# **Minnesota Department of Transportation**



TO:

**EQB Monitor Distribution List** 

Interested Parties

FROM:

Monty Hamri

Project Manager

DATE:

June 5, 2013

SUBJECT:

Environmental Assessment Worksheet for Trunk Highway (TH) 8 from Greenway Avenue

North to Karmel Avenue in the Cities of Forest Lake, Wyoming and Chisago, Washington

County and Chisago County, Minnesota

Attached please find a copy or copies of an Environmental Assessment Worksheet (EAW) for Trunk Highway 8 from Greenway Avenue North to Karmel Avenue in the Cities of Forest Lake, Wyoming and Chisago in Washington County and Chisago County, Minnesota, S.P. 1308-17PE (TH8). The proposed TH 8 solution involves preservation of a footprint to accommodate a future four-lane divided roadway concept that extends from the end of the existing four-lane section 0.52 mile west of Greenway Avenue North in Forest Lake east through the City of Wyoming to Karmel Avenue in Chisago City, a distance of seven miles. It is considered an expansion solution to provide design year 2030 capacity and access control on the existing alignment. The goal of this current TH 8 study is to identify a footprint for right of way preservation that would guide future development along the corridor. No specific construction projects are currently identified or funded within the study limits.

Copies of this letter and EAW are being distributed to those agencies on the current MEQB document review list and others. The required State review period will begin upon publication of the EAW availability notice in the June 10, 2013 EQB Monitor. Written comments will be accepted through July 10, 2013 and will be included in the official record. The comments received will be considered in deciding whether there is potential for the proposed solution to result in significant impacts to the environment, and whether an Environmental Impact Statement is needed. Comments may be directed to:

> Richard Dalton **Environmental Coordinator** MnDOT, Metro District 1500 West County Road B2 Roseville, MN 55113

Phone: 651-234-7677

E-mail: Richard.Dalton@state.mn.us

To afford an opportunity for all interested persons to comment on the EAW, an open house meeting will be held on Wednesday, June 26, 2013, from 5:30 p.m. to 7:30 p.m. at Lord of the Lakes Lutheran Church located at 25402 Itasca Avenue, Forest Lake, MN.

To request the document in an alternative format, please contact the MnDOT Affirmative Action Office at 651-366-4718 or 1-800-657-3774 (Greater Minnesota); 711 or 1-800-627-3529 (Minnesota Relay). You may also send an e-mail to ADArequest.dot@state.mn.us. (Please request at least one week in advance).

Thank you.

Enclosure(s): EAW for future expansion solution for TH 8 from Greenway Avenue North to Karmel Avenue in the Cities of Forest Lake, Wyoming and Chisago

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# Environmental Assessment Worksheet

# For

Trunk Highway 8 from Greenway Avenue North to Karmel Avenue S.P. 1308-17PE (TH8)

City of Forest Lake, City of Wyoming, and Chisago City Washington County, Minnesota Chisago County, Minnesota



Proposer and RGU: Minnesota Department of Transportation

May 31, 2013

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# Environmental Assessment Worksheet

Note to preparers: This form and EAW Guidelines are available at the Environmental Quality Board's website at: <a href="http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm">http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm</a>. The Environmental Assessment Worksheet (EAW) provides information about a project that may have the potential for significant environmental effects. The EAW is prepared by the Responsible Governmental Unit (RGU) or its agents to determine whether an Environmental Impact Statement should be prepared. The project proposer must supply any reasonably accessible data for — but should not complete — the final worksheet. The complete question as well as the answer must be included if the EAW is prepared electronically.

**Note to reviewers:** Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. **Project title** Trunk Highway (TH) 8 from Greenway Avenue North to Karmel Avenue

#### 2. Proposer

Contact person: Monty Hamri Title: Project Manager

Agency: Minnesota Department of Transportation

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City, state, ZIP: Roseville, MN 55113

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#### 3. RGU

Contact person: Richard Dalton

Title: Environmental Coordinator

Agency: Minnesota Department of Transportation

Address: 1500 West County Road B2

City, state, ZIP: Roseville, MN 55113

Phone: 651-234-7677 Fax: 651-234-7610

E-mail: Richard.Dalton@state.mn.us

4.	Reason for EAW preparation (check one)				
	EIS scoping X Mandatory EAWCitizen petition RGU discretionProposer volunteered				
	If EAW or EIS is mandatory give EOB rule category subpart number and subpart name:				

Minnesota Rules 4410.4300 subp. (B) – For the construction of additional lanes on an existing roadway for a length of one or more miles. The project that is the subject of this EAW is approximately seven linear miles.

# 5. Project Location

**County:** Washington County and Chisago County

City/Township: City of Forest Lake, City of Wyoming, and Chisago City

Sections: T32N, R21W, Sections 4, 5

T33N, R21W, Sections 1, 12, 13, 23, 24, 26, 27, 33, 34

## Attach each of the following to the EAW:

County map showing the general location of the project
 (See Figure 1 in Appendix A)

• U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries

(See Figure 2 in Appendix A)

• Site plan showing all significant project and natural features (See Figures 3 through 9 in Appendix A)

#### 6. Description

a. Provide a project summary of 50 words or less to be published in the *EQB Monitor*.

The proposed Trunk Highway (TH) 8 solution involves preservation of a footprint to accommodate a future four-lane divided roadway concept that extends from the end of the existing four-lane section 0.52 mile west of Greenway Avenue North in Forest Lake east through the City of Wyoming to Karmel Avenue in Chisago City, a distance of seven miles. It is considered an expansion solution to provide design year 2030 capacity and access control on the existing alignment. Additional Right of Way (ROW) would be required and private property may need to be acquired if the solution is funded. This corridor has several lakes and wetlands adjacent to the roadway, and there exists the potential to impact these resources when widening the roadway, constructing frontage roads, and relocating local street access. This EAW provides background data for consideration of the proposed solution alternative to be evaluated

during the future National Environmental Policy Act (NEPA) phase of the project if funding for project construction is identified. The goal of this current TH 8 study is to identify a footprint for right of way preservation that would guide future development along the corridor.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

Growing travel demand is a recognized need for TH 8. Similar demands are occuring in most trunk highways in the metropolitan region. The Minnesota Department of Transportation (MnDOT) - Metro District has implemented a new fiscally constrained investment strategy for addressing mobility on the trunk highway system. This strategy is focused on implementing solutions using active traffic management (ATM) improvements, constructing lower-cost/high-benefit projects, developing a system of managed lanes and affordable strategic capacity expansion to minimize the impacts of congestion.

MnDOT is also in the process of updating the 20-Year Minnesota State Highway Investment Plan 2014-2033 (MnSHIP). MnSHIP is updated every four years and guides future capital improvements on Minnesota's state highway system over a twenty year period. This plan is required to be fiscally constrained and with the projected fund shortages, expansion of the trunk highway system will be very limited and strategic in the region.

MnDOT recognizes that the TH 8 corridor study and the development of this environmental document started before the adoption of current regional planning direction. MnDOT therefore has decided to complete this EAW process to assist with local planning efforts but it should be recognized that fiscal realities make a four-lane expansion of the corridor a highly unlikely solution to implement to address the growing travel demand need of the corridor. All future planning efforts and projects for the TH 8 corridor will need to be consistent with these regional strategies.

#### TH 8 Study Process

The proposed TH 8 solution is considered an expansion solution to provide design year 2030 capacity along the existing alignment. The TH 8 expansion solution is being pursued to address growing travel demands, the need to accommodate existing and future traffic and to address safety concerns that are anticipated to worsen with increased traffic volumes and future development. A four-lane divided roadway concept is being carried forward for further consideration and is the subject of this EAW.

This study is a continuation of previous years of work identifying ways to address mobility and safety problems on TH 8 from TH 61 in Forest Lake to Taylors Falls. In September 2002, MnDOT worked with the TH 8 communities along the 23-mile section of TH 8 to complete the TH 8 Scoping Document. As a result of transportation analysis and community input, the Greenway-to-Karmel segment of the corridor identified additional capacity as the solution.

This EAW, along with a series of environmental studies and technical memoranda completed as part of the overall study, serve as a guide for a possible future expansion of TH 8 from Greenway Avenue North to Karmel Avenue. This EAW identifies the environmental resources and existing conditions surrounding the TH 8 Greenway-to-Karmel segment of TH 8; provides background data for consideration of the proposed solution alternative to be evaluated during the future NEPA phase of the project if funding for project construction has been identified; and identifies potential social, economic and environmental impacts of the proposed project footprint.

This study is a collaborative effort led by MnDOT. The study included a public and agency involvement process, which is summarized in Appendix B. A Technical Advisory Committee (TAC), representing decision-making entities and key stakeholders affected by the proposed future solution, met regularly during the project development process to guide the study process. The study partners include:

- MnDOT
- Federal Highway Administration (FHWA)
- TH 8 Task Force
- Chisago County
- Washington County
- Chisago City
- City of Wyoming
- Comfort Lake--Forest Lake Watershed District

The TH 8 solution is in the pre-NEPA stage of the project development process. With no foreseeable funding for the proposed solution, NEPA fiscal constraints apply and the FHWA cannot approve a NEPA document for a TH 8 solution. Construction of the future roadway improvements may involve the use of future federal funds and will require project approval by the FHWA. As such, future studies and environmental reviews will be required as part of the NEPA review process to provide for the determination of a preferred alternative. Studies completed to date as part of the current TH 8 study are designed to document the vision for the corridor, with specific emphasis on identifying the future new roadway alignment and taking steps to preserve a project footprint.

The TH 8 study involved a two-tier screening process, including public involvement. A first-tier screening was used to identify broader transportation impacts and eliminate concepts that would not meet the purpose and need. Following first-tier screening, a more detailed evaluation was completed for the remaining concept: a four-lane divided roadway with a grassy median. This concept was carried forward for further consideration, with a number of alternatives developed that would address alignment and access. Refer to the Alternatives Evaluation in Appendix C for a summary of the two-tier preliminary screening and detailed evaluation process.

In fall 2012, TAC members, along with input from the corridor city councils of Wyoming and Chisago City, reached a consensus on recommending the "Alternative 5" concept, which is the subject of this EAW (refer to Figure 3 in Appendix A). Both cities concurred that designating a primary alternative would be preferred so it could be adopted into their respective comprehensive plans and the cities could endorse it. The project footprint of "Alternative 5" will be used to guide future development along the corridor.

## **Existing Conditions**

#### **Project Setting**

Through the study corridor, TH 8 is a rural undivided, two-lane roadway with a posted speed limit of 55 miles per hour (mph). From its western terminus near Greenway Avenue North and the city limits of Forest Lake, TH 8 study limits extend through the communities of Wyoming and Chisago City and terminate just west of and prior to the central business district of Chisago City.

At the western terminus of the TH 8 study corridor near the signalized intersection of Greenway Avenue North, TH 8 currently transitions from an access-controlled, four-lane roadway to a two-lane rural highway. For the remainder of the study corridor up to Karmel Avenue, the roadway cross-section is a two-lane rural section with additional lanes at major intersections. At the eastern terminus of Karmel Avenue, this intersection was recently reconstructed. East of Karmel Avenue, the highway transitions from a rural roadway section to a two-lane urban roadway section through downtown Chisago City.

#### National Highway System Principal Arterial

TH 8 plays an important role in the regional transportation system. TH 8 is a National Highway System (NHS) route, principal arterial that is one of the major routes for eastwest travel between the Twin Cities and the northern regions of Wisconsin. The primary purpose of TH 8, as defined by its role within the NHS and its function as a non-freeway principal arterial roadway, is to accommodate the movement of through traffic along the corridor. Over the years the travel demand on TH 8 has grown considerably. The percentage of commercial interstate traffic using this route is less

today than when the highway was constructed, but the quantity and proportion of recreational travel through the corridor has increased. Chisago County is viewed by many as a reasonable commuting distance to the Twin Cities, particularly with Interstate 35 (I-35) and the growth of commercial development in the northern Twin Cities. In general, much of the existing population in the county resides in either small cities or unincorporated areas, which has transformed the traditionally agricultural and resort-based communities into a commutershed for the Twin Cities Metropolitan area.

#### Local Function

TH 8 serves an important local function by providing mobility to residents, industry, farmers, and businesses within the study corridor and serving as a direct link to adjacent communities. Within the study limits, TH 8 serves the communities of Forest Lake, Wyoming, and Chisago City. Local traffic uses TH 8 to access points of interest including workplaces, schools, and residences.

The type and intensity of adjacent development has generated a high level of short distance local trips, a demand for a high level of access, and high volumes of turning traffic. These characteristics combined with the large volume of through traffic have resulted in concerns for the quality of traffic operations, slower travel speeds for through vehicles traveling along the corridor, and long delays for local traffic on the minor street approaches to TH 8. The number and density of access points along TH 8 has resulted in concerns relative to motorist safety.

### Alternative 5 Solution

#### TH 8 Four-Lane, Divided Roadway Footprint

The proposed solution, known as Alternative 5, involves preservation of a footprint to accommodate a four-lane divided roadway concept with a grassy median. The solution termini is from the end of the four-lane section 0.52 mile west of Greenway Avenue North on the west to Karmel Avenue on east. Refer to Figure 3 in Appendix A.

The proposed highway expansion solution would be located within the existing TH 8 corridor on an alignment that shifts north and south of the existing roadway according to existing conditions. Local street and direct access closures along the corridor would occur to reduce conflicting movements and to improve traffic safety in the corridor. Existing direct private access to TH 8 will be redirected to frontage/backage roads whenever possible. Full access intersection improvements would occur at the intersections listed below and would include designated left- and right-turn lanes to improve safety.

- Greenway Avenue North
- Hazel Avenue or Hamlet Avenue\*
- Heath Avenue

- County State Aid Highway 23 (CSAH 23 or Pioneer Road)
- James Avenue
- 273<sup>rd</sup> Street
- Viking Boulevard/Johnson Lane

\*The option of having the intersection at Hazel Avenue or Hamlet Avenue will be determined during future stages of project development. For the purpose of this EAW, the intersection improvement has been located at Hazel Avenue.

Additional right of way will be required and residential homes may need to be acquired when the solution is funded and constructed. The footprint identified in this EAW establishes preliminary right-of-way limits based on a four-lane divided roadway concept and local street relocations. Frontage/backage roads and relocation of local street access to TH 8 will be needed to consolidate TH 8 access points.

There are three traffic signals existing today at Greenway Avenue North, CSAH 23 (Pioneer Road) and Johnson Boulevard/Viking Boulevard that would require modification when the roadway is widened, and there may be a need for additional signals depending how the access management is accommodated in the future.

The future proposed solution may include replacement of the existing culvert at the TH 8 crossing to maintain the hydrologic connection between Comfort Lake and Little Comfort Lake. A bridge option was not considered during the preparation of this study.

Future stages of the proposed roadway expansion solution will consider drainage and will incorporate design features to detain and filter stormwater runoff. This phase of the study did not include these types of hydraulic studies.

*Future construction (future proposed solution)* 

More specific impacts associated with construction of the future proposed solution will be identified and documented in greater detail as part of a NEPA process prior to construction. A general characterization of typical construction impacts/activities is provided below and in other relevant sections of the EAW.

#### Construction Impacts (Future Solution)

Construction activities associated with the future roadway expansion are likely to result in noise, dust and traffic congestion. Dust generated during construction will be minimized through standard dust control measures such as applying water to exposed soils and limiting the extend and duration of exposed soil conditions. Construction contractors will be required to control dust and other airborne particulates in accordance with MnDOT standard specifications in place at the time of construction.

Permanent vegetation cover will be re-established as soon as practicable and within applicable regulatory agency rules. While MnDOT and its contractor(s) are currently exempt from local noise ordinance, it is MnDOT's practice to require contractor(s) to comply with applicable local noise restrictions and ordinances to the extent that is reasonable. Advance notice will be provided to affected communities of any planned abnormally loud construction activities. Refer to Item 24 for a discussion of noise during construction.

Excess materials and debris from the project such as existing pavement, fencing material, unsuitable grading material, structure demolition and trees/vegetation will be disposed of in accordance with MnDOT standard specifications and applicable rules (e.g., Minnesota Rules 7035.2825) in place at the time of construction. In particular, excess materials and debris will not be placed in wetlands, floodplains, or other sensitive areas.

Vibrations resulting from the use of high-impact equipment, such pavement jack hammering will be unavoidable with construction of the proposed project. While vibration is often a nuisance during roadway project, actual damage to structures is extremely rare. Construction vibrations may be perceptible and possbly annoying to occupants of buildings within the project area. Any necessary building susceptibility studies would be completed prior to construction following MnDOT standard practices in place at that time.

