn/DOT, City of Detroit Lakes, Reviewing/permitting agencies	2015+
<b>7 – Washington Avenue &amp; Highway 34</b>	Study Area 7A – Signalized Intersection	<ol style="list-style-type: none"> <li>1. Complete safety study.</li> <li>2. Complete traffic signal design (** short term project already warranted **)</li> <li>3. Implement long-term project from safety study.</li> </ol>	Lead: City of Detroit Lakes Others: Mn/DOT	2015+
<b>8 - Highway 59 and County Road 22</b>	8 – Highway 59 and County 22 Study Area 8A, 8C/8D- Roundabout option	<ol style="list-style-type: none"> <li>1. Refine concept and prepare design for right turn lane safety improvement (** short term project **)</li> <li>2. Complete safety study.</li> <li>3. Implement long-term project from safety study.</li> </ol>	Lead: Becker County, Mn/DOT Others: Reviewing/Permitting Agencies	2015+

General planning level roadway improvement costs were developed for each improvement. It is important to consider the following when reviewing the project cost estimates. First, because it is difficult to identify a specific year that each project might be constructed, all estimated costs are presented in 2010 dollars. Second, since specific details regarding design, engineering, and construction are often not available, the estimated costs represent a very general planning level cost estimate and are provided in a range of potential costs verses a single cost. As projects proceed to the detailed planning and engineering phases, resulting in more accurate estimates, the project cost estimates contained in this transportation plan should be updated.

Study Recommended Construction Cost Estimates

Study Area	Alternative	Major Item	Quantity	Total Cost Range	
1 - Access North of Highway 10	Study Area 1C – Offset Frontage Road to North	Frontage Road	0.43	\$752,500	\$1,128,750
2 – Highway 10 with Frontage Road	Study Area 2C – Urban 4-lane with Shoulders	4-Lane Road	1.4	\$4,900,000	\$7,350,000
	Study Area 2E – Frontage Road with Trails	Frontage Road with Trails	1.4	\$2,800,000	\$4,200,000
3 – Highway 59	Study Area 3C – Frontage Road	Frontage Road	0.4	\$700,000	\$1,050,000
	Study Area 3D – Roundabout “Willow Street”	Roundabout	1	\$1,500,000	\$2,250,000
	Study Area 3G – Holmes Street Connection with Highway 59 Frontage Road	2-Lane Road & Bridge	0.4	\$3,050,000	\$4,575,000
4 – East Parkway <b>(No concept alignment available for development of a cost estimate at the time of this Study)</b>	Study Area 4B – Parkway	Parkway		\$0	\$0
5 – West Parkway	Study Area 5B – Parkway	Parkway	2.8	\$7,000,000	\$10,500,000
6 - County Road 6	Study Area 6C – Turn lanes and Trail	2-Lane Road	2.2	\$4,400,000	\$6,600,000
7 – Washington Avenue & Highway 34	Study Area 7A – Signalized Intersection	Signal	1	\$250,000	\$375,000
8 - Highway 59 and County Road 22	Study Area 8A – Separated Right Turn	Intersection Improvement	1	\$300,000	\$450,000
	Study Area 8C – Roundabout Option “CSAH 22”	Roundabout	1	\$1,500,000	\$2,250,000
	Study Area 8D – Signalized Intersection	Signal with turn lanes	1	\$750,000	\$1,125,000

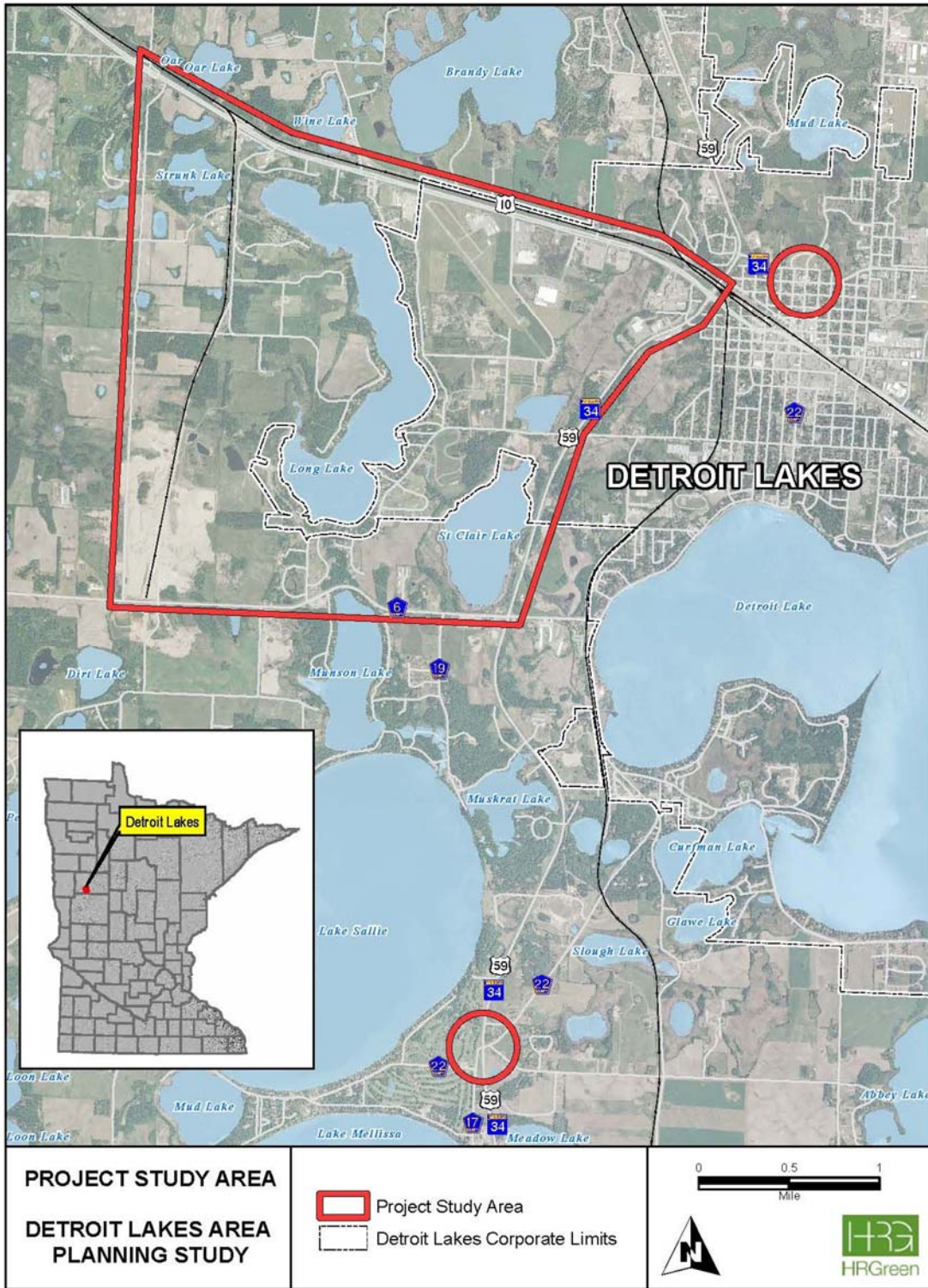
## 2.0 Study Background

### 2.1 *Development of a Problem Statement*

The City of Detroit Lakes is a growing community in Becker County, Minnesota. West-centrally located in Becker County, Detroit Lakes is situated around three major State Trunk Highways, including Highways 10, 59, and 34. Detroit Lakes is a recreational destination with more than 400 lakes within 25 miles. Several large festivals take place in the community, the largest of which is WeFest, which attracts over 50,000 people to the community in a three-day period. Detroit Lakes is the county seat of Becker County and as a regional center serving local and recreational traffic demands, more than 16,000 vehicles a day travel through Detroit Lakes on Highway 10. In addition, 40-45 freight trains per day pass through the community on the BNSF Railroad. With a growing commercial and residential area developing west of Highway 59, the possible expansion of the airport and increased traffic needing improved access to the growth areas, and desire for better linkages for all modes of ground travel between the established and growing areas of the community, it became apparent to State and local transportation providers that a coordinated transportation system study would be needed to identify State, County, and City transportation system needs and potential solutions for further development. In addition, the recent completion of Highway 10 through the majority of the community represents a substantial safety, mobility, capacity, and economic development investment that the transportation agencies agreed needs to be preserved, protected – and complemented - over time. Therefore, the Minnesota Department of Transportation, the City of Detroit Lakes, and Becker County agreed to begin a comprehensive look at potential solutions to area transportation issues in summer 2009. The focus of the study was on the area immediately surrounding the Detroit Lakes Municipal Airport, Long Lake, Highway 10 (west of Highway 59), and isolated specific intersections in the community and adjacent to the larger study area in Becker County. The general study area is illustrated in *Exhibit 1*.

Recommendations for access management, circulation and safety improvements, and mobility enhancements for all travel modes are emerging as concerns in the study area. Alternative solutions were also determined to be needed to assess circulation system deficiencies. The Study Partners also sought implementation guidance to integrate projects with an activity schedule with lead jurisdictions to champion solutions toward design and construction projects with coordination agencies. Mn/DOT led the transportation study in partnership with the City of Detroit Lakes and Becker County. HR Green Company was hired to facilitate the study for the study partners. The study began in late fall 2009 and was completed in spring 2011.

### Exhibit 1 Project Study Area



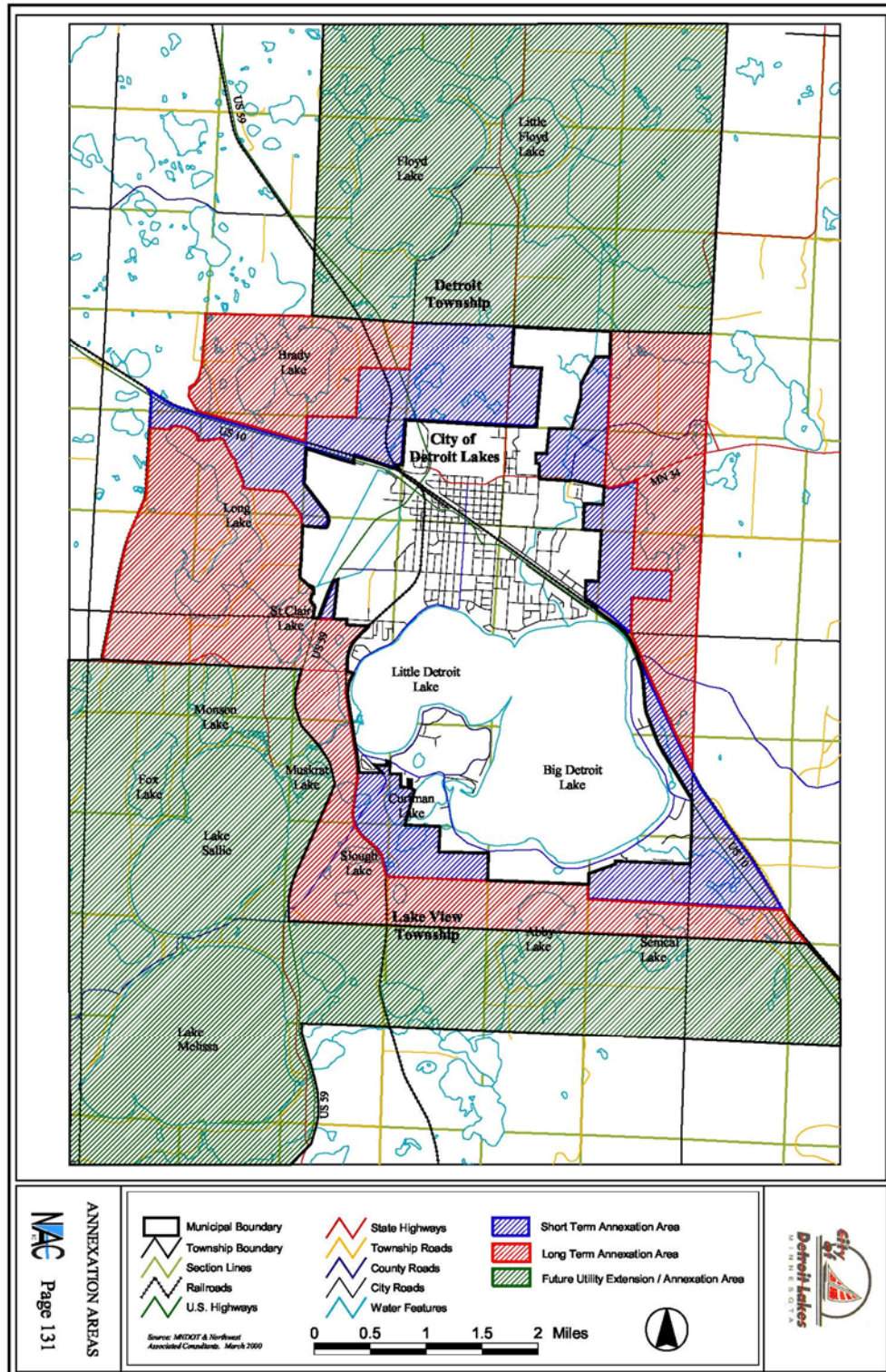
## **2.2 Community Growth and Development**

According to the Detroit Lakes Comprehensive Plan, residential and commercial growth is projected to occur south and west of the current city limits, in particular the area around the Detroit Lakes Airport, Long Lake, and St. Clair Lake, to the west of Highway 59, north of County State Aid Highway 6, and south of Highway 10. Much of this land is currently developed within Becker County (Detroit and Lakeview Townships) but is expected to infill and develop in a more compact form, especially to the west and southwest of Long Lake. This will lead to greater land use densification and more residential development, placing greater demands on existing local roadways. Short and long-term annexation will occur in this area, according to the Detroit Lakes Comprehensive Plan, over the next 10-20 years, particularly as demands for city utilities are expected to increase due to environmental considerations or private utility maintenance costs.

The local roadway system will need to provide for the planned growth by anticipating capacity, safety, and continuity/connectivity needs. A future collector roadway planned west of Long Lake, for instance, will need to integrate with other local and regional roadway system improvements to identify additional needs or future deficiencies in the area and plan for orderly growth and development.

Exhibit 2 illustrates the City of Detroit Lakes' planned growth and annexation areas within the project study limits.

## Exhibit 2 – Land Use Plan and Annexation Exhibit





### 3.0 Study Organization

The project was organized to include working committees comprised of the project partners, regulatory agencies, and local stakeholders including businesses and institutions, as well as members of the general public. A Technical Advisory Committee (TAC), a Steering Committee, groups of stakeholders including businesses and permitting agencies, and the general public were engaged in a multilevel process at assigned frequencies of participation during the study. These committees formed the basis of the main operating committees of the study.

#### 3.1. *Technical Advisory Committee*

The TAC was comprised of administrative, planning and/or engineering staff from Mn/DOT, the City of Detroit Lakes, and Becker County. The TAC met monthly to discuss the tasks of the project and guide the development of study area alternatives and recommendations.

#### 3.2. *Steering Committee*

The Steering Committee met approximately quarterly and was comprised of staff from local and state regulatory agencies with interests pertaining to future transportation system plans within the study area. This group provided feedback and suggestions for improvements to the recommendations of the TAC. Members invited to participate on the Steering Committee included the following individuals:

Agency or Jurisdiction (*Invited Participants*)

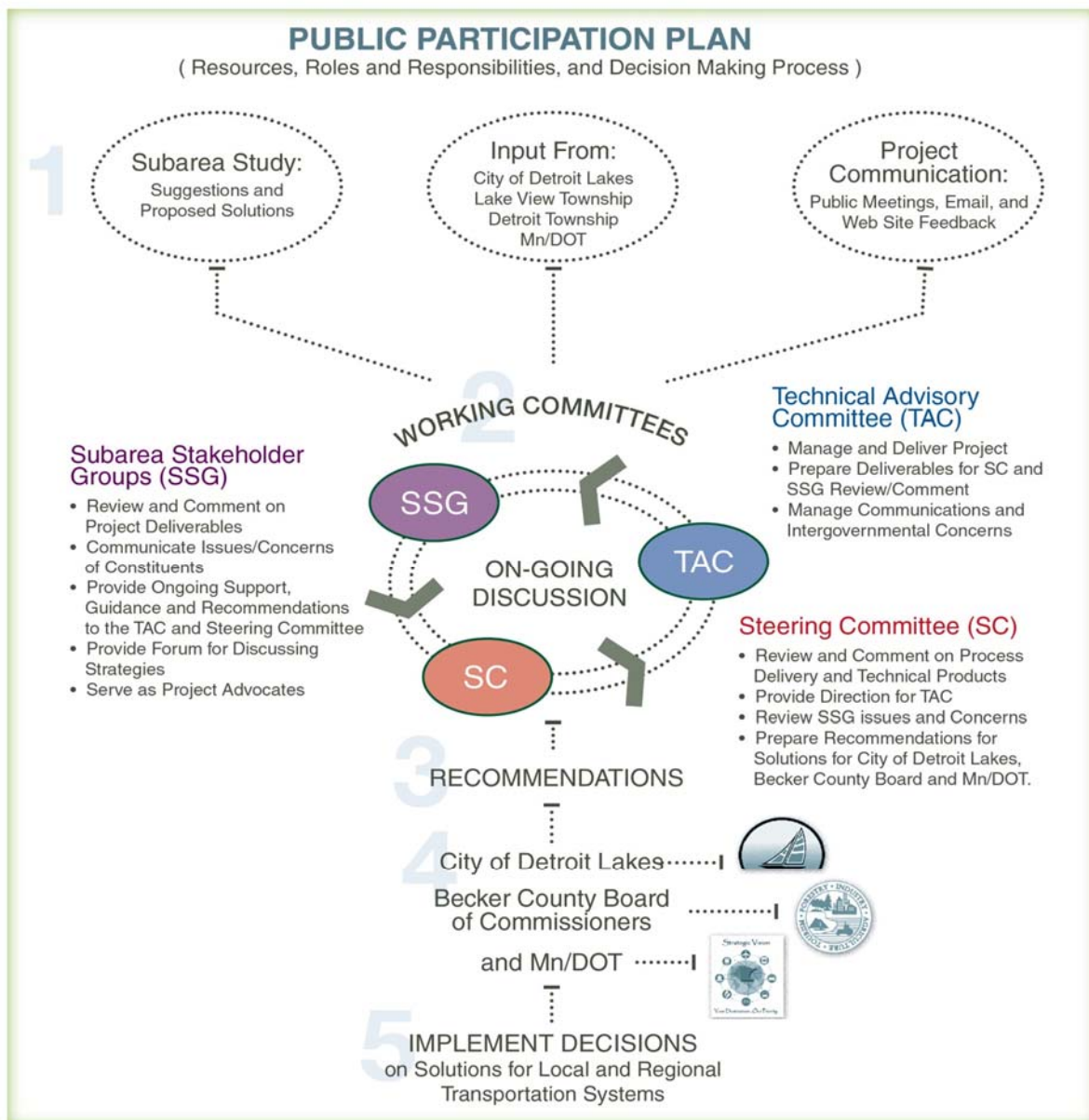
- Mn/DOT (*Shiloh Wahl, Jody Martinson, Dana Hanson*)
- City of Detroit Lakes (*Lee Kessler, Leonard Heltemes*)
- Becker County Commission, Lakeview Township and Detroit Township (*John Bellefeuille, Rusty Haskins, John Okeson, and Eugene Pavelko*)
- Becker County Soil and Water Conservation Commission (*Brad Grant, Ed Clem*)
- Detroit Lakes Airport Commission (*Mark Hagen, Howard Hansen*)
- Pelican River Watershed District (*Tera Guetter*)
- Minnesota Department of Natural Resources (*Dave Barsness, Bob Merritt*)
- Minnesota Pollution Control Agency (*Tim James*)
- West Central Initiative (*Wayne Hurley*)

#### 3.3. *Other Stakeholders*

Meetings with affected businesses, individuals, and regulatory staff were held during the study. Three public meetings were also held during the study to engage the public. A project website was hosted by Mn/DOT and periodically updated with a project study area survey, study information, and opportunities to submit questions and comments.

Members of the project committees and a record of stakeholder involvement activities are available from the District 4 office of the Minnesota Department of Transportation. File records include working committee meeting minutes, public meeting comments, website comments, and electronic and print media news articles. These file records are included on compact disc in Appendix B. The project's working structure and public engagement process is illustrated in *Exhibit 3*.

### Exhibit 3 Public Participation Plan



## **4.0 Study Process**

### **4.1 Development of a Problem Statement**

The development of a comprehensive problem statement for the areas to be studied was approached by engaging the study committees, stakeholders, and members of the public through an outreach exercise involving an open house. The problem statement has two primary purposes:

- 1) To help agency long-range transportation planners and engineers systematically document decision-making data used to complete a long-range transportation planning study; and,
- 2) To help choose the level of detail and the data needed to support the foundation for the development of “Purpose and Need” documentation when projects are programmed and move to preliminary design and environmental analysis.

A great deal of work that occurred during the planning study can be used to support the Purpose and Need for individual projects. With consistent documentation and format, this important information will be more easily and completely carried from long-range planning to individual projects to increase awareness and decrease “redo” during project design. The development of a comprehensive problem statement was initiated by identifying issues and concerns in the study area that corresponded to three unique community-based perspectives:

#### ***Technical***

The Technical part of the problem statement focuses on solutions that meet established design standards or guidelines, and add safety, capacity, or mobility improvements to a proposed solution. An example would be designing a typical section of roadway according to its capacity to accommodate forecasted traffic and surrounding future land uses.

#### ***Regulatory***

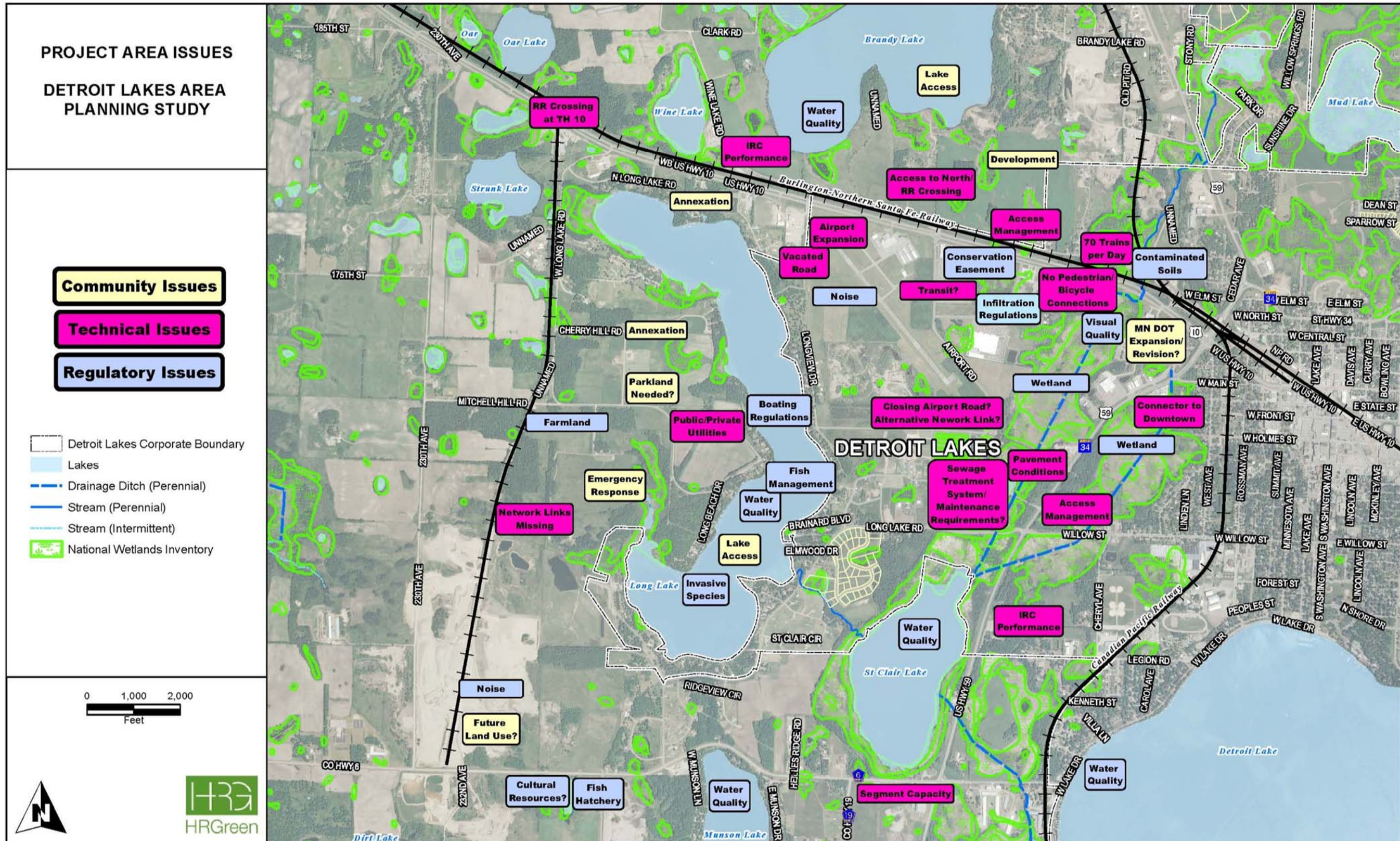
The Regulatory part of the problem statement focuses on the external agency reviews, permits, and approvals that are required to uphold local, state, and federal laws and regulations that may be affected by the proposed roadway. An example would be a permitting agency reviewing wetland impacts associated with a proposed roadway and requesting that avoidance alternatives be examined in addition to the alternative that solves a technical problem.

#### ***Community***

The Community part of the problem statement pertains to the effects of a roadway solution on residents, commuters, and commercial /freight operators. An example would be how well the roadway functions to deliver users to its destination, and how compatible it is for activities within neighborhoods, both residential and commercial, that it passes through.

Exhibit 4 illustrates a summary of the issues and concerns gathered according to type of concern, e.g. technical, regulatory, or community.

### Exhibit 4 Issues and Concerns



## 4.2 Development of Study Goals and Objectives

The Detroit Lakes Transportation Planning Study process and implementation outcomes were founded on the “smart growth” partnership goals adopted by the US Department of Transportation, Environmental Protection Agency, and Department of Housing and Urban Development. On June 16, 2009, EPA joined with the U.S. Department of Housing and Urban Development (HUD) and the U. S. Department of Transportation (DOT) to help improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide. Through a set of guiding livability principles and a partnership agreement that will guide the agencies' efforts, this partnership will coordinate federal housing, transportation, and other infrastructure investments to protect the environment, promote equitable development, and help to address the challenges of climate change.

### HUD, EPA, and US DOT Partnership Agreement Principles

- **Enhance integrated planning and investment.** The partnership will seek to integrate housing, transportation, water infrastructure, and land use planning and investment. HUD, EPA, and DOT propose to make planning grants available to metropolitan areas and create mechanisms to ensure those plans are carried through to localities.
- **Provide a vision for sustainable growth.** This effort will help communities set a vision for sustainable growth and apply federal transportation, water infrastructure, housing, and other investments in an integrated approach that reduces the nation's dependence on foreign oil, reduces greenhouse gas emissions, protects America's air and water, and improves quality of life. Coordinating planning efforts in housing, transportation, air quality, and water—including planning cycles, processes, and geographic coverage—will make more effective use of federal housing and transportation dollars.
- **Redefine housing affordability and make it transparent.** The partnership will develop federal housing affordability measures that include housing and transportation costs and other expenses that are affected by location choices. Although transportation costs now approach or exceed housing costs for many working families, federal definitions of housing affordability do not recognize the strain of soaring transportation costs on homeowners and renters who live in areas isolated from work opportunities and transportation choices. The partnership will redefine affordability to reflect those costs, improve the consideration of the cost of utilities, and provide consumers with enhanced information to help them make housing decisions.
- **Redevelop underutilized sites.** The partnership will work to achieve critical environmental justice goals and other environmental goals by targeting development to locations that already have infrastructure and offer transportation choices. Environmental justice is a particular concern in areas where disinvestment and past industrial use caused pollution and a legacy of contaminated or abandoned sites. This partnership will help return such sites to productive use.
- **Develop livability measures and tools.** The partnership will research, evaluate, and recommend measures that indicate the livability of communities, neighborhoods, and metropolitan areas. These measures could be adopted in subsequent integrated planning efforts to benchmark existing conditions, measure progress toward achieving community visions, and increase accountability. HUD, DOT, and EPA will help communities attain livability goals by developing and providing analytical tools to evaluate progress, as well as state and local technical assistance programs to remove barriers to coordinated housing, transportation, and environmental protection investments. The partnership will develop incentives to encourage communities to implement, use, and publicize the measures.
- **Align HUD, DOT, and EPA programs.** HUD, DOT, and EPA will work to assure that their programs maximize the benefits of their combined investments in our communities for livability, affordability, environmental excellence, and the promotion of green jobs of the future. HUD and DOT will work together to identify opportunities to better coordinate their programs and encourage location efficiency in housing and transportation choices. HUD, DOT, and EPA will also share information and review processes to facilitate better-informed decisions and coordinate investments.
- **Undertake joint research, data collection, and outreach.** HUD, DOT, and EPA will engage in joint research, data collection, and outreach efforts with stakeholders to develop information platforms and analytic tools to track housing and transportation options and expenditures, establish standardized and efficient performance measures, and identify best practices.

## Detroit Lakes Study Goals

**Goal 1: Provide more transportation choices.** *Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - Promote safe access for all ages and abilities.
  - Provide adequate mobility along and across travel corridors (highways, streets, sidewalks, trails)
  - Determine multimodal transportation system needs in the transportation planning area and affected populations by mode.
  - Provide opportunities to link multi-modal transportation system users and needs with future transportation system implementation plans.
  - Develop opportunities for new trails along planned roadways and connections between existing and future trails.

**Goal 2: Promote equitable, affordable housing.** *Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - Compare long range housing and land use plans with future transportation system linkages to determine where mobility could or should be increased and greater efficiencies between planned residential and transportation systems could be attained.
  - Identify locations where more efficient means of mobility could or should be provided. For example, higher density residential areas in some cases could be efficiently served with more bicycle, pedestrian, and transit facilities than lower density residential developments.

**Goal 3: Enhance economic competitiveness.** *Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - Plan the future roadway system to improve connections between trade and employment centers along TH 10 and US 59/CSAH 34.
  - Provide for additional land development opportunities by developing future roadway access for underserved or land-locked parcels.
  - Complement the recommendations of the Detroit Lakes Comprehensive Plan and efforts of area business development groups in targeting roadway improvements to areas that would otherwise not be developable due to inadequate property access.
  - Accommodate suburban economic with downtown economic development opportunities.

**Goal 4: Support existing communities.** *Target federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - Provide roadway and multimodal facility plans that complement existing plans for land use and development, and existing and future annexation activities.
  - Discourage roadway and multimodal facility plans that promote sprawling development and inefficient connections of utilities and higher than average costs to provide services and maintain infrastructure.

**Goal 5: Coordinate and leverage federal policies and investment.** *Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - FAA, water quality, and county housing authority (HUD) – how are they synergistic
  - Avoid wetlands, encourage biodiversity, discourage invasive species.
  - Develop transportation system plans that are a product of an ongoing collaborative effort between Federal, State, and Local agencies that have mutual interests in the study areas.
  - As transportation system concepts are explored, study methods to solve mutual problems between agencies and respond with solutions that provide opportunities and benefits for affected stakeholders. For example, it may be possible to construct transportation facilities that will provide benefits to improve water quality of area lakes.

**Goal 6: Value communities and neighborhoods.** *Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.*

- **Objectives for the Detroit Lakes Transportation Planning Study:**
  - Quality of life and livability – follow new Mn/DOT initiatives for Context Sensitive Solutions and Return on Investment Strategies.
  - Outside of the developed, compact urbanized areas of Detroit Lakes, encourage the development and connection of trails for bicyclists and pedestrians, especially where gathering areas such as community facilities, parks, etc. will serve as focal points.
  - Improve bicycle and pedestrian facility connectivity between developing and developed areas of the community.
  - With area residents and property owners, develop solutions that address the appropriate facilities for the types of needs of area residents and tourists. (i.e. sidewalks, trails, wide shoulders, and safety features at specified crossings).

### 4.3 Measures of Effectiveness

Using the Goals and Objectives, Measures of Effectiveness were developed to apply to the development of project alternatives. The measures of effectiveness were used to articulate the performance of study area alternatives by assessing whether or not the alternative has a clear, potentially beneficial, or little to no benefit for the alternative to achieve the project's goals and objectives. Exhibit 5 illustrates the measures of effectiveness that were developed to measure the performance of each project alternative.

**Exhibit 5: Measures of Effectiveness Applied to Goals and Objectives**

Alternative & Description	How Well Does the Alternative...	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
	<p>Measures Of Effectiveness</p> <p>(+) Clearly Beneficial</p> <p>(0) Potential to be Beneficial</p> <p>(-) Little or No Potential To Be Beneficial</p>	<p>Integrate Modes?</p> <p>Link Users of different modes?</p> <p>Create new pedestrian/bicycle facilities or future opportunities?</p>	<p>Show a positive relationship to housing plans?</p> <p>Increase mobility to planned residential areas?</p>	<p>Improve connections between trade and employment centers?</p> <p>Appropriately open new land development opportunities (i.e. plan guided)?</p> <p>Conform to local plans and economic development priorities?</p>	<p>Support local redevelopment planning?</p> <p>Improve opportunities for more orderly development and growth?</p>	<p>Complement other federally-funded initiatives planned for or already occurring in the study area?</p> <p>Minimize disproportionate impacts to the natural or social environments?</p> <p>Help solve mutual problems for multiple</p>	<p>Improve the connection of community facilities?</p> <p>Improve bicycle and pedestrian facility connectivity (existing and new?)</p> <p>Address the needs of area residents and tourists with “complete streets”?</p>



## 5.0 Transportation System Analysis

### 5.1 Traffic Studies

Traffic studies were prepared for the planning study and included collection of updated traffic counts to obtain volumes at designated locations, intersection traffic capacity analyses, and access management review, and a safety assessment. Highways 10 and 59 within the study area are undergoing a transition from rural to urban highways. Development of adjacent properties has led to an increased demand for access.

#### 5.1.1 Traffic Data Collection

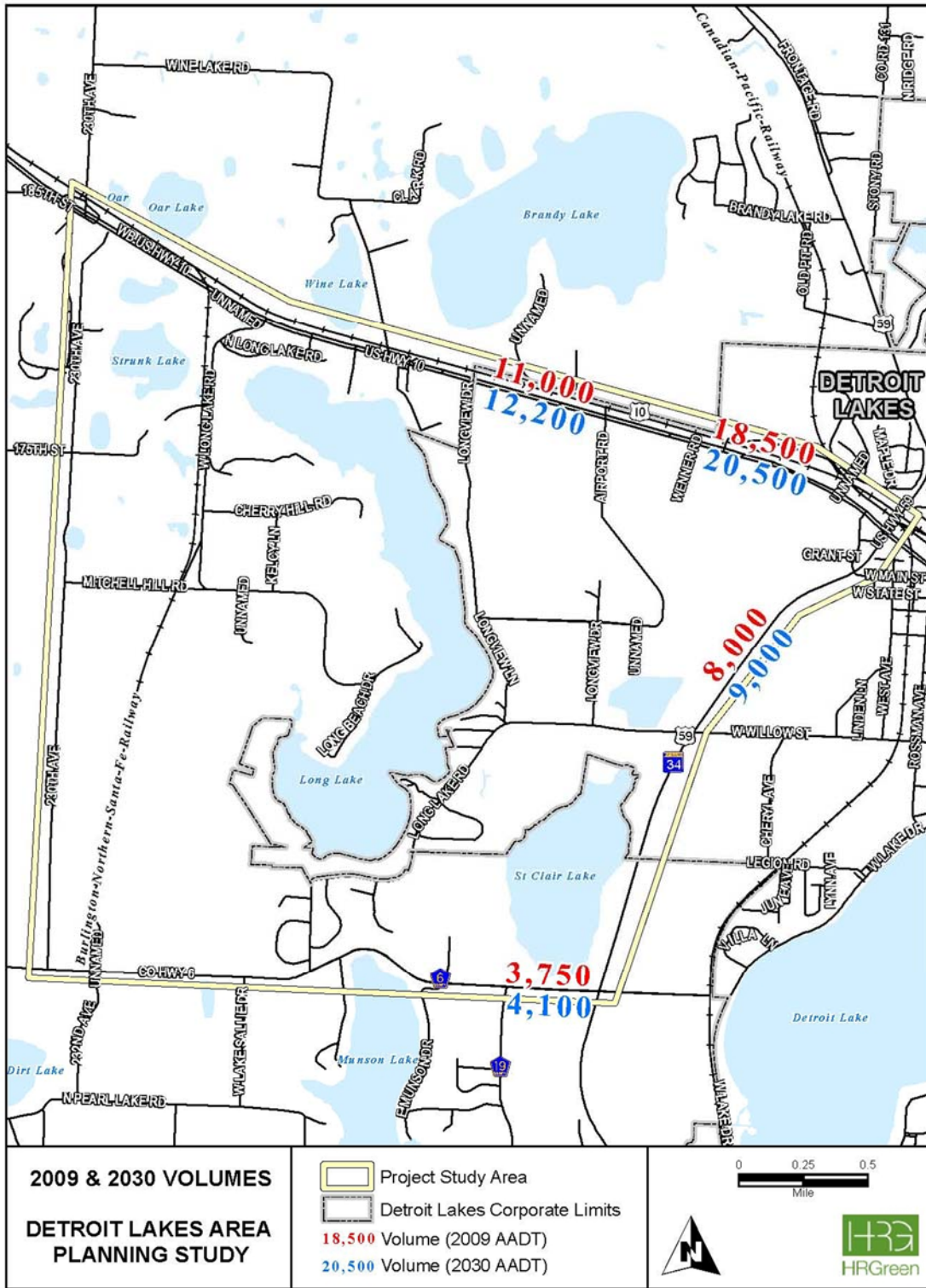
A traffic data collection effort was undertaken to obtain current traffic volumes at designated locations. Traffic counts were obtained by two methods: 48-hour road tube counts and peak hour intersection turning movement counts. Traffic counts were obtained during the month of November 2009 and updated in June and July, 2010, to account for seasonal variations. At eight locations, 48 hour counts were taken. This data was then adjusted to represent the Average Annual Daily Traffic (AADT) at these locations. Intersection turning movement counts were taken at 16 locations. For most intersections, turning movement counts were taken during the morning, midday and evening peak traffic periods. A detailed summary of field traffic count data can be found in the *Detroit Lakes Transportation Planning Study - Traffic Analysis Technical Memorandum* in Appendix B. Table 1 includes a summary of 2009 AADT volumes for the roads where counts were taken.

**Table 1 - 48-Hour Count Locations**

STREET	LOCATION	2009 ADT	2009 AADT	2010 ADT	2010 AADT	ADT % Change
Airport Road	South of US10 & Frontage Rd	1840	2230	4240	3640	130.4
W. Long Lake Road	West of US10 & Frontage Rd	290	360	580	500	100
230 Avenue	South of US10 & Frontage Rd	90	110	140	120	55.6
230 Avenue	North of Becker CSAH 6	100	120	160	120	60.0
West Lake Sallie Drive	South of Becker CSAH	1060	1290			
Long Lake Road	North of Becker CSAH 6	560	680	1130	860	101.8
Becker CSAH 6	West of MN59 & C-Store	3570	4310	4770	3630	33.6
Long Lake Road	West of MN59 & Willow St	1750	2120	3460	2980	97.7
Long View Drive	N. of Long Lake			2360	1790	

To evaluate traffic operations for the area in the future, forecasted volumes for the year 2030 were calculated. To determine the forecasted 2030 volumes, an annual 0.5% growth rate was applied to the 2009 volumes. In addition, growth in local trips resulting from the partial build out of the area bounded by US 59 on the east, US 10 on the north, Co. Hwy. 6 on the south and 230<sup>th</sup> Avenue on the west was forecasted based on the ITE Trip Generation Manual. Forecasted 2030 Average Annual Daily Traffic (AADT) volumes for the road segments in the area are shown in Exhibit 6 with Mn/DOT 2009 AADT volumes.

Exhibit 6 - 2009 and 2030 Volumes



### Existing Capacity Analysis - Road/Streets

For each road segment, a volume to capacity ratio (v/c) was calculated (Table 2). The v/c ratio is a comparison between the road's traffic volume (existing or future) and its total traffic capacity. A v/c equal to 1.0 or greater indicates that the demand volume is exceeding the available capacity of the roadway and forced flow conditions will inevitably result; this is Level of Service (LOS) F operation. The other categories vary slightly depending on the particular methodology from the Highway Capacity Manual that is being employed, but in general the following v/c ratios and their corresponding LOS are as follows:

- (1)  $v/c < 0.65$  = LOS A, B, C (Not Congested)
- (2)  $0.65 < v/c < 0.85$  = LOS D (Marginal Congestion)
- (3)  $0.85 < v/c < 1.00$  = LOS E (Moderate Congestion)
- (4)  $v/c > 1.00$  = LOS F (Serious Congestion)

**Table 2 - 2009 Level of Service Criteria for 48-Hour Count Locations**

STREET	LOCATION	VOLUME (2009 AADT)	CAPACITY	V/C RATIO	LOS
Airport Road	South of US Highway 10 & Frontage Rd	4000	10000	0.40	B
W. Long Lake Road	West of & US Highway 10 & Frontage Rd	600	10000	0.06	A
230th Avenue	South of US Highway 10 & Frontage Rd	200	10000	0.02	A
230th Avenue	North of Becker CSAH 6	200	10000	0.02	A
West Lake Sallie Drive	South of Becker CSAH 6	2300	10000	0.23	A
Long Lake Road	North of Becker CSAH 6	1200	10000	0.12	A
Becker CSAH 6	West of US Highway 59 & C-Store	4310	10000	0.43	C
Long Lake Road	West of US Highway 59 & Willow St	3800	10000	0.38	B
US Highway 10	West of Airport Road	11000	52700	0.21	A
US Highway 10	East of Airport Road	18500	52700	0.35	A
US Highway 59	North of Willow	8000	15900	0.50	B

Table 2 indicates capacity on most roads is adequate when considering AADT. Operations are generally good, however the highest traffic was found on CSAH 6 west of Highway 59 where the level of service determination was C.

**Table 3 - 2030 Level of Service Criteria for 48-Hour Count Locations**

STREET	LOCATION	VOLUME (2030 AADT)	CAPACITY	V/C RATIO	LOS
Airport Road	South of US Highway 10 & Frontage Rd	4500	10000	0.45	B
W. Long Lake Road	West of & US Highway 10 & Frontage Rd	670	10000	0.07	A
230th Avenue	South of US Highway 10 & Frontage Rd	220	10000	0.02	A
230th Avenue	North of Becker CSAH 6	220	10000	0.02	A
West Lake Sallie Drive	South of Becker CSAH 6	2500	10000	0.25	A
Long Lake Road	North of Becker CSAH 6	1350	10000	0.14	A
Becker CSAH 6	West of US Highway 59 & C-Store	4800	10000	0.48	C
Long Lake Road	West of US Highway 59 & Willow St	4200	10000	0.42	B
US Highway 10	West of Airport Road	12200	52700	0.23	A
US Highway 10	East of Airport Road	20500	52700	0.39	A
US Highway 59	North of Willow	9000	15900	0.57	A

*Intersections*

As with the road segments, intersections where traffic counts were obtained were evaluated in terms of level of service (LOS). An intersection's LOS is determined from the average delay to a vehicle that travels through the intersection during the peak traffic hour. Level of Service is defined between LOS A being most favorable and LOS F being least favorable. Typically the minimum accepted intersection LOS for design in urban areas is LOS D.

Overall, each study intersection demonstrated favorable operating conditions, defined as LOS C or better. (See the referenced *Traffic Analysis Technical Memorandum* for a detailed summary of intersection capacity, located in Appendix B.

When considering individual turning movements, there are a few movements that are experiencing unfavorable delays in the study area. These locations are the following non-signalized intersections:

- Highway 10 at & Frontage Road (Wal-Mart): Northbound left is operating at LOS D (Midday and PM Peak)
- Highway 10 at K-Mart: Northbound left is operating at LOS D (PM peak only)
- Highway 10 at Morrow: Northbound left is operating at LOS D (PM peak only)
- Highway 34 at Washington: Northbound and southbound (AM and PM periods) movements are operating at LOS D or greater (AM, Midday and PM periods)

### **5.1.2 Access Management Review**

Mn/DOT has created comprehensive access management guidelines to be applied to trunk highways (state-owned routes) within the state. The goal of the access management guidelines is to protect the performance and safety of Minnesota's key transportation corridors both now and in future years. Within the study area, Highways 10 and 59 are of concern in this regard. To apply the Mn/DOT access management guidelines, it is first necessary to determine how a trunk highway has been classified in terms of Category and Sub-Categories. Table 4 below lists the access categories from the Mn/DOT Access Management Manual.

**Table 4 - Mn/DOT Access Management Manual Access Categories**

Category	Land-Use or Facility Type	Typical Functional Classification	Typical Posted Speed
<b>1 -High-Priority Interregional Corridors (IRCs)</b>			
1F	Interstate Freeway	Interstate Highways	55 – 75 mph
1AF	Non-Interstate Freeway	Principal Arterials	55 – 65 mph
1A	Rural	Principal Arterials	55 – 65 mph
1B	Urban / Urbanizing	Principal Arterials	40 – 55 mph
1C	Urban Core	Principal Arterials	30 – 40 mph
<b>2 -Medium-Priority Interregional Corridors</b>			
2AF	Non-Interstate Freeway	Principal Arterials	55 – 65 mph
2A	Rural	Principal Arterials	55 – 65 mph
2B	Urban / Urbanizing	Principal Arterials	40 – 55 mph
2C	Urban Core	Principal Arterials	30 – 40 mph
<b>3 - Regional Corridors</b>			
3AF	Non-Interstate Freeway	Principal Arterials	55 – 65 mph
3A	Rural	Principal/Minor Arterials	45 – 65 mph
3B	Urban / Urbanizing	Principal /Minor Arterials	40 – 45 mph
3C	Urban Core	Principal/Minor Arterials	30 – 40 mph
<b>4 - Principal Arterials in the Twin Cities Metropolitan Area and Primary Regional Trade Centers (Non-IRCs)</b>			
4AF	Non-Interstate Freeway	Principal Arterials	55 – 65 mph
4A	Rural	Principal Arterials	45 – 55 mph
4B	Urban / Urbanizing	Principal Arterials	40 – 45 mph
4C	Urban Core	Principal Arterials	30 – 40 mph
<b>5 -Minor Arterials</b>			
5A	Rural	Minor Arterials	45 – 55 mph
5B	Urban / Urbanizing	Minor Arterials	40 – 45 mph
5C	Urban Core	Minor Arterials	30 – 40 mph
<b>6 - Collectors</b>			
6A	Rural	Collectors	45 – 55 mph
6B	Urban / Urbanizing	Collectors	40 – 45 mph
6C	Urban Core	Collectors	30 – 40 mph
<b>7 - Specific Area Access Management Plans</b>			
7	All	All	All

### Highway 10

Highway 10 has been classified as a Category 2 Medium-Priority Interregional Corridor. These corridors connect Secondary Regional Trade Centers to Primary Regional Trade Centers. According to the *Interregional Corridor System Plan*, these are significant corridors that provide both interstate and intrastate travel. Performance measures are based on an average *corridor* peak-hour travel speed of 55 mph. Highways within this access category are functionally classified as Principal Arterials, and access management along these corridors emphasizes mobility.

## *Highway 59*

Highway 59 has been classified as a Category 3 High Priority Regional Corridor. This Category is intended for Regional Corridors, which connect smaller regional trade centers to the rest of the state. Although their primary function is to provide mobility among communities, Regional Corridors may also provide direct property access in areas where a supporting local road network or hierarchical grid pattern has not been established. Regional Corridors are expected to operate at an average *corridor* peak-hour travel speed of 50 mph; however, posted speeds may vary as the highway passes through a community. For this reason, access management practices along these highways may vary greatly. Regional Corridors may be functionally classified as either Principal or Minor Arterials.

### Subcategories

The segments of Highways 10 and 59 in the study area corridor have been assigned three of five sub-categories according to Mn/DOT's Access Management Manual sub-category plan. These sub-categories recognize that access needs may change as a highway passes through or around a community. As with the primary category assignment, the sub-category assignment is intended to reflect the future or long-term function of the roadway over a 20-year planning horizon, not the existing condition.

#### *Subcategory A – Rural*

The segments of Highways 10 and 59 approaching the study area are classified as *rural*. This sub-category is intended for trunk highway segments that extend through agricultural, open, or forested areas with limited development. It is also assigned to areas planned for long-term, low-density development, characterized by scattered, large-lot residential development and limited commercial or industrial use.

#### *Subcategory B – Urban/Urbanizing*

The segments of Highways 10 and 59 transitioning between the urban core and rural subcategories are classified as *urban/urbanizing*. This sub-category is intended for areas outside the urban core that are either urbanized or planned for urbanization over the next 20 years with a full range of urban services, especially a local supporting street network.

#### *Subcategory C – Urban Core*

The intersection of Highways 10 and 59 are near the downtown area of Detroit Lakes. This intersection has been classified as an urban core area. This sub-category is intended for highway segments extending through fully-developed town centers and central business districts.

## Primary and Secondary Intersection Spacing

For each Primary Category and Sub-Category, Mn/DOT's access management guidelines dictate the minimum spacing of public street connections and the allowance of driveways onto the state trunk highway system. In general, this spacing is dictated by the need to provide adequate spacing of signals to obtain progressive traffic flow as well as the need to provide adequate spacing for left-turn lanes on unsignalized highways.

Primary intersection allowance is shown below in Table 5. It refers to a full-movement intersection that may be considered for signalization if the appropriate signal warrants have been met. Secondary intersection spacing and allowance is also summarized in Table 5. It refers to intersections that may be accommodated midway between primary intersections if they do not create a high-risk conflict condition. A high risk intersection is defined as one that does not create a potential risk to safety and mobility through the gap analysis procedure.

**Table 5 - Recommended Street Spacing**

Highway	Category	Facility Type	Public Street Spacing	
			Primary	Secondary
US-10	2A	Rural	1 Mile	½ Mile
US-10	2B	Urban/Urbanizing	½ Mile	¼ Mile
US-59	3B	Urban/Urbanizing	½ Mile	¼ Mile

### Highway 10

On Highway 10, between its intersection with Highway 59 to Airport Road, there are six existing at-grade crossovers. Several of these intersections are spaced in closer proximity than recommended by the guidelines in Table 2. Included among these is the intersection of Highway 10 with Morrow Avenue (Perkins), which is located approximately 600 feet from Highway 59. Also, two other crossover intersections within this segment of Highway 10 have a spacing of less than 1,000 feet to the nearest adjacent intersection.

Figure 1 and Figure 2 show the existing intersections along TH 10 and identify non-compliant intersections on the top of the page and proposed modifications to the existing intersections on the bottom. Figure 1 covers the area from West Long Lake Road to the airport, and it shows four non-compliant intersections. However, only the intersection near the airport is proposed to be modified. Although the intersections of West Long Lake Road, North Long Lake Road and Long Lake Lane do not meet Mn/DOT access management guidelines, they are without other mobility or access alternatives since they are cut off topographically by Long Lake. They are also have low traffic volumes with residential land use, so there is limited exposure to crossing traffic and crashes will likely remain very low. Constructing frontage roads would be costly due to the topography and would not yield a high return on investment since there is not a



crash problem. Finally, the traffic volumes are not anticipated to grow in the future and there is currently no plan for redevelopment that would generate more traffic in this area. Therefore, it was recommended that the access points remain in place even if they do not meet Mn/DOT access management guidelines.

Figure 2 covers the area of TH 10 from the airport to TH 59. The access categories transition from rural to urban at Airport Road so minor access is allowed every  $\frac{1}{4}$  mile instead of  $\frac{1}{2}$  mile for rural roads. The recommendations for this section of roadway include access consolidation and closures. The access west of Wenner Road is recommended to be closed since traffic volumes are high, there is little room for queue storage and frontage roads exist for traffic to use for access to the nearest intersection.

### Highway 59

Overall driveway and side road spacing is adequate, however some exceptions exist. Immediately south of Highway 10, the Morrow Avenue/Main Street intersection is located about 1,000 feet south of Highway 10. South of Morrow Avenue/Main Street, two additional intersections have been provided within 1,000 feet of the Morrow Avenue/Main Street intersection. Existing access points and modifications to existing access is shown for TH 59 on Figures 3 and 4. The water treatment plant access does not meet spacing guidelines, but it will remain open since very little traffic accesses the site.

Figure 1: TH 10 Access Management Plan - West Segment

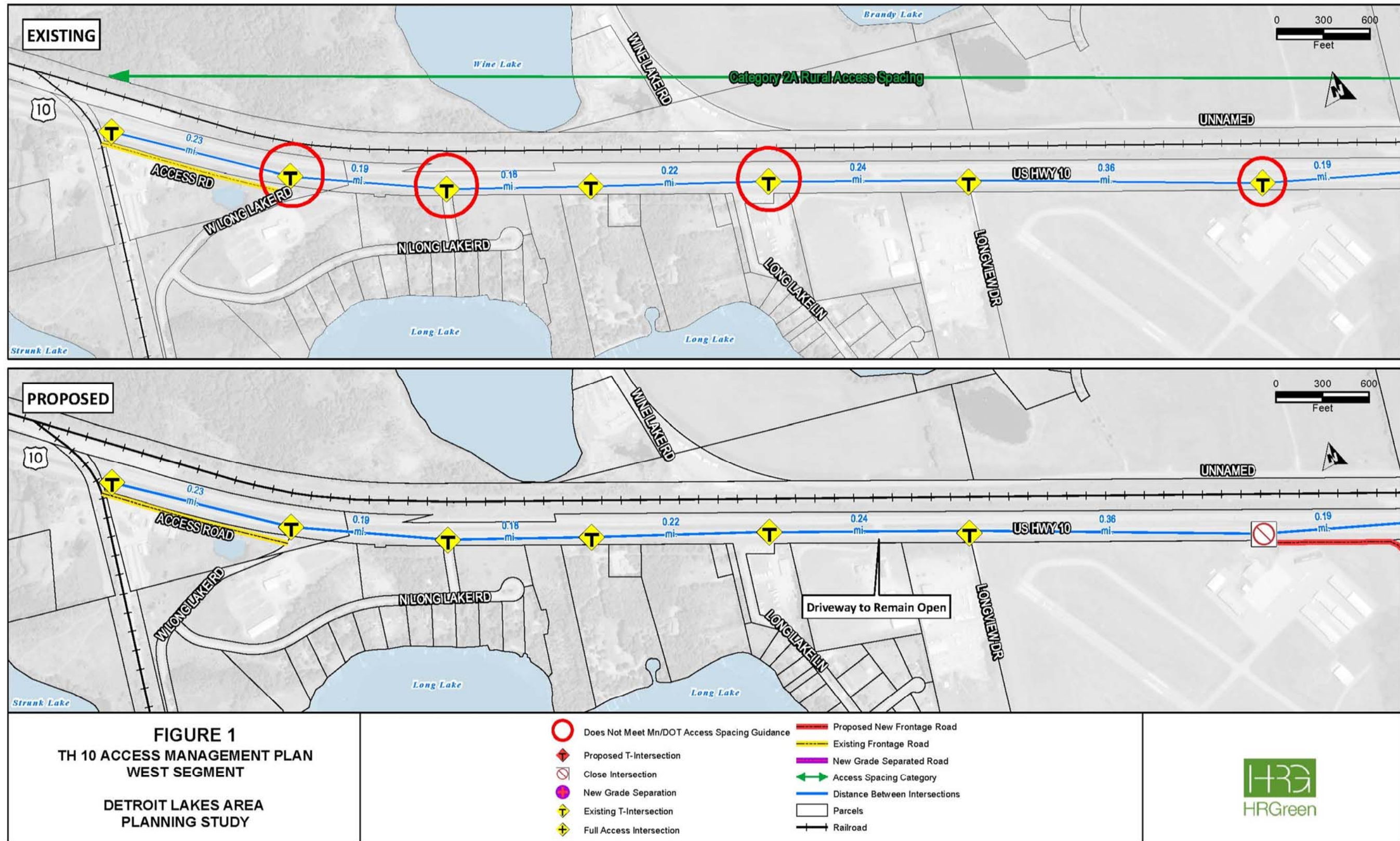


Figure 2: TH 10 Access Management Plan – East Segment

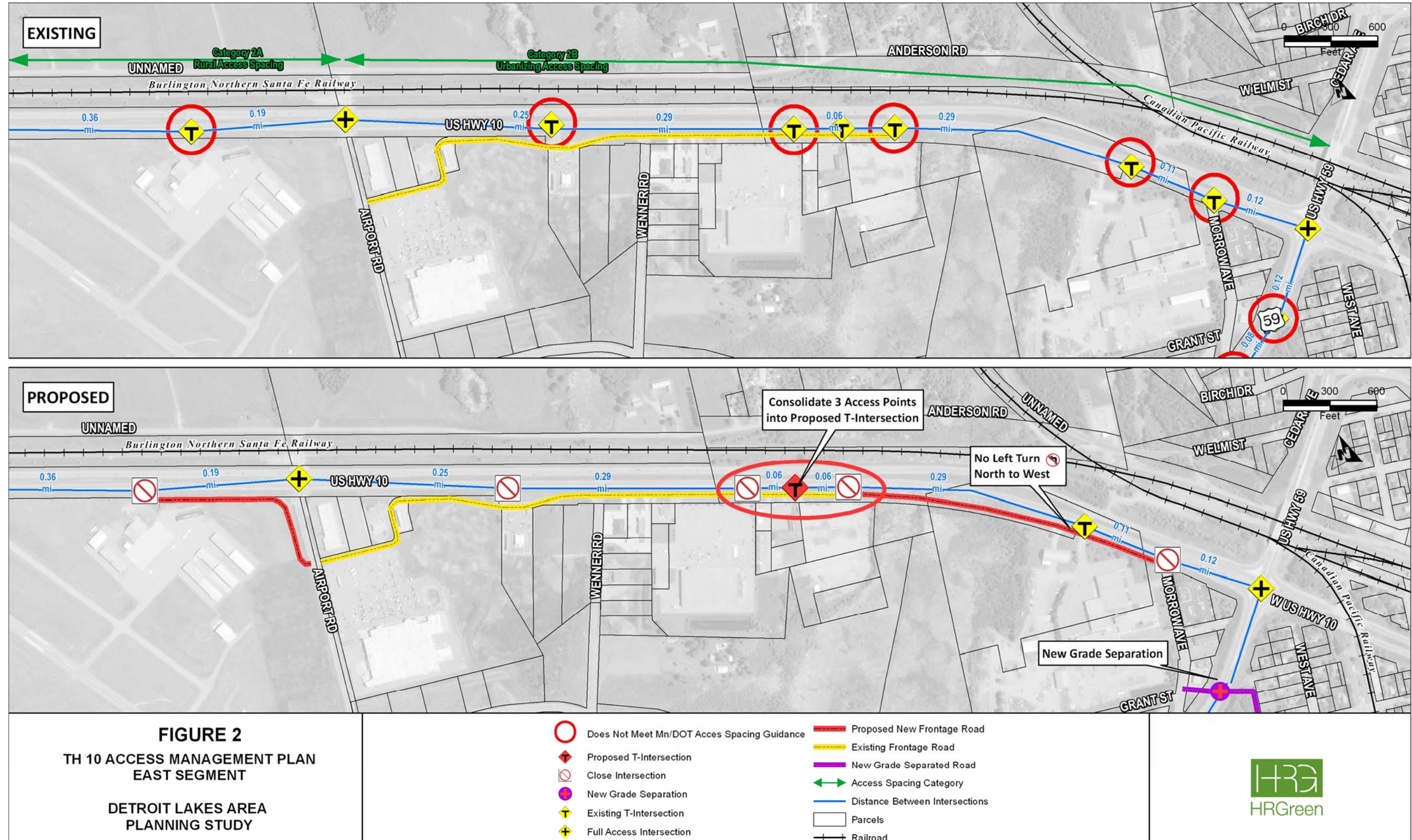


Figure 3: TH 59 Access Management Plan – South Segment

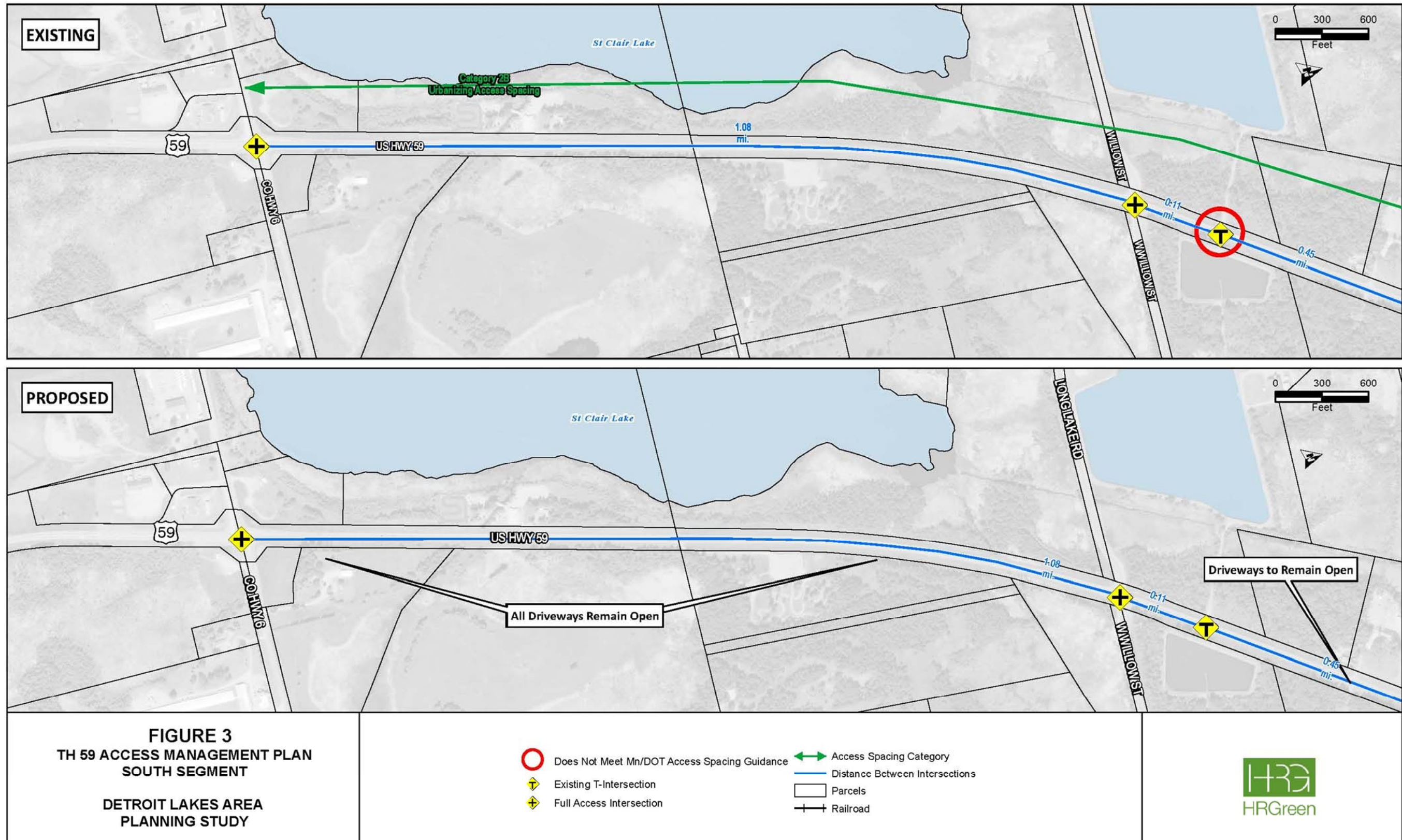
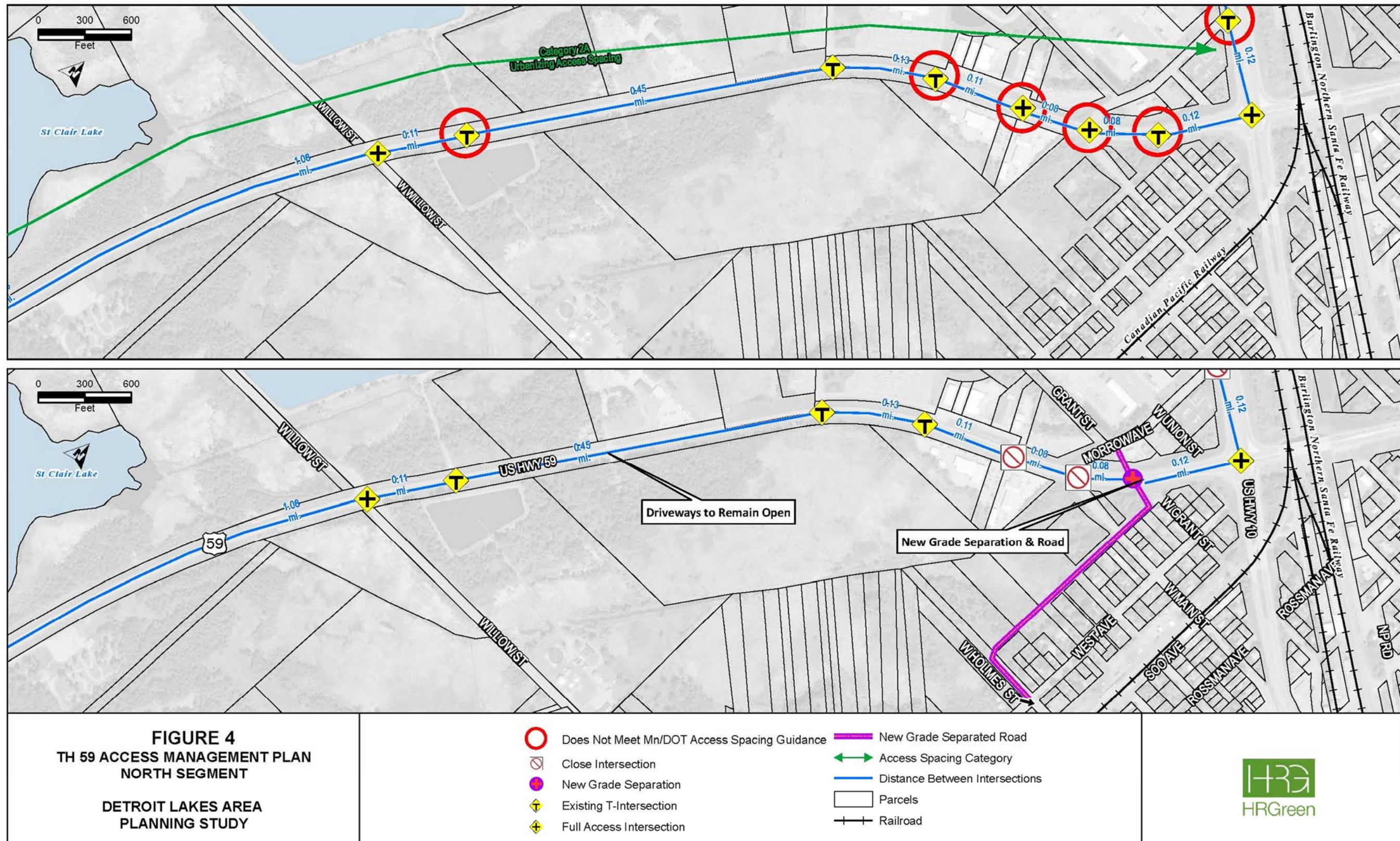


Figure 4: TH 59 Access Management Plan – North Segment



### **5.1.3 Street Connectivity**

The access management guidelines support land use that promotes mobility and interconnectivity of the local street network. Local streets and collector roads should be designed to promote interconnection and avoid fragmentation. Streets that are fragmented or not interconnected result in longer trip length and the development of bottlenecks within the road network as the local-trip driver and the through-trip driver are forced to compete for the available roadway capacity.