A Transportation Management Plan would be prepared for this solution. The plan would lay out strategies for managing project work-zone impacts. The plan would include both construction traffic operation controls and public information components.

#### Timing and Duration of Construction Activities

The timing and duration of construction activities will be determined in the future, when funding becomes available and as part of the final design process.

# c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

#### Project Purpose and Need

The purpose of the proposed solution is to provide sufficient capacity to accommodate existing and future traffic, address growing travel demand, and address safety concerns that are anticipated to worsen with increased traffic volumes and future development. For a detailed discussion of the purpose and need for the proposed action, refer to the Purpose and Need Statement in Appendix D.

# **Project Beneficiaries**

Preservation of the proposed solution footprint in the TH 8 corridor will support the long-term growth and land use plans for adjacent communities. Future construction of the proposed solution would benefit both local and regional traffic and improve motorist safety.

The proposed solution would enhance opportunities for development along the corridor, consistent with local comprehensive plans, providing economic benefits to private parties and local municipalities.

d. Are future stages of this development including development on any other property planned or likely to happen? \_\_Yes \_X\_No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

e. Is this project a subsequent stage of an earlier project? \_\_Yes X No

If yes, briefly describe the past development, timeline and any past environmental review.

### 7. Project Magnitude Data

**Total project acreage:** 227.5 acres (total area within the project footprint, including

existing and proposed new right of way)

**Total project length:** 7.0 miles (from the end of the four-lane section 0.52 mile west

of Greenway Avenue in Forest Lake and extending east through

the City of Wyoming to Karmel Avenue in Chisago City)

**Number of residential units: unattached**: Not applicable **attached**: Not applicable **maximum units per building** 

Commercial, industrial or institutional building area (gross floor space): total square

**feet:** Not applicable

**Indicate areas of specific uses (in square feet):** 

Office: Not applicable
Retail: Not applicable
Warehouse: Not applicable
Light industrial: Not applicable
Other commercial (specify): Not applicable
Institutional: Not applicable
Agricultural: Not applicable
Building height: Not applicable
If over 2 stories, compare to heights of nearby buildings: Not applicable

8. Permits and Approvals Required. List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.

See Table 1 for the list of anticipated permits and approval required. This list will be updated with the future NEPA process based on approval and permitting requirements in place at that time.

TABLE 1
PERMITS AND APPROVALS

Permit/Approval	Agency	<b>Action Required or Status</b>
Federal		
National Environmental Policy	FHWA	Approval/Determination
Act (NEPA) review and decision		
Section 4(f) determination	FHWA	Approval
Section 106 (Historic /	FHWA	Determination
Archeological)		
Jurisdictional Determination	U.S. Army Corps of Engineers	Determination
Section 404 Permit - Individual	U.S. Army Corps of Engineers	Permit
State		1
EAW Certification	MnDOT	Approval
EIS Need Decision (State	MnDOT	Declaration Order
environmental review process		
Geometric Layout Review	MnDOT	Approval
Construction Plans	MnDOT	Approval
Wetland Conservation Act	MnDOT	Approval
Wetland Conservation Act	MnDOT with review by Board	Approval/Review
(Replacement Plan) for new	of Soil and Water Resources	
roads and capacity expansion	and Minnesota Department of	
projects	Natural Resources	
Well Sealing	Minnesota Department of	Notification
	Health	
Public Waters Work Permit	Minnesota Department of	Permit
	Natural Resources	
Temporary Water Appropriation	Minnesota Department of	Permit
Permit	Natural Resources	
Prohibited Invasive Species	Minnesota Department of	Permit
Permit (if needed)	Natural Resources	

Permit/Approval	Agency	Action Required or Status
Section 401	Minnesota Pollution Control	Certification
	Agency	
National Pollutant Discharge	Minnesota Pollution Control	Permit
Elimination System (Re-issue	Agency	
August 2013)		
Section 106 (Historic /	MnDOT Cultural Resources	Determination of Effect
Archeological)	Unit (CRU)	
Local		
Municipal Consent	City of Wyoming	Approval
	City of Chisago	
Permits for stormwater	Comfort Lake Forest Lake	Permits
management, erosion and	Watershed District	
sediment control and		
stream/waterway crossing		
Wetland Conservation Act	Local Governmental Unit	Approval
(Outside MnDOT right of way)		

# **Project Costs and Funding**

Preliminary planning-level cost estimates for the proposed project are estimated to be approximately \$18.81 million, excluding right of way. Right of way costs were estimated to be approximately \$4.83 million. The total project cost is estimated at \$23.64 million (all cost estimates reflect 2011 dollars).

Funding for the proposed project has not been identified. Construction of the future roadway improvements may involve the use of future federal funds.

9. Land use. Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

#### **Land Use and Compatibility**

Current land use patterns within the study limits include agricultural, open space, commercial and residential uses. The TH 8 solution will require some right of way from adjacent properties (refer to Additional Federal Issues in Appendix E). The proposed TH 8 solution may result in 103 partial parcel takes and 9 full parcel takes. In some cases, a partial take may put an existing structure into non-conformity, however, this would be allowed. Since the TH 8 solution follows the existing roadway alignment, the solution is considered to be compatible with adjacent land uses and is not expected to cause a

significant change in land use or lead to the development of any large scale commercial, industrial, residential or other development.

The TH 8 corridor traverses through or near a number of different landscapes including, wetlands, floodplains, lakes, woodlands and farmlands. Locations of particular concern due to physical constraints of water resources include the area between Big Comfort Lake and Little Comfort Lake in Wyoming and the area between Little Green Lake and a wetland, known as Ellen Lake, in Chisago City.

#### City of Forest Lake

Forest Lake is bordered by the City of Wyoming on the north, the City of Hugo on the south, the City of Scandia on the east, and the City of Columbus on the west. Highway commercial use is located along the northwest side of TH 8 and low density residential is located along the southeast side.

The transportation section of the City of Forest Lake Comprehensive Plans (2030) does not specifically discuss the future of TH 8, as the segment of TH 8 within Washington County/Forest Lake is currently a four-lane divided section. The proposed TH 8 solution is primarily located in Chisago County, but ties into the existing four-lane roadway at its western terminus in Forest Lake.

Improvements to TH 8 would be compatible with commercial development in Forest Lake. The proposed solution may require some minor right of way from adjacent properties, but since the solution follows existing roadway alignment, the solution is considered compatible with adjacent land uses in the City of Forest Lake.

### City of Wyoming

Wyoming is bordered by the City of Stacy on the north, Chisago City on the east, Forest Lake on the south, and the City of Columbus and Linwood Township on the west. TH 8 passes through the southeast corner of Wyoming. The city's land use plan identifies:

- Commercial use along TH 8 from its southern city limit to Hamlet Avenue.
- Residential and Commercial from Hamlet Avenue to just beyond Hazel Avenue and between 250<sup>th</sup> Avenue North and Heath Avenue North.
- Conservation/Open Space from east of Hazel Avenue and 250<sup>th</sup> Avenue North and between Heath Avenue North and Little Comfort Lake.

The Wyoming Comprehensive Plan (2008) indicates that the city will participate in the TH 8 design process for capacity and safety improvements that will be conducted by MnDOT. It further indicates that the city will work with MnDOT to redesign the access to TH 8 in the vicinity of Hamlet and Hale Avenues with the objective of reducing or combining access points to the TH 8.

Improvements to TH 8 would be compatible with commercial development. The proposed solution will require some right of way from adjacent properties, but since the solution follows existing roadway alignment, the solution is considered compatible with adjacent land uses in the City of Wyoming.

# Chisago City

Chisago City is bordered by Chisago Lake Township on the north, Lindstrom on the north and east, Forest Lake on the south and Wyoming on the west. TH 8 diagonally bisects the city from southwest to northeast. The Chisago City's future land use plan identifies:

- Commercial use along TH 8 at the intersections of CSAH 23 (Pioneer Road), Viking Boulevard/Johnson Lane and Karmel Avenue.
- Residential use is primarily on the south side of TH 8 between CSAH 23 (Pioneer Road) and Karmel Avenue.
- Mixed use and public/semi-public use is generally located on the north side of TH 8 between CSAH 23 (Pioneer Road) and Karmel Avenue.
- Park/open space use is located at 276<sup>th</sup> Street.

The transportation section of the Chisago City Comprehensive Plan (2006) supports the objective to continue upgrading and improving key intersections for safety as development, growth and intensification occurs along the TH 8 corridor.

Improvements to TH 8 would be compatible with commercial development. The solution will require some right of way from adjacent properties, but since the solution follows the existing roadway alignment, the solution is considered compatible with adjacent land uses within Chisago City. The parcel of land located at 276<sup>th</sup> Street has been designated as "park/open space" on the city's future land use map; however, this land is currently in private ownership, and the city does not expect to purchase this land prior to the reconstruction of TH 8 (refer to EAW Item 25 for additional discussion).

The proposed TH 8 solution is compatible with the surrounding land uses in that it will increase mobility and improve safety along the Greenway-to-Karmel segment of TH 8.

#### Potential Environmental Hazards

#### Affected Environment

The presence of potentially contaminated properties (defined as properties where soil and/or groundwater is impacted by pollutants, contaminants or hazardous wastes) is a concern in the development of highway projects because of potential liabilities associated with ownership of such properties, potential cleanup costs, and safety concerns associated with construction personnel encountering unsuspected wastes or contaminated soil or groundwater.

A Phase I Environmental Site Assessment<sup>1</sup> (ESA) was conducted to assess the likely presence of potential or known contaminated sites within 500 feet or directly adjacent to the TH 8 corridor along the study area section between TH 8 and Greenway Avenue North in Forest Lake to TH 8 and Karmel Avenue in Chisago City. Properties along the corridor were evaluated using ranking criteria provided by MnDOT as high, medium, and low potential for the presence of contamination. "Low potential" sites include hazardous waste generators and possibly some farmsteads and residences. "Medium potential" sites include all closed leaking underground storage tank (LUST) sites, all sites with underground storage tanks (UST) or aboveground storage tanks (AST), and all sites with vehicle repair activities. "High potential" sites include all active and inactive Voluntary and Investigative Cleanup (VIC) and Minnesota Environmental and Response Liability Act (MERLA) sites, all active and inactive dump sites, and all active LUST sites. The Phase I ESA was completed in January 2011 in general conformance with the scope of limitations of ASTM Practice E 1527.

# Environmental Consequences

Contaminated materials encountered during highway construction projects must be properly handled and treated in accordance with state and federal regulations. Improper handling of contaminated materials can worsen impacts on the environment. Contaminated materials also cause adverse impacts to highway projects by increasing construction costs and causing construction delays, which also can increase project costs.

The Phase I ESA located sixty-four (64) known or potentially contamination sites within the study area: two (2) sites with a high risk potential for contamination, seventeen (17) with a medium risk, and forty-five (45) with a low risk. Table 2 lists the properties rated as having high or medium potential for contamination, and their locations are shown in Figure 4. Of these sites, two high risk and five medium risk sites have a potential for hazardous material related impacts by the future project because these sites are likely to be disturbed by the proposed solution (shown as shaded rows in Table 2). The 45 low risk potential sites are comprised of clusters of several parcels that cover all remaining areas of the study area and are not depicted on the figure.

As part of the future NEPA process and project design process, when additional information, such as right-of-way acquisition and roadway profile elevations are being determined, the proposed solution will be reevaluated for potential contamination issues and additional environmental assessment(s) will be completed if necessary.

### Potential Mitigation

The results of any soil and groundwater investigations will be used to determine whether any contaminated areas identified can be avoided or whether their impacts to the project

<sup>&</sup>lt;sup>1</sup>Peer Engineering, *Phase I Environmental Site Assessment, S.P. 1308-17PE, Trunk Highway 8, Forest Lake, Wyoming, and Chisago City, Minnesota* (Peer File #20119), dated January 4, 2011.

can be minimized. If necessary, a plan will be developed for properly handling and treating contaminated soil and/or groundwater during construction. Any contaminated property with the potential to incur excessive cleanup costs or expose the public to unacceptable environmental liability may need to be avoided, if possible.

TABLE 2
SITES OF POTENTIAL CONTAMINATION

Site #	Site Name	Address	Risk Potential	Reason for Ranking
2	John's Small Engines/Blue Diamond Enterprises	23710 Goodview Circle, Forest Lake, MN	Medium	Past agricultural use. Current commercial uses including an engine repair business and a landscaping business. Potential use and/or storage of hazardous substances or petroleum products. Site is outside area likely to be disturbed by the proposed project.
3	Koppy Motors	23713 Goodview Circle, Forest Lake, MN	Medium	Past agricultural use. Current commercial uses including an automobile service department. Occupant identified as a conditionally exempt small quanity hazardous waste generator. Site is outside area likely to be disturbed by the proposed project.
6	Bever Landscaping	23950 Lake Boulevard, Forest Lake	Medium	Past agricultural use. Current commercial uses including an automobile service department. Former occupant identified as a small quanity hazardous waste generator. Current commercial use is landscaping materials use. Site is outside area likely to be disturbed by the proposed project.

TABLE 2 SITES OF POTENTIAL CONTAMINATION

Site #	Site Name	Address	Risk Potential	Reason for Ranking
7	A-1 Mini Storage; Forest lake Muffler; Anthony Auto Repair; and Palermo Lundahl Industries	24060 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Current commercial uses including vehicle repair activites. Potential use and/or storage of hazardous substances or petroleum products. Site is outside area likely to be disurbed by proposed project.
9	Elias Import Repair/Custom Refinishing	24144 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Current commercial uses including vehicle repair activities. Former/current occupants identified as small quantity hazardous waste generators. Use and/or storage of hazardous substances or petroleum products. Site is outside area likely to be disurbed by the proposed project.
11	Commercial Use (Name Unknown)	24232 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Past commercial uses including vehicle repair activities. Former occupant identified as a small quanity hazardous waste generator. Current unknow commercial use. Potential use and/or storagemof hazardous substances or petroleum products. Site is outside area likely to be disturbed by the proposed project.

TABLE 2 SITES OF POTENTIAL CONTAMINATION

Site#	Site Name	Address	Risk Potential	Reason for Ranking
12	Auto Werks	24246 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Past and current commercial uses including vehicle repair activities with a septic system. Former/current occupants identified as conditionaly exempt small quanity hazardous waste generators. A closed LUST site. Use and/or storage of hazardous substances or petroleum products. Site is outside area likley to be disurbed by the proposed project.
14	Tire Warehouse and Service	24336 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Current commercial use including vehicle repair activities. Occupant identified as a small quanity hazardous waste generator. Use and/or storage of hazardous substances or petroleum products. Site is outside area likley to be disurbed by the proposed project. Site is outside area likely to be disturbed by the proposed proposed project.
15	Wholesale Enterprises	24352 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Current commercial use including vehicle repair activities. Potential use and/or storage of hazardous substances or petroleum products. Site is outside area likley to be disurbed by the proposed project.

TABLE 2 SITES OF POTENTIAL CONTAMINATION

Site #	Site Name	Address	Risk Potential	Reason for Ranking
16	Commercial Property	24428 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Current commercial use including possible vehicle repair activities. Potential use and/or storage of hazardous substances or petroleum products. Site is outside area likley to be disurbed by the proposed project. Site is outside area likely to be disturbed by the proposed project.
17	Bill's Auto Body	24408 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Past and current commercial uses including vehicle repair activies. Former/current occupants identified as small quantity hazardous waste generators. Use and/or storage of hazardous substances or petroleum products. Site is outside area likley to be disurbed by the proposed project.
18	Commercial Property	24428 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Past and current commercial uses including vehicle repair activies. Occupant identified as a small quantity hazardous waste generators. Use and/or storage of hazardous substances or petroleum products. Site is outside area likley to be disurbed by the proposed project.

TABLE 2 SITES OF POTENTIAL CONTAMINATION

Site #	Site Name	Address	Risk Potential	Reason for Ranking
20	Car Tunes	24103 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Current commercial use for vehicle repair activities. Occupant identified as conditionally exempt small quantity hazardous waste generator. Use and/or storage of hazardous substances or petroleum products. Site is adjacent to the area likely to be disturbed by the proposed project.
23	Super America	24203 Greenway Avenue, Wyoming, MN	Medium	Past agricultural use. Current commercial use as a gasoline filling station. Dispensing pumps and storage tanks located on site (three vent pipes observed). Use and/or storage of hazardous substances or petroleum products. Site is adjacent to the area likely to be disturbed by the proposed project.
26	Holiday	6571 Lake Boulevard, Wyoming, MN	Medium	Past agricultural use. Current commercial use as a gasoline filling station. Dispensing pumps and storage tanks located on site. A closed SPILLS site. Use and/or storage of hazardous substances or petroleum products Site is adjoining area likely to be disturbed by the proposed project. Site is adjacent to the area likely to be disturbed by the proposed by the proposed project.