#### Highway 10

To the south of Highway 10, interconnectivity is provided by three streets: 230 Avenue; West Long Lake Road; and Airport Road. Only 230<sup>th</sup> Avenue connects Highway 10 and County Road 6. The existing south frontage road for Highway 10 is a necessary component of good access management as it provides local access to adjacent properties. Unfortunately it is not continuous to the east, and it does not connect with Morrow Avenue nor does it extend west of Airport Road.

To the north of Highway 10, the existing railroad limits connectivity north of Highway 10. The railroad grade crossing opposite Airport Road limits mobility and connectivity. In the future, as a result of land development north of Highway 10, this crossing may be problematic from a safety and capacity standpoint.

#### Highway 59

The Highway 59 corridor has seen recent development of adjacent properties immediately south of Highway 59. Further to the south, the corridor exhibits relatively few driveways or side roads. St. Clair Lake, which is on the west side of Highway 59 north of County Road 6, provides a barrier to east-west connectivity as does the environmentally sensitive land use adjacent to portions of the road. There is no frontage or backage road system in place.

East-west connectivity is provided only by Morrow Avenue, Willow Street, or County Road 6. These streets may currently provide adequate provision for east-west movements; however, as land develops west of Highway 59, both intersections will become increasingly utilized. This will result in greater delays and potential demands to signalize both Willow Street and Morrow Avenue.

### **5.1.4 Signalization and Spacing of Signals**

Closely spaced or irregularly spaced traffic signals do not promote efficient signal timing and progressive traffic flow. The result is frequent stops, unnecessary delays, increased crash rates, increased fuel consumption, and excessive vehicle emissions. Table 6 provides the current signal spacing requirements from the access management guidelines.

**Table 6 - Recommended Signal Spacing**

Highway	Category	Facility Type	Signal Spacing
US Highway 10	2A	Rural	Must not diminish corridor speed
US Highway 10	2B	Urban/Urbanizing	1/2 Mile
US Highway 59	3B	Urban/Urbanizing	1/2 Mile

On Highway 10, only the intersection with Airport Road is currently signalized (not considering the intersection of US-10 and US-59). Additional future points of primary signalized intersection access on US-10 should be designated. These intersections should provide connectivity to the south and north for the local trip driver.

On Highway 59, only County Road 6 is currently signalized. Again additional future points of primary signalized intersections should be designated for east-west access. Signalizing Morrow Avenue/Main Street is not recommended due to its close proximity to Highway 10.

Proper planning, before the adjacent land is developed, is imperative to allow the application of the State's access management principles. If properly applied, access management will result in improved traffic safety and traffic flow, while maximizing the traffic speeds and capacity on the trunk highway. While Highway 59 has seen some recent development of adjacent properties south of Highway 10, the primary concern with regard to access management is along Highway 10 between Airport Road and Highway 59.

### **5.1.5 Safety**

An analysis of historic crash data for Highways 10 and 59 within the study area was completed. This analysis evaluated crash data that was available from Mn/DOT between the years 2003-2007 (more recent data was not used due to the recent Highway 10 construction project through Detroit Lakes). The historic crash data for this period was analyzed to determine: (1) Crash rates, (2) Critical crash rates, and (3) Crash severity rates for study intersections and the two highway segments. (See *Traffic Safety Technical Memorandum*, in Appendix B, for a detailed summary of the crash analysis.)

Based on the historic crash data, two crash rates were calculated: intersection and segment. To indicate potential problems, the crash rates were compared to the Mn/DOT average crash rate. Locations with crash rates above average may be due to the random nature of accidents, or may be the result of a problem or defect in the location. Comparison of intersection crash rates to average intersection crash rates showed that seven out of the eleven intersection crash rates were found to be higher than the Mn/DOT average crash rate. Segment crash rates were found to be below Mn/DOT average rates. The calculation of crash rates does not eliminate accidents that

are truly random in nature and not the result of a problem or deficiency. The determination of the critical crash rate addresses this shortfall. If a crash rate is greater than the critical crash rate, it indicates that the crashes are not truly random, and a problem may exist. Analysis of the critical crash rate for the study intersections indicate that only the intersection of Highway 59 at Morrow Avenue/Main had a crash rate that exceeded the critical rate. A detailed crash analysis of the Highway 59 at Morrow Avenue/Main intersection indicated that 70 percent of these crashes involve vehicles turning left from either Morrow Avenue or Main Street. Analysis of segment crash rates showed that they were below critical crash rates. The improvements made by the Highway 10 project in Detroit Lakes included left turn lanes at the Main/Morrow intersection on Highway 59. The separated lanes have provided improved operations along Highway 59. The improved operations along with greater separation between Highway 59 northbound and southbound traffic will benefit the specific safety concerns identified at this intersection. The calculation of crash severity rates allows the identification of locations that may experience a low crash rate but have a high percentage of injury or fatal crashes. All the study intersections have a severity rate below the Mn/DOT average severity rate with the exception of Highway 34 and County Road 22.

### **5.1.6 Traffic Study Conclusions**

#### Existing Capacity Analysis

Roads within the study area have acceptable capacity to carry traffic. Highway 10, east of Airport Road, carries the highest traffic volumes in the study area at 18,500 vehicles per day. Based on November counts and updated with 2010 seasonal data compiled during the summer months, the intersections within the study are generally operating well; however, at some of the non-signalized intersections, left turning vehicles are beginning to experience higher delays.

#### Traffic Safety

Access to the high speed highway can become more difficult as the traffic volumes grow, specifically for travelers attempting to turn left onto the highway. As gaps become fewer, drivers take more chances to enter the highway and this contributes to a higher probability of several types of crashes, including potentially fatal crashes. An example of this can be seen at the Highway 59 intersection with Willow Street, which has experienced a safety problem and as a result a four-way stop has now been installed to address the safety concern. While this interim change is prudent to address the current safety condition, the mobility impacts on Highway 59 then become incompatible with the mobility goal (i.e. expected travel speed) for this State highway.



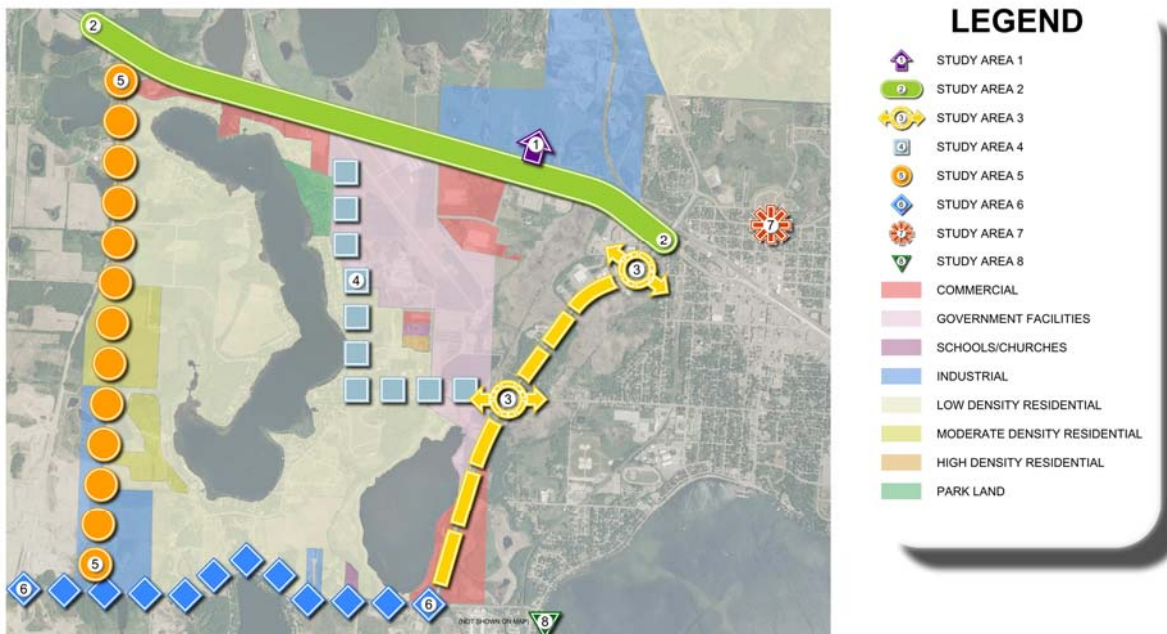
The analysis of crash data for US-10 and US-59 for the years 2003-2007 did not raise any serious concerns. Only one intersection, US-59 at Morrow Avenue/Main St. has a crash history that indicates corrective measures should be evaluated. All the study intersections have a severity rate below the Mn/DOT average severity rate with the exception of Highway 34 and County Road 22.

## 6.0 Study Sub Areas

With the classification of issues and concerns according to technical, regulatory, and community problem statements, the overall study area was divided into eight subareas for more detailed study. The subareas were defined as follows:

- Sub Area 1 – Access North of Highway 10
- Sub Area 2 – Highway 10 Frontage Road
- Sub Area 3 – Highway 59
- Sub Area 4 – East Parkway
- Sub Area 5 – West Parkway
- Sub Area 6 – County Road 6 (Munson Lake Road)
- Sub Area 7 – Washington Avenue and Highway 34 intersection
- Sub Area 8 – Highway 59 and County Road 22 intersection

**Exhibit 7 – Study Sub Areas**



## 7.0 Comprehensive Problem Statement

Prior to the development of alternatives, and using the Community-based data gathering approach, the issues and concerns gathered within the general study area were then sorted and grouped according to study area. Study Areas 1-6 are located in the same geographic area west of the established core of the community with similar issues. Study Areas 7 and 8 are located remotely. The outcome of the sorting is illustrated in Table 4 below and in the graphic illustrations that follow.

**Table 7 - Comprehensive Problem Statement by Study Area**

Study Area	Technical	Regulatory	Community
1-6	<ul style="list-style-type: none"> <li>• Access to Downtown</li> <li>• Mn/DOT - IRC Performance</li> <li>• Access Management</li> <li>• Pavement Conditions</li> <li>• RR Crossing location</li> <li>• 70 trains daily (safety)</li> <li>• Access to the north of Highway 10</li> <li>• IRC Performance</li> <li>• Access Management</li> <li>• No Pedestrian or Bicycle Access</li> <li>• Airport Expansion and possible Airport Road Closure</li> <li>• Vacated Roadway (west airport perimeter)</li> <li>• No transit, pedestrian or bicycle access</li> <li>• Sewage Treatment System/ Maintenance Requirements?</li> <li>• Public/Private Utilities</li> <li>• Missing Roadway Network Links</li> <li>• Roadway segment capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Contaminated Soils (brownfield redevelopment)</li> <li>• Conservation Easement</li> <li>• Visual Quality</li> <li>• Infiltration Regulations</li> <li>• Water Quality Impacted by Sewage Treatment/ Lake Treated to Seal Nutrients</li> <li>• Wetlands</li> <li>• Airport Noise</li> <li>• Long Lake – fisheries management</li> <li>• Water quality – all lakes</li> <li>• Invasive Species</li> <li>• Aquatic Management Areas</li> <li>• Farmlands</li> <li>• Fish Hatchery</li> <li>• Noise</li> <li>• Possible Cultural Resources</li> </ul>	<ul style="list-style-type: none"> <li>• Lake Access (north)</li> <li>• Development potential north of Highway 10</li> <li>• Annexation</li> <li>• Mn/DOT Expansion/ Possible access changes?</li> <li>• Public Access to Long Lake</li> <li>• Park Access</li> <li>• Annexation</li> <li>• Future Land Use</li> </ul>
7	<ul style="list-style-type: none"> <li>• Traffic Control / Intersection Design</li> </ul>	<ul style="list-style-type: none"> <li>• Storm water management</li> </ul>	<ul style="list-style-type: none"> <li>• Local Street Circulation</li> </ul>
8	<ul style="list-style-type: none"> <li>• Intersection Design and Safety</li> <li>• Access Management</li> </ul>	<ul style="list-style-type: none"> <li>• Wetlands</li> </ul>	<ul style="list-style-type: none"> <li>• Event Traffic Management</li> </ul>

## 8.0 Alternatives and Measures of Effectiveness Screening

Alternatives were developed for each study subarea. The alternatives developed ranged from “typical” solutions that would be appropriate for application based on approved review and evaluation procedures, established safety and cost-effectiveness benefits, to more innovative solutions involving more multidimensional thinking. In some cases, the development of potential alternatives hinge on the advancement of other local projects in the same geographic area.

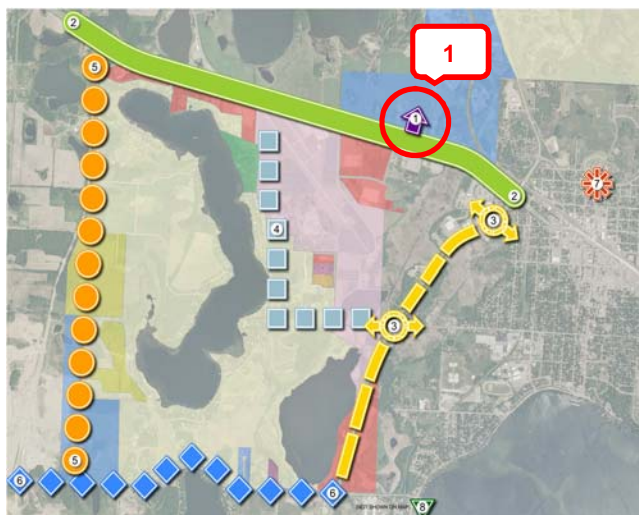
The alternatives developed, and their descriptions, are described in the following paragraphs. Potential solutions were introduced by the study consultant and members of the public, and refined by the study committees. Using the Measures of Effectiveness (Project’s Measures of Effectiveness) described in Section 3.3, the TAC collaborated on a screening analysis to rate study area alternatives according to ability to achieve goals and objectives, and resulted in the selection of a set of preferred solutions for further development by study subarea, See Appendix C – Measure of Effectiveness Worksheets. Exhibits of these alternative solutions follow, including summary description of ranking against project goals and objectives/measures of effectiveness, key issues and conceptual sketches.

### 8.1 Study Area 1 – Access North of Highway 10

Detroit Lake’s Long Range Land Use Plan calls for the continued development of properties north of Highway 10. However, developable properties north of Highway 10 are currently restricted by poor access due to the presence of the rail corridor and its limited crossing at Airport Road. The comprehensive problem statement for this subarea is as follows:

#### Exhibit 8 – Study Area 1 – Access North of Highway 10

##### Study Area 1 Access North of Highway 10



##### Technical Issues

- RR Crossing Location
- 70 Trains Daily
- Access to the North of Highway 10

##### Regulatory Issues

- Contaminated Soils

##### Community Issues

- Lake Access (north)
- Development Potential North of Highway 10
- Annexation

Three conceptual alternatives were developed for this study area:

### 1A - Bridging over the BNSF Railroad at Airport Road

The bridge alternative, 1A, was seen to meet the majority of the objectives, but the project cost would be extremely high and securing funding for this alternative was deemed to be unlikely.



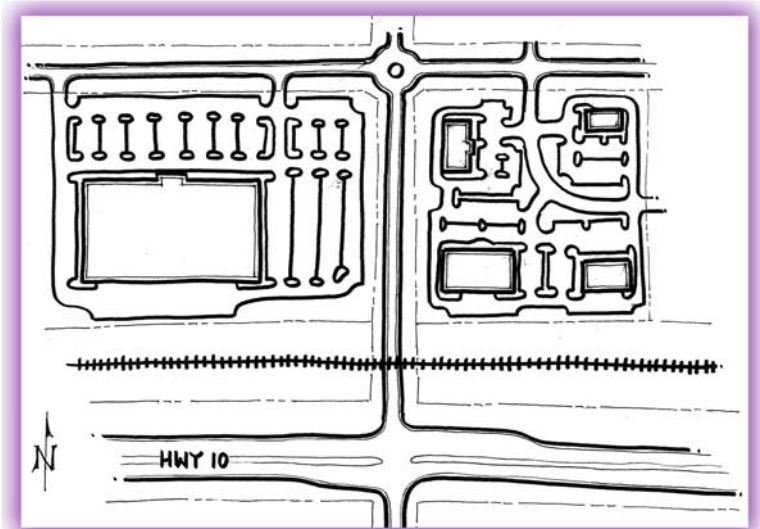
### 1B - Upgrading the existing BNSF railroad crossing at the Airport Road intersection with Highway 10

Alternative 1B, upgrade the existing crossing, would create a situation similar to the Kris Street crossing of Highway 10, on the eastern side of Detroit Lakes, which has considerable operational issues. This alternative did not measure well against any of the project objectives.




### 1C- Creating an offset frontage road to the north.

The offset frontage road alternative, 1C, eliminated the operational concerns that alternative 1B would create because of the longer distance approaching the railroad crossing. The new alignment of the offset frontage road would need to be coordinated with the proposed redevelopment of the land north of Highway 10 and the railroad.

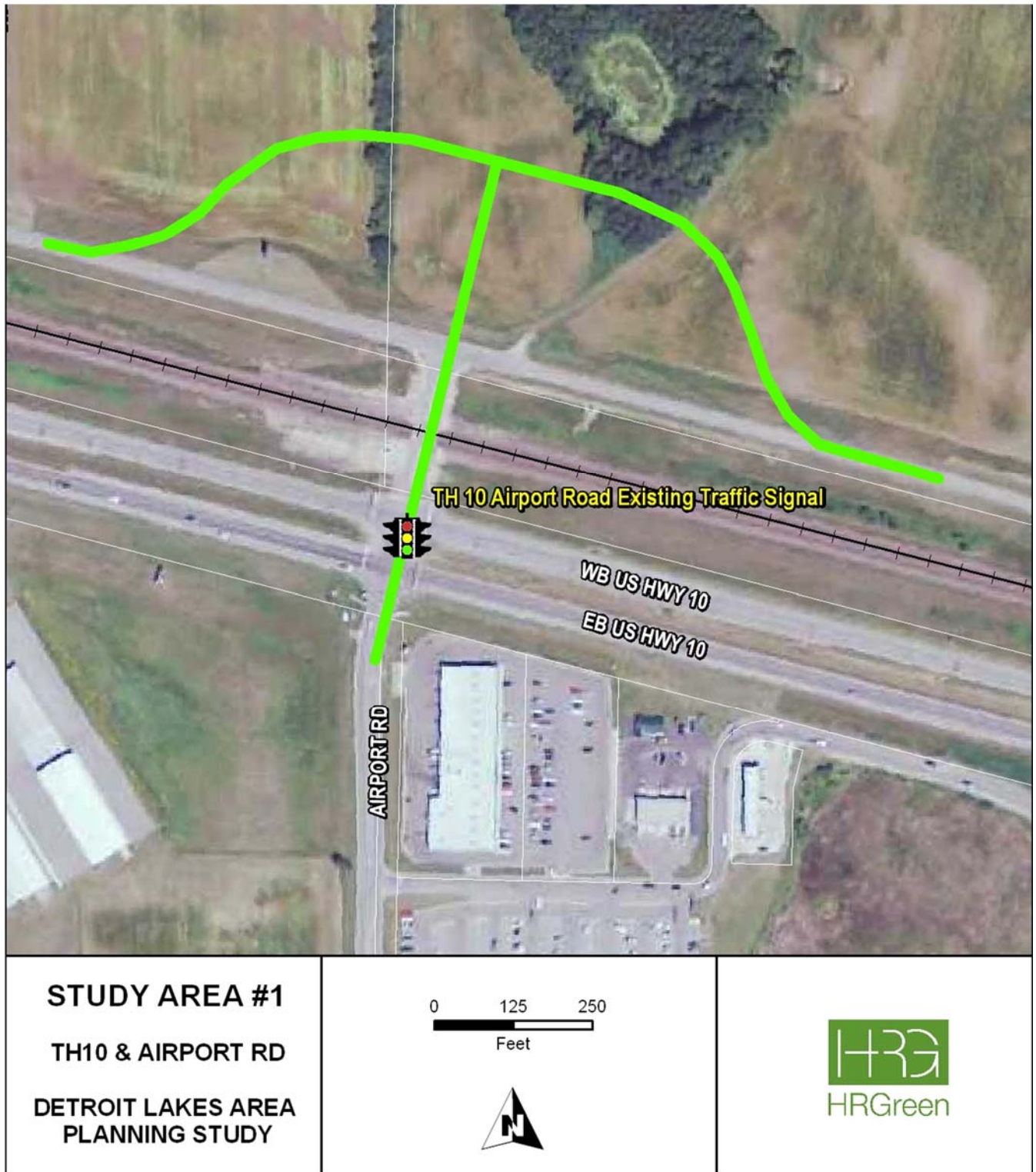


*Recommendation: Study Area 1 – Access North of Highway 10*

Using the Project’s Measures of Effectiveness, the TAC rated the **1C - offset frontage road to the north** as most likely to be clearly beneficial - or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
							
Study Area 1A Bridge Over RR		+	+	+	+	0	+
Study Area 1B Upgrade Existing Crossing		-	0	0	0	-	-
Study Area 1C Offset Frontage Road to North		+	+	+	+	+	0

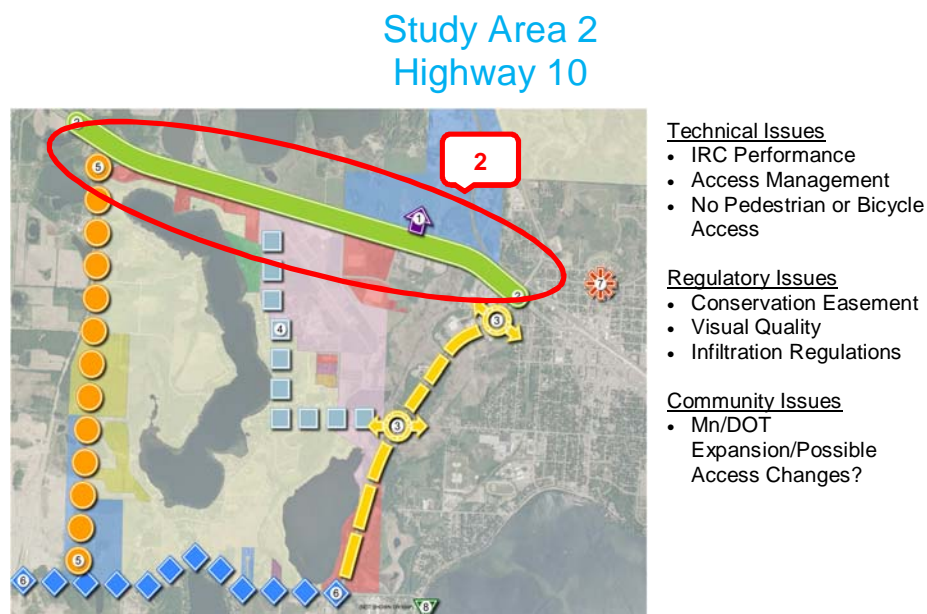
**Figure 5 – Recommendation Study Area 1 – Access North of Highway 10**



## 8.2 Study Area 2 – Highway 10 and Highway 10 Frontage Road

Highway 10 was designated by Mn/DOT in the early 2000's as one of the State's priority Interregional Corridors (IRC). To improve safety and mobility on this IRC route, access management and local street connections are needed. The comprehensive problem statement for this subarea is as follows:

### Exhibit 8 – Study Area 2 – Highway 10 and Highway 10 Frontage Road



Study Area 2 included the area in the vicinity of the Detroit Lakes Municipal Airport. To accommodate forecasted aircraft operations and due to restrictions placed on aircraft obstruction free and safety zones, the new displaced threshold associated with a planned 900 foot extension of the Detroit Lakes Municipal Airport's primary runway will potentially constrain potential continuous frontage road alternatives west of the Airport Road intersection along Highway 10. A coordination meeting with the airport designers along with the aviation review agencies was held on August 12<sup>th</sup>, 2010. A summary of this meeting is provided in section 10.3 *Study Area Stakeholder Businesses and Agency Coordination Meetings*. Five conceptual alternatives were developed for this study area. Three of these alternatives were developed for the highway mainline section and two were developed for its parallel frontage road system between Airport Road and Highway 59. They included the following:

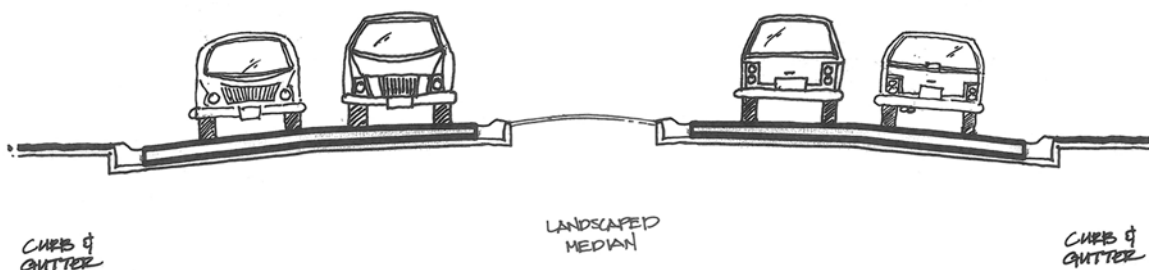


**2A - Providing minor access and safety modifications to the existing rural Highway 10 roadway section**



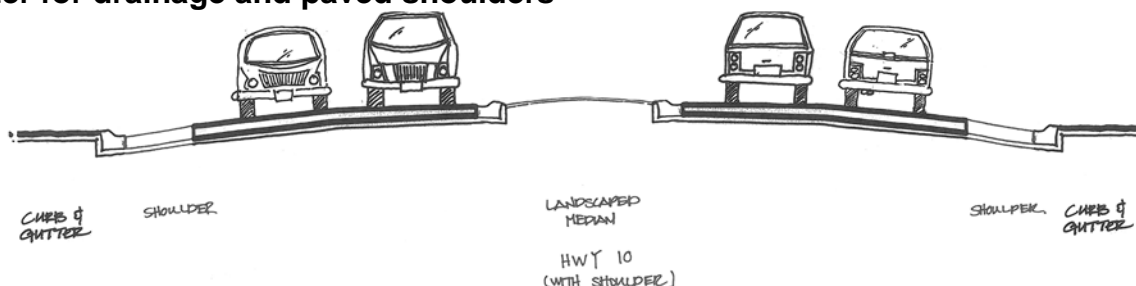
2A - Providing minor access and safety modifications to the existing rural Highway 10 roadway section did not address any existing concerns along this segment of highway from a State, regional or local perspective. This alternative would reduce construction costs, but did not measure well against the other objectives.

**2B - Developing an urban 4-lane Highway 10 roadway section, with curb and gutter for drainage**



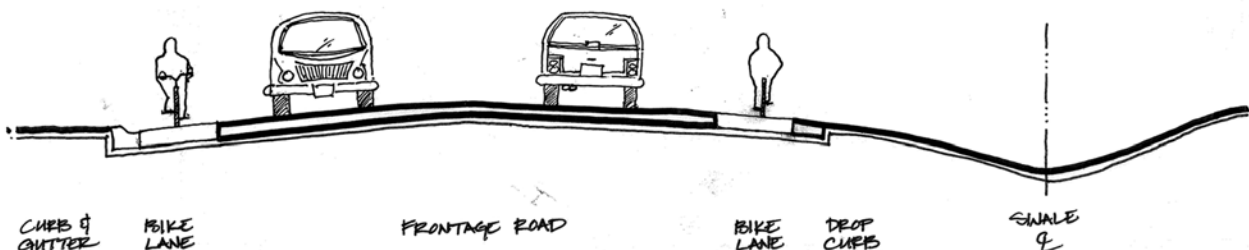
2B - Developing an urban 4-lane Highway 10 roadway section, with curb and gutter for drainage did not measure well against the project objectives. The increase in construction costs due to adding curbs and storm sewer along with the lack of shoulders on the highway resulted in the poor ratings.

**2C - Developing an urban 4-lane Highway 10 roadway section, with curb and gutter for drainage and paved shoulders**



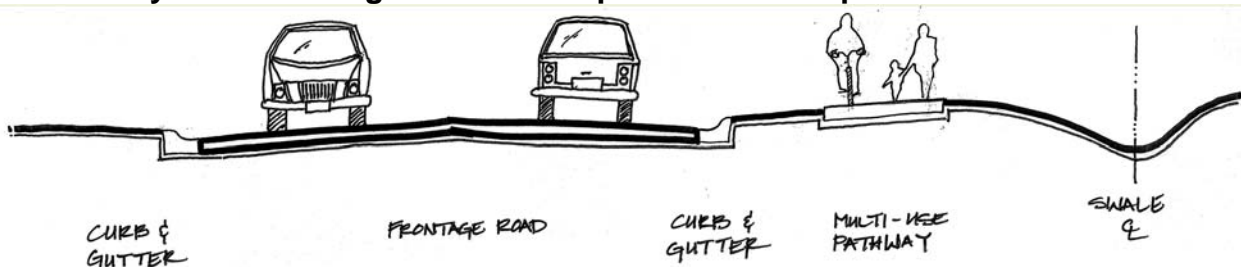
2C - Developing an urban 4-lane Highway 10 roadway section, with curb and gutter for drainage and paved shoulders rated highest of the Highway 10 mainline options. The narrowed urban section would provide space for the frontage road system and the shoulders would provide safe operations along Highway 10.

## 2D - Two-way traffic frontage road with bike lanes



2D - Two-way traffic frontage road with bike lanes would provide an alternative for motorists and some bicyclists to travel from the downtown to this western portion of the city, but the alternative does not provide for pedestrians or persons with walking difficulties.

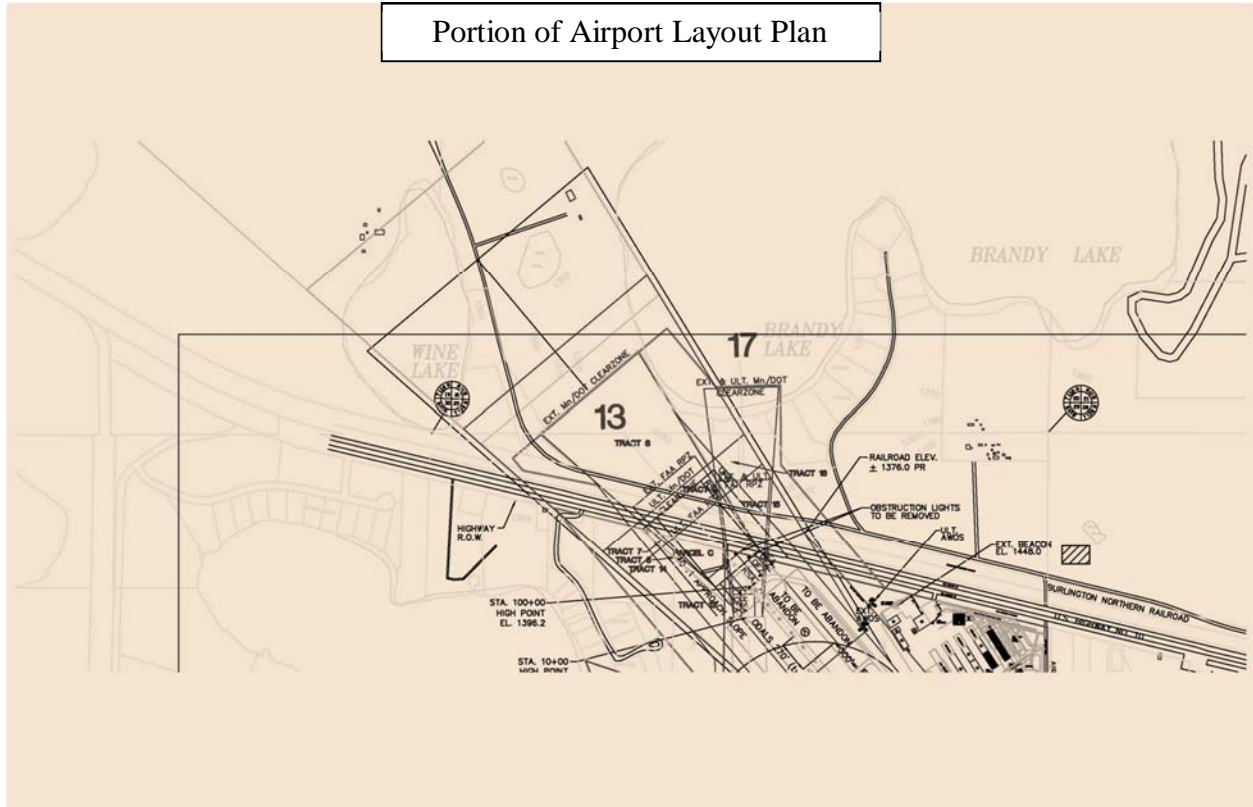
## 2E - Two-way traffic frontage road with separate bike and pedestrian trail



2E - Two-way traffic frontage road with separate bike and pedestrian trail provides safe mobility for all modes of transportation including pedestrians and persons with walking difficulties. This alternative scored high with all of the project objectives.

*Recommendation: Study Area 2 – Highway 10 and Highway 10 Frontage Road*

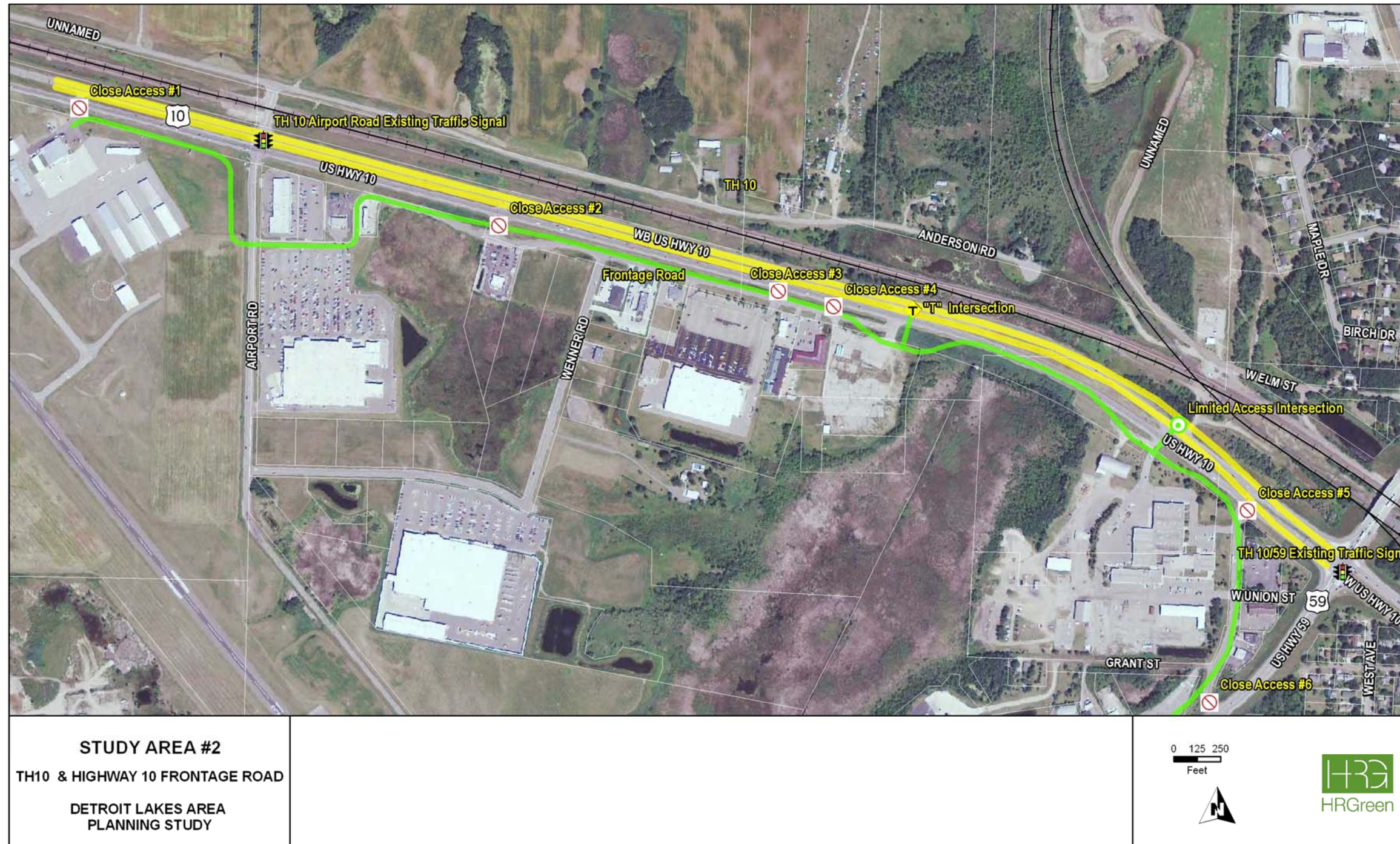
Using the Project's Measures of Effectiveness, the TAC rated the **2C - urban 4-lane Highway 10 roadway section**, with curb and gutter with paved shoulders, and **2E - a two-way traffic frontage road with separate bike and pedestrian trail** as most likely to be clearly beneficial – or have potential to be beneficial - to best achieve the goals and objectives among the conceptual alternatives studied. The narrowed section on Highway 10 and the frontage road could be extended past the airport and provide the flexibility to cross the runway safety areas without obstructions and grading to meet the aviation criteria. A portion of the Airport Layout Plan in the vicinity of Highway 10 is shown below.



The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 2A Existing TH 10 Section		-	-	-	-	0	-
Study Area 2B Urban 4-Lane		-	-	-	-	-	-
Study Area 2C Urban 4-Lane with Shoulders		+	-	0	0	0	0
Study Area 2D Frontage Road with Bike Lanes		+	0	+	0	+	+
Study Area 2E Frontage Road with Trail		+	+	+	+	+	+

Figure 6- Study Area 2 – Highway 10 and Highway 10 Frontage Road

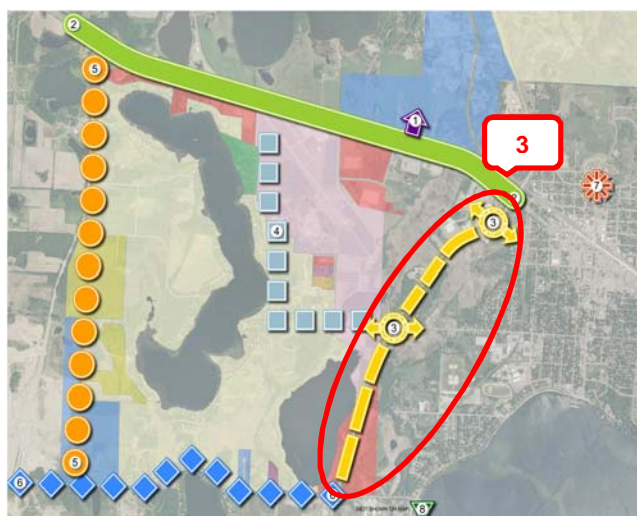


### 8.3 Study Area 3 – Highway 59

Several safety and access management concerns exist at intersections along Highway 59 in the study area. In addition, travel between the developing western and established core area of the community is limited to one at-grade crossing of Highway 59 at Morrow Avenue/Main Street or Highway 10. Study Area 3 included alternatives to improve safety and traffic control on Highway 59 as well as manage access and local circulation to improve connectivity in the community. The comprehensive problem statement for this subarea is as follows:

#### Exhibit 9 – Study Area – Highway 59

#### Study Area 3 Highway 59



#### Technical Issues

- Access to Downtown
- IRC Performance
- Access Management
- Pavement Conditions

#### Regulatory Issues

- Wetlands
- Water Quality Impacted by Sewage Treatment/Lake Treated to Seal Nutrients

#### Community Issues

- Mn/DOT Expansion/Possible Access Changes?

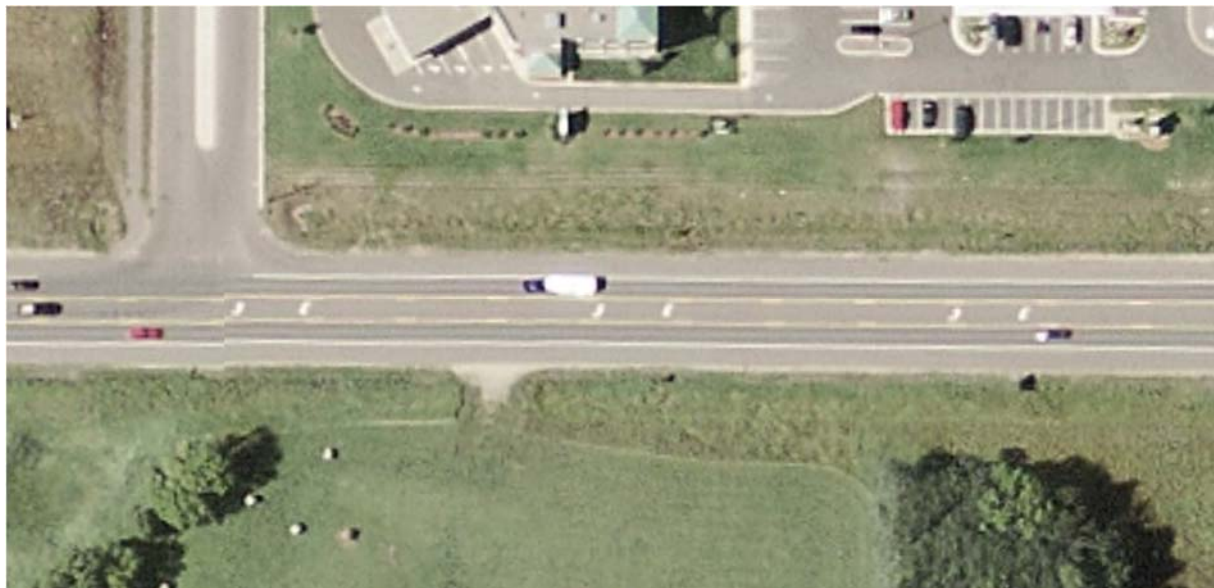
Six alternatives were studied to address safety and mobility issues along Highway 59, including the following:

#### 3A - Minor access and safety modifications to existing Highway 59

3A - Minor access and safety modifications to existing Highway 59 would only address specific areas of safety concerns, but the crash analysis did not indicate specific areas other than the major intersections. This alternative would do little to improve the corridor over the existing condition and did not measure well against the project objectives.



### **3B - Rural-three lane section on Highway 59 with continuous left turn lane**



3B - Rural-three lane section on Highway 59 with continuous left turn lane would address the safety and congestion related to vehicles stopped to make left turns off of the highway. The traffic analysis did not indicate a safety or operational concern due to vehicles turning left off of Highway 59. This alternative would do little to improve the corridor over the existing condition and did not measure well against the project objectives.

### **3C - Frontage roads along Highway 59 to connect properties and other local roads and close multiple points of access where safety problems occur**



3C - Frontage roads along Highway 59 to connect properties and other local roads and close multiple points of access where safety problems occur can most directly address the project issues along the corridor. The existing land use has multiple parcels on the west side of Highway 59 and a partial frontage road exists. Connecting the frontage

road to the Highway 10 frontage road will improve safe travel from these businesses into downtown or the western side of Detroit Lakes. This alternative was ranked high for all of the project's objectives.

### **3D - Roundabout at Willow Street as the preferred method of intersection traffic control**

3D - Roundabout at Willow Street as the preferred method of intersection traffic control was evaluated in detail and compared to traffic signals along with the 4-way stop condition. Roundabouts are a newer intersection alternative that has proven safety benefits. The detailed analysis is included in the Appendix of this study and a summary of the findings are included in the "Highway 59 at Willow Street Intersection Control Evaluation Summary" later in this section.



### **3E – Stop Lights at the intersection of Highway 59 and Willow Street**

3E – Stop Lights at the intersection of Highway 59 and Willow Street were considered in the detailed roundabout analysis performed for evaluation of 3D. The detailed analysis is included in the Appendix of this study and a summary of the findings are included in the "Highway 59 at Willow Street Intersection Control Evaluation Summary" later in this section.

### **3F - Extend Holmes Street to intersect with Highway 59 and to provide a local connection west of the highway**

3F - Extend Holmes Street to intersect with Highway 59 and to provide a local connection west of the highway was deemed unfeasible due to regulatory concerns of the impacts this new road would have on the wetlands. A coordination meeting with the environmental review agencies was held on September 8<sup>th</sup>, 2010. A summary of this meeting is provided in section 10.3 *Study Area Stakeholder Businesses and Agency Coordination Meetings*. The new road would bisect the wetlands and have detrimental long term impacts to these wetlands.



### **3G - Highway 59 Underpass to connect a new Highway 59 west frontage road with a new street connection to the established core of the community**

Members of the study's Steering Committee provided input to assist the TAC in choosing alternatives for further development. The DNR noted that any alternative that bisects the large wetland complex west of the core area of the community (and east of Highway 59) would need to first demonstrate that a reasonable avoidance alternative would not be available for further development. With the Holmes Street extension being potentially "fatally flawed", limited opportunities for new railroad crossings, and local neighborhood concerns of increased traffic and other community impacts, connecting the developing area of the community with a new Highway 59 western frontage road required a more extensive evaluation. Members of the Steering Committee contributed to suggestions for the new sub-alternatives. Six sub-alternatives to the Holmes Street connection were further studied, including the following:

#### **3G1 - Holmes Street Extension to Highway 59**

3G1 - Holmes Street Extension to Highway 59 is a similar alignment to the 3F – Holmes Street Extension except the extension would not extend past Highway 59 toward the west. The environmental impacts on the east of Highway 59 would have the same "fatal flaw" as those of the 3F alternative.



#### **3G2 - Highway 59 Underpass at West Avenue/Union Street**

3G2 - Highway 59 Underpass at West Avenue/Union Street would have significant impacts to the local businesses on the west side of Highway 59 and the residents on the east side of the highway. Concerns were expressed that the routing of traffic would be routed on existing streets and would require several turns to access the underpass and reduce the effectiveness of creating an alternative route between downtown and the western portion of the city.





### 3G3 - Holmes Street Extension to the Main Street/Morrow Avenue Underpass

3G3 - Holmes Street Extension to the Main Street/Morrow Avenue Underpass would create a new street that would follow the eastern edge of the wetland between Holmes Street and Main Street. This alignment would have some wetland impacts but it would not bisect the wetland as alternates 3F and 3G1. The traffic flow could leave downtown on Holmes Street and travel under Highway 59 without making any turns. This alternative was rated high on all of the project objectives.



### 3G4 - Underpass of Highway 10 to connect Main Street on both sides of the highway

3G4 - Underpass of Highway 10 to connect Main Street on both sides of the highway would require traffic to route on existing streets and would require several turns to access the underpass and reduce the effectiveness of creating an alternative route between downtown and the western portion of the city.



### 3G5 - Highway 59 parallel frontage road from the existing Main Street/Morrow Avenue intersection (without underpass access)

3G5 - Highway 59 parallel frontage road from the existing Main Street/Morrow Avenue intersection, (without underpass access), would direct traffic to a new at-grade intersection south of the existing Main Street intersection with Highway 59. There would be additional travel time above today's condition and the new at-grade intersection would not accommodate pedestrians and persons



with walking difficulty as efficiently as an underpass. This alternative was not considered as creating an alternative route between downtown and the western portion of the city.

### 3G6 - Highway 10 Bicycle and Pedestrian Improvements

3G6 - Highway 10 Bicycle and Pedestrian Improvements were deemed not to be a potentially safe alternative and because of this the Technical Advisory committee considered this alternative to have a “Fatal Flaw”. No further evaluation was performed.



*Recommendation: Study Area 3 – Highway 59*

Using the Project’s Measures of Effectiveness, Steering Committee member and neighborhood input, the TAC rated the **3D - Highway 59 Roundabout at Willow Street**, and the **3C - Highway 59 Frontage Road connection 3G3 - Holmes Street Extension to a new Main Street/Morrow Avenue Highway 59 Underpass** would be clearly beneficial – or have potential to be beneficial - to best achieve the goals and objectives among the conceptual alternatives studied. The City has also proposed to negotiate with the Canadian Pacific Railroad to minimize the duration of the closures of Main, Holmes and Willow Streets. The following chart indicates the results of the Technical Advisory Committee evaluation.

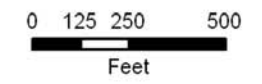
Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 3A		-	-	-	-	-	-
Existing TH 59 Section		-	-	-	-	-	-
Study Area 3B		-	o	o	o	o	o
Rural 3-Lane Section		-	-	-	-	-	-
Study Area 3C		+	+	+	+	+	+
Frontage Road		+	+	+	+	+	+
Study Area 3D		+	+	+	o	+	+
Roundabout (Willow)		+	+	+	o	+	+
Study Area 3E		o	+	o	o	o	o
Stop Light		+	+	+	o	+	+
Study Area 3F		+	+	+	o	+	+
Holmes Street Extension		+	+	+	o	+	+
Study Area 3G		+	+	+	o	o	+
Main Street Extension Underpass		+	+	+	o	o	+

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 3G1							
Holmes Street Extension		+	+	o	+	o	+
Study Area 3G2							
West Avenue/Union Street Underpass		+	o	+	o	o	-
Study Area 3G3		+	+	+	+	+	+
Holmes Street Extension to Main/Morrow Underpass		+	+	+	+	+	+
Study Area 3G4		+	+	+	o	o	o
Main Street Underpass w/ Main Street		+	+	+	o	o	o
Study Area 3G5		o	o	o	o	o	o
Parallel Frontage Road to Intersection South (without underpass)		o	o	o	o	o	o
Study Area 3G6							
Highway 10 Pedestrian and Bicyclist Improvements		SAFETY GOAL NOT ACHIEVED					

Figure 7 – Study Area 3 – Highway 59



**STUDY AREA #3**  
TH10 & HIGHWAY 10 FRONTAGE ROAD  
DETROIT LAKES AREA  
PLANNING STUDY



### Highway 59 at Willow Street Intersection Control Evaluation Summary

An Intersection Control Evaluation (ICE) was performed at the intersection of Highway 59 and Willow Street to determine the preferred type of traffic control for use at this intersection. Previously, the only solution to traffic delay and safety problems for at grade intersections was the installation of a traffic signal. Today, the engineer has a much wider number of options to choose from. Depending on a number of factors, the optimal choice for intersection control may not be a traffic signal. Therefore, it is imperative that an Intersection Control Evaluation (ICE) study be conducted during the planning phase of any intersection improvement project. The Intersection Control Evaluation is located in Appendix B.

The performance of this intersection was evaluated by several factors including safety and delay. The Level of Service of this intersection was examined for existing, future, and WE Fest traffic volumes. Level of Service is a qualitative measurement of the quality of traffic flow through intersections or along roadway segments using a letter-grade scale. LOS A represents high-quality conditions with little or no congestion. Conversely, LOS F represents poor conditions with extreme congestion and long delays.

**TABLE 7 – LEVEL OF SERVICE/INTERSECTION DELAY**

Signalized Intersections		Two-Way Stop Controlled Intersections	
LOS	Delay per Vehicle (Seconds/Vehicle)	LOS	Delay per Vehicle (Seconds/Vehicle)
A	<10	A	<10
B	>10-20	B	>10-15
C	>20-35	C	>15-25
D	>35-55	D	>25-35
E	>55-80	E	>35-50
F	>80	F	>50

Since a major part of the region’s commerce depends on recreation and many residents reside outside of the region during winters, seasonal traffic was also evaluated. Traffic counts were taken in January and July in order to compare differences in seasonal traffic volumes.

Safety was evaluated using crash data of the intersection for the most recent four years of data (2003-2007). There was a fatality that occurred at the intersection which did not appear in the crash data at the time the study was completed. Nearly half of the crashes at the intersection were right angle crash types, which resulted in a high crash severity for the intersection. An all-way stop was installed after the fatality. Initial crash data

indicates it has helped reduce crash severity, but more data is needed to accurately determine its performance.

Intersection traffic control alternatives evaluated in the report included the existing all way stop, a traffic signal, and a roundabout. A summary of each traffic control option is included below:

#### Existing all-way stop

The existing all-way stop south bound movement in the afternoon fails under existing conditions (2010). The intersection reaches overall Levels of Service of C and D in morning and afternoon peak hours respectively. The intersection fails at 2030 volumes and during WE Fest traffic.

#### Traffic Signal

A traffic signal would meet warrants for this intersection. The signal would function at an overall Level of Service B in 2010 and in 2030. WE Fest traffic for a signal would be Level of Service D. Traffic signals are not safety devices and installing a signal at this intersection could increase crash rates and/or severity.

#### Roundabout

A roundabout at this intersection would provide a Level of Service A in 2010 and 2030, and a Level of service B during WE Fest traffic. A roundabout would be a safety improvement that would reduce fatalities by 90 percent injury crashes by 75 percent and overall crashes by 40 percent compared to signalized intersections. WE Fest events would not require police officers directing traffic as is currently done with the all-way stop configuration.

Based on the information provided within this document and engineering judgment the following conclusions have been drawn:

- Considering the July 21, 2010 turning movement count and the existing all-way stop condition, the US 59 southbound left turn movement currently experiences unfavorable delays (LOS F). This is expected to worsen in the future.
- Constructing a roundabout at this location would appear to be feasible given existing land use and topography.
- The construction of a traffic signal at this location would require reconfiguration of lane usage to provide a dedicated left turn lane for each approach.
- The implementation of a roundabout at this intersection would result in the greatest reduction in accidents when compared to traffic signals or an all-way stop.

- The implementation of a roundabout at this intersection would result in the lowest delays to traffic.

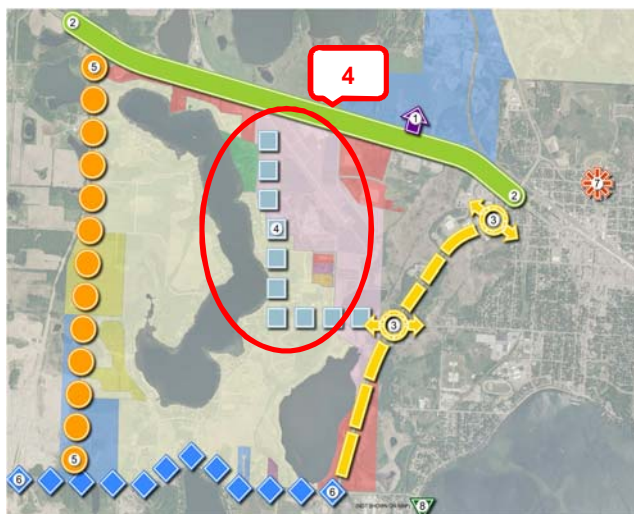
Based on the above mentioned conclusions, a single lane roundabout is the recommended alternative for this location.

#### 8.4 Study Area 4 – East Parkway

Study Area 4 included the area in the vicinity of the Detroit Lakes Municipal Airport. Specifically, there is an underserved area for local roadway connections between Willow Street and the commercial area along Highway 10. To accommodate forecasted aircraft operations and due to restrictions placed on aircraft obstruction free and safety zones, the new displaced threshold associated with a planned 900 foot extension of the Detroit Lakes Municipal Airport's primary runway will potentially sever Airport Road and/or constrain potential continuous frontage road alternatives west of the Airport Road intersection along Highway 10. In addition, the City's growth and annexation plans in the Long Lake area will increase traffic volumes on local roadways over time and also create longer trips for business patrons desiring access the Highway 10 commercial area by shifting traffic eastward to Highway 59 rather than using a local network of roadways. A coordination meeting with the airport designers along with the aviation review agencies was held on August 12<sup>th</sup>, 2010. A summary of this meeting is provided in section 10.3 *Study Area Stakeholder Businesses and Agency Coordination Meetings*. The comprehensive problem statement for this subarea is as follows:

#### Exhibit 10 - Study Area 4 – East Parkway

#### Study Area 4 East Parkway



#### Technical Issues

- Airport Expansion and possible Airport Road Closure
- Vacated Roadway (west airport perimeter)
- No Transit, Pedestrian or Bicycle Access
- Sewage Treatment System Maintenance Requirements?

#### Regulatory Issues

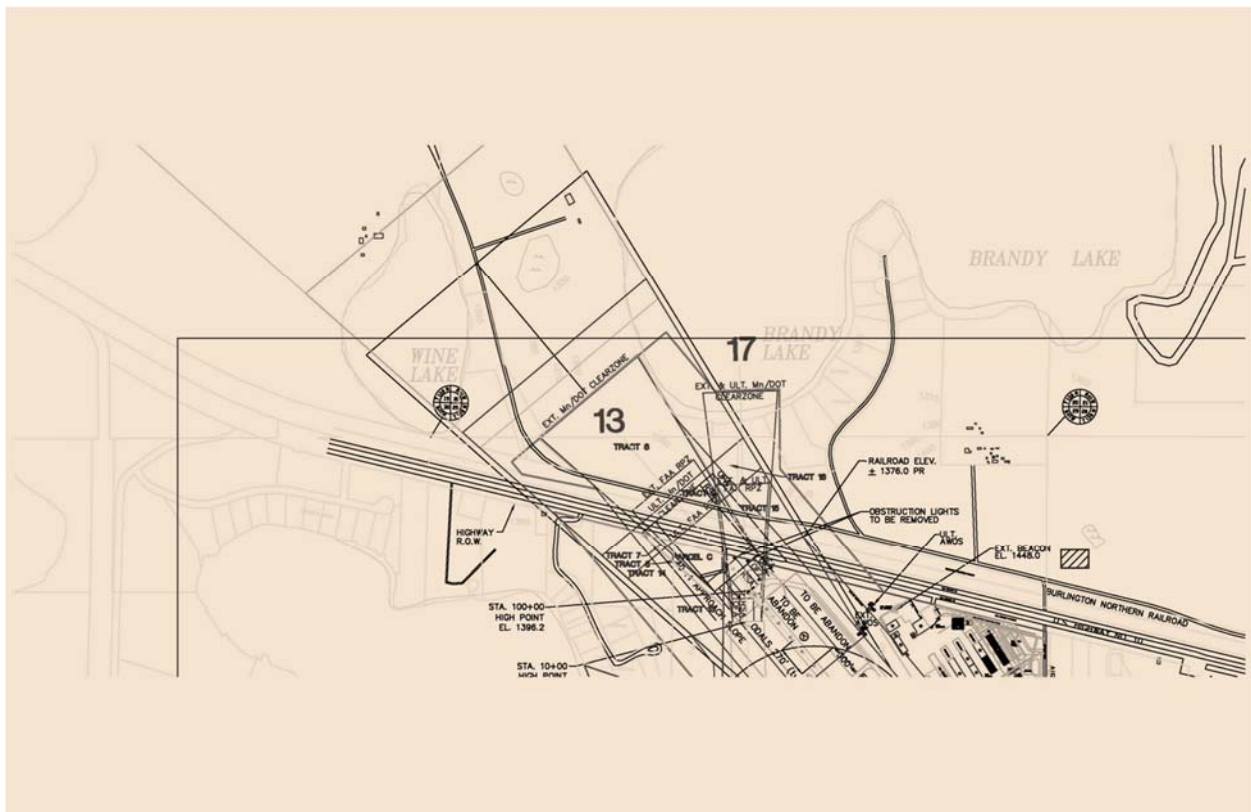
- Wetlands
- Airport Noise
- Long Lake Concerns
  - Fisheries Management
  - Water Quality
  - Invasive Species
  - Aquatic Management Areas

#### Community Issues

- Public Access to Long Lake
- Park Access

Members of the Steering Committee were extensively involved in the discussions of this study area, including the Detroit Lakes Airport Commission. The compatibility of ground transportation and airport facilities were extensively discussed with members of the TAC, Mn/DOT Aeronautics, and the FAA. Issues included the potential reconfiguration of the airport layout plan, see Figure 8, to accommodate future roadways and loss of developable airport land for needed runway or other facilities associated with its long range airport layout plan - in balance with local roadway needs.

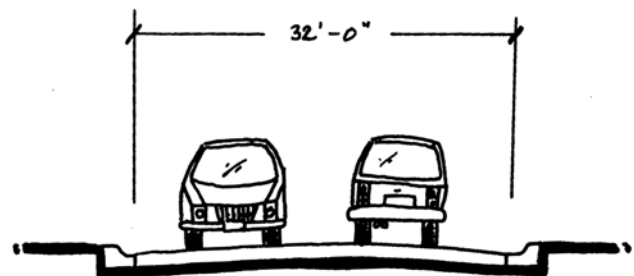
**Figure 8 – Portion of the Airport Layout Plan**



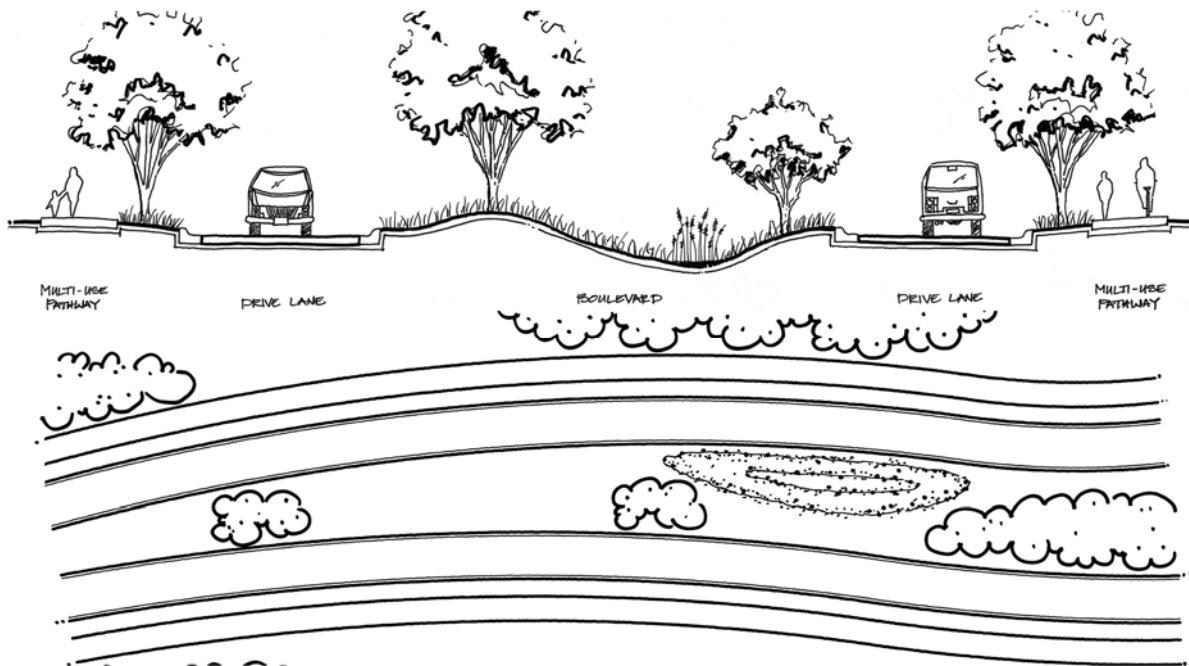
Three alternatives were studied to address these concerns, as follows:

**4A - New 32 ft. roadway**

4A - New 32 ft. roadway would serve the vehicular needs of the area, but other modes of transportation are not served well.