TABLE 2 SITES OF POTENTIAL CONTAMINATION

Site #	Site Name	Address	Risk Potential	Reason for Ranking
30	Interstate Companies	6671-6683 Lake Boulevard, Wyoming, MN	High	Past agricultural use. Former and current commercial uses including a boat center, automobile sales and service, and outdoor maintenance. Former occupants identified as conditionally exempt small quantitiy hazardous waste genenrators. Closed SPILLS site. Inactive VIC site. UST removed from site. AST observed on site. Use and/or storage of hazardous substances or petroleum products. Site is adjacent to the area likely to be disturbed by the proposed project.
50	Residential Properties	9337-9363 Lake Boulevard 27095-27135 Jeffrey Ave. 9418-9604 270th Street 27105-27268 Jody Court 273rd Steet, and 27415 Jody Avenue, Chisago City, MN	Medium	Past agricultural use. Current residential uses with possible septic systems. Closed SPILLS site. Potential use and/or storage of hazardous substances or petroleum products. Site is adjacent to the area likely to be disturbed by the proposed project.
53	Chisago Lake Baptist Church and School	9387 Wyoming Trail, Chisago City, MN	High	Past and current agricultural use. Current church and school uses with possible septic system. Open LUST site. Potential use and/or storage of hazardous substances or petroleum products. Site is adjacent to the area likely to be disturbed by the proposed project.

TABLE 2 SITES OF POTENTIAL CONTAMINATION

Site #	Site Name	Address	Risk Potential	Reason for Ranking
61	Lakeside	10345 Wyoming	Medium	Past and current use as a
	Elementary	Avenue, Chisago		school. Storage tanks
	School	City, MN		registered to site. Occupant
				identified as small to minimal
				hazardous waste generator.
				Use and/or storage of
				hazardous substances or
				petroleum products. Site is
				adjacent to area likely to be
				disturbed by the proposed
				project.

Note: Shaded rows in table indicate sites likley to be disturbed by the future proposed project.

# 10. Cover types. Estimate the acreage of the site with each of the following cover types before and after development:

Cover types before and after construction (within proposed solution right of way) are summarized in Table 3. Calculations of "before" cover types were completed by digitizing land cover types on 2008 aerial photography, augmented by the National Land Cover Database, as the Minnesota Land Cover Classification System inventory for the study area within Chisago County is not complete at this time.

TABLE 3
COVER TYPES

Cover Type	Roadway Corridor <sup>1</sup>			
Cover Type	Before Acres	After Acres <sup>(2)</sup>		
Types 1-8 Wetlands <sup>(3)</sup>	17	0		
Wooded/Forest	33	0		
Brush/Grassland	8	0		
Cropland	28	0		
Lawn/Landscaping <sup>(4)</sup>	76	143		
Impervious Surfaces <sup>(5)</sup>	66	85		
Other	0	0		
Total	228	228		

<sup>(1)</sup> Within proposed right of way

<sup>(2)</sup> Cover types analysis assumes that all areas within the proposed right of way would be converted to transportation uses (e.g., lawn/landscaping or impervious surface).

<sup>(3)</sup> During the design and permitting phase of the project, wetland impacts will be recalculated based on a formal delineation.

<sup>(4)</sup> Includes vegetated areas within existing highway right of way.

<sup>(5)</sup> Includes connecting roadways, structures, driveways, other impervious surfaces, and TH 8.

# If Before and After totals are not equal, explain why:

#### 11. Fish, wildlife and ecologically sensitive resources

a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

Numerous lakes, wetlands, water courses, and wooded areas are located within and adjacent to the study area. These resources provide habitat for an abundance of wildlife and opportunity for recreational activities. There is potential to impact these resources when widening the roadway, constructing frontage/backage roads, and relocating local street access. Some tree removal is anticipated.

#### Fish

The study area lakes are home to many species of sport fish such as: walleye, northern pike, bluegill, perch, and crappies. The proposed solution may have direct impacts on fisheries. The proposed solution may include replacement of the culvert at the TH 8 crossing of Comfort Lake and Little Comfort Lake to maintain the hydrologic connection between the two lakes.

Project-related impacts on aquatic habitats, shorelines and fisheries resources will be localized in nature. To ensure that potential impacts are minimized, future phases of project development will coordinate with resource and regulatory agencies to incorporate recommendations to avoid or minimize impacts to fish and fisheries.

The design of the new roadway will consider and incorporate design features to detain and filter stormwater runoff, such as swales and stormwater detention ponds.

#### Wildlife

The proposed solution will occur within an existing transportation corridor. Habitat types vary within the corridor and include wetlands, floodplains, landscaped development, wooded areas, and agricultural land. The variety of habitat types supports an abundance of wildlife. Efforts to avoid, minimize, or mitigate impacts to wildlife and their habitat will continue to be analyzed in the future as the project development progresses.

### Habitat

Staff from the MnDOT Office of Environmental Services (OES) performed a vegetation review of the study area and provided comments (refer to correspondence dated October 6, 2009, in Appendix F). The existing MnDOT right of way is void of woody vegetation; however, there are many pockets of woody vegetation scattered along the approximately seven-mile stretch of highway. The tree species noted include

Easter Red Cedar, Green Ash, Willow, American Elm, Boxelder, White Birch, Basswood, Aspen, Cottonwood, Smooth and Staghorn Sumac, and Buckthorn. The woody vegetation species mix is mirrored on either side of the roadway. Agricultural land and open fields exist on adjacent private properties. Planted landscape trees and shrubs are adjacent to the current MnDOT right of way on private properties.

Removal of vegetation, including woody vegetation, would result from construction of the proposed solution. The proposed solution may result in removal of approximately 33 acres of woody vegetation during construction.

During the future design process, reasonable efforts would be made to create a plan that will minimize impacts and losses of vegetation. Once the precise limits of construction are known, and where vegetation impacts along those limits will occur, those areas would be clearly identified so that vegetation protection measures are included as part of the construction plan, which would help minimize impacts. Vegetation protection measures would be based on MnDOT Standard Specification for Construction 2572 (Protection and Restoration of Vegetation) or the standard in place at that time. Plans would be developed to replace vegetation lost along the roadside in accordance with MnDOT guidelines. Plans would also be developed to restore ground cover lost on private properties along the proposed areas of construction.

# <u>Invasive Species</u>

To prevent potential spread of the invasive emerald ash borer beetle, ash wood will be stored and disposed of in accordance with Minnesota state laws.

Aquatic Invasive species have been identified in the following lakes along the project: Forest Lake (Flower Rush), Green Lake (Eurasian watermilfoil), and Little Green Lake (Eurasian watermilfoil). A list of designated infested waters by county can be found at: <a href="http://files.dnr.state.mn.us/eco/invasives/infested\_waters.pdf">http://files.dnr.state.mn.us/eco/invasives/infested\_waters.pdf</a>

Minnesota Rule 6216.0265 prohibits the transport of water from infested waters, except by permit. Currently, DNR's Statewide Amended General Permit for MnDOT (GP 2004-0001) authorizes work in infested waters and requires that all equipment, used in state waters that are known to contain aquatic invasive species and that are designated as infested waters, shall be inspected by MnDOT or its contractors and adequately decontaminated prior to being transported.

Contractors will be made aware of the presence of invasive species in waters along the project, and suitable precautions will be taken to prevent their spread. This includes limiting the movement of excavated material from wet ditches or wetlands from one area to another, as well as not allowing water for local dust control to be pulled out of the lakes listed above or other designated infested waters. DNR's "Best Practices for Prevention of Spread of Invasive Species" offers additional guidance and can be found at:

# http://www.dnr.state.mn.us/waters/watermgmt\_section/pwpermits/gp\_2004\_0001 manual.html

#### Wetlands

The solution may also result in approximately 17 acres of wetland impacts. Refer to EAW Item 12 for more information on potential impacts to wetlands.

b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources on or near the site?
 XYes \_\_No

If yes, describe the resource and how it would be affected by the project. Describe any measures that will be taken to minimize or avoid adverse impacts. Provide the license agreement number (LA-\_\_\_) and/or Division of Ecological Resources contact number (ERDB #20100271) from which the data were obtained and attach the response letter from the DNR Division of Ecological Resources. Indicate if any additional survey work has been conducted within the site and describe the results.

#### **State-Listed Species**

The Minnesota Department of Natural Resources (DNR) Natural Heritage Information System (NHIS) was queried for information on known occurrences of rare plant or animal species or other significant natural features within the one mile of the proposed solution. The Minnesota DNR index report documented occurrences of several species with some level of state protection within the vicinity of the proposed solution, as listed in Table 4 (correspondence with the Minnesota DNR, dated December 19, 2009, can be referenced in Appendix F).

TABLE 4 STATE-LISTED SPECIES

Scientific Name	Common Name	MN Status
Acipenser fulvescens	Lake Sturgeon	Special concern
Emydoidea blandingii	Blanding's Turtle	Threatened
Haliaeetus leucocephalus	Bald Eagle	Special concern
Rotala ramosior	Tooth-cup	Threatened
	Northern Poor Fen Class	N/A

Since the proposed solution is not scheduled and is not likely to be constructed for several years and because the Minnesota NHIS is continually updated as new information becomes available, the NHIS should be consulted for occurrences of rare features within three years prior to the start of construction.

The proposed solution is within an area of statewide importance to the Blanding's turtle, a state-listed threatened species, and therefore, this species may be impacted by the proposed solution. State law and rules prohibit the destruction of threatened or endangered species. Under current recommendations, the project contractor would be provided with a copy of the Blanding's Turtle Fact Sheet to make them aware of the possible presence of these turtles, and to help the contractor recognize the turtle in the field (refer to DNR correspondence in Appendix F). If Blanding's turtles are encountered on site and are in imminent danger, they would be moved by hand out of harm's way. Otherwise they would be left undisturbed.

### Federal-Listed Species

The MnDOT OES was contacted to review the study area for federally threatened and endangered species, and to coordinate with the U.S. Fish and Wildlife Service (FWS) for review of the proposed solution. In a letter dated October 16, 2009, MnDOT OES concluded that there are currently no known occurrences of federally listed endangered, threatened, proposed or candidate species in the general vicinity of the proposed solution. Further, there is no listed critical habitat in the project county. However, because the proposed solution is not currently scheduled and is not likely to be constructed for several years and because species information and habitat designation is subject to change, MnDOT OES stated that it would be premature to make any determination of effect at this point in time. Therefore, the proposed solution will be reevaluated and consultation reinitiated within three years prior to the start of construction. Correspondence with MnDOT OES can be referenced in Appendix F.

12. Physical impacts on water resources. Will the project involve the physical or hydrologic alteration — dredging, filling, stream diversion, outfall structure, diking, and impoundment — of any surface waters such as a lake, pond, wetland, stream or drainage ditch? XYes No

If yes, identify water resource affected and give the DNR Public Waters Inventory number(s) if the water resources affected are on the PWI: Reference Table 5 below. Describe alternatives considered and proposed mitigation measures to minimize impacts.

#### **DNR Public Waters Inventory**

The project corridor lies within one major watershed; the Sunrise River Watershed. The proposed solution would impact water resources located along the project corridor, including Public Waters. DNR Public Waters within and adjacent to the project corridor include 20 lakes, watercourses and wetlands. The DNR Protected Waters Inventory for lakes, watercourses, and wetlands is shown in Figures 5 and listed in Table 5.

TABLE 5
DNR PROTECTED WATERS INVENTORY<sup>1</sup>

Name/PWI Number	Type	Wetland	Potential	Notes	
		ID	Impacts (ac.)		
Forest Lake/82015900	Open Water			Flowering Rush ( <i>Butomus</i> umbellatus): Confirmed invasive species (1998)	
Unnamed/82017700	Wetland			None	
Shallow Pond/13005500	Wetland	19	0.00	None	
Sunrise River	Watercourse	12 59 60 74	0.00 0.06 0.04 0.02	Flows through Comfort     Lake	
Comfort Lake/13005300	Open Water	55	1.47	None	
Little Comfort Lake/13005400	Open Water	56	2.00	None	
Thompon Slough/13011100	Wetland			None	
Green (Main Basin) Lake/13004102	Open Water	49 50 51 52	0.00 0.00 0.00 0.02	<ul> <li>Eurasian watermilfoil:         Confirmed invasive species         1990.</li> <li>Special and/or         Experimental Fishing         Regulations exist on this         lake.</li> </ul>	
Little Green Lake/13004101	Open Water	54	0.66	<ul> <li>Eurasian watermilfoil:         Confirmed invasive species         1990.</li> <li>Special and/or         Experimental Fishing         Regulations exist on this         lake.</li> </ul>	
Unnamed/13004900	Wetland			None	
Unnamed/13005200	Wetland			None	
White Stone Lake/13004800	Open Water			None	
Smith's Slough/18010900	Wetland			None	
Sam Lake/13004500	Open Water/ Wetland			None	
Unnamed/13015600	Open Water/ Wetland			None	
Emily Lake/13004600	Open Water/ Wetland			None	
Ellen Lake/13004700	Open Water/ Wetland	53	0.36	Eurasian watermilfoil:     Confirmed invasive species     1990.	

Name/PWI Number	Туре	Wetland	Potential	Notes
		ID	Impacts (ac.)	
Bjorkman	Wetland			None
Slough/13010800				
Hawkinson	Wetland			None
Slough/13010700				
Martha	Open Water			None
Lake/1300400				

<sup>1.</sup> DNR Protected Waters identified from west to east along the TH 8 corridor

At the eastern end of the project corridor a wetland named Ellen Lake and Green Lake (comprised of three distinct basins: the north end, which is commonly called Little Green, the large windswept main basin, and the southern end, which consists of shallow bays with abundant vegetation) have been designated as infested waters (DNR, June 30, 2012) due to the presence of Eurasian water milfoil (*Myriophyllum spicatum*), meaning that activities at these waters are subject to Minnesota Rules 6216. The purpose of parts 6216.0100 to 6216.0600 is to prevent the spread of invasive species, including prohibited and regulated invasive aquatic plants and wild animals, into and within the state.

## Potential Impacts to Public Waters

It is anticipated that the proposed solution will cross Public Waters. Potential impact areas are located between Little Comfort Lake and Big Comfort Lake, as well as between Little Green Lake and a wetland named Ellen Lake. DNR permit requirements would be met for work in public waters or public waters wetlands, as well as steps to prevent spread of invasive species.

#### Wetlands

Wetlands in the study area are regulated by agencies at the state and federal levels including the U.S. Army Corps of Engineers (USACE) and the EPA at the federal level; and, the Minnesota Board of Water and Soil Resources (BWSR), the Minnesota Department of Natural Resources (MNDNR) and the Minnesota Pollution Control Agency (MPCA) at the state level. At the local level, the Minnesota Department of Transportation has responsibility for administration of the Minnesota Wetland Conservation Act (WCA) of 1991 for portions of the project that are within existing MnDOT right-of-way.

Wetlands were identified using standard delineation methodology described in the *Corps of Engineers Wetland Delineation Manual (1987)*. In order to meet federal and state requirements, wetlands in the study area were identified, inventoried and classified. The process of identifying these wetlands involved reviewing aerial photographs and conducting a windshield survey in the spring of 2009. This initial wetland determination provided a rough estimate of wetlands in the study area. In the summer of 2009, an on-site wetland identification and boundary delineation was conducted to identify and categorize

wetlands in the study area. Table 6 summarizes the wetland characteristics and potential impacts. Figure 6 shows the locations of the wetlands identified in Table 6. The proposed solution has the potential to affect approximately 17 acres of these wetland areas. During the design and permitting phase of the project, wetland impacts will be recalculated based on a formal delineation.