#### 4B - New two-lane parkway with bicycle and pedestrian trails



4B – New two-lane parkway with bicycle and pedestrian trails will serve all the modes of transportation along with providing the adjacent parcels and neighborhood the potential for streetscaping. This alternative ranked high with all of the project objectives.

#### 4C - Airport Road tunnel connection under the planned runway extension

4C - Airport Road tunnel connection under the planned runway extension would have to tunnel under the runway and the new taxiway. This length of tunnel would have an extremely high construction cost and the securing funding for this alternative was deemed to be unlikely.





*Recommendation: Study Area 4 – East Parkway*

Of the alternatives presented, the TAC selected the **4B - new two-lane parkway** as best achieving the project’s Measures of Effectiveness. If the long term planning for the airport cannot accommodate a local road for travel between Long Lake Road and Highway 10, the improvements to Highway 59 can accommodate the diverted traffic. Ultimately, the TAC decided to defer the location of this recommended concept for further development pending the results of the airport’s long-range planning studies. The following chart indicates the results of the Technical Advisory Committee evaluation.

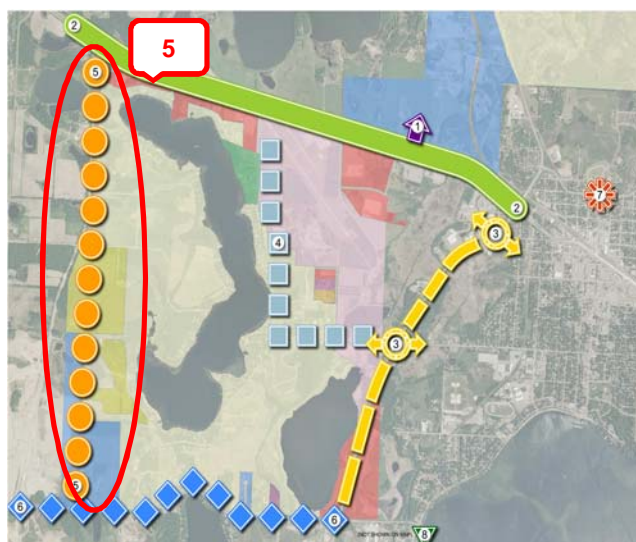
Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 4A DZ Road		-	+	+	0	0	-
Study Area 4B Parkway		+	+	+	+	+	+
Study Area 4C Tunnel Under Runway		-	0	0	0	0	+

**8.5 Study Area 5 – West Parkway**

This study area, located west of Long Lake, is an area of planned growth and annexation by the City of Long Lake. A local roadway corridor connection between County Highway 6 (Munson Lake Road) and Highway 10 is needed to provide access to the local area’s principal and minor arterial roadways and to alleviate future congestion on Long Lake Road. The comprehensive problem statement for this subarea is as follows:

**Exhibit 11 - Study Area 5 – West Parkway**

Study Area 5  
West Parkway

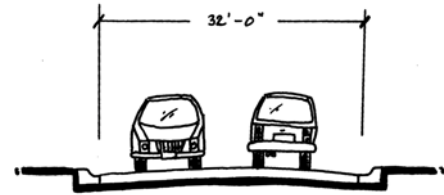


- Technical Issues
- Public/Private Utilities
  - Missing Roadway Network Links
- Regulatory Issues
- Wetlands
  - Farmlands
  - Similar Long Lake Concerns as East Parkway (Study Area 4)
- Community Issues
- Annexation
  - Future Land Use

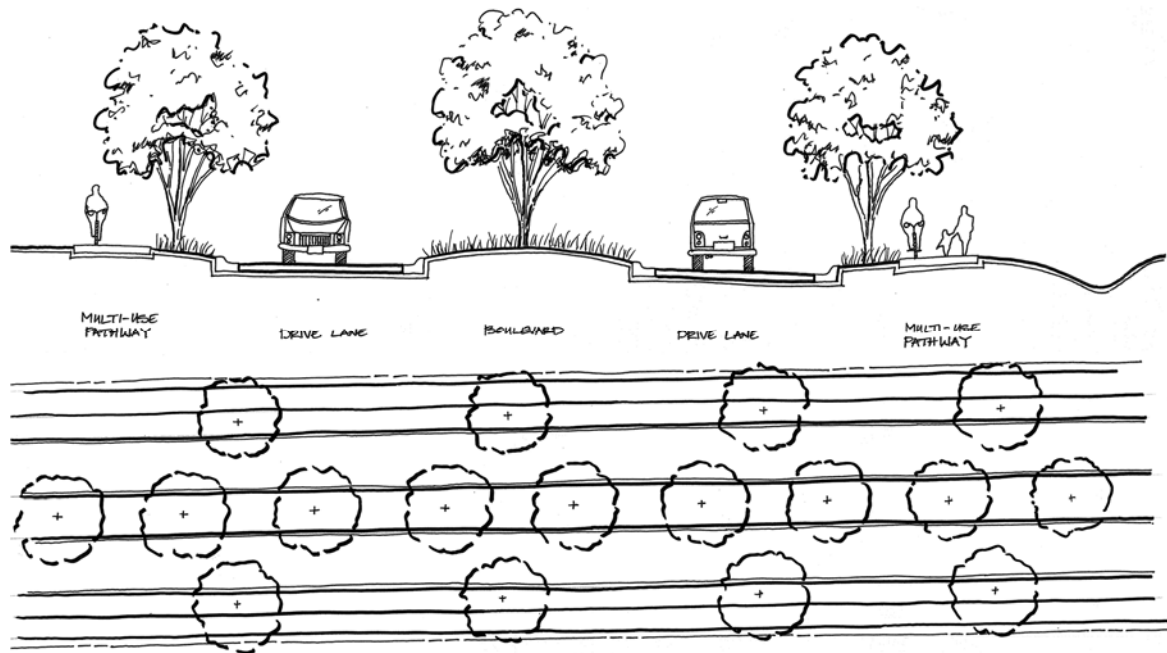
Two alternatives were proposed for this study area, including the following:

**5A - New 32 ft. roadway**

5A - New 32 ft. roadway would serve the vehicular needs of the area, but other modes of transportation are not served well.



**5B - New two-lane parkway with bicycle and pedestrian trails**



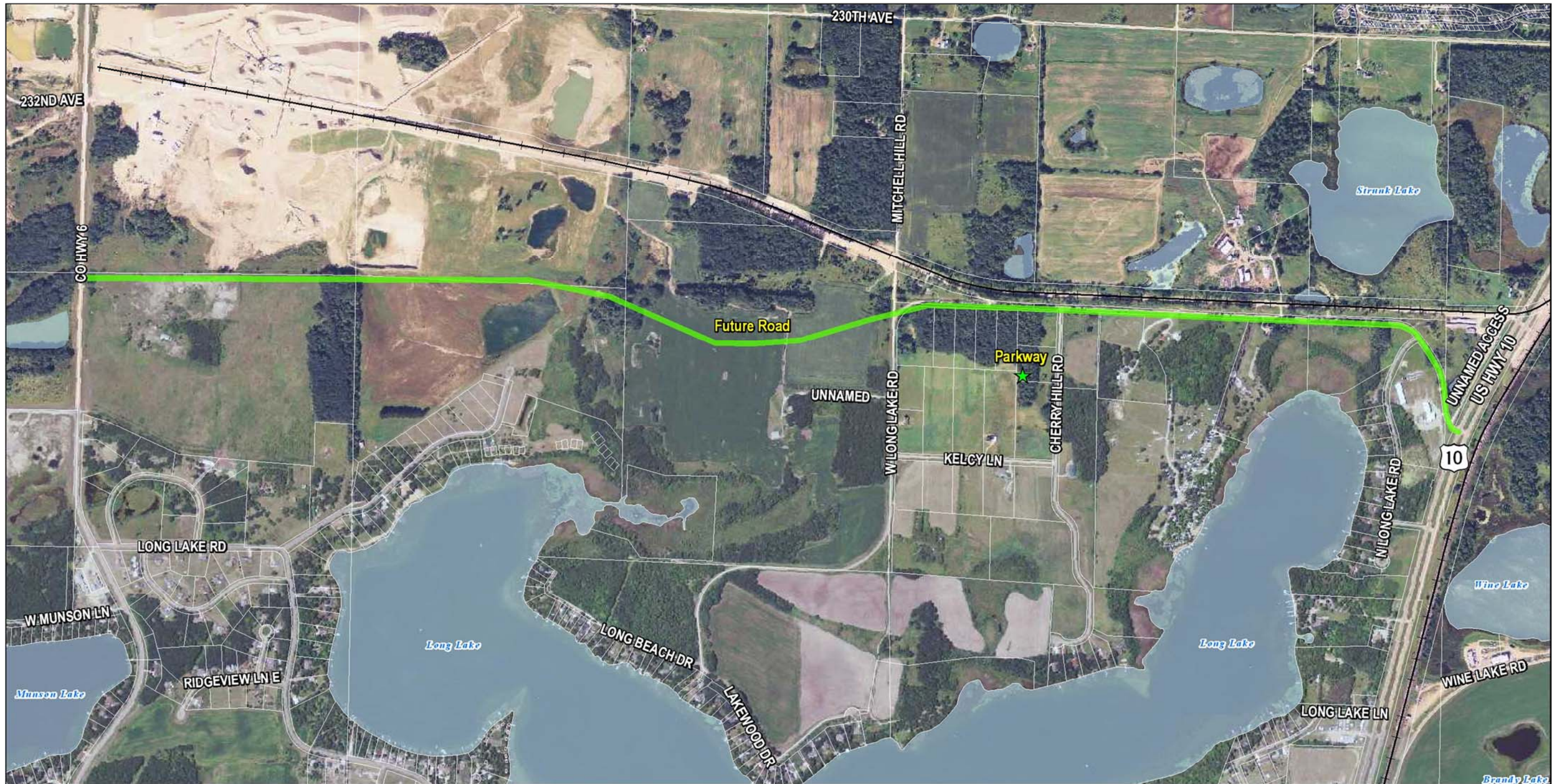
5B - New two-lane parkway with bicycle and pedestrian trails will serve all the modes of transportation along with providing the adjacent parcels and neighborhood the potential for streetscaping. This alternative ranked high with all of the project objectives.

*Recommendation: Study Area 5 – West Parkway*

Using the project’s Measures of Effectiveness, the TAC concluded that the **5B - new two-lane parkway** would be clearly beneficial – or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 5A 32' Road		-	+	+	+	+	-
Study Area 5B Parkway		+	+	+	+	+	+

Figure 9 - Study Area 5 – West Parkway



**STUDY AREA #5**  
**FUTURE WEST PARKWAY**  
**DETROIT LAKES AREA**  
**PLANNING STUDY**

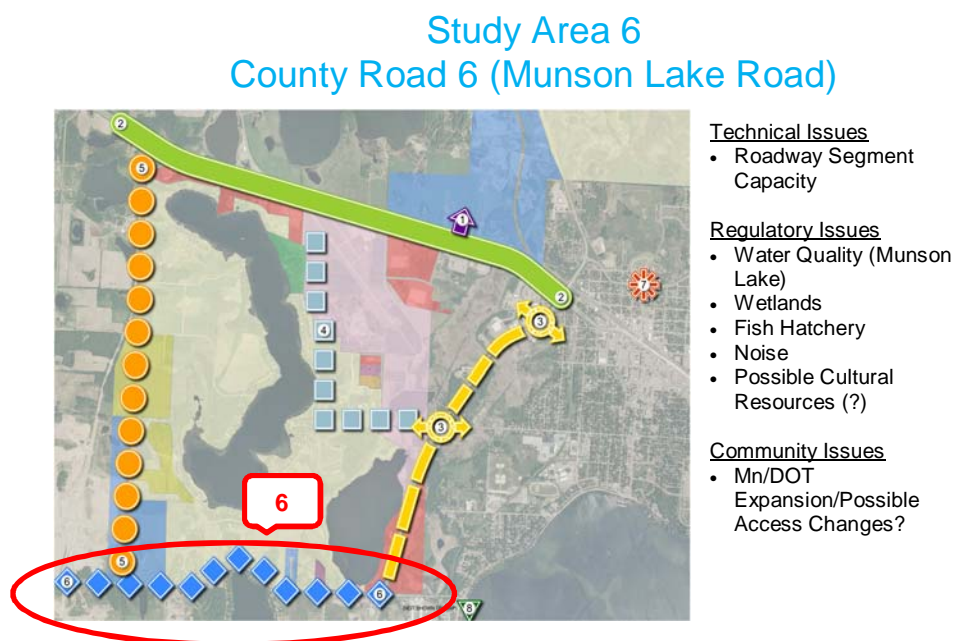
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## 8.6 Study Area 6 – Becker County Road 6 (Munson Lake Road)

This study area includes Becker County Road 6 (Munson Lake Road) from its intersection with 230<sup>th</sup> Avenue to Highway 59. Growing traffic volumes on this County facility are expected as Detroit Lakes plans long-range growth to the south of its current limits, and as regional traffic volumes grow with new rural residential developments in Becker County. Ultimately, safer intersections are needed and bicycle/pedestrian travel needs to be accommodated. The comprehensive problem statement for this subarea is as follows:

### Exhibit 12 – Study Area 6 – Becker County Road 6 (Munson Lake Road)



The TAC studied three alternative concepts in this study area, including the following:

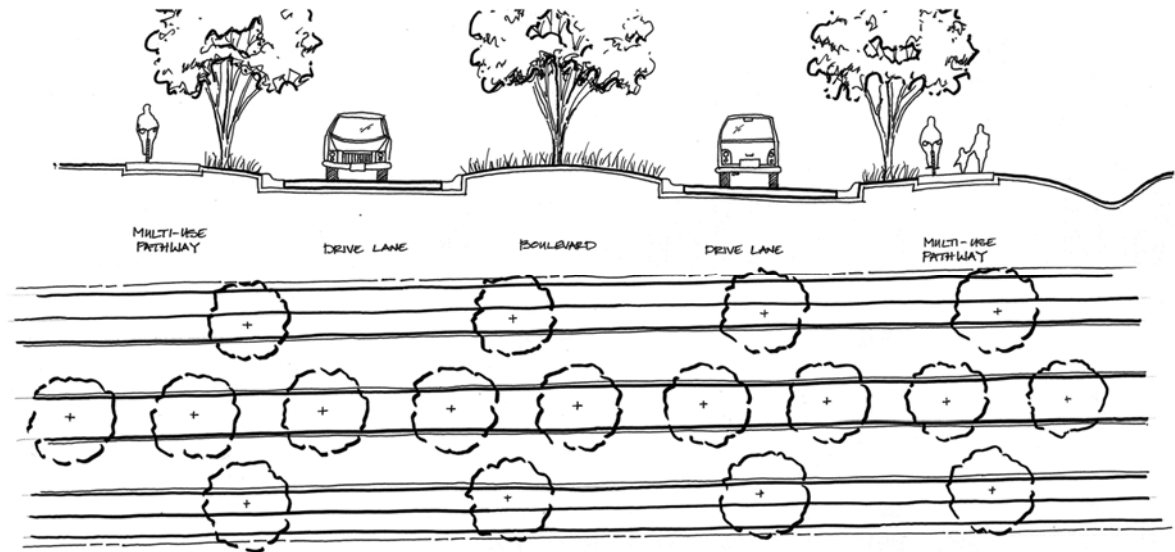
#### 6A - Rural two-lane roadway with continuous center turn lane and bicycle/pedestrian trails

6A - Rural two-lane roadway with continuous center turn lane and bicycle/pedestrian trails would address the safety and congestion related to vehicles stopped to make left turns off of the highway. The traffic analysis did not indicate a safety or operational concern due to



vehicles turning left off of CSAH 6. This alternative would do little to improve the corridor over the existing condition for vehicles, but it would improve mobility for other modes of transportation.

### 6B - Two-lane parkway with bicycle/pedestrian trails



6B - Two-lane parkway with bicycle/pedestrian trails would have a high construction cost including potential right-of-way acquisition requirements.

### 6C - Two-lane roadway with turn lanes and bicycle/pedestrian trails

6C - Two-lane roadway with turn lanes and bicycle/pedestrian trails would only widen the roadway at intersections and allow the road and trails to fit into the right-of-way better than the other options. This alternative provides improvement for vehicular travel and accommodates the other modes of transportation and ranked high with all of the project objectives.



*Recommendation: Study Area 6 – Becker County Road 6 (Munson Lake Road)*

Using the project’s Measures of Effectiveness, the TAC concluded that the **6C - new two-lane roadway with turn lanes and bicycle/pedestrian** would be clearly beneficial – or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. Planning for the corridor could include staging the improvements such as adding turn lanes with an overlay project and construction of the trail at a later date. The following chart indicates the results of the Technical Advisory Committee evaluation.


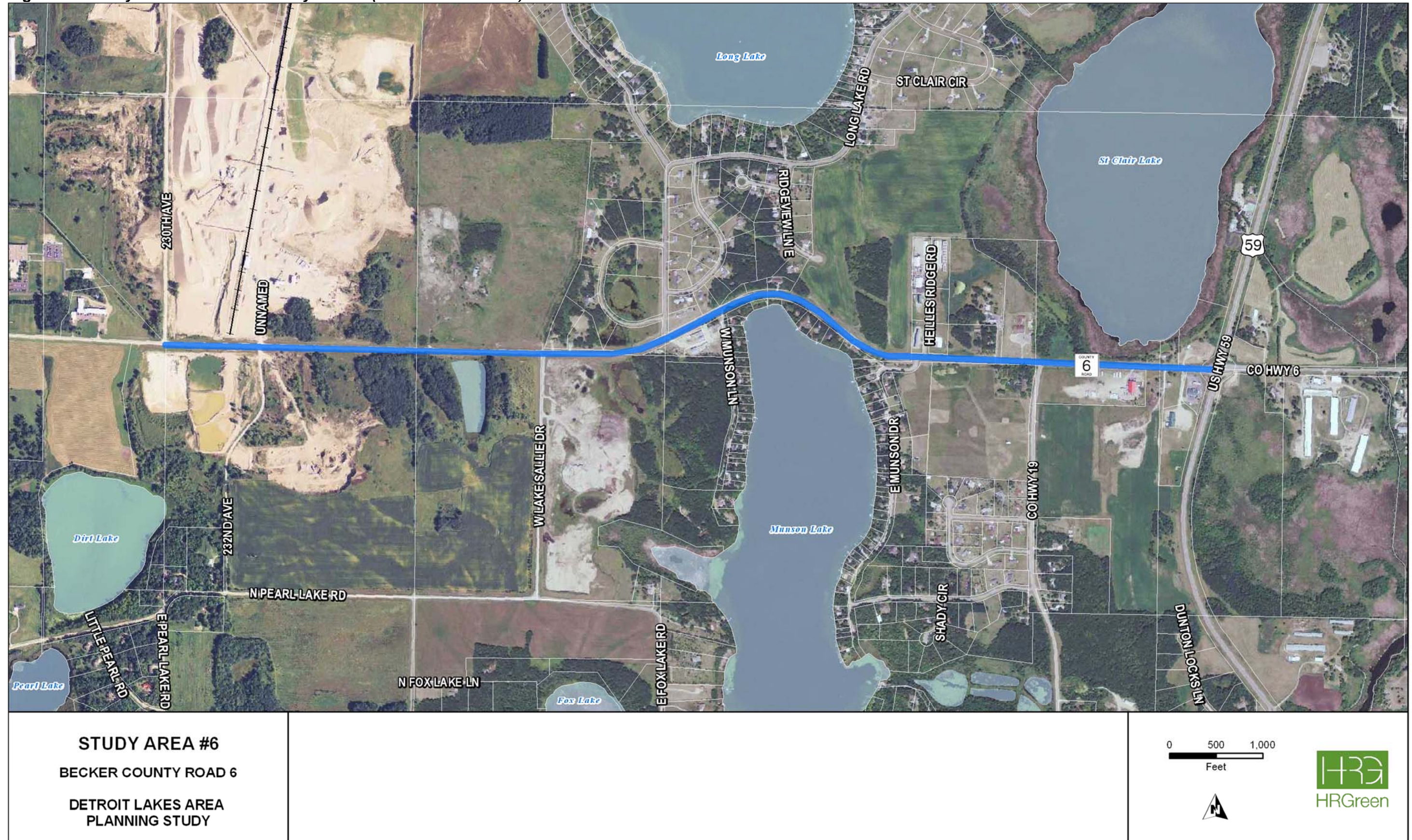
Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
							
Study Area 6A		+	+	+	+	O	+
Rural 3-Lane Section							
Study Area 6B		+	+	+	+	O	+
Parkway							
Study Area 6C		+	+	+	+	+	+
2-Lane with Turn Lanes & Trail							

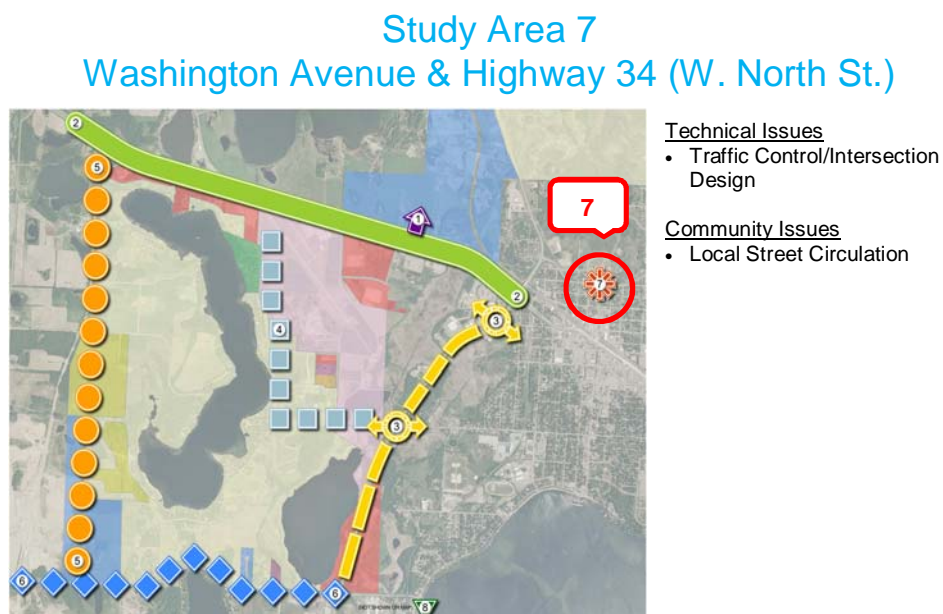
Figure 10 - Study Area 6 – Becker County Road 6 (Munson Lake Road)



## 8.7 Study Area 7 – Washington Avenue and Highway 34

Study Area 7 is specifically focused on the intersection of Washington Avenue and Highway 34 directly north of the downtown area of Detroit Lakes. This intersection is currently two-way stop controlled on Washington Avenue only. The comprehensive problem statement for this subarea is as follows:

### Exhibit 13 - Study Area 7 – Washington Avenue and Highway 34



Two conceptual alternatives were considered by the TAC for this intersection improvement project, including the following:

#### 7A - Signalized intersection

#### 7B - Roundabout

The detailed analysis is included in the Appendix of this study and a summary of the findings are included in the “Highway 34 at Washington Avenue Intersection Control Evaluation Summary” later in this section.



#### *Recommendation: Study Area 7 – Washington Avenue and Highway 34*

A safety study is needed to determine the appropriate traffic control design for this intersection. For study purposes and using the project’s Measures of Effectiveness, the TAC concluded that a **7A - signalized intersection** would be clearly beneficial – or have potential to be beneficial – and best achieve the goals and objectives among the



conceptual alternatives studied. The following chart indicates the results of the Technical Advisory Committee evaluation.


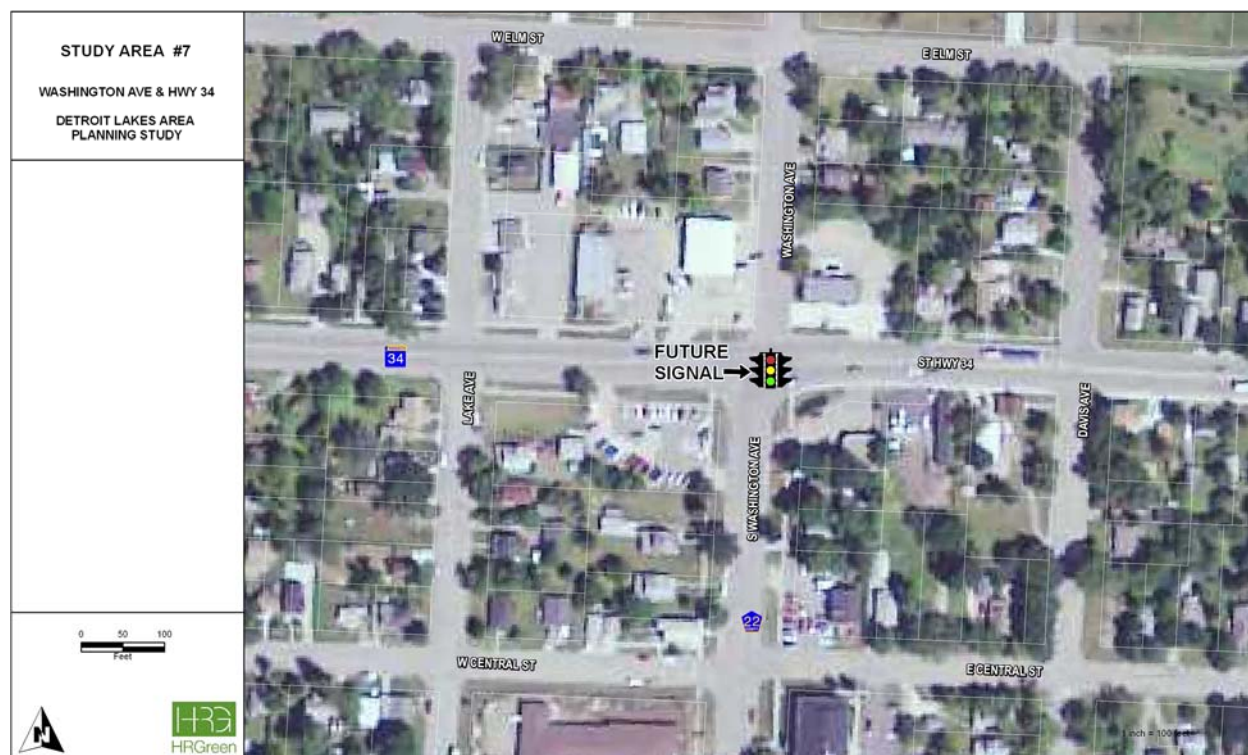
Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
 Study Area 7A Signalized Intersection		+	+	+	+	+	+
Study Area 7B Roundabout		0	0	0	0	0	0

Figure 11 - Study Area 7 – Washington Avenue and Highway 34



### Highway 34 at Washington Avenue Intersection Control Evaluation Summary

An Intersection Control Evaluation (ICE) was performed at the intersection of Highway 34 and Washington Avenue to determine the preferred type of traffic control for use at this intersection. Previously, the only solution to traffic delay and safety problems for at grade intersections was the installation of a traffic signal. Today, the engineer has a much wider number of options to choose from. Depending on a number of factors, the optimal choice for intersection control may not be a traffic signal. Therefore, it is imperative that an Intersection Control Evaluation (ICE) study be conducted during the planning phase of any intersection improvement project. The Intersection Control Evaluation is located in Appendix B.

The performance of this intersection was evaluated by several factors including safety and delay. The Level of Service of this intersection was examined for existing and future

traffic volumes. Level of Service is a qualitative measurement of the quality of traffic flow through intersections or along roadway segments using a letter-grade scale. LOS A represents high-quality conditions with little or no congestion. Conversely, LOS F represents poor conditions with extreme congestion and long delays.

**TABLE 7 – LEVEL OF SERVICE/INTERSECTION DELAY**

Signalized Intersections		Two-Way Stop Controlled Intersections	
LOS	Delay per Vehicle (Seconds/Vehicle)	LOS	Delay per Vehicle (Seconds/Vehicle)
A	<10	A	<10
B	>10-20	B	>10-15
C	>20-35	C	>15-25
D	>35-55	D	>25-35
E	>55-80	E	>35-50
F	>80	F	>50

Since a major part of the region's commerce depends on recreation and many residents reside outside of the region during winters, seasonal traffic was also evaluated. Traffic counts were taken in January and July in order to compare differences in seasonal traffic volumes.

Safety was evaluated using crash data of the intersection for the most recent four years of data (2003-2007). No issues with safety performance were found at this intersection.

Intersection traffic control alternatives evaluated in the report included the existing two-way stop, a traffic signal, and a roundabout. A summary of each traffic control option is included below:

#### Existing two-way stop

The existing two-way stop northbound left turn movement is at Level of Service E under existing conditions (2010). The intersection reaches overall Levels of Service of B. The northbound and southbound movements on Washington Avenue operate at Levels of Service E and F at 2030 volumes.

#### Traffic Signal

A traffic signal would meet warrants for this intersection. The signal would function at an overall Level of Service B or C in 2010 and in 2030.

## Roundabout

A roundabout at this intersection would impact the right of way in every quadrant of the intersection including homes and businesses. Therefore, the roundabout was ruled out as a traffic control option.

Based on the information provided within this document and engineering judgment the following conclusions have been drawn:

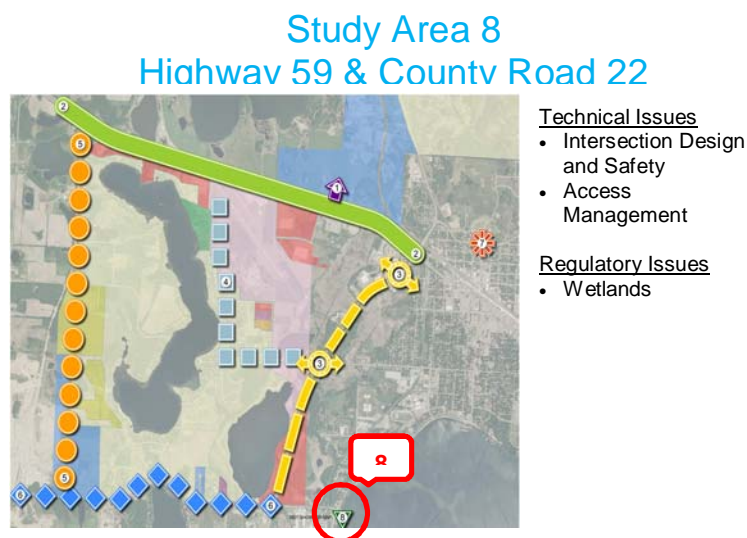
- Considering 2030 traffic volumes, Washington Avenue will experience unfavorable delays (LOS F) in the future. An all-way stop will reduce the delays for the side road, but will greatly increase delays for TH 34.
- Constructing a roundabout at this location would have a negative impact to the adjacent properties due to the large footprint required to build it.
- Crashes at this location do not appear to be a significant concern when considering crash rates and detailed crash reports.
- The construction of a traffic signal at this location would be feasible without widening the existing pavement, and the resultant LOS is favorable.

Based on the above mentioned conclusions, a signalized intersection is the recommended alternative for this location.

### 8.8 Study Area 8 – Highway 59 and County Road 22

Study Area 8 is located at the intersection of Highway 59 and Becker County State Aid Highway 22 east of the Detroit Country Club. Two-way traffic stop control is currently provided from Becker County Road 22. Intersection traffic control and potential roadway realignment improvements are needed to improve safety and traffic mobility. The comprehensive problem statement for this subarea is as follows:

#### Exhibit 14 - Study Area 8 – Highway 59 and County Road 22



The TAC considered the following six conceptual alternatives for this study area, as follows:

### **8A - Separated right turn lane (as a short-term solution)**

8A - Separated right turn lane (as a short-term solution) would improve the restricted sight distance for eastbound traffic looking for southbound through traffic. This alternative does not address the other intersection sight distance problems. This alternative ranked low with all of the project objectives.



### **8B - All-way stop (as a short-term solution)**

8B - All-way stop (as a short-term solution) was evaluated in detail and compared to traffic signals along with the Roundabout. The detailed analysis is included in the Appendix of this study and a summary of the findings are included in the “Highway 59 at County Road 22 Intersection Control Evaluation Summary” later in this section.



### **8C – Roundabout**

8C – Roundabout as the preferred method of intersection traffic control was evaluated in detail and compared to traffic signals along with the 4-way stop condition. Roundabouts are a newer intersection alternative that has proven safety benefits. The detailed analysis is included in the Appendix of this study and a summary of the findings are included in the “Highway 59 at County Road 22 Intersection Control Evaluation Summary” later in this section.



### 8D - Signalized Intersection

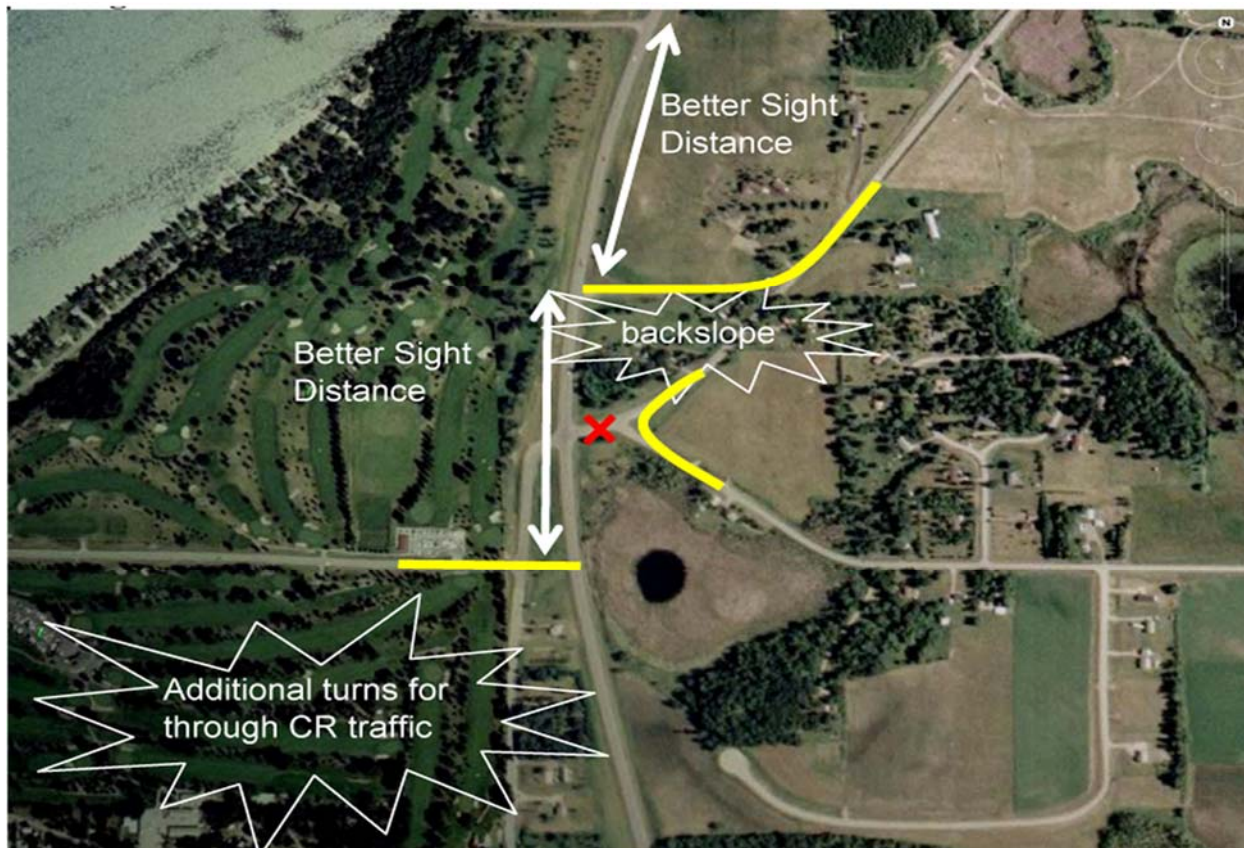
8D - Signalized Intersection was evaluated in detail and compared to the 4-way stop condition along with the Roundabout. The detailed analysis is included in the Appendix of this study and a summary of the findings are included in the “Highway 59 at County Road 22 Intersection Control Evaluation Summary” later in this section.

### 8E - Realignment of County Road 22 with a new intersection at Highway 59



8E - Realignment of County Road 22 with a new intersection at Highway 59 would also require a re-profiling of Highway 59. This alternative could address the sight distance issues at this intersection but would be a major reconstruction project. Securing funding for this alternative was deemed to be unlikely.

## 8F - Offset intersections



8F - Offset intersections with two new intersections at Highway 59 would also require a re-profiling of Highway 59. This alternative could address the sight distance issues at this intersection but would be a major reconstruction project. Securing funding for this alternative was deemed to be unlikely.

*Recommendation: Study Area 8 – Highway 59 and County Road 22*

Using the project's Measures of Effectiveness, the TAC concluded that a 8A - separated right turn lane (as a short-term solution) and a **roundabout, 8C** would be clearly beneficial – or have potential to be beneficial – and best achieve the goals and objectives among the conceptual alternatives studied. With the TAC recommendation, a safety study is needed to determine the appropriate traffic control design for this intersection. The following chart indicates the results of the Technical Advisory Committee evaluation.

Detroit Lakes Transportation Planning Study							
Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives							
Alternative & Description	How Well Does the Alternative... Measures of Effectiveness (+) Clearly Beneficial (o) Potential to be Beneficial (-) Little or No Potential to be Beneficial	Goal 1: More Transportation Choices	Goal 2: Promotes Equitable, Affordable Housing	Goal 3: Enhanced Economic Competitiveness	Goal 4: Supports Existing Communities	Goal 5: Coordinates, Leverages Federal Policies and Investments	Goal 6: Values Communities and Neighborhoods
Study Area 8A Separated Right Turn		-	-	-	-	-	-
Study Area 8B All Way Stop		-	-	-	-	o	-
Study Area 8C TH 59 Roundabout		o	+	o	o	o	-
Study Area 8D Signalized Intersection		o	+	-	o	o	-
Study Area 8E Realign CR 22		o	+	o	o	-	o
Study Area 8F Offset Intersection		o	o	-	o	-	-

Figure 12 - Study Area 8 – Highway 59 and County Road 22



### Highway 59 at County Road 22 Intersection Control Evaluation Summary

An Intersection Control Evaluation (ICE) was performed at the intersection of Highway 59 and County Road 22 to determine the preferred type of traffic control for use at this intersection. Previously, the only solution to traffic delay and safety problems for at grade intersections was the installation of a traffic signal. Today, the engineer has a much wider number of options to choose from. Depending on a number of factors, the optimal choice for intersection control may not be a traffic signal. Therefore, it is imperative that an Intersection Control Evaluation (ICE) study be conducted during the planning phase of any intersection improvement project. The Intersection Control Evaluation is located in Appendix B.

The performance of this intersection was evaluated by several factors including safety and delay. The Level of Service of this intersection was examined for existing, future, and WE Fest traffic volumes. Level of Service is a qualitative measurement of the quality of traffic flow through intersections or along roadway segments using a letter-grade scale. LOS A represents high-quality conditions with little or no congestion. Conversely, LOS F represents poor conditions with extreme congestion and long delays.

**TABLE 7 – LEVEL OF SERVICE/INTERSECTION DELAY**

Signalized Intersections		Two-Way Stop Controlled Intersections	
LOS	Delay per Vehicle (Seconds/Vehicle)	LOS	Delay per Vehicle (Seconds/Vehicle)
A	<10	A	<10
B	>10-20	B	>10-15
C	>20-35	C	>15-25
D	>35-55	D	>25-35
E	>55-80	E	>35-50
F	>80	F	>50

Since a major part of the region’s commerce depends on recreation and many residents reside outside of the region during winters, seasonal traffic was also evaluated. Traffic counts were taken in January and July in order to compare differences in seasonal traffic volumes.

Safety was evaluated using crash data of the intersection for the most recent four years of data (2003-2007). Half of the crashes at the intersection were right angle crash types, which resulted in a high crash severity for the intersection.

Intersection traffic control alternatives evaluated in the report included the existing two-way stop, an all-way stop, and a roundabout. A traffic signal did not meet signal warrants, therefore it was not considered for use at this intersection. A summary of each traffic control option is included below:

#### Existing two-way stop

The existing two-way stop intersection operates at an overall Level of Service A with 2010 volumes, with only the eastbound movement experiencing somewhat significant delays and measures at a Level of Service C. The intersection reaches overall Levels of Service of C in 2030 with the eastbound movement failing. The intersection fails at 2030 volumes and during WE Fest traffic.



### All-way stop

The all-way stop would function at an overall Level of Service A in 2010 and C in 2030. WE Fest traffic for a signal would be Level of Service F and a traffic officer would be required during the WE Fest event. The all-way stop would likely bring the crash severity rate down to a level at or below the state wide average, however, it would not eliminate sever crashes at the intersection.

### Roundabout

A roundabout at this intersection would provide a Level of Service A in 2010 and 2030, and a Level of service B during WE Fest traffic. A roundabout would be a safety improvement that would reduce fatalities by 90 percent injury crashes by 75 percent and overall crashes by 40 percent compared to signalized intersections. WE Fest events would not require police officers directing traffic as is currently done with the all-way stop configuration.

Based on the information provided within this document and engineering judgment the following conclusions have been drawn:

- The all-way stop condition operates at an acceptable level of service currently and is anticipated to remain so by year 2030.
- The all-way stop condition does not provide an acceptable level of service during the WE-Fest high traffic periods. A two-way stop condition is less desirable during these same periods.
- Traffic signal warrants for the intersection were not met.
- Constructing a roundabout at this location would appear to be feasible given existing land use and topography.
- Crashes at this location do not appear to a significant concern when considering crash rates and detailed crash reports.
- Construction of a roundabout provides the best safety benefit
- A roundabout will operate well during the WE-Fest high traffic periods.

Based on the above mentioned conclusions, a roundabout intersection is the recommended alternative for this location.

## 9.0 Implementation

### 9.1 Project Planning

The TAC assembled study-recommended projects from each of the eight study areas into three general sets of priorities. These priorities were established based on available funding to proceed with preliminary/ final design and construction, urgency in correcting safety issues, resolution of outstanding issues, market conditions, and long-term needs (i.e. important but lower immediate priority).

*Priority 1: Programmed Projects:* funding substantially in place with planned construction beginning as early as 2013. These projects have been identified in the 10-year Highway Investment Plan (HIP) and have had funding programmed in the 2012-2015 State Transportation Improvement Program (STIP)

*Priority 2: Planned Projects:* fiscally-constrained projects requiring detailed study and construction beginning after 2015. These projects have been identified in the 10-year Highway Investment Plan (HIP) and will be considered in the future as potential projects.

*Priority 3: Potential Projects Dependent on Market Conditions and/or Airport Expansion:* These project needs are dependent on the pace of growth in the community and decisions on constraints such as the proposed airport expansion. These projects will typically occur when market conditions improve or issues can be resolved to avoid selecting a transportation system decision that may need to be changed over time.

The next steps for these project priorities were then matched to an implementation schedule on the following Table 8.

# Study-Recommended Projects

## Programmed Projects (Construction beginning in 2012 to 2015)



- Highway 10 Overlay (west of Airport Road)
- CSAH 6 (Overlay with turn lanes)(Study Area 6)
- Highway 10 Urban Four-Lane Section, Access Management Improvements, and East Frontage Road (Study Area 2 & 3)
- CSAH 22/Highway 59 intersection right turn lane safety improvement (Study Area 3)
- Highway 59 Frontage Road and Underpass (Homes Street Extension)(Study Area 3)

## Planned Projects (Construction beginning after 2015)



- CSAH 6 (trail)  
(Study Area 6)
- CSAH 22/Highway 59  
Full Intersection  
Improvement (Study  
Area 8)

## Potential Projects Dependent on Market Conditions and/or Airport Expansion (Future Construction)



- Airport Road/East Parkway (Study Area 4)
- Highway 10 West Improvements (with or without frontage road west of airport road)
- Offset Highway 10 Frontage Road (north of highway) (Study Area 1)
- West Long Lake Parkway (Study Area 5)
- Washington Avenue/TH 34 Intersection Signalized Improvements (Study Area 7)

**Table 8 - Implementation Schedule and Next Steps**

Study Area Number and Name	Preferred Alternative(s) For Further Development	Implementation Next Steps Prior to Right of Way Acquisition and Construction	Lead Agency/ Other Coordination Agencies	Construction Begins
<b>1 - Access North of Highway 10</b>	Study Area 1C - Offset Frontage Road to North	<ol style="list-style-type: none"> <li>1. Refine conceptual roadway design for comprehensive plan amendment/update for use with developers/others interested in developing property north of the highway.</li> <li>2. Refine Highway 10 intersection design (preliminary design process)</li> <li>3. Coordinate crossing with BNSF Railroad</li> <li>4. Secure intersection funding</li> </ol>	Lead: City of Detroit Lakes Others: Mn/DOT, BNSF Railroad	2015+
<b>2 – Highway 10 with Frontage Road</b>	Study Area 2C – Urban 4-lane with Shoulders Study Area 2E – Frontage Road with Trails	<ol style="list-style-type: none"> <li>1. Coordinate DL planning study outcomes with Mn/DOT ten year plan and program (i.e. preserve ability to add Offset Frontage Road to North).</li> <li>2. Refine conceptual roadway design and coordinate with other study projects (Areas 1, 3, 4, 5).</li> <li>3. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: Mn/DOT Others: City of Detroit Lakes, reviewing/permitting agencies	2015
<b>3 – Highway 59</b>	Study Area 3C – Frontage Road	<ol style="list-style-type: none"> <li>1. Develop concept plan for Highway 59 frontage road and further study with preliminary design process.</li> <li>2. Refine conceptual design by developing preliminary design alternatives.</li> <li>3. Secure funding.</li> <li>4. Complete design/environmental/permitting processes</li> </ol>	Lead: Mn/DOT Others: City of Detroit Lakes, reviewing/permitting agencies	2015
	Study Area 3D - Willow Street/ Highway 59 Intersection Improvements	<ol style="list-style-type: none"> <li>1. Complete safety study and choose preferred alternative.</li> <li>2. Implement long-term project (expected to be a roundabout) from safety study.</li> </ol>	Lead: Mn/DOT Others: City of Detroit Lakes	2014
	Study Area 3G – Holmes Street Connection with Highway 59 Frontage Road	<ol style="list-style-type: none"> <li>1. Refine concept design alternatives to connect Highway 10 frontage road with Holmes Street.</li> <li>2. Coordinate alternatives with Highway 10 design process (Study Area 2).</li> <li>3. Work with regulatory agencies to implement best management practices (BMPs).</li> <li>4. Secure funding.</li> <li>5. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: City of Detroit Lakes Others: Mn/DOT, reviewing/permitting agencies	2015
<b>4 – East Parkway</b>	Study Area 4B – Parkway	<ol style="list-style-type: none"> <li>1. Resolve Airport Layout Plan issues with FAA <ol style="list-style-type: none"> <li>a. Confirm runway extension displacement/threshold.</li> <li>b. Determine if a new roadway extension will be compatible with the ultimate location of a crosswind runway.</li> <li>c. Regulatory issues related to airport expansion (wetlands, WWTP maintenance, etc.)</li> </ol> </li> <li>2. Develop concept design alternatives and establish design standards; consider future Highway 10 access (coordinate with Study Area 1 preliminary design).</li> <li>3. Continue to develop BMPs with regulatory agencies.</li> <li>4. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: City of Detroit Lakes Others: Mn/DOT, Becker County, reviewing/permitting agencies	2011-2015
<b>5 – West Parkway</b>	Study Area 5B – Parkway	<ol style="list-style-type: none"> <li>1. Update comprehensive planning and annexation documents to include this roadway.</li> <li>2. Set design standards and complete conceptual roadway, trail, and intersection designs.</li> <li>3. Work with regulatory agencies to implement BMPs.</li> <li>4. Secure funding.</li> <li>5. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: City of Detroit Lakes Others: Becker County, Mn/DOT, reviewing/permitting agencies	Annexation and Development-driven (Likely 10+ years)
<b>6 - County Road 6</b>	Study Area 6C – Turn lanes and Trail	<ol style="list-style-type: none"> <li>1. Set design standards and complete conceptual roadway, trail, and intersection designs.</li> <li>2. Work with regulatory agencies to implement BMPs.</li> <li>3. Secure funding.</li> <li>4. Complete Design/Environmental/Permitting Processes.</li> </ol>	Lead: Becker County Others: Mn/DOT, City of Detroit Lakes, Reviewing/permitting agencies	2015+
<b>7 – Washington Avenue &amp; Highway 34</b>	Study Area 7A – Signalized Intersection	<ol style="list-style-type: none"> <li>1. Complete safety study.</li> <li>2. Complete traffic signal design (** short term project already warranted **)</li> <li>3. Implement long-term project from safety study.</li> </ol>	Lead: City of Detroit Lakes Others: Mn/DOT	2015+
<b>8 - Highway 59 and County Road 22</b>	8 – Highway 59 and County 22 Study Area 8A, 8C/8D- Roundabout option	<ol style="list-style-type: none"> <li>1. Refine concept and prepare design for right turn lane safety improvement (** short term project **)</li> <li>2. Complete safety study.</li> <li>3. Implement long-term project from safety study.</li> </ol>	Lead: Becker County, Mn/DOT Others: Reviewing/Permitting Agencies	2015+

## 9.2 Project Construction Cost Estimates

General planning level roadway improvement costs were developed for each improvement. It is important to consider the following when reviewing the project cost estimates. First, because it is difficult to identify a specific year that each project might be constructed, all estimated costs are presented in 2010 dollars. Second, since specific details regarding design, engineering, and construction are often not available, the estimated costs represent a very general planning level cost estimate and are provided in a range of potential costs versus a single cost. As projects proceed to the detailed planning and engineering phases, resulting in more accurate estimates, the project cost estimates contained in this transportation plan should be updated.

For the purpose of transportation plan, projects were grouped into one of three categories: programmed (completed prior to year 2015), planned (completed prior to year 2020), and potential-driven by economic/development conditions by year 2030. The potential project category is driven more by the timing of development than other factors and could move forward more quickly if development occurs sooner. The terminology (programmed, planned, and potential projects) was used for analyzing the various transportation improvements and does not guarantee that a specific roadway improvement will be constructed. Furthermore, there is no guarantee that a specific improvement will be constructed during the time frame identified. The design, engineering, and construction of the specific roadway improvements identified in this transportation plan depend heavily on the availability of transportation funds.

The following data was used to prepare the construction cost estimate for each recommended project.

**Table 9 - Project Construction Cost Estimate**

Items	Unit Cost (Range)	
Frontage Road / Mile	\$1,750,000	\$2,625,000
Frontage Road with Trail / Mile	\$2,000,000	\$3,000,000
2-Lane Road / Mile	\$2,000,000	\$3,000,000
Parkway	\$2,500,000	\$3,750,000
4-Lane Road / Mile	\$3,500,000	\$5,250,000
Signal	\$250,000	\$375,000
Signal with Turn Lanes	\$750,000	\$1,125,000
Roundabout	\$1,500,000	\$2,250,000
Intersection Improvement	\$300,000	\$450,000
Bridge	\$2,250,000	\$3,375,000

**Table 10 - Study Recommended Construction Cost Estimates**

Study Area	Alternative	Major Item	Quantity	Total Cost (Range)	
1 - Access North of Highway 10	Study Area 1C – Offset Frontage Road to North	Frontage Road	0.43	\$752,500	\$1,128,750
2 – Highway 10 with Frontage Road	Study Area 2C – Urban 4-lane with Shoulders	4-Lane Road	1.4	\$4,900,000	\$7,350,000
	Study Area 2E – Frontage Road with Trails	Frontage Road with Trails	1.4	\$2,800,000	\$4,200,000
3 – Highway 59	Study Area 3C – Frontage Road	Frontage Road	0.4	\$700,000	\$1,050,000
	Study Area 3D – Roundabout	Roundabout	1	\$1,500,000	\$2,250,000
	Study Area 3G – Holmes Street Connection with Highway 59 Frontage Road	2-Lane Road & Bridge	0.4	\$3,050,000	\$4,575,000
4 – East Parkway <b>(No concept alignment available for development of a cost estimate at the time of this Study)</b>	Study Area 4B – Parkway	Parkway		\$0	\$0
5 – West Parkway	Study Area 5B – Parkway	Parkway	2.8	\$7,000,000	\$10,500,000
6 - County Road 6	Study Area 6C – Turn lanes and Trail	2-Lane Road	2.2	\$4,400,000	\$6,600,000
7 – Washington Avenue & Highway 34	Study Area 7A – Signalized Intersection	Signal	1	\$250,000	\$375,000
8 - Highway 59 and County Road 22	Study Area 8A – Separated Right Turn	Intersection Improvement	1	\$300,000	\$450,000
	Study Area 8C – Roundabout Option	Roundabout	1	\$1,500,000	\$2,250,000
	Study Area 8D – Signalized Intersection	Signal with turn lanes	1	\$750,000	\$1,125,000

### 9.3 Project Funding Strategies

State, County, and City staff are well versed in state and federal funding programs and are actively seeking a variety of funding sources to supplement local funding sources. The funding strategies should consider present constraints and opportunities while planning for the transportation infrastructure needed to meet expected growth. It is recommended that State, County, and City leaders actively investigate and possibly pursue the following specific funding programs/strategies to address future transportation investment needs:

<b>Federal Transportation Funds</b>	<b>Congressional High Priority Project (HPP) Funding</b>
<b>State Roads of Regional Significance Funds</b>	<b>Trunk Highway Corridor Account Loan Program (revolving loan fund)</b>
<b>Mn/DNR Recreation Grant Programs</b>	<b>Mn/DOT's Rural Safety Audit (RSA) Grants</b>
<b>Comprehensive Highway Safety Plan (CHSP) Central Fund</b>	<b>Mn/DOT Safe-Route-To-School Grant Program</b>
<b>Mn/DOT Hazard Elimination (HES) Funds</b>	<b>Mn/DOT Turn-back Account Funding</b>
<b>Mn/DOT Access Management Program Funding</b>	<b>Municipal State Aid</b>
<b>Transportation Economic Development (TED) Pilot Program</b>	<b>General Obligation Bonds</b>
<b>General Ad Valorem (Property) Taxes</b>	<b>Tax Increment Financing (TIF)</b>
<b>Property Tax Abatement</b>	<b>Developer Contributions/Impact Fees</b>
<b>Assessments</b>	

Projects funding from many of these funding sources are secured through the State Transportation Improvement Program (STIP) which allows a fair allocation of funds across the state. In this process projects are identified by the route and funding is allocated through programs and funding categories. Improvements on the Programmed Project category have been evaluated and are listed in the STIP. The following tables list the STIP Route System Categories, Figure 5 from the STIP, Program Categories, Figure 6 from the STIP, and Proposed Fund Categories, Figure 7 from the STIP.

**Figure 5**  
**Route System Categories**

Route System	Description
BB	Transit (buses)
CITY	City project
CMAQ	Congestion Mitigation and Air Quality
CR	County Road
CSAH	County State Aid Highway
DA	Disability Act
EN	Enhancement (not assigned to a specific road and not a pedestrian or bicycle path)
FH	Forest Highway
I	Interstate Highway
IRR	Indian Reservation Roads and Bridges
ITS	Intelligent Transportation Systems
LOCAL 999	Local project not associated with a road
MSAS	Municipal State Aid Street
MUN	Municipal Street
PED/BIKE	Pedestrian or Bike Path/Trail (not assigned to a specific road)
PL	Planning
RECTRAIL	DNR Recreational Trail
RR	Railroad
TH	Trunk Highway
TH 999	State project not associated with a road (not an Enhancement)
TWN	Township Road

**Figure 6**  
**Program Categories**

Program	Description
AM	Municipal Agreement
BI	Bridge Improvement
BR	Bridge Replacement
BT	Bike Trail (not an Enhancement)
CA	Consultant Agreement
DR	Drainage
EN	Enhancement (STP)
IR	Indian Reservation Roads
MA	Miscellaneous Agreements
MC	Major Construction
NA	Not Applicable (Uncommitted)
NO	Noise Walls
PL	Planning
PM	Preventive Maintenance
RB	Rest Area/Beautification
RC	Reconstruction
RD	Recondition
RS	Resurfacing
RT	Recreational Trail (DNR only)
RW	Right of Way Acquisition
RX	Road Repair (Bridge and Road Construction) (BARC)
SA	Supplemental Agreement/Cost Overruns
SC	Safety Capacity
SH	Highway Safety Improvement Program (HSIP)
SR	Safety Railroads
TM	Transportation Management
TR	Transit (FHWA)
B9	FTA Urbanized Area Formula – Section 5307
CF	Clean Fuels – Section 5308
B3	FTA Capital Program - Section 5309
NB	FTA Elderly and Person with Disabilities – Section 5310
OB	FTA Non-urbanized Areas - Section 5311
JA	FTA Job Access and Reverse Commute – Section 5316
NF	New Freedom Section 5317

**Figure 7**  
**Proposed Fund Categories**

Fund	Description
BF	Bond Funds
BH	Bridge Rehabilitation
BR	Bridge Replacement
BROS	Off System Bridge
CBI	Coordinated Border Infrastructure
CMAQ	Congestion Mitigation and Air Quality
DPS	Department of Public Safety
ER	Emergency Relief
FFM	Federal Fund Miscellaneous (TCSP, Special Appr.)
FH	Forest Highway
FTA	Federal Transit Administration
HSIP	Highway Safety Improvement Program
HSR	High Speed Rail
HPP	High Priority Project (Earmarked)
IM	Interstate Maintenance
IRR	Indian Reservation Roads
ITS	Intelligent Transportation Systems
LF	Local Funds or Other
NCIP	National Corridor Infrastructure (Earmarked)
NHS	National Highway System
PNRS	Projects of National and Regional Significance (Earmarked)
PUB	Public Lands
RES	Research
RRS	STP Rail Safety
RT	Recreational Trail
SB	Scenic Byways
SF	State Funds
STP	Surface Transportation Program
SU	STP Small Urban
TEA	Transportation Enhancement (STP)
TI	Transportation Improvements (Earmarked)
TRLF	Transportation Revolving Loan Fund
UG	STP Urban Guarantee



## 10.0 Public and Agency Participation Activities

In addition to the work completed by the project committees, over the course of the study a number of public and agency participation activities took place. There were three public open houses, meetings with specific groups, and two neighborhood meetings. Media announcements and press coverage included newspaper articles (print and online).

A project web site was established at <http://www.dot.state.mn.us/d4/projects/dlstudy> where regular study updates, illustrations, and announcements were made. A community questionnaire was administered via the web site asking for local input related to transportation system concerns in the study area. A unique feature of the web site was an opportunity to email a written comment or question related to a specific study area and its alternatives under consideration. This resource was a convenient way for members of the public to provide feedback and to help the study committees guide conclusions for policymakers in the community.

A summary of public participation activities and substantive comments received is summarized below. A detailed record of comments received from public meetings and from the project website is available on compact disc in Appendix B.

### 10.1 Public Meeting Comment Summary

Three community-wide public meetings were held for the study. The meeting format was open-house style discussion with displays and informal discussion with project personnel. A brief presentation was given related to the project study purpose and need, and status of project activities.

#### Public Meeting No. 1 (February 25, 2010)

Approximately 25 persons attended this meeting held at the Minnesota State Technical and Community College in Detroit Lakes. The purpose of the meeting was to introduce the study to members of the public, establish its purpose and need and issues identified to date, describe the study components, and indicate the next steps. Questions raised at the meeting pertained to the benefits of possible solutions (such as roundabouts), needs for changes in access and intersection controls, and ability to plan for long-term growth and future development of the community.

A questionnaire was distributed to meeting attendees to gather opinions on perceived safety problems, travel conditions, changes in streets desired, and general changes needed in Detroit Lakes' transportation system. Questionnaire respondents indicated that peak summer traffic makes local travel difficult and that problem areas (primarily intersections) become even more dangerous. Respondents also indicated a need for more bicycle and pedestrian facilities to

connect older and newer areas of town and to be sure that new roadways have adequate facilities to accommodate these additional modes.

#### Public Meeting No. 2 (July 14, 2010)

Approximately 40 persons attended this meeting held at the Minnesota State Technical and Community College in Detroit Lakes. The purpose of this meeting was to present and gauge public feedback on the study subareas, problem statement considerations associated with each area (technical, regulatory, and community concerns) and their potential conceptual solutions. Members of the public again asked questions about the benefits of potential solutions, such as roundabouts vs. traffic signals, and queried the need and potential funding sources for some of the potential solutions proposed.

#### Public Meeting No. 3 (February 24, 2011)

Approximately 22 persons attended this meeting held at the Minnesota State Technical and Community College in Detroit Lakes. The purpose of this meeting was to reacquaint members of the public with the study subareas and the recommendations made by the project's operating committees for alternatives for further consideration and development. There were no written comments received at this meeting.

### **10.2      *Neighborhood Meetings***

Two meetings were held with local residents and businesses concerned with proposed future access changes associated with Highway 59 and local connection alternatives proposed between downtown Detroit Lakes and commercial business areas along Highways 59 and 10. The first meeting was held on October 6, 2010 and attended by residents of neighborhoods west of the downtown area and businesses located along the Highway 59 Corridor. Concerns at this meeting included routing along the grid of streets, train crossing delays, potential reopening of Main Street to Highway 10, and issues with wetland impacts associated with an extension of Willow Avenue to Highway 59. Of primary concern was the route a proposed local street connection would assume to cross Highway 59 (over/under), possible land use and private property impacts, and the source of funds, such as local street assessments, to pay for associated roadway improvements.

A second neighborhood meeting was held on January 25, 2011 in response to concerns expressed at the first meeting of the local residents and businesses. Approximately 25 persons were in attendance. The overall study process and alternative study area concepts with a higher level of refinement were presented at this meeting. Questions from the participants included traffic volume effects (i.e. increase), railroad crossing issues, effects on a local wetland, and property tax assessments for proposed improvements. At the end of the meeting, a show of hands indicated the meeting attendees preferred one of the local connection alternatives over other alternatives.

### **10.3 Study Area Stakeholder Businesses and Agency Coordination Meetings**

#### Business Coordination

Two meetings were held with representatives of area businesses on September 8, 2010 to discuss study area issues. Representatives from 30 businesses located along Highway 10 were invited to attend and due to the large number of potential attendees, two meeting sessions were scheduled. Questions regarding the project timing and impacts to access during and after traffic were raised. The following was presented at the meeting, and no major objections were stated: The Highway 10 project and related frontage roads are anticipated to take two construction seasons and may begin as early as 2014. Ultimately there will be less direct access to Highway 10, but a new continuous frontage road into town will be constructed to provide alternative access to the business without using the highway.