TABLE 6
WETLAND CHARACTERISTICS AND POTENTIAL IMPACTS

Wetland ID	Basin Size	Wetland Classifications			
	(ac.)	Field ID	Circular 39	Eggers & Reed	
0	0.46	Wet Meadow	Type 2	Wet Meadow	0.24
1	1.32	Wet Meadow	Type 2	Wet Meadow	0.23
2	7.74	Wet Meadow	Type 2	Wet Meadow	2.89
3	0.31	Wet Meadow	Type 2	Wet Meadow	0.10
4	0.31	Wet Meadow	Type 2	Wet Meadow	0.00
5	0.73	Wet Meadow	Type 2	Wet Meadow	0.15
6	1.00	Wet Meadow	Type 2	Wet Meadow	0.00
7	9.92	Wet Meadow	Type 2	Wet Meadow	1.95
8	12.54	Wet Meadow	Type 2	Wet Meadow	1.38
9	0.59	Wet Meadow	Type 2	Wet Meadow	0.00
10	0.40	Wet Meadow	Type 2	Wet Meadow	0.00
11	0.90	Wet Meadow	Type 2	Wet Meadow	0.00
12	1.61	Wet Meadow	Type 2	Wet Meadow	0.00
13	0.90	Shallow Marsh	Type 3	Shallow Marsh	0.17
14	5.13	Shallow Marsh	Type 3	Shallow Marsh	0.00
15	0.18	Shallow Marsh	Type 3	Shallow Marsh	0.00
16	0.52	Shallow Marsh	Type 3	Shallow Marsh	0.00
17	0.08	Shallow Marsh	Type 3	Shallow Marsh	0.00
18	2.91	Shallow Marsh	Type 3	Shallow Marsh	1.23
19	0.57	Shallow Marsh	Type 3	Shallow Marsh	0.00
20	4.14	Shallow Marsh	Type 3	Shallow Marsh	1.12
21	0.02	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.02
22	0.03	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.04
23	0.06	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.06
24	0.10	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.10
25	0.08	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.09
26	0.01	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
27	0.06	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
28	0.21	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
29	0.28	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.28
30	0.09	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.10
31	0.10	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.10
32	0.08	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.08
33	0.04	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.04
34	0.04	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.05
35	0.04	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.04

TABLE 6
WETLAND CHARACTERISTICS AND POTENTIAL IMPACTS

Wetland ID	Basin Size	Wetland Classifications			
	(ac.)	Field ID	Circular 39	Eggers & Reed	
36	0.09	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.10
37	0.09	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.09
38	0.01	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
39	0.01	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
40	0.01	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
41	0.02	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
42	0.03	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
43	0.02	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.02
44	0.02	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.03
45	0.73	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.73
46	0.01	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.01
47	0.01	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.01
48	0.06	Roadside Ditch	Type 2	Wet Meadow/Sedge Meadow	0.00
49	2.89	Lakeshore	Type 4	Deep Marsh	0.00
50	1.35	Lakeshore	Type 4	Deep Marsh	0.00
51	5.40	Lakeshore	Type 4	Shallow Marsh	0.00
52	2.54	Lakeshore	Type 4	Shallow Marsh	0.02
53	13.95	Lake	Type 5	Shallow Open Water	0.36
54	23.97	Lake	Type 5	Shallow Open Water	0.66
55	10.69	Lake	Type 5	Shallow Open Water	1.47
56	20.29	Lake	Type 5	Shallow Open Water	2.00
57	0.11	Wet Meadow	Type 2	Wet Meadow	0.00
58	1.17	Forested	Type 1/Type 7	Floodplain Forest	0.22
59	1.46	Forested	Type 1/Type 7	Floodplain Forest	0.06
60	5.20	Forested	Type 1/Type 7	Hardwood Swamp	0.04
61	0.14	Forested	Type 1/Type 7	Hardwood Swamp	0.00
62	0.14	Farmed	Type 1	Seasonal Flooded Basin	0.00
63	0.55	Farmed	Type 1	Seasonal Flooded Basin	0.00
64	1.00	Farmed	Type 1	Seasonal Flooded Basin	0.57
65	0.45	Farmed	Type 1	Seasonal Flooded Basin	0.00
66	0.87	Farmed	Type 1	Seasonal Flooded Basin	0.00
67	0.22	Farmed	Type 1	Seasonal Flooded Basin	0.22
68	0.38	Farmed	Type 1	Seasonal Flooded Basin	0.00
69	0.17	Farmed	Type 1	Seasonal Flooded Basin	0.00
70	1.57	Farmed	Type 1	Seasonal Flooded Basin	0.00
71	0.13	Farmed	Type 3	Seasonal Flooded Basin	0.00
72	0.02	Drainage Ditch	Type 1 Seasonal Flooded Basin		0.00
73	0.43	Drainage Ditch	Type 1	Seasonal Flooded Basin	0.03
74	0.39	Drainage Ditch	Type 1	Seasonal Flooded Basin	0.02
75	0.79	Shallow Marsh	Type 3	Shallow Marsh	0.00
				Total Wetland Impacts (acres)	17.1

#### Sequencing Analysis and Mitigation

Prior to wetland replacement plan approval, proposed impacts to non-exempt wetlands must undergo a sequencing process. Sequencing is a review to assess the efforts made by the applicant to follow, in descending order, these principles:

- Avoidance:
- Minimization:
- Reduction or Elimination of impacts over time; and
- Replacement.

Wetland sequencing measures have been implemented to avoid and minimize impacts from the proposed solution. Total avoidance is not possible due to the prevalence of wetlands and their distribution throughout the TH 8 corridor. However, impact avoidance and minimization efforts were considered and accomplished through selection of a design that had the least amount of wetland impacts, but still achieved the project purpose and need.

During the development of alternatives, alternative roadway alignments were evaluated to determine if wetlands could be avoided and to identify minimization opportunities. Complete avoidance is not feasible because those wetlands with potential for impact are located within the right of way and along both sides of the current alignment. Refer to Appendix C for Alternatives Evaluation.

As alternative configurations for the road advanced, opportunities to reduce or avoid wetland impacts were sought. The design of the medians along the isthmus between Comfort Lake and Little Comfort Lake and the area between Little Green Lake and the wetland named Ellen Lake was narrowed to minimize impacts to wetlands and public waters.

On June 2, 2009, a pre-delineation Technical Evaluation Panel meeting was held with representatives from local governments, the project proposer (MnDOT), Washington Conservation District, Chisago Soil and Water Conservation, DNR and the USACE.

In a meeting on November 9, 2011, MnDOT, the USACE, and BWSR discussed the project alternatives under consideration at that time, project impacts, and options for wetland impact avoidance and mitigation. MnDOT inquired about the Least Environmentally Damaging Practicable Alternative (LEDPA) determination, referring to the similar acreage of potential wetland impacts for each alternative under consideration. The USACE indicated that the LEDPA determination would also take into account other considerations, such as safety, property impacts, and cost.

For wetland impact mitigation, the USACE referenced the Janet Johnson Wildlife Management Area wetland banking site, which is a proposed, very large site of approximately 500 acres located between the City of North Branch and I-35. This site is

located in the watershed. The mitigation ratio in advance is 2:1. The USACE stated the project will require an individual permit with review duration of 120 days.

MnDOT prepared an application for an Approved Jurisdictional Determination that will be submitted in spring of 2013.

13. Water use. Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? X Yes \_\_ No

If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

#### Water Wells

A review of the Minnesota Geological Survey/Minnesota Department of Health County Well Index (CWI) identified 107 wells within the study area. One of the wells is listed as a monitoring well and is located at 24227 Greenway Avenue, 104 wells are listed as domestic in use, one well is listed as unknown, and one well is listed as abandoned.

As part of the proposed solution, residential acquisitions may occur and would result in removal of structures. The domestic wells associated with acquired properties would be properly sealed in accordance with Minnesota Department of Health Standards. If any unused or unsealed wells are discovered within the project limits at such a time construction commences, they would also be addressed in accordance with Minnesota Rules, Chapter 4725 (Wells and Borings).

#### Public Water Supplies

The proposed solution would involve construction within a portion of Drinking Water Supply Management Area (DWSMA) and Wellhead Protection Area (WHP), as established by the Minnesota Department of Health. Within the vicinity of the proposed solution, the DWSMA and WHP boundaries lie along the west end of the TH 8 corridor approximately one-third mile to the Forest Lake and Wyoming municipal boundary. The City of Forest Lake Wellhead Protection Plan covers three existing wells (Well Nos. 3, 4, 5) and currently serving the City's water supply system. All three wells obtain water from the Mount Simon aquifer, with Well No. 3 also open to the Franconia-Ironton-Galesville aquifer. The Mount Simon aquifer underlies the DWSMA for the three wells and is ranked as being "low" in vulnerability to contamination. Management efforts outlined in the Wellhead Protection Plan are aimed at managing other groundwater wells within the DWSMA.

#### **Dewatering**

Dewatering may be needed in localized areas during project construction. Activities that could require temporary dewatering include culvert installation between Comfort Lake and Little Comfort Lake and roadway embankment construction along the peripheral areas of Ellen Lake and Little Green Lake. If temporary dewatering is needed, the appropriate MnDNR groundwater appropriation permits will be obtained. Best management practices will be implemented prior to any dewatering activities for treatment of dewatering discharges per the National Discharge Elimination System (NPDES) Construction Stormwater Permit requirements in place at the time of the future proposed project construction.

14. Water-related land use management district. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? X Yes \_\_No

If yes, identify the district and discuss project compatibility with district land use restrictions.

## **Shoreland Zoning District**

TH 8 is within the shoreland overlay district of Forest Lake and the Sunrise River and in the City of Forest Lake; Shallow Pond, Comfort Lake and Little Comfort Lake in the City of Wyoming; Green Lake, Little Green Lake, an unnamed wetland (13015600-W), Emily Lake, Ellen Lake and Martha Lake in Chisago City.

Compatibility of the proposed solution with local ordinances is an important consideration. Under the proposed TH 8 solution, grading and fill activities would occur in shoreland areas. Complete avoidance is not feasible because shorelands with potential for impact are located within the right of way and along both sides of the current alignment. The future TH 8 solution will consider design solutions to minimize adverse impacts to shoreland.

### Floodplain Assessment

### Purpose

This floodplain assessment was prepared in accordance with Executive Order 11988 and Minnesota Statutes 103F.101 – 103F.155. If the project limits cross or lie adjacent to any floodplain area a floodplain impact may exist.

# Floodplain Assessment

The proposed solution includes a four-lane divided roadway with a grassy median.

For the proposed solution the following maps were researched:

- Federal Emergency Management (FEMA) Flood Insurance Rate Maps (FIRM) for Washington County, Minnesota and incorporated areas (effective date February 3, 2010, panel number 0040E, Panel of 40 of 456); and
- Federal Emergency Management (FEMA) Flood Insurance Rate Maps (FIRM) for Chisago County, Minnesota and incorporated areas (effective date August 2, 1993, panel number 0175C, Panel 175 of 200).
- Federal Emergency Management (FEMA) Flood Insurance Rate Maps (FIRM) for Chisago City, Minnesota (effective date January 7, 1983, panel number 0001A, Only Panel Printed).

Other sources of information were used in this assessment include the Comfort Lake – Forest Lake Watershed Management Plan – Revised July 2008, and Comfort Lake – Forest Lake Permit Guidance and Information Handbook – February 2009.

# Potential Floodplain Encroachments

The FIRM for Washington County indicates the 100-year floodplain for Forest Lake is Zone AE with a base flood elevation of 903 feet, and the Sunrise River is Zone A, for which no base flood elevations have been determined. The FIRM for Chisago County indicates the 100-year floodplain for Green Lake and Little Green Lake is Zone A5 with a base elevation of 895 feet, as well as flood hazard factors having been determined. The FIRM for Chisago City indicates the 100-year floodplain for Ellen Lake is Zone A, for which no base flood elevations have been determined. The FIRM for Chisago County indicates that Comfort Lake and Little Comfort Lake are not within a delineated floodplain and are in Zone C, defined as areas of minimal flooding.

Affected floodplains are longitudinally and transversely encroached upon by the proposed solution right of way, as summarized in Table 7 and illustrated in Figure 7. Longitudinal and transverse encroachments represent crossing angles less than 30 degrees and angles greater than or equal to 30 degrees respectively.

Transverse and longitudinal encroachment of the floodplains listed in Table 7 are based the current proposed solution right of way. During future design phases, when construction limits are determined, transverse encroachment of the Sunrise River and longitudinal encroachment to Little Green Lake and Ellen Lake may be avoided.

TABLE 7
FLOODPLAIN ENCROACHMENT SUMMARY

Map ID	Floodplain	FEMA FIRM Map	Type of Encroachment	Approx. Length (Feet)
1	Sunrise River	Washington Co. – Panel 27163C0040E	Transverse	250
2	Little Green Lake	Chisago Co. – Panel 2706820175C	Longitudinal	1400
3	Little Green Lake	Chisago City – Panel 2707070001A	Longitudinal	100
4	Ellen Lake	Chisago City – Panel 2707070001A	Longitudinal	800

# Floodplain Impact Analysis

In accordance with Executive Order 11988 and Minnesota Statute 103F.101 - 103F.155, an analysis of floodplain impacts that would result from the proposed solution was performed. Under this order and statutes, the proposed solution will be determined to have no adverse impacts based on the following criteria and discussion:

- No significant potential for interruption of a transportation facility which is needed for emergency vehicles or provides a community's only evacuation route will occur.
  - o All proposed solution roadway grades will be designed above the 100-year floodplain.
- No significant impact on natural and beneficial floodplain values will occur.
  - o No fisheries impacts are anticipated.
  - o There may be wetland impacts caused by the proposed solution. Refer to EAW Item 12.
  - o Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, were reported in the project vicinity. For information regarding methods that will implemented to avoid impacts to Blanding's turtles, refer to EAW Item 11.
  - Appropriate turf establishment and erosion control measures in accordance with (NPDES).
- No significant increased risk of flooding will result.
  - Future stages of project development will analyze risk for increased flooding. Floodplain fills will be mitigated to the maximum extent possible within any affected floodplain area.

- The project will not support and/or result in incompatible floodplain development.
  - o No incompatible floodplain development would result from the proposed solution as the solution does not provide additional access to the floodplain areas. Local and watershed management agencies have floodplain ordinances that restrict development within the floodplain.

# Designated Wild or Scenic River Land Use District

There are no state or federally designated wild or scenic rivers in the vicinity of the proposed solution.

15. Water surface use. Will the project change the number or type of watercraft on any water body? \_Yes XNo

If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

16. Erosion and sedimentation. Give the acreage to be graded or excavated and the cubic yards of soil to be moved:

The proposed solution will grade approximately 227 acres. An estimate of cubic yards of soil to be moved will be calculated during future stages of project design.

Describe any steep slopes or highly erodible soils and identify them on the site map. The EAW Guidelines (Minnesota EQB, 2010) identify steep slopes as having 12 percent or greater.

The Chisago County and Washington County Soil Surveys indicate that the soil type, Nebish Loam 40D, is present within the project footprint and has a steep slope of 12 to 25 percent. Within the corridor steep slopes occur along the shore of Little Green Lake. Refer to EAW Item 19b and Figure 8 in Appendix A for location of this soil type.

Describe any erosion and sedimentation control measures to be used during and after project construction.

Erosion and sedimentation of all exposed soils within the projects limits of the proposed alternative will be minimized by employing Best Practices during construction activities. Implementation of Best Practices during construction greatly reduces the amount of construction-related sedimentation and helps to control erosion and runoff. Ditches, dikes, silt fences, biorolls, sedimentation basins, and temporary seeding will be used as temporary control measures during construction grading and excavation. Temporary and permanent erosion control plans will be identified in final site grading plans and in construction plans for each stage, as required by the NPDES permitting for construction sites in place at the time of construction, as the current permit expires on August 1, 2013.

Enhanced Best Practices to prevent the mobilization of sediment and limit the generation of dissolved pollutants from construction sites would be required. New requirements would address site considerations during construction, design of stormwater controls, and pollution prevention measures.

# 17. Water quality: surface water runoff

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

Drainage in the study area is primarily rural in nature that include vegetated ditches along the outside shoulders of the TH 8 corridor. Drainage patterns from the western half of the study area outlets to Comfort Lake and remainder of the study area drains to Green Lake/Little Green Lake.

The solution proposes to construct a four-lane divided roadway with a grass median. The proposed solution will increase the impervious surface.

Rural drainage systems consist of vegetated ditches and open channels as opposed to the curb and gutter and storm sewer drainage systems characteristic of urban drainage designs. Rural drainage systems provide some water quality treatment, reducing the pollutant load conveyed by highway runoff. Curb and gutter drainage allows little infiltration of runoff into soils and tends to convey most of the pollutants to receiving waters. Conversely, rural drainage systems allow pollutants to settle or become absorbed by the soil and vegetation. Since the proposed solution is of rural drainage design and does not introduce highway runoff to new or sensitive water bodies, no significant impacts on water quality should result.

However, the proposed solution will include the construction of stormwater BMPs to mitigate water quality and quantity impacts. In general, stormwater BMPs for the future project may include filtration ponds and ditch features throughout the project limits. A Stormwater Pollution Protection Plan (SWPPP) will be created during the final design phase of the project, as required for the NPDES. This will address permanent and construction erosion, sediment, and pollution control. Additionally, the standards and rules established by local agencies and watershed agencies will be followed to the extent possible to mitigate the water quality and quantity impacts created by the future proposed project.