#### Environmental Agency Coordination

A third meeting was held with local environmental review agencies later in the day on September 8, 2010. Representatives from the Pelican River Watershed District, MN Department of Natural Resources, Becker Soil and Water Conservation District and the MN Pollution Control Agency attended. Key discussion items are summarized as follows:

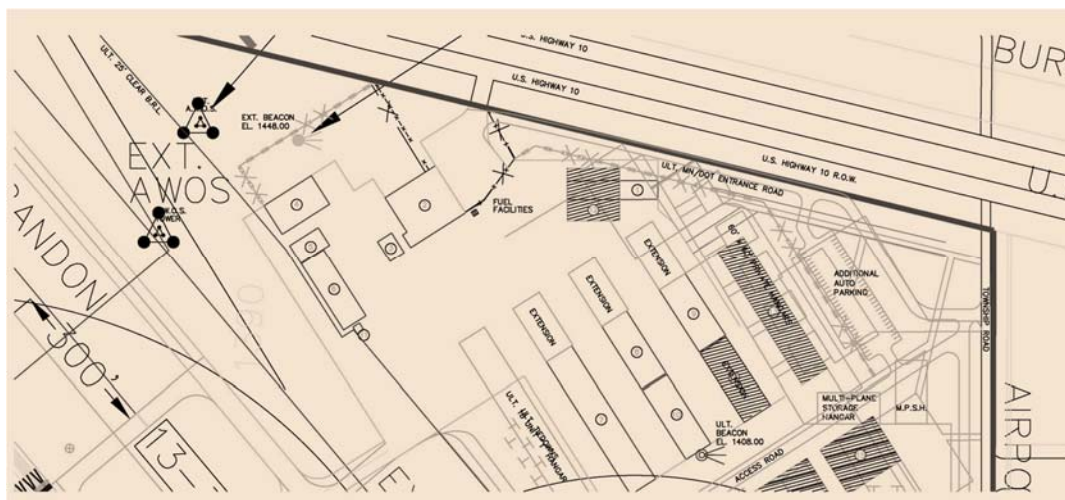
- Project in Northeast for anoxic summer flow. Interest in iron filing treatment/filter option for Rice Lake with the goal to keep Big Detroit Lake at 24 ppb.
- Hwy 10 is the access to Wal-Mart area for vehicular traffic, but there is not good access for other modes. Bike/Pedestrian/Handicap access very compelling problem to be addressed.
- 'AVOID' is the main solution. The agencies stated that bisecting either wetland is a no-go. Although skirting the wetland edge, especially on the eastern wetland, may work ok.
- Lake St. Clair treated in 1998- Alum treatment for winter pulse of phosphorus (Jan-March). 170 ppb reduced to 40 ppb
- Next steps for study-
  - Bike alternative: Is there a bike/pedestrian route on backside (west) of Mn/DOT site?
  - Holmes street extension to skirt wetland up to HWY 59

### Airport Coordination

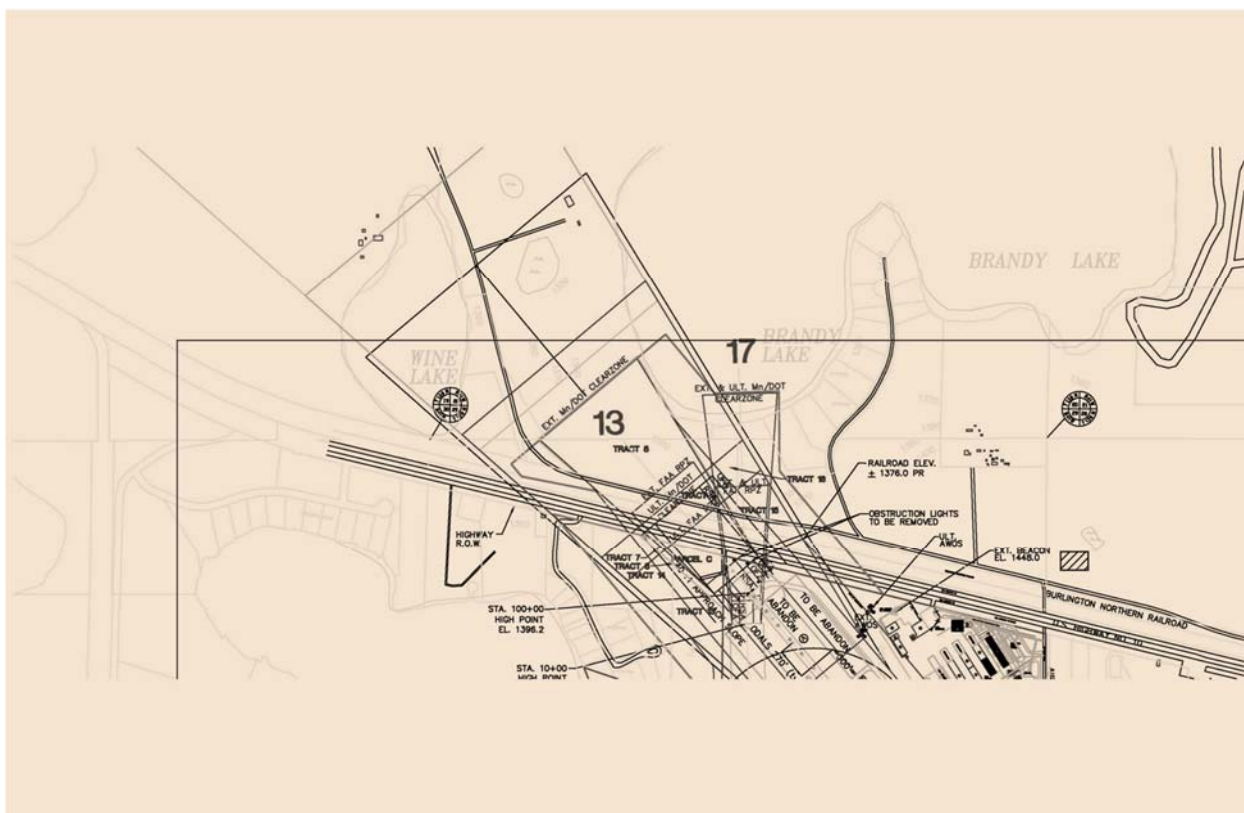
A meeting was held on August 12<sup>th</sup>, 2010 to coordinate the future airport expansion project. The meeting was attended by members of the Federal Aviation Agency, Mn/DOT Aeronautics, and the City of Detroit Lakes. Key discussion items are summarized as follows.

- Runways have several areas which restrict obstructions in a large area extending from the end of the physical runway. The existing runway has several non-compliant obstructions in the vicinity of Highway 10. Proposed modifications to the runway would include shifting the runway away from the highway to address these concerns.
- Future design of Highway 10 and a new frontage road may be advantageous to the runway safety areas if the designs flatten the grades and do not introduce new obstructions such as lights or trees.
- It would be a real challenge to fit in a west perimeter airport road. The roadway would need to be a compatible function to the aviation purpose. The Float plane operation would need to be coordinated with any future road in the vicinity.
- One option would be to go up the west side of Long Lake.
- 2014 airport road frontage road. Narrow TH 10 and make into a urban setting. Tie into existing frontage road? Or add a frontage road on the NORTH side of the strip mall? Connect to mini-frontage road on n. side of Long Lake? Don't want to stop in the middle of nowhere – need to make them as continuous as possible. How about to the new West Parkway?

**Figure 13: Portion of Airport Layout Plan – Hangar Area**



**Figure 14: Portion of Airport Layout Plan – Northern Safety Areas**



#### 10.4 Web Site Comments Received

Opportunities to submit comments online were made available to members of the public. The study questionnaire was posted online as were opportunities to leave comments pertaining to potential solutions related to each of the study subareas. General responses to online questionnaires received are as follows:

Safety problems along Highways 10 or 59 – where? What would make it safer?

- Seasonal traffic problem (summer) and effects on existing intersection traffic controls, including need for turning lanes and improved traffic management at the Highway 59/Willow Street intersection.
- Need for continuous frontage roads along developed or developing areas along Highways 10 and 59
- Highway 59/County Road 22 – bad intersection
- Improved bicycle and pedestrian facilities

- Lower speeds needed on Highway 10
- Too many access points on Highway 59
- Turning traffic into Perkins Restaurant (signage issue?)
- Signalized intersection (not roundabout) at Highway 59 and Willow Street.

From locations noted – certain times per day/days per week of perceived unsafe travel?

- Summer months
- WeFest
- Lakes areas, especially on weekends
- Mornings
- School traffic (a.m. and p.m.)

New Street Connections Needed Around the Community for safer/more convenient travel?

- Bicycle and pedestrian connections more so than streets

New bicycle and pedestrian facilities (where?)

- Around area lakes
- New street connections or planned routes
- Improved sidewalks to the downtown area via Washington Avenue

Other transportation improvements needed in the Detroit Lakes area?

- Pave 230<sup>th</sup> Avenue between County Road 6 and Highway 10
- Transit (Connection to Fargo)
- Main Street/Morrow Avenue Underpass is needed

## 11.0 List of References

The following references were used to prepare the Detroit Lakes Transportation Planning Study report. Traffic studies are available on compact disc in the Appendix or by contacting the Minnesota Department of Transportation or City of Detroit Lakes as noted below.

### Summary of Traffic Studies Completed for the Project

1. Detroit Lakes Planning Study Traffic Technical Memorandum – Data Collection and Existing Traffic Capacity Analysis, HR Green, December 2009
2. Detroit Lakes Planning Study Technical Memorandum – Summary of Safety, Traffic Analysis and Access Management, HR Green, January 2010
3. 48-Hour Traffic Counts, Various Locations, June 30, 2010 and July 7, 2010
4. Intersection Control Evaluation Report – TH 34 at Washington Avenue, HR Green, October 2010
5. Intersection Control Evaluation Report – TH 59 at Willow Street, HR Green, February 2011
6. Intersection Control Evaluation Report – TH 59 at CSAH 22, HR Green, February 2011

### Summary of Other Reference Documents Used In Preparing the Study

1. Detroit Lakes Airport preliminary Draft EIS and Airport Layout Plan, 2010 to present
2. Detroit Lakes Wastewater Treatment Plant NPDES Discharge Permit, April 2007
3. Minnesota Department of Transportation, Interregional Corridor Performance Methodology, Appendix C, A Guide for Plan Development and Corridor Management, September, 2000
4. Detroit Lakes Comprehensive Plan, 2000
5. Detroit Lakes Annexation Plans, 2010

## **APPENDIX A**

Potential Intersection Design Solutions for Study Area 2 and  
Study Area 3 (Inverted Tee Bridge Design and Green Tee  
Intersections)



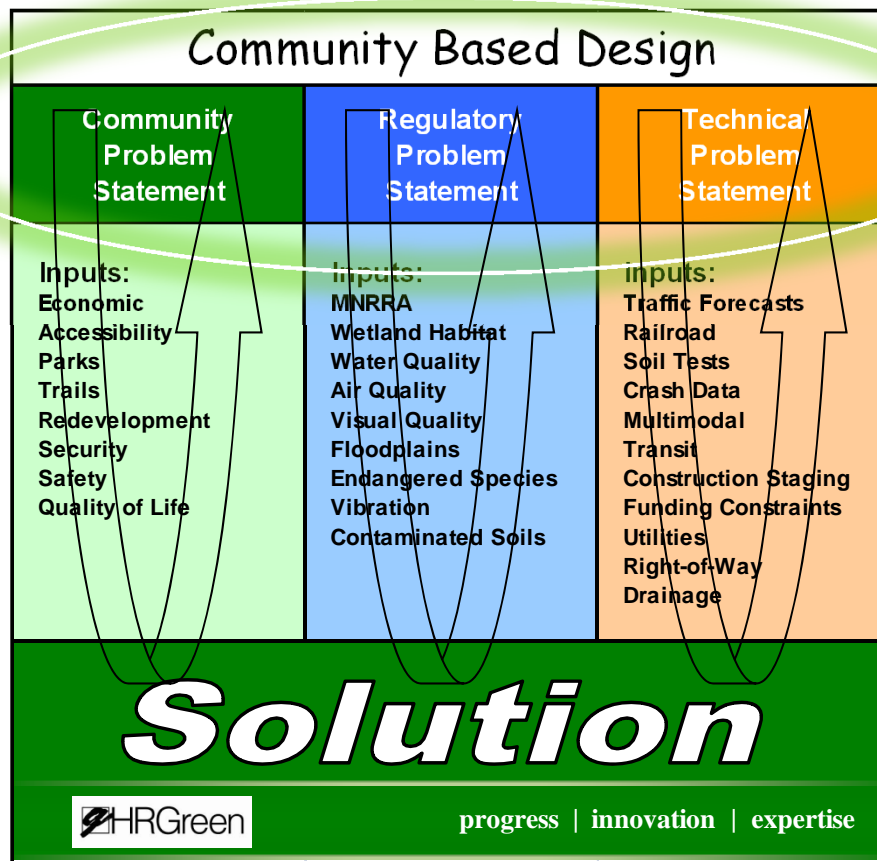
# Detroit Lakes Predesign

April 5<sup>th</sup>, 2011

Jack Broz

Bill Klingbeil

# Community Based Design



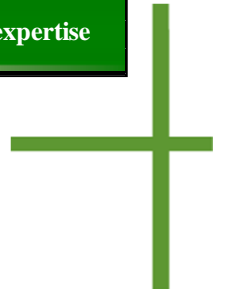
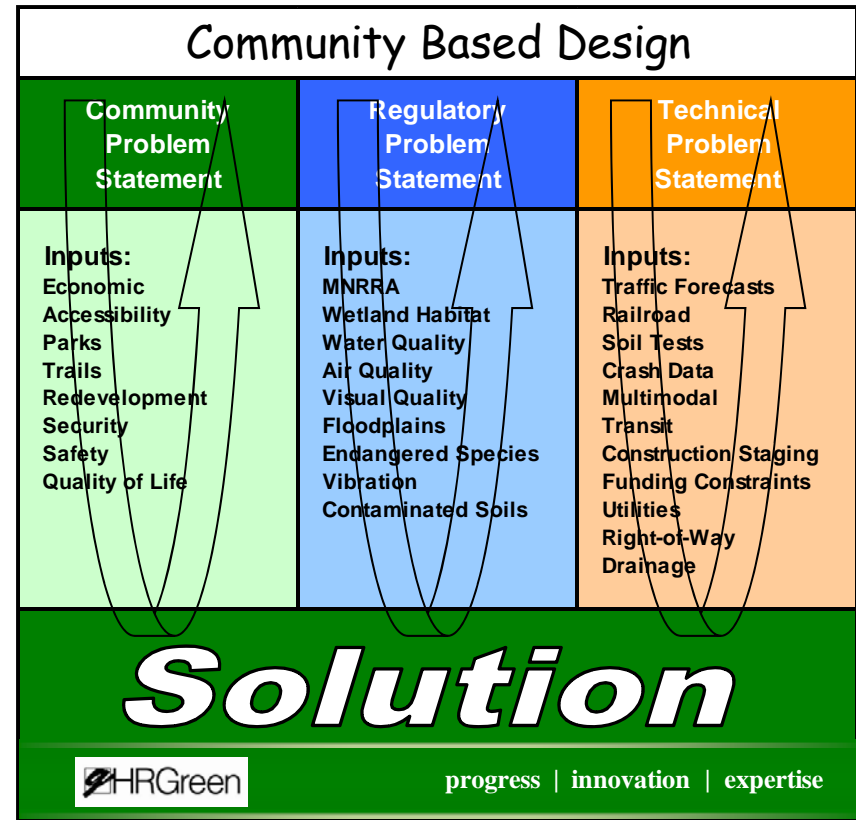
Comprehensive  
Problem Statement

Engaged Public and  
Regulatory Agencies

One Solution can  
address multiple  
Problems



# HUD-EPA-DOT Partnership



# Study Area 8: TH 59/CSAH 22

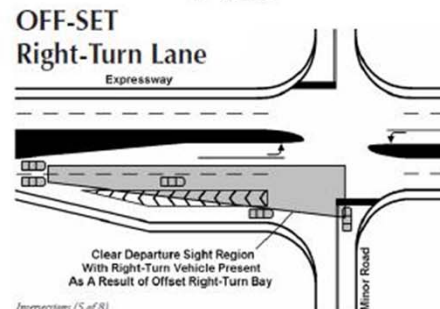
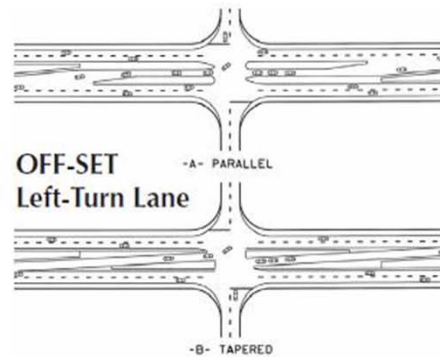
## Traffic Safety Fundamentals Handbook



Minnesota Department of Transportation  
Office of Traffic, Safety and Technology  
Published August 2008  
Prepared by DIZM HILL, Inc.



## Turn Lane Designs

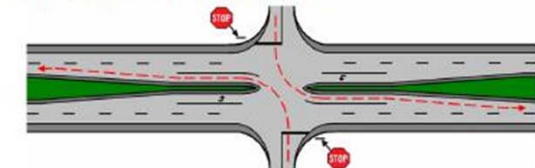


Intersections (5 of 8)  
Source: NCHRP 15-30 Preliminary Draft

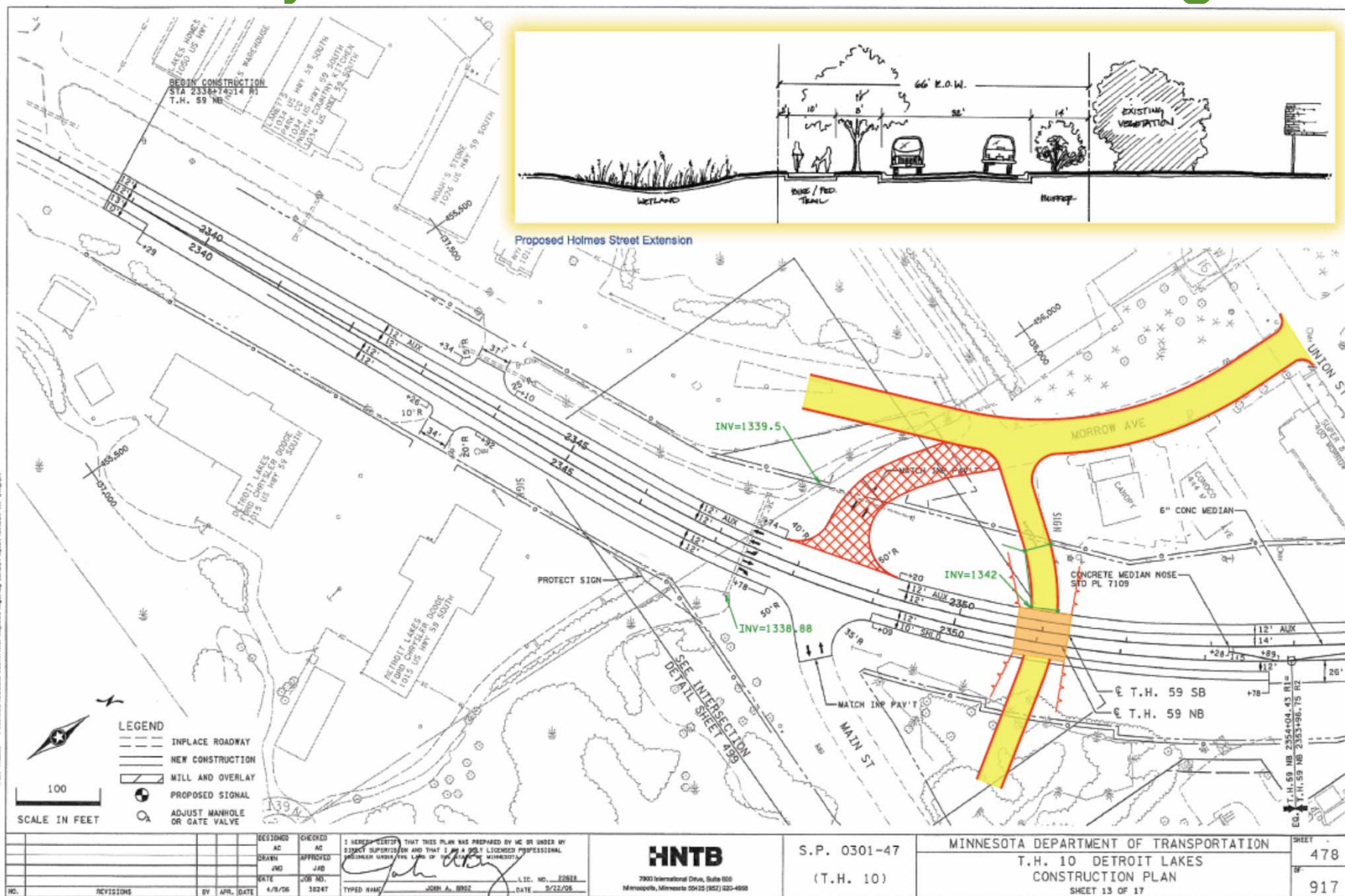
### Highlights

- Providing right and left turn lanes at intersections are included in Minnesota's list of High Priority strategies.
- However, there are locations where vehicles are stopped or decelerating in the turn lane and can block the line of sight for other vehicles waiting at the intersections. In these cases the use of Off-set left and right turn lanes will improve the line of sight for vehicles waiting to complete their crossing or turning maneuvers.
- Off-set turn lanes are considered Tried (as opposed to Proven). A Before vs. After Study of Off-set Left Turn lanes in North Carolina reported a 90% reduction in Left Turn crashes. A similar study of Off-set Right Turn lanes in Nebraska found a 70% reduction in near-side right angle crashes.
- The Median Acceleration Lane (MAL) has been used at a number of locations in Minnesota and is also considered Tried – Before vs. After studies indicate a 75% reduction in same direction sideswipe crashes, a 35% reduction in far-side right angle crashes and a 25% reduction involving left turn crashes from the minor road.

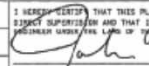
### Median Acceleration Lane



# Study Area 3: TH 59 over Frontage Rd



POST TABLE: \\minn001\cadd\as\tr\tr\kasson\agency\10307\user\mcdoff\10307-10307.dwg

DESIGNED	AC	CHECKED	AC	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.	
DRAWN	JAD	APPROVED	JAD		
DATE	1/8/06	JOB NO.	10247	L.I.C. NO.	22928
TYPED NAME	JOHN A. BREY		DATE	2/22/06	

**HNTB**  
 7900 International Drive, Suite 600  
 Minneapolis, Minnesota 55425 (952) 822-4999

S.P. 0301-47  
 (T.H. 10)

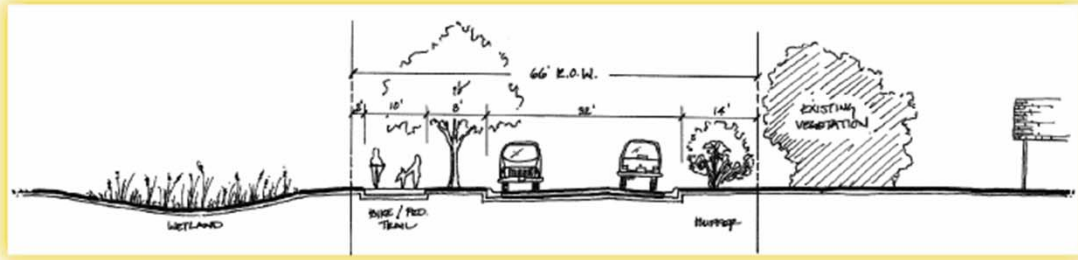
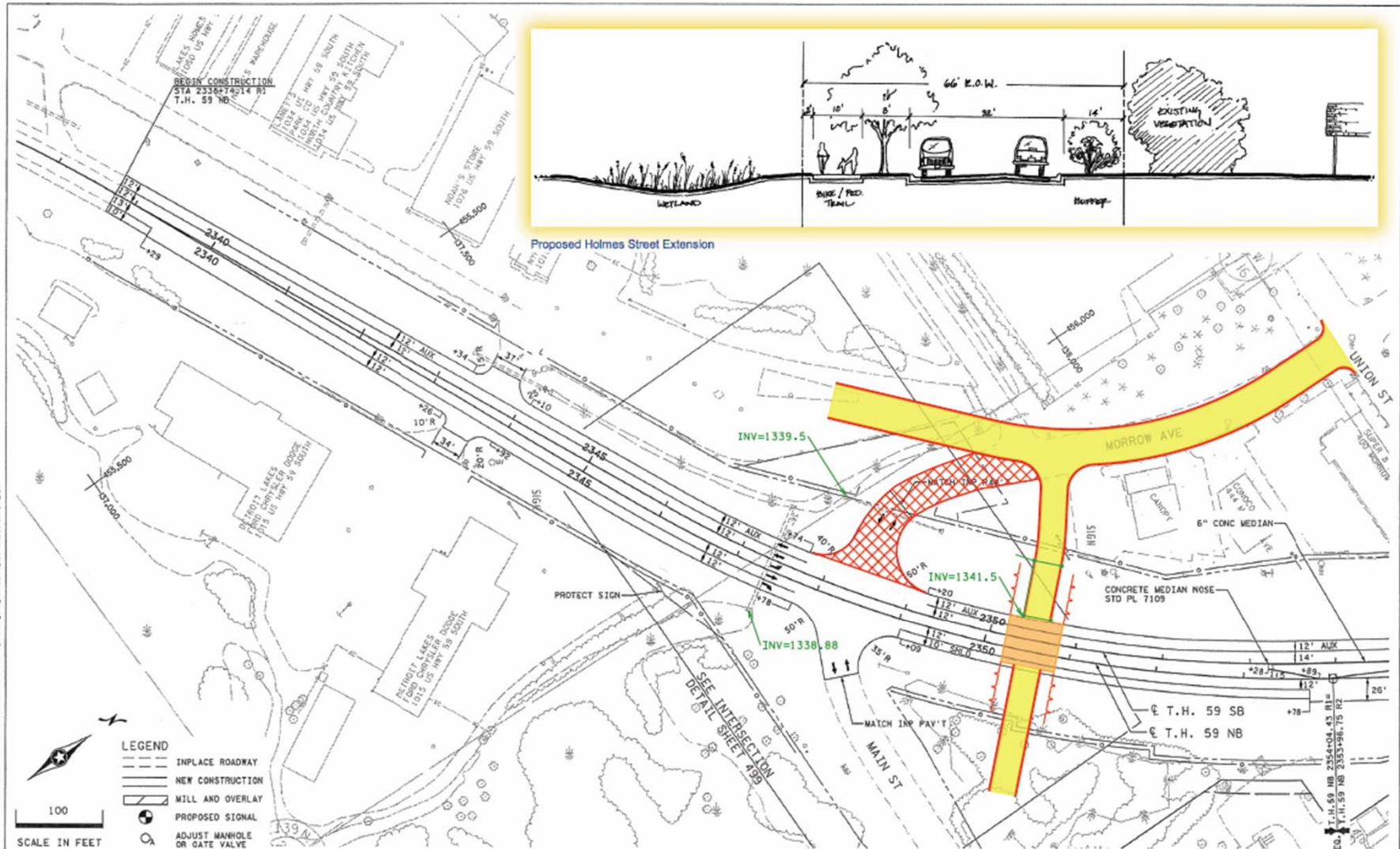
MINNESOTA DEPARTMENT OF TRANSPORTATION  
 T.H. 10 DETROIT LAKES  
 CONSTRUCTION PLAN  
 SHEET 13 OF 17

SHEET	478
OF	917



HRGreen

# Study Area 3: TH 59 over Frontage Rd



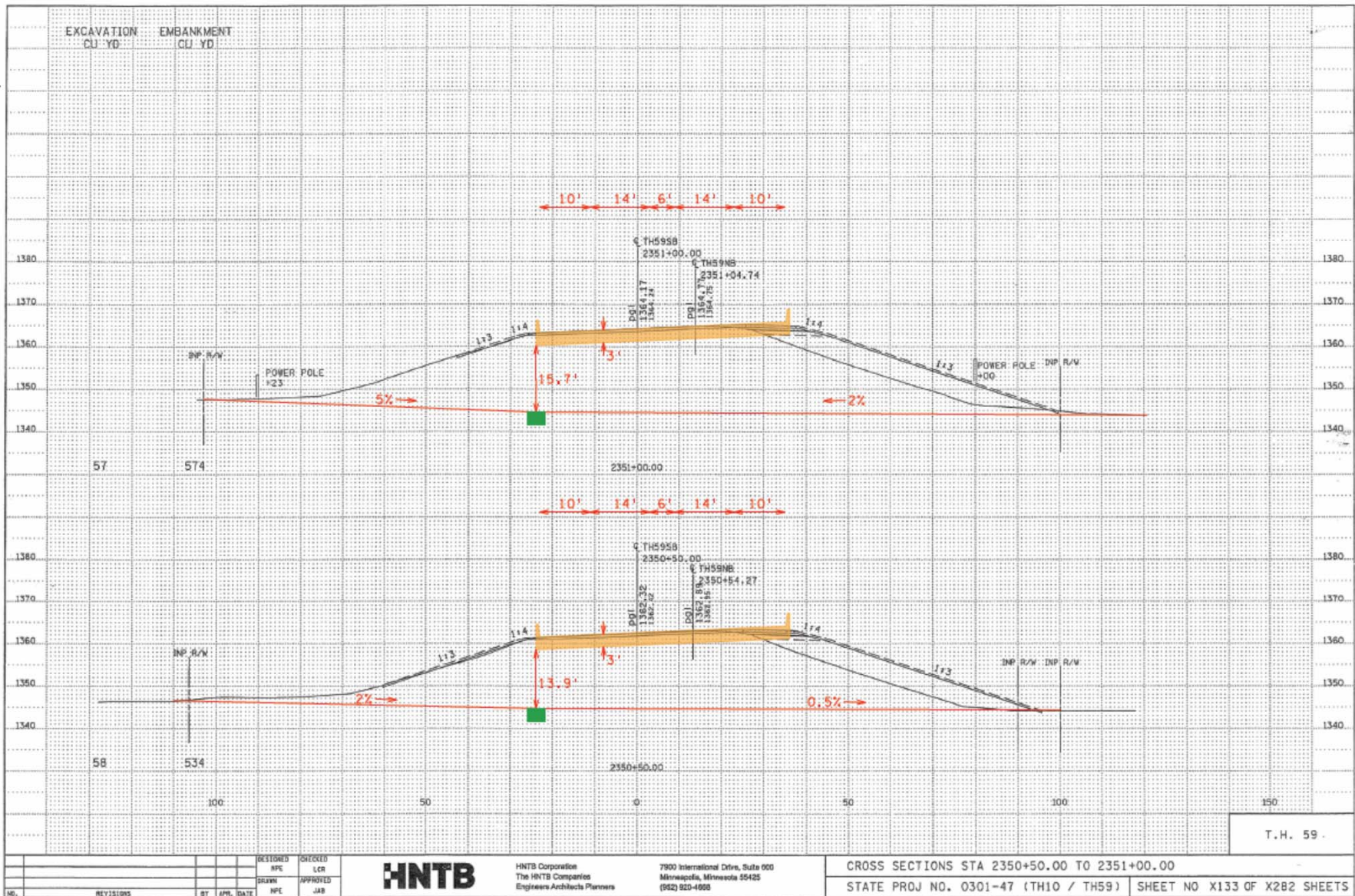
Proposed Holmes Street Extension

DESIGNED AC		CHECKED AC	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.	 7900 International Drive, Suite 600 Minneapolis, Minnesota 55435 (612) 635-4900	S.P. 0301-47 (T.H. 10)	MINNESOTA DEPARTMENT OF TRANSPORTATION T.H. 10 DETROIT LAKES CONSTRUCTION PLAN SHEET 13 OF 17	SHEET 478 OF 917
SEAL	DATE	DATE			TYPED NAME	DATE	
	4/8/06	8/24/07	JOHN A. BRUZZI	5/27/05			



HRGreen

# Study Area 3: TH 59 over Frontage Rd



T.H. 59

NO.	REV	DESCRIPTION	BY	APP.	DATE

**HNTB**

HNTB Corporation  
The HNTB Companies  
Engineers Architects Planners

7900 International Drive, Suite 600  
Minneapolis, Minnesota 55425  
(952) 920-1699

CROSS SECTIONS STA 2350+50.00 TO 2351+00.00

STATE PROJ NO. 0301-47 (TH10 / TH59) SHEET NO X133 OF X282 SHEETS

# Inverted Tee Design

LRFD Bridge Design Workshop

June 12, 2007

Keith Molnau, P.E., Design Unit Leader

Moises C. Dimaculangan, Bridge Designer





# Highlighted Projects to Date



# Background/Development of System

- A practical mode of construction, combining the advantages of Precast Girders + CIP Slab Span, without the falsework.