Future stages of project development will evaluate the existing drainage including the need for and size of culverts, as well as the need for storm water retention ponds. The design of the new roadway will consider and incorporate design features to detain and filter stormwater runoff, such as swales and stormwater detention ponds. This will be accomplished in accordance with permitting requirements of the NPDES in place at

the time. MnDOT will work with the Comfort Lake--Forest Lake Watershed District (CLFLWD) to ensure that drainage design features are coordinated with the plans of the Watershed District.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The TH 8 study area lies within the Sunrise River Watershed. The Comfort Lake–Forest Lake Watershed in northern Washington County and southern Chisago County, and Chisago Lakes Chain of Lakes Watershed fall within the western and eastern limits of the study, respectively.

The CLFLWD administers the approximate 47-square-mile Comfort Lake-Forest Lake watershed. The Chisago Lakes Lake Improvement District (CL-LID), governed by a Board of Directors, makes recommendations to the Chisago County Board of Commissioners in matters of development and environmental quality to the Chisago Lakes Chain of Lakes watershed.

Receiving water bodies located from west to east along the limits of the study area are shown in Table 8.

TABLE 8
RECEIVING WATER BODIES

	Receiving	
Watershed	Water Body	Notes
CLFLWD	Sunrise River	Flows northeast to through Shallow Pond (DNR Protected Water -
		13005500) to Comfort Lake
CLFLWD	Wetland 19	Shallow Pond - DNR Protected Water Body – 13005500-W
CLFLWD	Comfort Lake	DNR Protected Water Body – 130053000-P
CLFLWD	Little Comfort	DNR Protected Water Body – 130054000-P
	Lake	
CL-LID	Wetland 52	Lakeshore – Green Lake, DNR Protected Water Body – 13004102-P
CL-LID	Wetland 51	Lakeshore – Green Lake, DNR Protected Water Body – 13004102-P
CL-LID	Wetland 49	Lakeshore – Green Lake, DNR Protected Water Body – 13004102-P
CL-LID	Ellen Lake	DNR Protected Water Body – 13004700-W
CL-LID	Green (Little	DNR Protected Water Body – 13004101-P
	Green) Lake	

Within the study area Comfort Lake, Little Comfort Lake, and the Sunrise River are listed 303(d) impaired waters (2012). The EPA-approved (2010) CLFLWD "Six Lakes" Total Maximum Daily Load (TMDL) implementation plan addresses six waterbodies, including Comfort Lake and Little Comfort Lake. The TMDLs address impairments due to excess nutrients (mainly phosphorus). In addition to the "six lakes," The CLFLWD TMDL will also work to reduce phosphorous loadings to the Sunrise River.

The CL-LID also has an EPA-approved (2013) TMDL plan for impaired and unimpaired waters within its district, including Emily Lake in the vicinity of TH 8.

Stormwater generated from the proposed solution will be directed, to the extent practicable, to the BMPs described in 17a. At this time the stormwater conveyance and treatment systems have not been designed. It is anticipated most runoff will continue with rural drainage system; however, the proposed frontage and certain designated areas may include curb and gutter with treatment facilities. MnDOT will work with the CLFLWD and CL-LID to ensure that proposed drainage design features are coordinated with the plans of the Watershed District.

# 18. Water quality: wastewaters

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

Not applicable.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies (identifying any impaired waters), and estimate the discharge impact on the quality of receiving waters. If the project involves onsite sewage systems, discuss the suitability of site conditions for such system

Not applicable.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

No applicable.

# 19. Geologic hazards and soil conditions

a. **Approximate depth (in feet) to ground water:** from less than 10 to approximately 20 feet

to bedrock: 50' minimum 50' to 300' average.

Source:

- Geologic Atlas, Bedrock Topography and Depth to Bedrock, Chisago County, Minnesota, by the Minnesota Geologic Survey, 2010.
- Geologic Atlas, Bedrock Topography and Depth to Bedrock, Washington County, Minnesota, by the Minnesota Geologic Survey, 1990.

Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

No sink holes, shallow limestone formations or karst conditions were noted as part of a review of geologic conditions in the vicinity of the study area.

b. Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil texture and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

Soil types within the study area, based on the Natural Resources Conservation Service (NRCS) Soil Survey for Washington and Chisago Counties are listed in Table 9 and illustrated in Figure 8 and Figure 9 in Appendix A.

TABLE 9 SOIL CHARACTERISTICS

				Depth to		
Soil		Slope	Drainage	Water Table	Frequency	Frequency
Symbol	Soil Type	(%)	Class	(ft.)	of Flooding	of Ponding
40B <sup>(1)</sup>	Nebish loam	2 to 6	Well drained	>6	None	None
40C <sup>(2)</sup>	Nebish loam	6 to 12	Well drained	>6	None	None
40D <sup>(4)</sup>	Nebish loam	12 to 25	Well drained	>6	None	None
75 <sup>(4)</sup>	Bluffton loam	0 to 1	Very poorly drained	<1	None	Frequent
113 <sup>(3)</sup>	Webster loam	0 to 2	Poorly drained	<1	None	None
158B <sup>(4)</sup>	Zimmerman loamy fine sand	1 to 6	Excessively drained	>6	None	None
159B <sup>(2)</sup>	Anoka loamy very fine sand	1 to 6	Well drained	>6	None	None
162 <sup>(2)</sup>	Lino loamy fine sand	0 to 2	Somewhat poorly drained	1	None	None
169B <sup>(2)</sup>	Braham loamy fine sand	2 to 6	Well drained	>6	None	None
170 <sup>(4)</sup>	Blomford loamy fine sand	0 to 3	Poorly drained	<1	None	None
225 <sup>(1)</sup>	Nessel fine sandy loam	1 to 4	Moderately well drained	3	3 None	
346 <sup>(3)</sup>	Talmoon loam	0 to 2	Poorly drained	<1	None	None

TABLE 9 SOIL CHARACTERISTICS

				Depth to		
Soil Symbol	Soil Type	Slope (%)	Drainage Class	Water Table (ft.)	Frequency of Flooding	Frequency of Ponding
Зуппоп	3011 Type	(70)		(11.)	of Flooding	of Politiling
540 <sup>(4)</sup>	Seelyeville muck	0 to 1	Very poorly drained	<1	None	Frequent
543 <sup>(4)</sup>	Marky Muck	0 to 1	Very poorly drained	<1	None	Frequent
544 <sup>(4)</sup>	Cathro muck	0 to 1	Very poorly drained	<1	None	Frequent
678 <sup>(1)</sup>	Beltami loam, thick solum	0 to 3	Moderately well drained	2	None	None
722 <sup>(4)</sup>	Blomford loamy sand, lacustrine substratum	0 to 2	Poorly drained	<1	None	None
1033 <sup>(4)</sup>	Udifluvents	0 to 6	Somewhat poorly drained	>6	None	None
1040	Udorthents			>6	None	None

- (1) Prime Farmland
- (2) Farmland of Statewide Importance
- (3) Prime Farmland (where drained)
- (4) Not Prime Farmland

Source: Soil Resource Report for Chisago County and Washington County, Minnesota. Natural Resource Conservation Service (NCRS)

The Minnesota Geological Survey hydrogeology plate for the Washington County Geologic Atlas reports a water table elevation between 900 and 950 feet within the portion of the study area in Washington County. The Anoka Sand Plain Regional Assessment hydrogeology plate reports a water table elevation between 875 and 900 feet within the portion of the study area in Chisago County. The surface elevation of the study area ranges from approximately 890 to 920 feet. The topography in the study is rolling and the ground water table is estimated to occur at depths ranging from less than 10 feet to approximately 20 feet.

The sensitivity to pollution in the water table is rated on the basis of depth to the water table and the conductivity of geologic materials. The aquifer's sensitivity to pollution is rated based on the relative time of contaminates to the aquifer, which is affected by the number and effectiveness of confining layers between aquifers and the surface, depth to bedrock, and the composition of the soil. Sensitivity to pollution for the Prairie du Chien-Jordan aquifer ranges from moderate to moderate-high at the west end of the study area to low to moderate at the east end of the study area. Typical areas of high to very high sensitivity ratings include sensitive areas around wetlands, lakes, and streams. These are also areas where the depth to the water table is less than a foot.

The proposed project construction process will involve the use of contaminates (primarily fuel for construction activities) and there will be potential for limited soil contamination. In the event of a spill, appropriate action to remediate the spill would take place immediately in accordance with MPCA guidelines and regulations.

# 20. Solid wastes, hazardous wastes, storage tanks

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

## Solid Wastes

The disposal of solid waste generated by clearing the construction area is a common occurrence associated with road construction projects. Preliminary design will consider selection of gradelines and locations to minimize excess materials and consideration will be given to using excess materials on other nearby projects.

Excess materials and debris from this project such as concrete and asphalt will be disposed of in accordance with MnDOT Standard Specification for Construction, 2104.3C and Minnesota Rule 7035.2825. In particular, excess materials and debris will not be placed in wetlands or floodplains.

Stable material that conforms to the appropriate standards and definitions may be disposed of by burying in roadway embankment in compliance with County waste ordinances, and combustible materials disposed of in a landfill. Off-site disposal would be at publicly controlled dump sites, or at sites arranged for and secured by the contractor, which would not create a public nuisance or result in unsightly conditions. Borrow material, which may be required, would be identified in contract special provisions. Disposal would be done in accordance with MnDOT specifications and according to a disposal plan satisfactory to the project engineer.

#### Hazardous Wastes or Storage Tanks

There will be no hazardous waste generated, or storage tanks on site.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

#### Affected Environment

The presence of potentially contaminated properties (defined as properties where soil and/or groundwater is impacted with pollutants, contaminants or hazardous wastes) is a concern in the development of highway projects because of potential liabilities associated with ownership of such properties, potential cleanup costs, and safety concerns associated with construction personnel encountering unsuspected wastes or contaminated soil or groundwater. Contaminated materials encountered during highway construction projects must be properly handled and treated in accordance with state and federal regulations. Improper handling of contaminated materials can worsen their impact on the environment. Contaminated materials also cause adverse impacts to highway projects by increasing construction costs and causing construction delays, which also can increase project costs.

A Phase I Environmental Site Assessment (Phase I) provides information on potentially contaminated properties (defined as properties where soil and/or groundwater is impacted with pollutants, contaminants or hazardous wastes). These properties are identified through review of historic land use records and air photos, Federal EPA, State MPCA (Minnesota Pollution Control Agency) and county/city records, personal interviews, as well as current property condition.

A Phase I of the project area has been completed. Potentially contaminated properties identified in the Phase I will be evaluated to determine if they are likely to be impacted by construction and/or acquired as right of way during future stages of project development. Any properties with a potential to be impacted by the project will be drilled and sampled if necessary to determine the extent and magnitude of contaminated soil or groundwater in the areas of concern. The results of the drilling investigation will be used to determine if the contaminated materials can be avoided, or the project's impacts to the properties minimized. If necessary, a plan will be developed for properly handling and treating contaminated soil and/or groundwater during construction in accordance with all applicable state and federal regulations.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

No above or underground storage tanks are planned for permanent use in conjunction with the proposed solution.

Temporary storage tanks for petroleum products may be located in the project area for construction equipment during roadway construction. Appropriate measures would be taken during construction to avoid spills that could contaminate groundwater or surface water in the project area. In the event that a leak or spill occurs during construction, appropriate action to remediate the situation would be taken immediately in accordance with MPCA guidelines and regulations.

# 21. Traffic. Parking spaces added: Not applicable.

Existing spaces (if project involves expansion): Not applicable.

Estimated total average daily traffic generated: See discussion below.

Estimated maximum peak hour traffic generated and time of occurrence: See discussion below.

# Indicate source of trip generation rates used in the estimates.

If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Using the format and procedures described in the Mn/DOT Access Management Manual <a href="http://www.dot.state.mn.us/accessmanagement/pdfchapters/chapter5.pdf">http://www.dot.state.mn.us/accessmanagement/pdfchapters/chapter5.pdf</a>) or a similar local guidance, provide an estimate of the impact on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system.

Growth in travel demand is expected due to increased population and employment growth in southern Chisago County, northern Washington County and the north metropolitan area in general. The 2009 annual average daily traffic (AADT) volumes and forecast 2030 volumes are listed in Table 10 below.

One measure of rating congestion on a roadway is to divide the number of vehicles that use or are expected to use the roadway by the number of vehicles the roadway can safely accommodate. This measure is known as the Volume-to-Capacity (V/C) ratio. If the ratio exceeds 1.0, the roadway is over capacity. As indicated in Table 10, TH 8 already exceeds typical capacity under existing conditions. Using growth rate scenarios of 1, 1.5 and 2 percent, the forecast traffic growth by 2030 on TH 8 will increase congestion, which will result in longer travel delays and cause potential safety problems.

TABLE 10
EXISTING AND FUTURE NO-BUILD TRAFFIC VOLUMES AND V/C RATIO

Segment of TH 8	Existing (2009 AADT) (13,500 capacity*)	V/C Ratio	Future (2030 AADT) (13,500 capacity*) 1%	V/C Ratio	Future (2030 AADT) (13,500 capacity*) 1.5%	V/C Ratio	Future (2030 AADT**) (13,500 capacity*) 2%	V/C Ratio
Between Greenway Ave N and CSAH 23	19,600	1.45	24.200	1.79	26,800	1.99	29,700	2.20
Between CSAH 23 and CSAH 22	14,300	1.06	17,600	1.30	19,500	1.44	21,700	1.61
Between CSAH 22 and Karmel Ave.	17,100	1.27	21,100	1.56	23,400	1.73	25,900	1.92

Source: Highway Capacity Manual 2000 and MnDOT

<sup>\*</sup>Capacity of roadway at LOS D/E boundary

<sup>\*\*2030</sup> volumes determined by applying a 1%, 1.5% and 2% per year growth factor

The proposed solution is not intended to generate traffic; rather, the purpose of this solution is to improve mobility and safety along the TH 8 corridor by reducing congestion and improving pedestrian and bicycle circulation. The Purpose and Need Statement (refer to Appendix D) lists several mobility and safety concerns and needs that the proposed solution would address. The following is a summary of those needs.

- The forecast traffic growth by 2030 on TH 8 will increase congestion, which will result in longer travel delays and cause potential safety problems.
- A traffic analysis (refer to the Traffic Analysis Technical Memorandum in Appendix G) was performed to analyze the operational performance for three key intersections along TH 8 under existing, 2030 no-build and 2030 build conditions in October 2009.
  - O These key intersections are TH 8 at Greenway Avenue, TH 8 at CSAH 23/Pioneer Road, and TH 8 at CSAH 36/Johnson Lane. The results indicated that these intersections operate at a LOS Level of Serve (LOS) D or better under 2009 volume conditions. However, the intersection of Greenway Avenue is expected to operate in an unacceptable manner (LOS F) with an intersection delay ranging from 84 seconds/vehicle to over 120 seconds/vehicle during AM and PM peak periods under 2030 no-build conditions. The intersection of CSAH 23 is expected to operate at LOS F with an intersection delay of 102 seconds/vehicle during the AM peak period under 2030 no-build conditions.
- Alternative parallel through routes are not available to help alleviate congestion along TH 8. As a result, the need for capacity improvement is critical at both intersection level and corridor level for the studied segment of TH 8 under 2030 conditions.
- One of the main deficiencies causing traffic safety problems in this corridor is the lack of access control. There are more than 50 access points along this segment of roadway, which create traffic conflict points. Of these access points, approximately 30 are commercial or residential driveways.
  - o The vision for TH 8 includes widely-spaced intersections rather than grade-separated interchanges.
  - Secondary intersections, which have lower traffic volumes, could occur at the midpoint between primary intersections. Private driveways are discouraged along arterial routes and should be provided by exception or deviation only.
- Seventy-three crashes occurred at major segments and key intersections along TH 8 from Greenway Avenue in Wyoming to Karmel Avenue (County Road 80) in Chisago City from 2008 to 2010.
  - o Among these crashes, 49 percent were property damage crashes, 47 percent involved injuries, and three fatal crash were reported.

22. Vehicle-related air emissions. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts.

# INTRODUCTION TO TRANSPORTATION AIR QUALITY

Motorized vehicles affect air quality by emitting airborne pollutants. Changes in traffic volumes, travel patterns, and roadway locations affect air quality by changing the number of vehicles in an area and the congestion levels. The air quality impacts from the project are analyzed by addressing criteria pollutants, a group of common air pollutants regulated by EPA on the basis of criteria (information on health and/or environmental effects of pollution). The criteria pollutants identified by the EPA are ozone, particulate matter, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide. Potential impacts resulting from these pollutants are assessed by comparing projected concentrations to National Ambient Air Quality Standards (NAAQS). In addition to the criteria air pollutants, the EPA also regulates mobile source air toxics.

# **NAAQS** Criteria Pollutants

Ozone

Ground-level ozone is a primary constituent of smog and is a pollution problem throughout many areas of the United States. Exposures to ozone can cause people to be more susceptible to respiratory infection, resulting in lung inflammation, and aggravating respiratory diseases, such as asthma. Ozone is not emitted directly from vehicles but is formed when volatile organic compounds (VOCs) and nitrogen oxides (NOx) react in the presence of sunlight. Transportation sources emit NOx and VOCs and can, therefore, affect ozone concentrations. However, due to the phenomenon of atmospheric formation of ozone from chemical precursors, concentrations are not expected to be elevated near a particular roadway.

The MPCA, in cooperation with various other agencies, industries and groups, has encouraged voluntary control measures to control ozone and has begun developing a regional ozone modeling effort. Ozone concentrations in the lower atmosphere are influenced by a complex relationship of precursor concentrations, meteorological conditions, and regional influences on background concentrations. The MPCA staff has begun development of ozone modeling for the Twin Cities metropolitan area. Recent conversations with MPCA staff indicate that the ozone models currently use federal default traffic data and a relatively coarse modeling grid. As such, ozone modeling in Minnesota is in its developmental stage, and therefore, there is no available method of determining the contribution of a single roadway to regional ozone concentrations. Ozone levels in the Twin Cities metropolitan area currently meet state and federal standards. Additionally, the State of Minnesota is classified by the Environmental Protection Agency as an "ozone attainment area," which means that Minnesota has been identified as a

geographic area that meets or exceeds the national standards for the reduction of ozone levels. Because of these factors, a quantitative ozone analysis was not conducted for this study.

#### Particulate Matter

Particulate matter (PM) is the term for particles and liquid droplets suspended in the air. Particles come in a wide variety of sizes and have been historically assessed based on size, typically measured by the diameter of the particle in micrometers. PM<sub>2.5</sub>, or fine particulate matter, refers to particles that are 2.5 micrometers or less in diameter. PM<sub>10</sub> refers to particulate matter that is 10 micrometers or less in diameter.

Motor vehicles (i.e., cars, trucks, and buses) emit direct PM from their tailpipes, as well as from normal brake and tire wear. Vehicle dust from paved and unpaved roads may be reentrained, or re-suspended, in the atmosphere. In addition, PM<sub>2.5</sub> can be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds. PM<sub>2.5</sub> can penetrate the human respiratory system's natural defenses and damage the respiratory tract when inhaled. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing;
- Decreased lung function;
- Aggravated asthma;
- Irregular heartbeat;
- Nonfatal heart attacks; and,
- Premature death in people with heart or lung disease.

Source: http://www.epa.gov/air/particlepollution/health.html

In December of 2012, the EPA strengthened the annual ambient air quality standard to 12 ug/m³ (micrograms per cubic meter) in response to new scientific information on the health effects of fine particle pollution. The EPA retained the existing 24-hour standard of 35 ug/m³. The annual standard is based on a three-year average of annual mean PM<sub>2.5</sub> concentrations; the 24-hour standard is based on a three-year average of the 98th percentile of 24-hour concentrations. The NAAQS 24-hour standard for PM<sub>10</sub> is 150 ug/m³, not to be exceeded more than once per year, on average, over three years. According to the MPCA report <u>Air Quality in Minnesota: 2013 Report to the Legislature</u>, all areas of the state currently meet these standards.

The Clean Air Act conformity requirements include the assessment of localized air quality impacts of federally funded or federally approved transportation projects that are deemed to be projects of air quality concern located within  $PM_{2.5}$  nonattainment and maintenance areas. This project is located in an area that has been designated as an unclassifiable/attainment area for PM. This means that Minnesota has been identified as a

geographic area that meets or exceeds the national standards for the reduction of PM levels, and therefore is exempt from performing PM analyses.

Nitrogen Dioxide (Nitrogen Oxides)

Nitrogen oxides, or NOx, is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NOx are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. The MPCA's <u>Annual Pollution Report to the Legislature: A Summary of Minnesota's Air Emissions and Water Discharges</u>, April 2012, indicates that:

More than a quarter of  $NO_x$  emissions come from non-road sources such as railroads and agricultural, construction and recreational equipment. Another 25 percent comes from on-road gasoline vehicles. Electric utilities contribute 10 percent of  $NO_x$  emissions. Combustion from other large point sources emits 13 percent while diesel vehicles emit an additional 15 percent. Fuel combustion from smaller sources contributes most of the remainder of  $NO_x$  emissions in Minnesota.

Nitrogen dioxide (NO<sub>2</sub>), which is a form of nitrogen oxide (NO<sub>x</sub>), is regularly monitored in the Twin Cities metropolitan area. Currently, NO<sub>2</sub> levels meet state and federal standards. Data presented in the MPCA's <u>2013 Annual Air Monitoring Network Plan for Minnesota</u>, indicates that:

On January 22, 2010 the EPA finalized revisions to the NO2 NAAQS. As part of the standard review process, the EPA retained the existing annual NO2 NAAQS, but also created a new 1-hour standard. This new 1-hour NAAQS will protect against adverse health effects associated with short term exposures to elevated NO2. To meet this standard, the three-year average of the annual 98th percentile daily maximum 1-hour NO2 concentration must not exceed 100 ppb. Minnesota averages ranged from 33 ppb to 46 ppb; therefore, all Minnesota sites currently meet the 1-hour NAAQS for NO2.

The EPA's regulatory announcement, EPA420-F-99-051 (December 1999), describes the Tier 2 standards for tailpipe emissions, and states:

The new tailpipe standards are set at an average standard of 0.07 grams per mile for nitrogen oxides for all classes of passenger vehicles beginning in 2004. This includes all light-duty trucks, as well as the largest SUVs. Vehicles weighing less than 6000 pounds will be phased-in to this standard between 2004 and 2007.

As newer, cleaner cars enter the national fleet, the new tailpipe standards will significantly reduce emissions of nitrogen oxides from vehicles by about 74 percent by 2030. The standards also will reduce emissions by more than 2 million tons per year by 2020 and nearly 3 million tons annually by 2030.

In addition to the Tier 2 standards, EPA's regulatory announcement, EPA-420-F-13-016a (March 2013) describes the proposed Tier 3 standards and states:

The U.S. Environmental Protection Agency (EPA) is issuing a proposed rule designed to reduce air pollution from passenger cars and trucks. Starting in 2017, Tier 3 would set new vehicle emissions standards and lower the sulfur content of gasoline, considering the vehicle and its fuel as an integrated system.

Within the study area, it is unlikely that NOx standards will be approached or exceeded based on the relatively low ambient concentrations of NOx in Minnesota and on the long-term trend toward reduction of NOx emissions. Because of these factors, a specific analysis of NO<sub>2</sub> was not conducted for this study.

Sulfur Dioxide

Sulfur dioxide (SO<sub>2</sub>) and other sulfur oxide gases (SOx) are formed when fuel containing sulfur, such as coal, oil, and diesel fuel is burned. Sulfur dioxide is a heavy, pungent, colorless gas. Elevated levels can impair breathing, lead to other respiratory symptoms, and at very high levels, can aggravate heart disease. People with asthma are most at risk when SO<sub>2</sub> levels increase. Once emitted into the atmosphere, SO<sub>2</sub> can be further oxidized into sulfuric acid, a component of acid rain. Emissions of sulfur oxides from transportation sources are a small component of overall emissions and continue to decline due to the desulphurization of fuels.

The MPCA's <u>Annual Pollution Report to the Legislature: A Summary of Minnesota's Air Emissions and Water Discharges</u>, April, 2012, indicates that:

Nearly half (48 percent) of  $SO_2$  emissions come from coal-burning electric utilities. Twenty percent come from industrial point sources while 16 percent are the result of smaller industrial burning of coal, distillate oil and prescribed burning. Non-road agricultural, railroad and construction equipment burning distillate oil make up the bulk of remaining  $SO_2$  emissions.

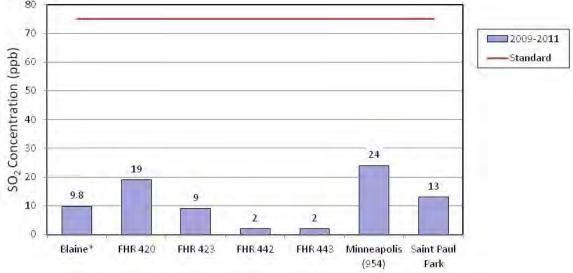
MPCA monitoring shows that ambient  $SO_2$  concentrations are consistently below standards. The MPCA has concluded that long-term trends in both ambient air concentrations and total  $SO_2$  emissions in Minnesota indicate steady improvement.

The seven county Metropolitan Area, which includes the county of Washington, was designated as a nonattainment area for SO2 on November 15, 1990. In the SIP (State Implementation Plan) the MPCA (Minnesota Pollution Control Agency) determined through monitoring and modeling that the exceedance was due to a point source emission problem. The seven county Metropolitan Area, including Washington County, was redesignated as a maintenance area on July 14, 1997 (66 FR 26230).

In the "Annual Air Monitoring Network Plan for Minnesota, 2013," it states the following with regard to SO2:

On June 2, 2010, the EPA finalized revisions to the primary SO2 NAAQS. EPA established a new 1-hour standard which is met if the three-year average of the annual 99th percentile daily maximum 1-hour SO2 concentration is less than 75 ppb. In addition to creating the new 1-hour standard, the EPA revoked the existing 24-hour and annual standards. Figure 10 describes the 2009-2011 average 99th percentile 1-hour SO2 concentration and compares them to the 1-hour standard. Minnesota averages ranged from 2 ppb at FHR 442 and FHR 443 to 24 ppb in Minneapolis (954); therefore, all Minnesota sites currently meet the1-hour NAAQS for SO2.

FIGURE 10
1-HOUR SO2 CONCENTRATIONS COMPARED TO THE NAAQS
80



<sup>\*</sup> The monitoring site did not meet the minimum completeness criteria for design value calculations. A site meets the completeness requirement if 75% of required sampling days are valid for each calendar quarter included in the design value calculation. SO2 at Duluth was part of a one year assessment and not intended to collect 3 years of data for design value calculations.

In addition, in a letter received on February 6, 2013, from EPA Region V, Regional Administrator, it states that "EPA's review of the monitored air quality data from 2009-2011 shows no violations of the 2010 SO2 standard in any areas in Minnesota." In addition the letter also states, "EPA expects to be able to proceed with designation action in Minnesota once additional data are gathered pursuant to our comprehensive implementation strategy." Because of these factors, an analysis for sulfur dioxide was not conducted for this project.

#### Lead

Due to the phase-out of leaded gasoline, lead is no longer a pollutant associated with vehicular emissions.

#### Carbon Monoxide

Carbon monoxide (CO) is a colorless and odorless toxic gas formed when carbon in fuels is not burned completely. CO enters the bloodstream and reduces the delivery of oxygen to the body's organs and tissues. Exposure to elevated CO concentrations is associated with vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. Prolonged exposure to high levels can lead to death. Carbon monoxide is also oxidized to form carbon dioxide (CO2) which contributes to climate change and the formation of ground-level ozone. CO is the traffic-related pollutant that has been a concern in the Twin Cities Metropolitan Area.

# **Air Quality Conformity**

The 1990 Clean Air Act Amendments require that State Implementation Plans (SIP) must demonstrate how states with non-attainment and maintenance areas will meet federal air quality standards. Within Minnesota, the EPA has designated all of Hennepin, Ramsey, Anoka, and portions of Carver, Scott, Dakota, Washington, and Wright counties as maintenance areas for carbon monoxide (CO). This area includes a portion of the study area, measuring approximately three-quarters of a mile, which is located in Washington County. The remainder of the project is located in Chisago County, which has been designated as an attainment area for CO.

The EPA issued final rules on transportation conformity (amended as 40 CFR 93 in 2008) which describe the methods required to demonstrate SIP compliance for transportation projects. It requires that transportation projects must be part of the Metropolitan Council's Long Range Transportation Policy Plan (LRTPP) and the four-year Transportation Improvement Program (TIP). The TH 8 project is not currently included in the 2030 MPO's LRTPP or the current 2013-2016 TIP and no timeframe for project implementation has been identified. When funding is identified for the project, the information will be provided to Metropolitan Council and the Transportation Advisory Board (TAB) for review and approval to amend the LRTPP and the TIP. A TIP conformity determination will then be made by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The proposed project is not anticipated to interfere with TIP conformity and will not interfere with implementation of any transportation control measure included in the SIP.

On November 8, 2010, the EPA approved a limited maintenance plan request for the Twin Cities maintenance area. Under a limited maintenance plan, the EPA has determined that there is no requirement to project emissions over the maintenance period and that "an emission budget may be treated as essentially not constraining for the length of the

maintenance period. The reason is that it is unreasonable to expect that our maintenance area will experience so much growth within this period that a violation of CO National Ambient Air Quality Standard (NAAQS) would result." (U.S. EPA Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas, October 6, 1995). Therefore, no regional modeling analysis is required; however, federally funded and state-funded projects are still subject to "hot spot" analysis requirements. The limited maintenance plan adopted in 2010 determines that the level of CO emissions and resulting ambient concentrations will continue to demonstrate attainment of the CO NAAQS.

# Carbon Monoxide Hot-Spot Analysis

Although the TH 8 project is located in an area where conformity requirements apply, the scope of the solution does not indicate that air quality impacts should be expected. Furthermore, the EPA has approved a screening method to determine which intersections need hot-spot analysis. By the results of the EPA screening procedure, MnDOT demonstrated that there are no signalized intersections included in this study area that require hot-spot analysis. Therefore, no further air quality analysis is necessary.

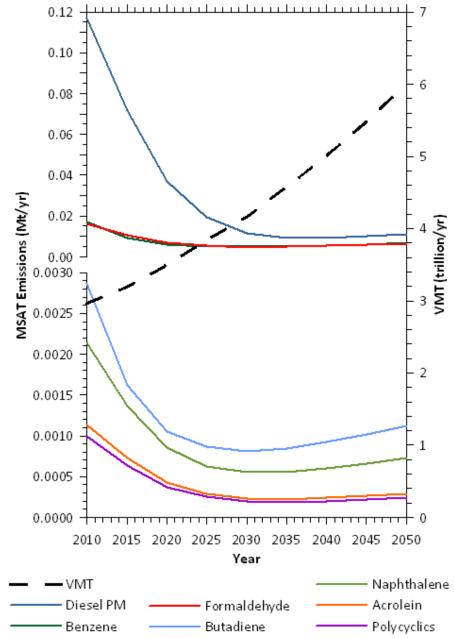
*Mobile Source Air Toxics (MSAT)* 

## Background

In addition to the criteria air pollutants, EPA also regulates air toxics. On December 6, 2012, the FHWA released an update to its interim guidance on the necessary analyses for MSATs in the NEPA process for highways and states the following:

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 11.

FIGURE 11 NATIONAL MSAT EMISISON TRENDS 2010 – 2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA'S MOVES2010B MODEL



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors Source: EPA MOVES2010b model runs conducted during May - June 2012 by FHWA.

## Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES improves upon the previous MOBILE model in several key aspects: MOVES is based on a vast amount of in-use vehicle data collected and analyzed since the latest release of MOBILE, including millions of emissions measurements from light-duty vehicles. Analysis of this data enhanced EPA's understanding of how mobile sources contribute to emissions inventories and the relative effectiveness of various control strategies. In addition, MOVES accounts for the significant effects that vehicle speed and temperature have on PM emissions estimates, whereas MOBILE did not. MOVES2010b includes all air toxic pollutants in NATA that are emitted by mobile sources. EPA has incorporated more recent data into MOVES2010b to update and enhance the quality of MSAT emission estimates. These data reflect advanced emission control technology and modern fuels, plus additional data for older technology vehicles.

Based on an FHWA analysis using EPA's MOVES2010b model, as shown in Figure 11, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

The implications of MOVES on MSAT emissions estimates compared to MOBILE are: lower estimates of total MSAT emissions; significantly lower benzene emissions; significantly higher diesel PM emissions, especially for lower speeds. Consequently, diesel PM is projected to be the dominant component of the emissions total.

# INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, <a href="http://www.epa.gov/iris/">http://www.epa.gov/iris/</a>). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in future vehicle emissions substantially decrease the (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<a href="http://pubs.healtheffects.org/view.php?id=282">http://pubs.healtheffects.org/view.php?id=282</a>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (<a href="http://www.epa.gov/risk/basicinformation.htm#g">http://www.epa.gov/risk/basicinformation.htm#g</a>) and the HEI (<a href="http://pubs.healtheffects.org/getfile.php?u=395">http://pubs.healtheffects.org/getfile.php?u=395</a>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately

100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived from FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA (December 6, 2012).

For the Build Alternative (Alternative 5) in this EAW, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same. The VMT estimated for the Build Alternative is expected to be the same as the No Build Alternative due to the lack of alternative routes in the area to attract additional traffic. (Refer to Table 11.) As the Build Alternative proposes to increase efficiency and speeds, the Build Alternative may potentially have lower emissions than the No-Build Alterative due to lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Also, if the Build Alternative is implemented, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

TABLE 11 VEHICLE MILES TRAVELED

Scenario	Average 2030 ADT	Approximate Travel Distance	2030 VMT	
No-Build & Build Alternative 5	26,800	6.88 miles	67.3 million vehicle miles	

The additional travel lanes contemplated as part of the Build Alternative will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, there may be localized areas where ambient concentrations of MSAT could be higher under the Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built between Greenway Avenue and Hazel Avenue and between James Avenue and 275<sup>th</sup> Street. However, the magnitude and the duration of these potential increases compared to the No-Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

23. Stationary source air emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing) and any greenhouse gases (such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

This project will not pose any stationary source air emissions.

# 24. Odors, noise and dust. Will the project generate odors, noise or dust during construction or during operation? X Yes No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

# Odors and Dust During Construction

Potential odors would likely include exhaust from diesel engines and fuel storage, however, no additional odors are anticipated during construction. Dust generated during construction will be minimized through standard dust control measures such as applying water to exposed soils and limiting the extent and duration of exposed soil conditions. Construction contractors will be required to control dust and other airborne particulates in accordance with MnDOT specification in place at the time of project construction. After construction is complete, dust levels are anticipated to be minimal because all soil surfaces exposed during construction would be in permanent cover (i.e., paved or re-vegetated areas).

#### Construction Noise

The construction activities associated with the future proposed solution would result in increased noise levels relative to existing conditions. These impacts would primarily be associated with construction equipment and activities.

The following table (Table 12), developed by the FHWA and the EPA, shows peak noise levels from various types of construction equipment when monitored at a distance of 50 feet. The equipment listed is primarily associated with site grading/site preparation, which is the roadway construction phase generally associated with the highest noise levels.

TABLE 12 CONSTRUCTION EQUIPMENT NOISE (RANGE AND AVERAGE) AT 50 FEET

<b>Equipment Type</b>	Manufacturers	Total No. Models	Peak Noise	Range	
	Sampled	in Sample	Level (dBA)	Average	
Backhoes	5	6	74 - 92	83	
Front loaders	5	30	75 - 96	85	
Bulldozers	8	41	65 - 95	85	
Graders	3	15	72 - 92	84	
Scrapers	2	27	76 - 98	87	
Pile Drivers	N/A	N/A	95 - 105	101	

Source: United States Environmental Protection Agency and Federal Highway Administration

Elevated noise levels are unavoidable for a project of this nature. Some high-impact equipment noise, pavement jack hammering will be unavoidable with construction of the proposed solution. Construction equipment will be required to be properly muffled and maintained and contractors will be required to comply with applicable state and local noise restrictions. While no definitive staging plans have been developed, local municipalities and residents would be kept informed on what type of impacts are expected, including length of impact. Specific construction noise issues will need to be addressed in more detail in any final documentation.

# **Traffic Noise Analysis**

A simplified planning-level analysis of traffic noise was completed based on the Alternative 5 roadway alignment. The goal of this planning-level analysis is to identify future traffic noise levels based on forecast traffic volumes for purposes of land use planning. For additional information, refer to the Traffic Noise Analysis Report in Appendix H.

In general, modeled daytime traffic noise levels at distances of up to 350 to 400 feet from the proposed Alternative 5 roadway alignment would exceed State noise standards under future (2030) Build conditions. Modeled nighttime traffic noise levels at distances greater than 1,000 feet from the offset interchange would exceed State noise standards under future Build conditions. Modeled daytime traffic noise levels at distances of up to 200 to 250 feet would exceed Federal noise abatement criteria.

A more detailed noise analysis would be completed in accordance with the applicable MnDOT Noise Policy at the time of the future NEPA review for this project. The analysis should include noise modeling at specific receiver locations along the project corridor, along with an analysis of noise abatement measures if necessary.

25. Nearby resources. Are any of the following resources on or in proximity to the site? Archaeological, historical or architectural resources? \_Yes XNo
Prime or unique farmlands or land within an agricultural preserve? XYes \_No
Designated parks, recreation areas or trails? XYes \_No
Scenic views and vistas? XYes \_No
Other unique resources? Yes X No

If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

#### Archaeological, Historical or Architectural Resources

An archaeological survey and an architecture/history survey of the study area have been completed. For the purposes of the review, historic properties are defined as those which are listed in or eligible for the National Register of Historic Places.

The archaeological survey did not identify any National Register-eligible archaeological properties within the composite construction limits of the proposed alternatives. Within these limits, there is one area with high archaeological potential which could not be surveyed. A survey of this area will be needed after selection of the final alternative. In addition, several archaeological sites and areas with archaeological potential were identified in the area immediately surrounding the composite construction limits. If the construction limits of the final project alternative exceed the composite construction limits of the proposed alternatives, additional survey may also be needed.

The architecture/history survey identified one property in the project Area of Potential Effect that was recommended as National Register-eligible.<sup>3</sup> However, subsequent consultation between the MnDOT Cultural Resources Unit and the Minnesota State Historic Preservation Office (refer to Appendix F for correspondence) resulted in a determination that this property, a farmstead, is not eligible. As a result, no National Register-eligible architecture/history properties are located within the area of potential effect, as delineated in the survey report.

# Prime or unique farmlands

Soils that are classified by the NRCS as prime farmland and farmland of statewide importance are located within the proposed project footprint (refer to Figure 9, Appendix A). Given that the communities have identified TH 8 as a growth area, primarily for commercial and mixed-use development, it cannot be determined at this time how much of the property within the study area will remain in farmland by the time the project is constructed. As part of the future NEPA process, Form AD 1006 (Farmland Conversion Impact Rating) will be processed (refer for Appendix E for a discussion regarding additional federal issues).

## Designated parks, recreation areas or trails

No parks or recreation areas are located within the proposed project footprint. The project scope does not include a bicycle trail along TH 8 nor are there long-range plans to incorporate such a facility. However, the future stages of project development will consider the connectivity of trails, including those planned but not yet built. This might influence the design of intersections to accommodate safe bicycle/pedestrian crossings at signalized intersections and the connectivity of the frontage road system to accommodate localized movement up and down the corridor. Further, since the proposed TH 8 solution would be built as a non-freeway principal arterial, bicycles and pedestrians will not be

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<sup>&</sup>lt;sup>2</sup> Vermeer, Andrea C. and Michelle M. Terrell. *Phase I and II Archaeological Investigations for the Trunk Highway 8 Improvement Project, Chisago and Washington Counties, Minnesota*. Draft submitted to MnDOT by Two Pines Resource Group, LLC, November 2011.

<sup>&</sup>lt;sup>3</sup> Zellie, Carol S. and Amy Lucas. *Phase I and II Architectural History Evaluation for the Proposed TH 8 Reconstruction, Forest Lake to Chisago City, Chisago and Washington County, Minnesota*. Submitted to MnDOT by Landscape Research LLC, November 2010.

prohibited from using the roadway and without alternate routes nearby, will likely continue to travel along the roadway. The safety of pedestrians and bicycles will continue to be considered in future stages of project development even if a designated trail facility is not planned by local partners.

The proposed solution has been reviewed for potential Section 4(f) involvement. Chisago City's future land use map designates a parcel of land, known as Lindberg Point, adjacent to the existing ROW as "future park and open space." The property is not parkland and is not publically owned. The land is currently privately owned and not open to the public; therefore, the property does not meet the criteria for 4(f) involvement at this time. The reconstruction of TH 8 is not anticipated for several years, and the Chisago City does not anticipate acquiring this property prior to the letting/reconstruction of TH 8.

The proposed solution will not affect properties covered by Section 4(f) involvement; therefore, no Section 4(f) involvement exists at this time. The TH 8 solution will be reviewed for potential 4(f) involvement as part of future environmental reviews.

The TH 8 solution has been reviewed for potential Section 6(f) involvement. The solution will not cause the conversion of any land acquired, planned or developed with funds from the Land and Water Conservation Fund (L&WCF). No Section 6(f) involvement currently exists on this proposed solution. The future project will be reviewed for potential 6(f) involvement as part of future environmental reviews based on the DNR list of L&WCF properties available at that time.

## Scenic view and vistas

Numerous lakes, wetlands, water courses, and wooded areas are located within and adjacent to the study area. The setting provides a visually attractive environment. The current roadway offers views to these natural resources and the roadway can be seen from these resources. The TH 8 solution will require the removal of vegetation. Plans would be developed to replace vegetation lost along the roadside in accordance with MnDOT guidelines. Plans would also be developed to restore ground cover lost on private properties along the proposed areas of construction. The future project would not obstruct views to natural resources.

26. Visual impacts. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? X Yes No

#### If yes, explain.

Visual impacts associated with construction would include the introduction of equipment, construction materials and equipment lights causing a disruption of the landscape. These temporary impacts would be noticeable to drivers traveling through the area, residents living along TH 8, and boaters on adjacent lakes.

The proposed solution will create adverse impacts to visual quality by causing minor changes to the visual resources of the natural environment. The adverse impacts to natural visual resources are minor. Plans would be developed to replace vegetation lost along the roadside in accordance with MnDOT guidelines.

27. Compatibility with plans and land use regulations. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? XYes No.

If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

Refer to EAW Item 9 for more information on compatibility with the corridor cities' comprehensive plans and land use regulations.

Local comprehensive and transportation plans were reviewed for compatibility with the proposed solution. The compatibility of the proposed solution with plans and land use was an important consideration during this study. The main points in each of these documents, relevant to the TH 8 solution, are summarized below.

Washington County and the City of Forest Lake comprehensive plans (2030) do not specifically discuss the future of TH 8, as the segment of TH 8 within Washington County/Forest Lake is currently a four-lane divided section. The proposed TH 8 solution is primarily located in Chisago County, but ties into the existing four-lane roadway at its western terminus in Forest Lake.

The Chisago County Transportation Plan (2005) states that based on 2030 traffic projections, a four- or five-lane road would be appropriate for TH 8 for it entire length in the Chisago County, which includes the Greenway-to-Karmel segment.

The Wyoming Comprehensive Plan (2008) indicates that the city will participate in the TH 8 design process for capacity and safety improvements that will be conducted by MnDOT. It further indicates that the city will work with MnDOT to redesign the access to TH 8 in the vicinity of Hamlet and Hale Avenues with the objective of reducing or combining access points to the TH 8.

The transportation section of the Chisago City Comprehensive Plan (2006) supports the objective to continue upgrading and improving key intersections for safety as development, growth and intensification occurs along the TH 8 corridor.

28. Impact on infrastructure and public services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? \_\_Yes X No.

If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

No new utilities or public services would be required to serve the proposed solution. If utility relocations are required, coordination with the utility owners would occur prior to construction.

29. Cumulative potential effects. Minnesota Rule part 4410.1700, subpart 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative potential effects. (Such future projects would be those that are actually planned or for which a basis of expectation has been laid.) Describe the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects (or discuss each cumulative potential effect under appropriate item(s) elsewhere on this form).

The purpose of a cumulative potential impacts analysis is to look for impacts that may be individually minimal, but which could accumulate and become significant and adverse when combined with the effects of other actions. Cumulative potential effects are not necessarily causally linked to the proposed solution. Rather, they are the total effect of all known actions (past, present, and future) in the vicinity of the proposed solution with impacts on the same types of resources.

## Scope of Cumulative Potential Effects

The cumulative potential effects analysis is limited to those resources, ecosystems, and human communities affected by the proposed solution. While the proposed action may affect several resources either directly or indirectly, the purpose of the cumulative potential effects analysis is to narrow the focus to the project-related impacts that could potentially have the largest cumulative effect.

The geographic scope of this analysis varies by the resource being examined, but in general is limited to an area within the vicinity of the proposed project footprint and along TH 8 from I-35 in Minnesota to the Wisconsin border. The temporal scope of the analysis attempts to consider previous impacts to the resources that have occurred as a result of human activity over time. The year 2030 is considered the current limit of comprehensive planning activities for the area, as the extent of transportation and land use planning efforts are reasonably available up to this time, and thus can be used as the basis for future cumulative effects assessment.

#### Actions

Past actions include the conversion of wetlands and agricultural land to roadway right of way for the TH 8 corridor. The existing segment of TH 8 was originally constructed in the 1920s where a rail line was once located. Today, the adjacent parcels surrounding the project footprint include a mixture of commercial, residential, and agricultural land uses.

Recent actions along TH 8 from the Chisago/Washington County border to the St. Croix River crossing in Taylors Falls have already been implemented. Some of these projects include:

- *TH 8 Resurfacing and Improvement Project*. Located between I-35 in Forest Lake and Karmel Avenue in Chisago City, the project added two new westbound right turn lanes at Hale Avenue and Deer Garden Lane and pedestrian ramp accessibility updates at three intersections.
- Karmel Avenue (previously County Road 80) Intersection Reconstruction.
- Reconstruction of a 0.9 mile segment of TH 8 in Center City. The project included access consolidation to the highway, the addition of left and right turn lanes and the construction of a new bridge to replace an existing culvert between North and South Center Lakes.

Known present and future actions in the vicinity of the TH 8 corridor include:

- Lindstrom Project from Shoquist to Chisago Lakes Middle School. The project provides additional capacity to accommodate traffic, and addresses access, safety and operational problems in Lindstrom as identified by partnership and scoping study. The 2.8-mile project includes a one-way pair concept through downtown Lindstrom. Municipal Consent Public Hearings on Layout Approval by the City of Lindstrom and Chisago City were held in June 2008. Construction started in spring 2012 and will be completed in summer 2013.
- Hazelden Intersection Project TH 8 at County State Aid Highway (CSAH) 26/82. The project includes an intersection reconstruction between Center City and Shafer. (completed in 2012)
- *TH 8 Mill and Overlay Project*. The project location is between Center City and the TH 95 west intersection, completed in 2012.
- Pavement reconstruction of Highway 95 from Taylors Falls to Sunrise will be completed in 2013.
- *US 8 Bridge Maintenance Project.* Taylors Falls, MN and Saint Croix Falls, WI. Completed in 2012.

• Anticipated future adjacent development that would occur along the corridor.

# **Evaluation of Cumulative Potential Effects**

#### Wetlands

The proposed TH 8 solution will result in unavoidable fill of approximately 17 acres of wetlands. However, mitigation will be completed consistent with applicable regulatory requirements. The other foreseeable actions will also be required to implement sequencing in the planning phases, and provide mitigation. Wetlands impacted by the proposed solution plus other foreseeable actions will be mitigated consistent with applicable regulatory requirements; therefore, adverse cumulative effects on wetlands are not anticipated.

## Soils/erosion and sedimentation

Erosion and sedimentation of all exposed soils within the projects limits of the proposed alternative will be minimized by employing BMPs during construction activities. Implementation of BMPs during construction greatly reduces the amount of construction-related sedimentation and helps to control erosion and runoff. Ditches, dikes, silt fences, biorolls, sedimentation basins, and temporary seeding will be used as temporary control measures during construction grading and excavation. Temporary and permanent erosion control plans will be identified in final site grading plans and in construction plans for each stage, as required by the NPDES permitting for construction sites.

Future land development and roadway construction projects could also result in soil erosion or sedimentation. Future foreseeable construction projects would also be required to comply with the NPDES permit program, and to use appropriate BMPs to limit soil erosion and sedimentation. Therefore, there is low potential for adverse cumulative potential effects due to soil erosion.

## Water Quality and Quantity

The proposed TH 8 solution will increase impervious surface resulting in an increase in pollutant loading and quantity of stormwater volume generated. The proposed project will include the construction of stormwater BMPs to mitigate water quality and quantity impacts. In general, stormwater BMPs for the project may include filtration ponds and ditch features throughout the project limits. A SWPPP will be created during the final design phase of the project, as required for the NPDES. This will address permanent and construction erosion, sediment, and pollution control. Additionally, the standards and rules established by local agencies and watershed agencies will be followed to the extent possible to mitigate the water quality and quantity impacts created by the proposed project.