*It's a fairly simple system, with many advantages...*



# Advantages of MnDOT Precast Slab System

- No Falsework
- Rapid Construction
- Environmental Advantages
- Controlled Precasting Environment Advantages
  - Higher concrete strengths than C.I.P.
  - Factory reliability, better quality assurance...
- Simple, Non-Specialized Construction Methods
- IBRD \$ Applied for 2 Minnesota Pilot Projects

# FHWA: Every Day Counts



[FHWA](#) >> [Every Day Counts](#) >> [Accelerating Technology](#) >> [GRS-IBS](#) >> Case Studies

## GRS-IBS Case Studies

Researchers at the Federal Highway Administration (FHWA) knew simple bridges could be built better, faster, and for less money. They were ready to test that theory. By using Geosynthetic Reinforced Soil (GRS) in an Integrated Bridge System (IBS), FHWA advanced a new bridge construction.

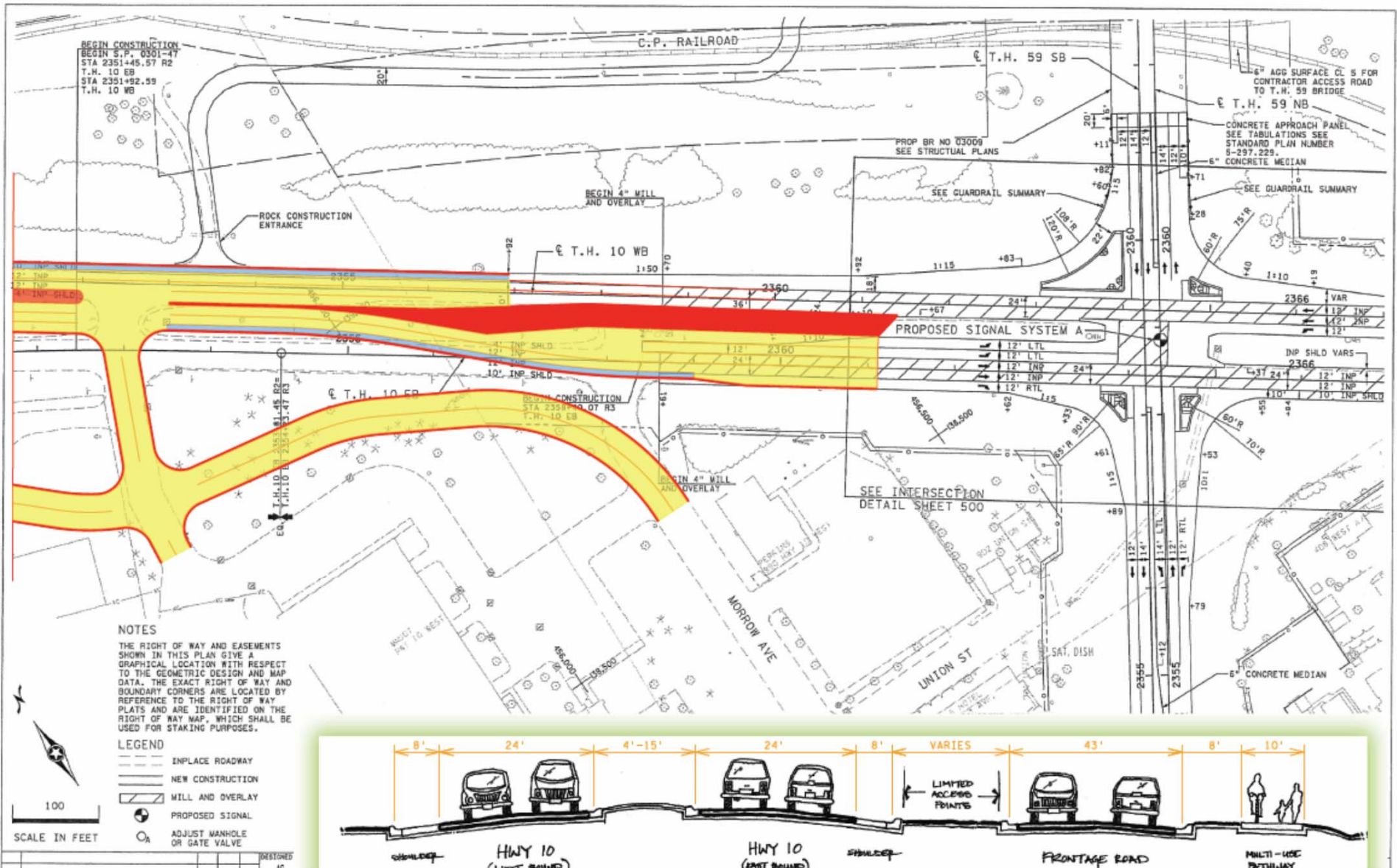
### ▼ Defiance County Proves a Simpler Bridge Can Be a Better Bridge



Bowman Bridge, Defiance County, Ohio



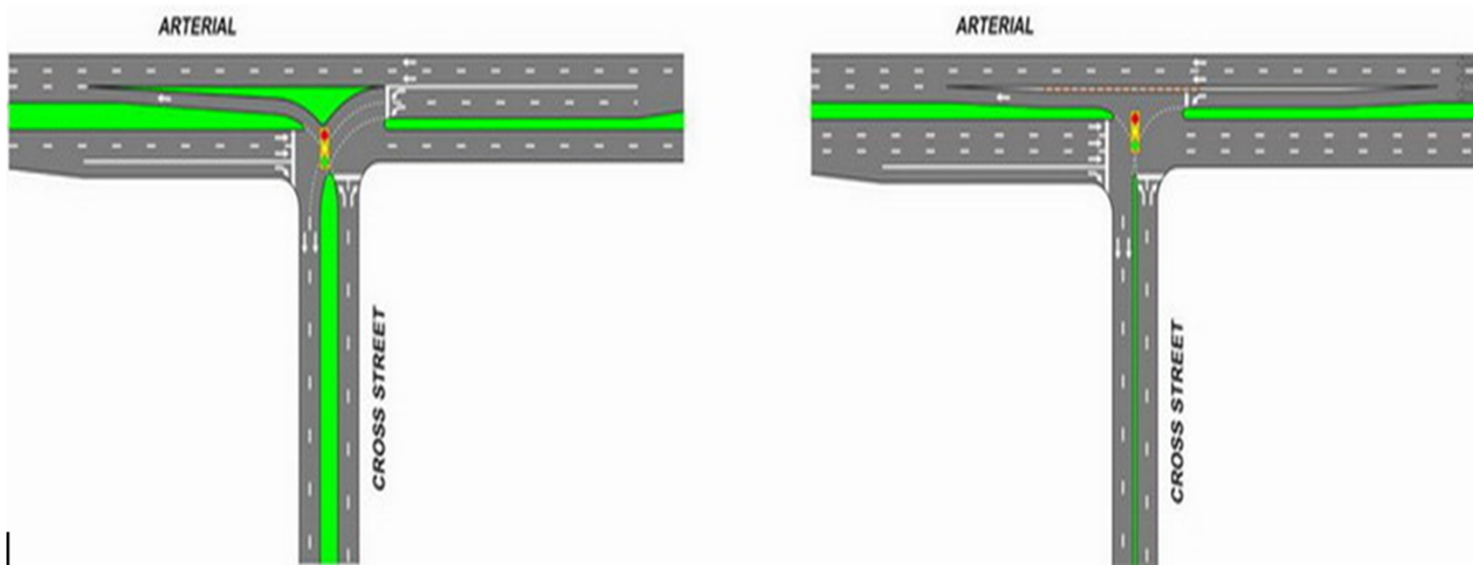
# Study Area 2: TH 10



PLAN SHEET 1 1/2" X 11" (VERTICAL) CONSTRUCTION AND EASEMENT LOCATIONS, AGENCY/CLIENT, 1/24/11, 1/24/11, 1/24/11, 1/24/11, 1/24/11, 1/24/11

## Study Area 2: TH 10

# Continuous Green “T” Intersection



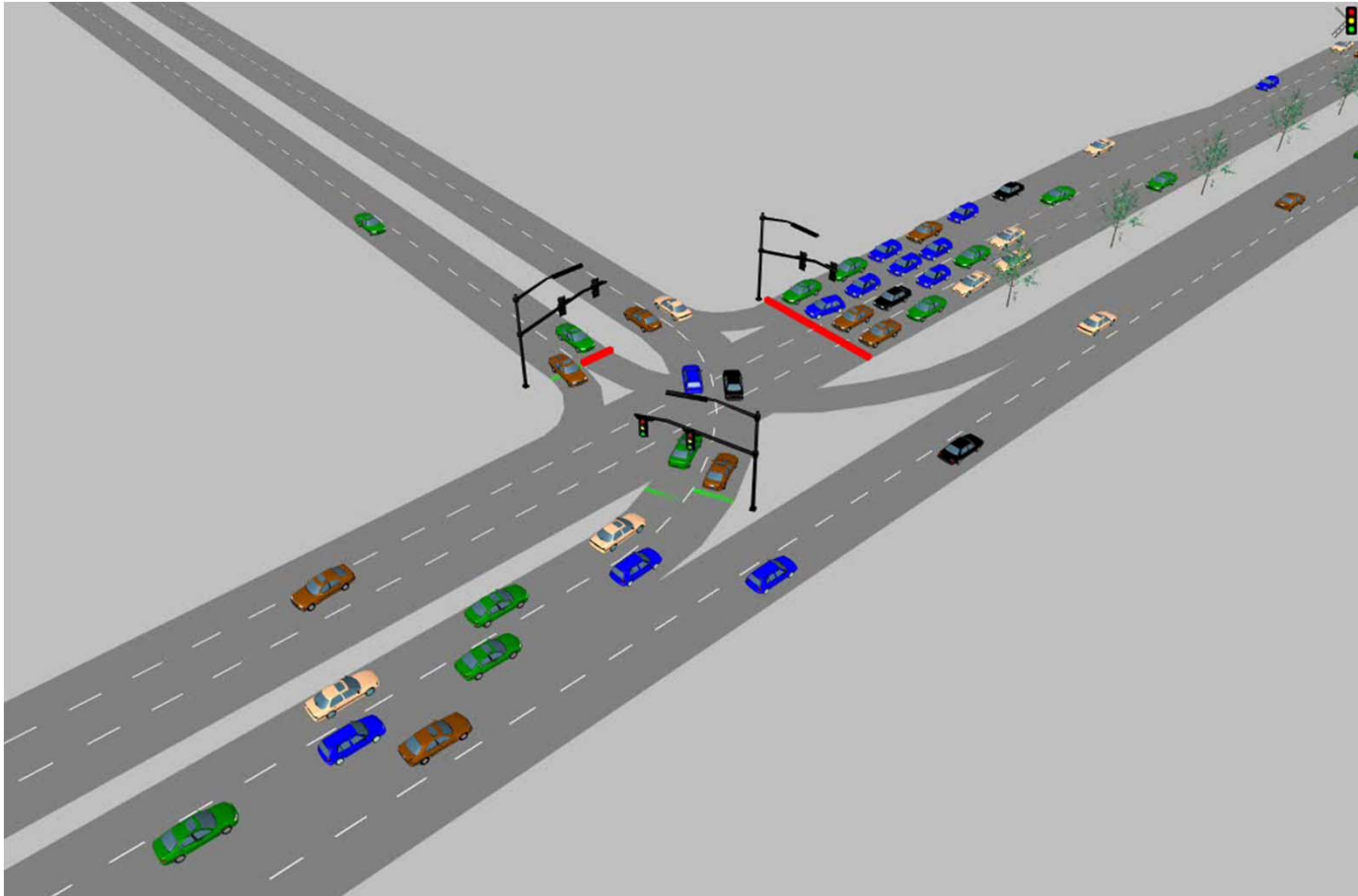
## Continuous Green-T

The Continuous Green-T can only be used at T-intersections. The design provides free-flow operations in one direction on the arterial and can reduce the number of approach movements that need to stop to three by using free-flow right turn lanes on the arterial and cross streets and acceleration/merge lanes for left turn movements from the cross street.

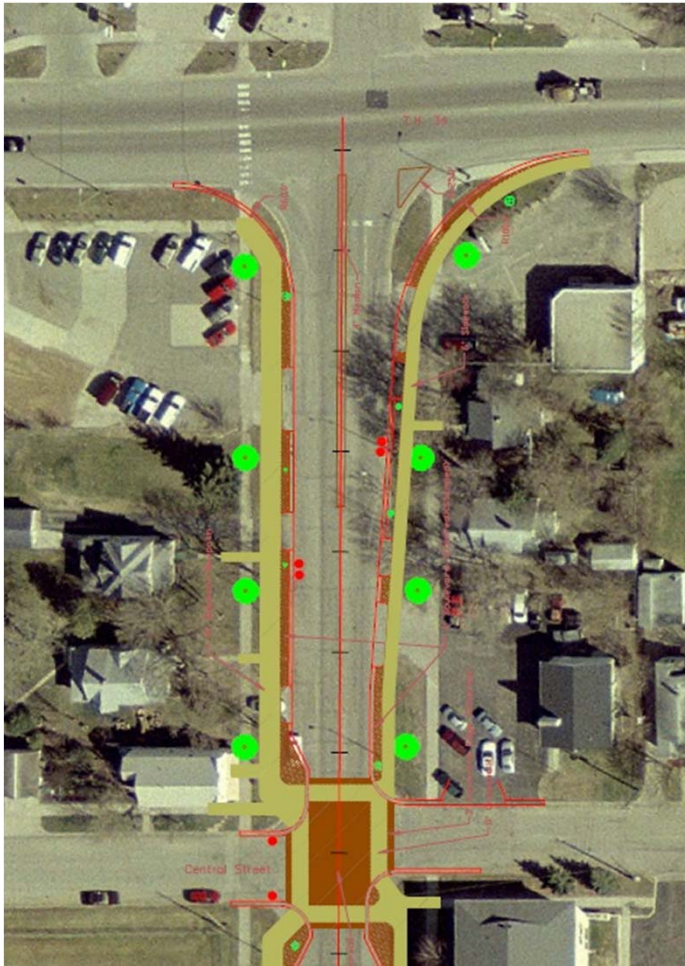


# Study Area 2: TH 10

## Continuous Green "T" Intersection



# TH 34 & Washington Ave



- ICE completed to assist County's planned intersection improvements.
- Initial intersection had left, thru, and free right.
- ICE process reviewed the traffic volumes and multi-modal needs of the intersection.
- Examined how the intersection could be staged for a future signal.
- Looked for ways to clean up other geometric deficiencies.





# TH 34 & Washington Ave

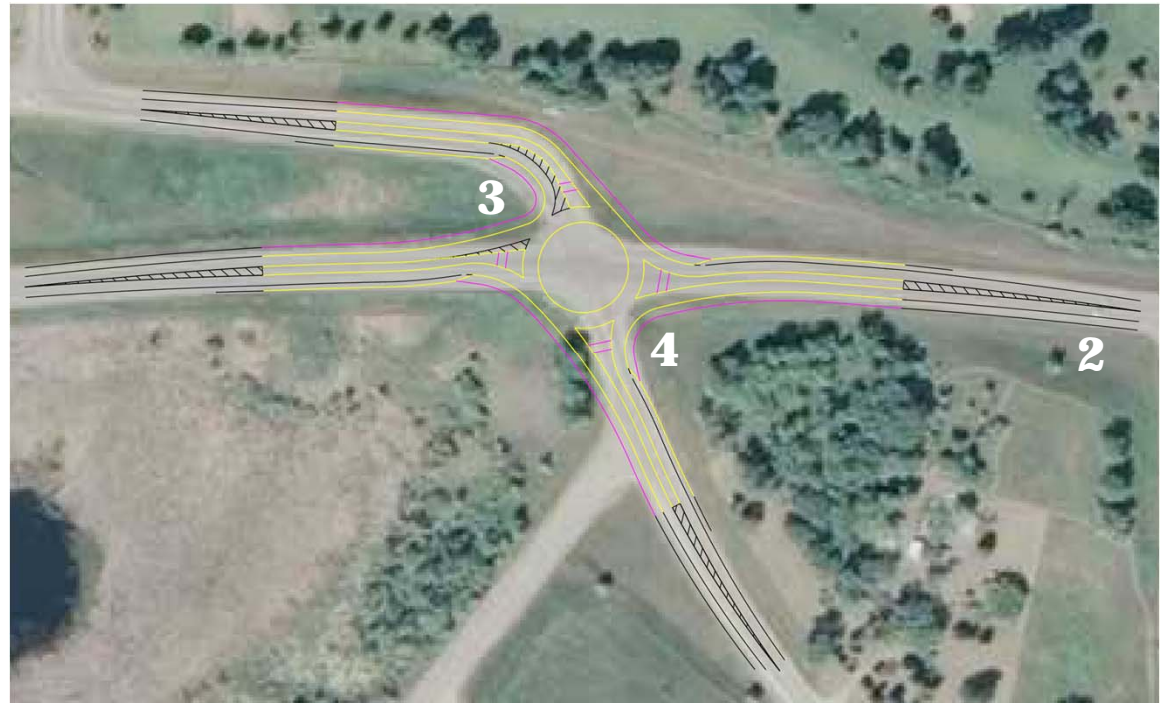
## New lane configuration:

- Eliminated free right
- Created separation between SB and WB traffic at the intersection.
- Created a well defined left turn lane making it easier for peds to cross the west leg.
- Intersection meets signal warrants.



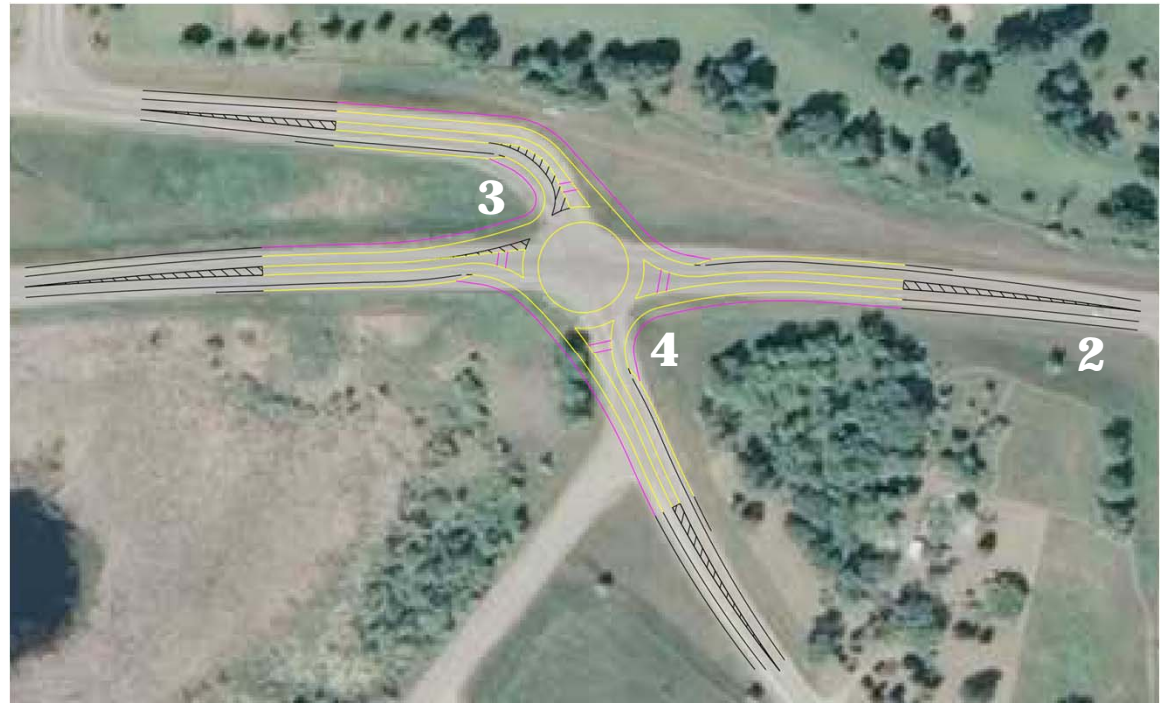
# TH 59 & CSAH 22

1. ICE was performed as part of the planning study at the request of Becker County to examine safety concerns at the intersection.
2. SB approach has combination horizontal and vertical curve.
3. West leg has blocked sight from right turning vehicles and difficulty picking up cars do to problems with SB approach.
4. East leg is at skew and has obstructed view from trees and embankment



# TH 59 & CSAH 22

- Crash severity is higher than average at this intersection
- Roundabout is an “ultimate” solution that could solve the intersection issues.
- The crash severity could be brought down to average with the implementation of an all-way stop.
- Crash types at this intersection are considered correctable according to the MNMUTCD
- Recommend All-way stop until funding is available for a roundabout



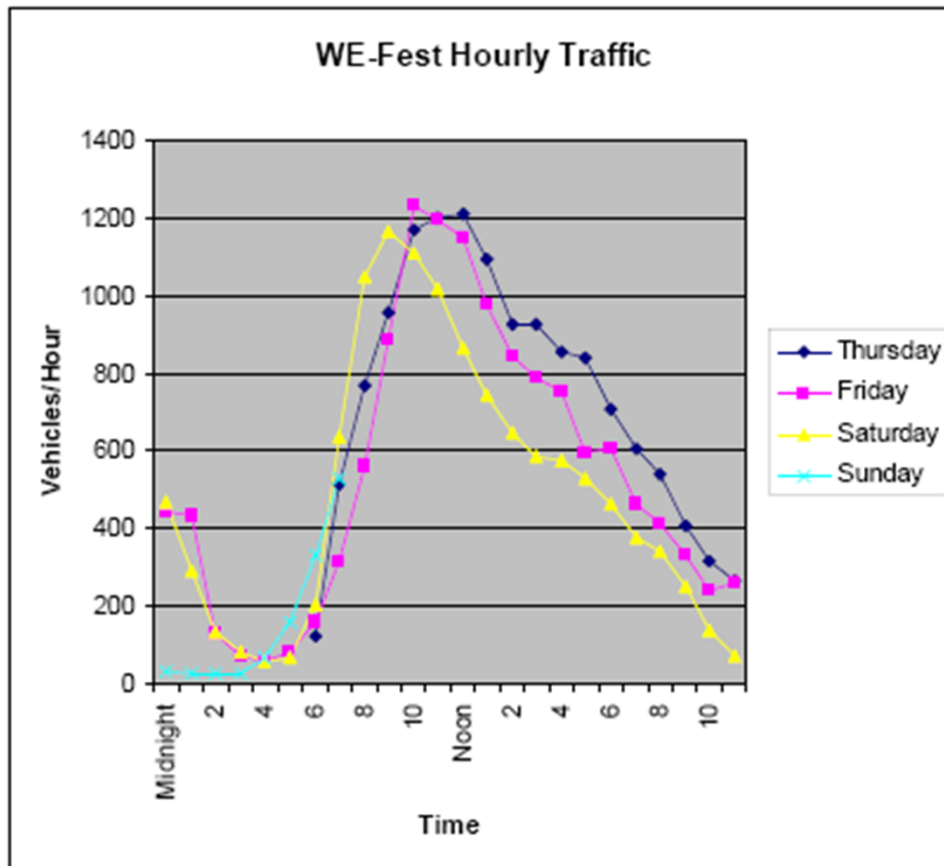
## TH 59 & Willow St



- Recommendation is a roundabout
- Safety issues at this intersection including a fatality.
- 4-way stop has helped reduce crash rate, but only 2 years of data so far.
- Intersection is currently experiencing noticeable delay
- Traffic signal helps solve delay problem.
- Traffic signal is not a safety device.
- Roundabout would improve capacity and safety.



# WE-Fest Traffic Impact



- Study measured WE-Fest traffic volumes to use for evaluating intersection traffic control options.
- All-way stop had LOS F
- Signal LOS C, w/2 moves failing (left turns)
- Roundabout LOS B, no need for police to direct traffic.
- How would you stage construction for a roundabout here?



# TH 59 & Willow St



## Construction Staging: Construct under traffic

- May have to eliminate turn lanes and/or drive on shoulders
- May have some temp. pavement or grading
- Fill in corners where widening occurs
- Circle placement can help construction staging.



# TH 59 & Willow St



**Construction Staging:  
Construct under traffic**

- Route traffic to widened areas.
- Try to build as much as you can.



# TH 59 & Willow St



**Construction Staging:  
Construct under traffic**

- Use grading for ped trails for traffic
- Use ped crossing area for wider circulatory roadway





# TH 59 & Willow St



**Construction Staging:  
Construct under traffic**

- Move traffic back in toward middle, finish curb/shoulder/trail work on outside.



## **APPENDIX B**

Compact Disc of Related Study Documents  
Meetings and Public Involvement  
Access Management Technical Memorandum  
Traffic Analysis Technical Memorandum  
Summary of Traffic Issues Technical Memorandum  
Intersection Control Evaluations  
Highway 59 at Willow Street  
Highway 59 at County Road 22  
Highway 34 at Washington Avenue

## **APPENDIX C**

### Measures of Effectiveness Worksheets

**Detroit Lakes Transportation Planning Study**  
**Comparison of Alternatives - Measures of Effectiveness Based on Goals and Objectives**  
Please Complete and Return to Jack Broz at HR Green by April 20, 2010

Alternative & Description	How Well Does the Alternative...	Goal 1: More Transportation Choices			Goal 2: Promotes Equitable, Affordable Housing		Goal 3: Enhanced Economic Competitiveness			Goal 4: Supports Existing Communities		Goal 5: Coordinates, Leverages Federal Policies and Investments			Goal 6: Values Communities and Neighborhoods		
Study Area 1A <b>Bridge over RR</b>				+	+	o	+	+	+	+	+	o	o	+	+	+	o
Study Area 1B <b>Upgrade Existing Crossing</b>				-	o	o	o	o	o	o	o	o	-	-	-	-	-
Study Area 1C <b>Offset Frontage Road to North</b>				o	+	o	o	+	+	+	+	+	+	o	o	o	o
Study Area 2A <b>Existing TH 10 Section</b>				-	-	-	-	-	-	-	-	o	o	-	-	-	-
Study Area 2B <b>Urban 4-Lane</b>				-	-	-	-	-	-	-	-	-	o	-	-	-	o
Study Area 2C <b>Urban 4-Lane with Shoulders</b>				+	+	o	-	-	o	o	o	o	+	o	o	o	o
Study Area 2D <b>Frontage Road with Bike Lanes</b>				+	+	+	o	o	+	+	o	+	o	+	+	+	+
Study Area 2E <b>Frontage Road with Trail</b>				+	+	+	+	+	+	+	+	+	+	+	+	+	+
Study Area 3A <b>Existing TH 59 Section</b>				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Study Area 3B <b>Rural 3-Lane Section</b>				-	-	o	o	o	o	o	o	o	o	o	o	-	o
Study Area 3C <b>Frontage Road</b>				+	+	+	+	+	+	+	+	+	+	+	+	o	+
Study Area 3D <b>Roundabout at Willow</b>				+	+	+	+	+	+	o	+	o	+	+	+	+	o
Study Area 3E <b>Holmes St Extension</b>				+	+	+	+	+	+	o	+	+	-	+	+	+	o
Study Area 3F <b>Underpass</b>				+	+	+	+	+	+	o	-	o	o	+	+	+	+

Alternative & Description	How Well Does the Alternative...	Goal 1: More Transportation Choices			Goal 2: Promotes Equitable, Affordable Housing		Goal 3: Enhanced Economic Competitiveness			Goal 4: Supports Existing Communities		Goal 5: Coordinates, Leverages Federal Policies and Investments			Goal 6: Values Communities and Neighborhoods		
Study Area 4A 32' Road		o	-	-	+	+	-	+	+	o	+	o	+	-	+	-	-
Study Area 4B Parkway		+	+	+	+	+	o	+	+	+	+	+	+	o	+	+	+
Study Area 4C Tunnel under Runway		-	-	o	o	o	o	o	+	o	o	+	o	o	+	-	+
Study Area 5A 32' Road		o	-	-	+	+	o	+	+	+	+	+	+	o	+	-	-
Study Area 5B Parkway		+	+	+	+	+	o	+	+	+	+	o	+	+	o	+	+
Study Area 6A Rural 3-Lane Section & Trail		+	o	+	+	+	+	+	+	+	+	+	o	o	+	+	+
Study Area 6B Parkway		+	+	+	+	+	+	+	+	+	+	+	o	o	+	+	+
Study Area 6C 2-Lane with Turn Lanes & Trail		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Study Area 7A Signalized Intersection		+	+	+	+	+	+	o	+	+	+	+	o	+	+	+	o
Study Area 7B Roundabout		o	o	o	o	o	o	-	o	o	o	o	o	o	o	o	o
Study Area 8A Separated Right Turn		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Study Area 8B All-Way Stop		-	-	-	-	-	-	-	-	-	-	-	o	o	-	-	-
Study Area 8C Roundabout		o	o	o	o	+	o	o	o	o	o	-	o	o	o	-	-
Study Area 8D Signalized Intersection		o	o	-	o	+	o	-	-	o	o	-	o	o	o	-	-
Study Area 8E Realign CR 22 with new intersection		o	o	o	o	+	o	o	o	o	o	o	-	-	+	o	-
Study Area 8F Offset intersections		-	o	o	-	o	-	-	-	o	-	-	o	-	-	-	-

Alternative & Description	How Well Does the Alternative...	Goal 1: More Transportation Choices			Goal 2: Promotes Equitable, Affordable Housing		Goal 3: Enhanced Economic Competitiveness			Goal 4: Supports Existing Communities		Goal 5: Coordinates, Leverages Federal Policies and Investments			Goal 6: Values Communities and Neighborhoods		
	Measures Of Effectiveness (+) Clearly Beneficial (0) Potential to be Beneficial (-) Little or No Potential To Be Beneficial	Safely Integrate Modes?	Link Users of different modes?	Create new pedestrian/bicycle facilities or future opportunities?	Show a positive relationship to housing plans?	Increase mobility to planned residential areas?	Improve connections between trade and employment centers?	Appropriately open new land development opportunities (i.e. plan guided)?	Conform to local plans and economic development priorities?	Support local redevelopment planning?	Improve opportunities for more orderly development and growth?	Complement other federally-funded initiatives planned for or already occurring in the study area? (Benefit/Cost and synergies)	Minimize disproportionate impacts to the natural or social environments?	Help solve mutual problems for multiple agencies?	Improve the connection of community facilities?	Improve bicycle and pedestrian facility connectivity (existing and new?)	Address the needs of area residents and tourists with "complete streets"?
Study Area 3G1 Holmes Street Extension																	
Study Area 3G2 West Avenue/Union Street Underpass		+	+	+	+	+	+	+	+	○	○	○	○	○	-	-	-
Study Area 3G3 Main Street Underpass		+	+	+	+	+	+	+	+	○	○	○	○	-	○	○	○
Study Area 3G4 Holmes Street Extension to Main/Morrow Underpass		+	+	+	+	+	+	+	+	+	+	+	○	+	+	+	+
Study Area 3G5 Highway 10 Pedestrian and Bicyclist Improvements	<i>Alternative 3G5 cannot be evaluated the same as the others because no roadway connectivity improvements are included.</i>																
Study Area 3G6 Parallel Frontage Road to Intersection South (without underpass)		○	○	-	○	○	○	○	○	○	○	○	○	○	○	○	○

Fatal Flaw - DNR

## **APPENDIX D**

City Council Acceptance of Transportation Planning Study



# City of Detroit Lakes

1025 Roosevelt Ave., P.O. Box 647 Detroit Lakes MN 56502

July 21, 2011

Mr. Shiloh Wahl  
MN Department of Transportation, District 4  
1000 Highway 10 West  
Detroit Lakes MN 56501

RE: Transportation Planning Study

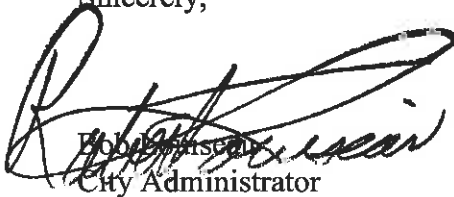
Dear Shiloh:

At their regular meeting on July 12, 2011, the Detroit Lakes City Council accepted the Transportation Planning Study Detroit Lakes MN prepared by HR Green for the MNDOT, District 4, City of Detroit Lakes and Becker County. We appreciate Becker County and MNDOT's assistance in developing the plan. The planning study helps address several important issues related to the future development of our Community.

We look forward working with MNDOT and the County to implement the plan.

If you have any questions, please let me know.

Sincerely,



Robert Louiseau  
City Administrator

The City of Detroit Lakes is an equal opportunity service provider