Future development and roadway construction projects may result in increased impervious surfaces and/or stormwater quality/quantity effects. However, these projects will be required to provide mitigation in conformance with the NDPES and/or watershed regulations, minimizing surface water impacts.

#### Farmland

Over time, farmland within and near the area of the proposed TH 8 solution has been converted to roadway, commercial, and residential uses. Farmland impacts associated with the proposed future project may occur along the corridor. Current and future land use in the area surrounding the proposed TH 8 solution is guided toward commercial and mixed use development. The proposed solution is compatible with future land uses described in the *City of Wyoming Comprehensive Plan* (2008) and *The City of Chisago City Comprehensive Plan* (2006).

# Conclusion

Based on the findings of the previous discussion, no significant cumulative potential effects would result from the proposed TH 8 solution plus other foreseeable future actions in the vicinity.

30. Other potential environmental impacts. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

Refer to Appendix E for an evaluation of additional federal issues.

31. Summary of issues. Do not complete this section if the EAW is being done for EIS scoping; instead, address relevant issues in the draft Scoping Decision document, which must accompany the EAW. List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

# Environmental Review (Future NEPA Process)

The TH 8 solution is in the pre-NEPA stage of the project development process. Construction of the future roadway may involve the use of future federal funds and, if so, will require approval by FHWA. As such, future studies and environmental review will be required under the NEPA process after project funding is identified.

# Access Changes

Direct access to TH 8 will be limited for safety reasons. The proposed solution would result in numerous access changes for local properties. Approximately 17 properties and 9 local roadways would be affected with access points being eliminated and/or moved to frontage/backage roads when improvements are constructed. In locations where it is not feasible to remove direct access, some access points may be allowed to remain until future land use change occurs.

# Right of Way

Approximately 85 acres of additional new right of way will be obtained for the proposed solution. This represents areas that are outside of state-, county-, or city-owned right of way. The number of privately owned parcels potentially affected is 112 parcels based on proposed right of way of the preliminary concept layout. The amount of right of way and number of parcels affected is subject to change during the more detailed final design phase.

The proposed solution will result in 103 partial parcel takes and 9 full parcel takes. Of the full parcel takes, 7 are residential takes and may result in relocations. The other 2 full parcel takes are "land only." The acquisition and relocation of property will be conducted in accordance with regulations in place at the time.

## EAW Item 9 – Potential Environmental Hazards

Seven properties adjacent to the areas likely to be disturbed by the prosposed solution are identified as having high risk or medium risk potential for contamination. As part of the future NEPA process and project design process, when additional information, such as right-of-way acquisition and roadway profile elevations are being determined, the project will be evaluated for potential contamination issues, and additional Phase II environmental assessment(s) will be completed.

## EAW Item 11 – Fish, Wildlife, Ecologically Sensitive Resources

#### Habitat

Removal of vegetation, including woody vegetation, will result from construction of the proposed TH 8 solution. The proposed TH 8 solution may result in approximately 33 acres of woody vegetation being removed during construction. During the future design process, reasonable efforts sould be made to create a plan that will minimize impacts and losses of vegetation. Plans would be developed to replace vegetation lost along the roadside in accordance with MnDOT guidelines. Plans would also be developed to restore ground cover lost on private properties along the proposed areas of construction. To prevent potential spread of the invasive emerald ash borer beetle, ash wood will be stored and disposed of in accordance with Minnesota state laws.

# **Invasive Species**

In accordance with DNR permit requirements, all in-water equipment will be inspected and decontaminated prior to removal of in-water equipment or materials from the site to prevent spread of invasive species.

# Blanding's Turtles

The proposed TH 8 solution is within an area of statewide importance to the Blanding's turtle, a state-listed threatened species, and therefore, this species may be impacted by the proposed solution. State law and rules prohibit the destruction of threatened or endangered species. Under current recommendations, the project contractor would be provided with a copy of the Blanding's Turtle Fact Sheet to make them aware of the possible presence of these turtles, and to help the contractor recognize the turtle in the field (refer to DNR correspondence in Appendix F). If Blanding's turtles are encountered on site and are in imminent danger, they would be moved by hand out of harm's way. Otherwise they would be left undisturbed.

# EAW Item 12 – Physical Impacts on Water Resources

Approximately 17 acres of wetland impacts are expected with the proposed TH 8 solution. Efforts to avoid, minimize impacts, and/or identify and secure mitigations will continue as project design moves forward. Applications for permits will be submitted to the U.S. Army Corps of Engineers, the DNR, and project area watershed district. Approval of these permits is anticipated, as regulatory agencies have been involved early in the planning of the solution.

## EAW Item 14 – Water-related Land Use Management District

Floodplain encroachment will occur; however, no permanent impacts to water quality are anticipated and additional analysis will be conducted during future project development.

# EAW Item 17 – Water Quality; Surface Water Runoff

Future stages of project development will evaluate the existing drainage including the need for and size of culverts, as well as the need for storm water retention ponds and other treatment practices (BMPs). The design of the new roadway will consider and incorporate design features to detain and filter stormwater runoff, such as swales and stormwater detention ponds, as well as infiltration features. This will be accomplished in accordance with permitting requirements of the Comfort Lake - Forest Lake Watershed District, Minnesota Pollution Control Agency, Minnesota Department of Natural Resources, and the U.S. Army Corps of Engineers for regulated water bodies and wetlands that include Big Comfort Lake, Little Comfort Lake, and Green Lake.

# EAW Item 20 – Solid Wastes, Hazardous Waste and Storage Tanks

Excess materials and debris from this project such as concrete and asphalt will be disposed of in accordance with MnDOT Standard Specification for Construction, 2104.3C and Minnesota Rule 7035.2825. In particular, excess materials and debris will not be placed in wetlands or floodplains.

Stable material that conforms to the appropriate standards and definitions may be disposed of by burying in roadway embankment in compliance with County waste ordinances, and combustible materials disposed of in a landfill. Off-site disposal would be at publicly controlled dump sites, or at sites arranged for and secured by the contractor, which would not create a public nuisance or result in unsightly conditions. Borrow material, which may be required, would be identified in contract special provisions. Disposal would be done in accordance with MnDOT specifications and according to a disposal plan satisfactory to the project engineer.

## RGU CERTIFICATION. (The Environmental Quality Board will only accept SIGNED Environmental Assessment Worksheets for public notice in the EQB Monitor.)

## I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9b and 60, respectively.

Copies of this EAW are being sent to the entire EQB distribution list.

Signature Mill Date June 3, 2013
Title Chief Environment at Officer

## **APPENDICES**

APPENDIX A: Figures

APPENDIX B: Public and Agency Involvement

APPENDIX C: Alternatives Evaluation

APPENDIX D: Purpose and Need Statement

APPENDIX E: Additional Federal Issues

APPENDIX F: Correspondence

APPENDIX G: Traffic Analysis Technical Memorandum

APPENDIX H: Traffic Noise Analysis Report

## Appendix A

## **Figures**

Figure 1: Project Location

Figure 2: Project Location (USGS)

Figure 3: Project Footprint

Figure 4: Project Corridor Contamination Risk Potential

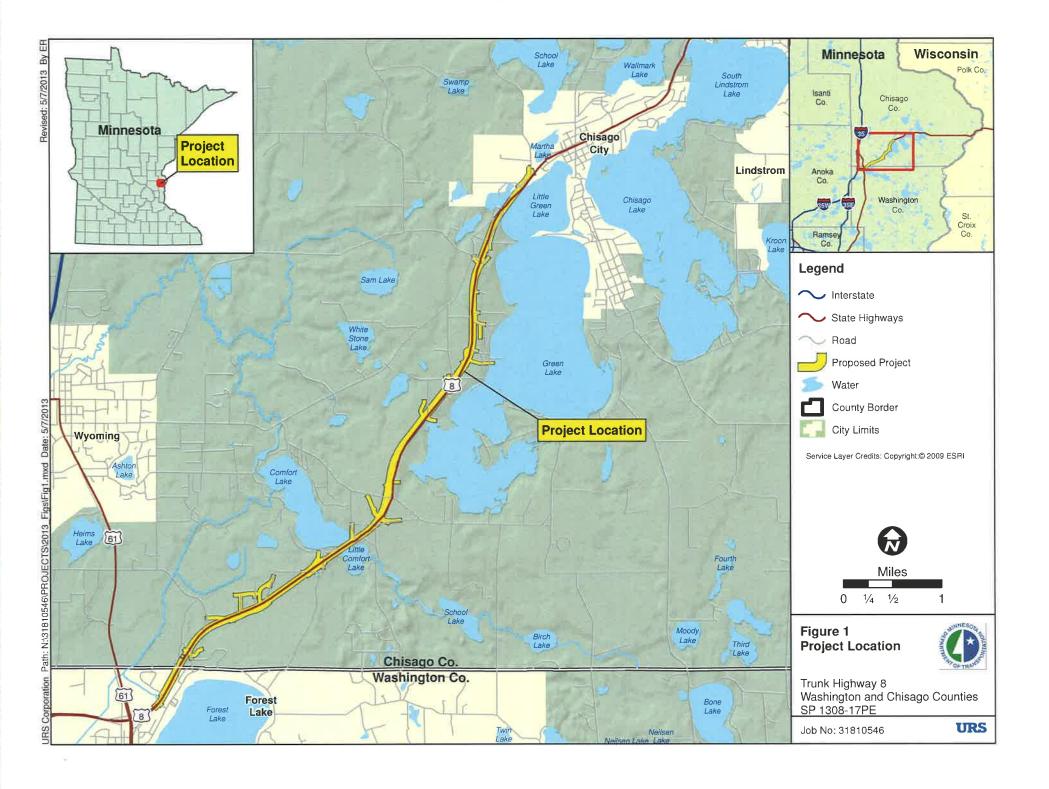
Figure 5: Water Resources

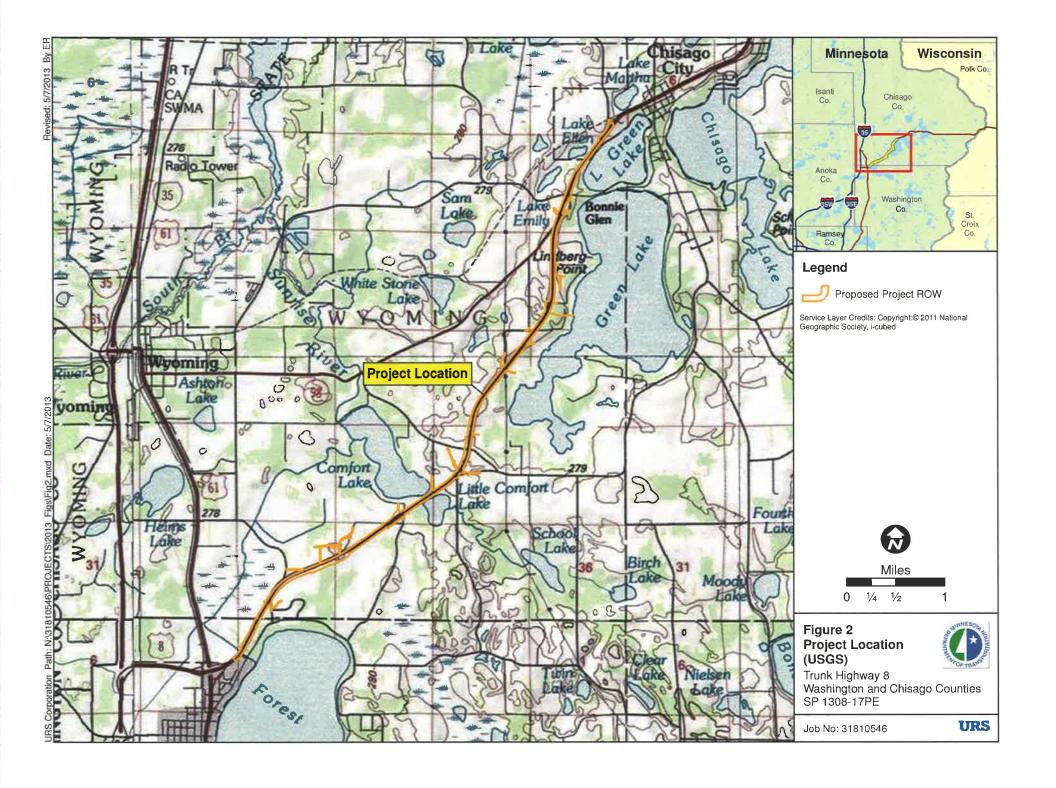
Figure 6: Wetlands

Figure 7: Floodplain Encroachment

Figure 8: Soils

Figure 9: Farmland Soils

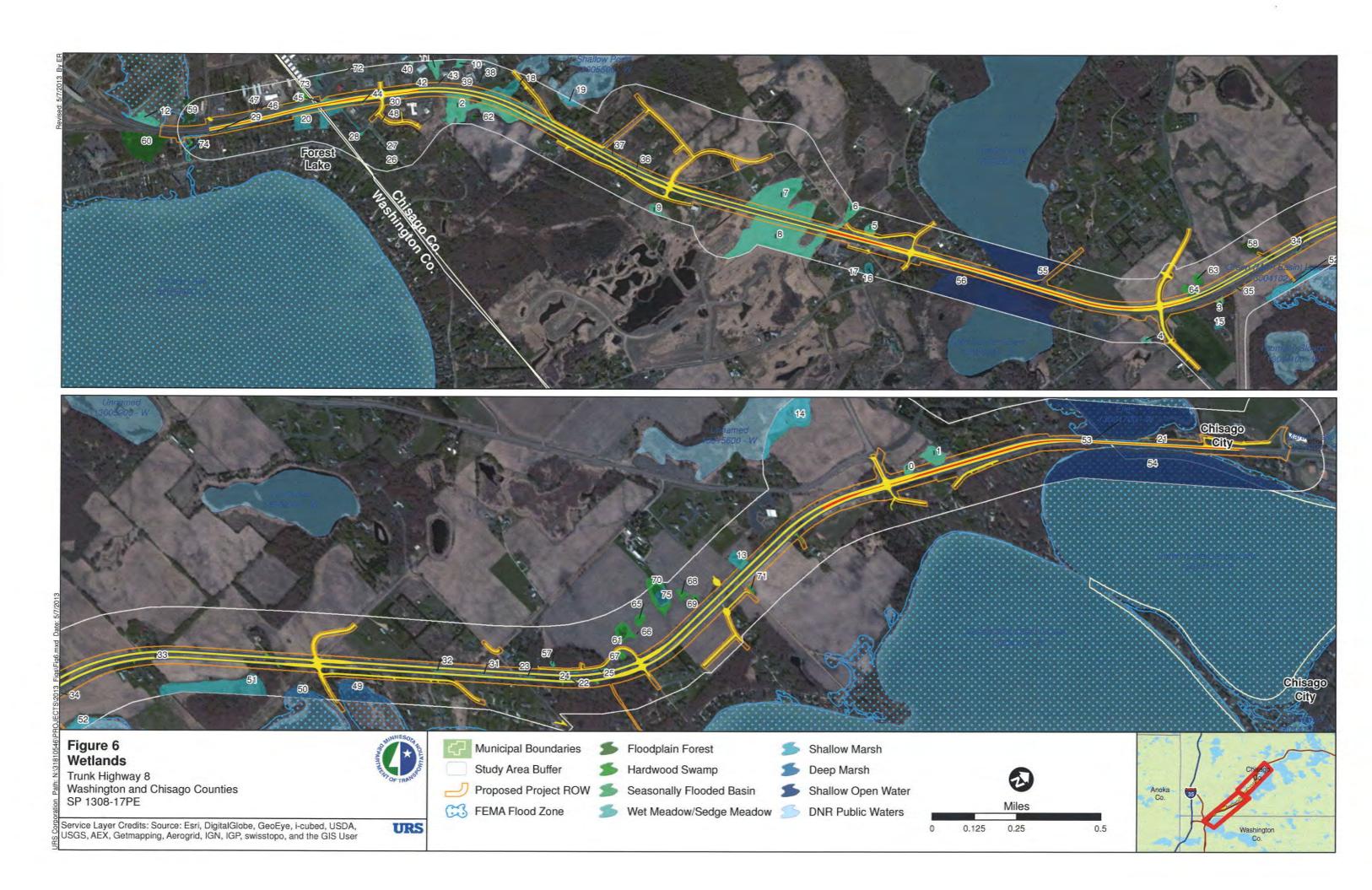


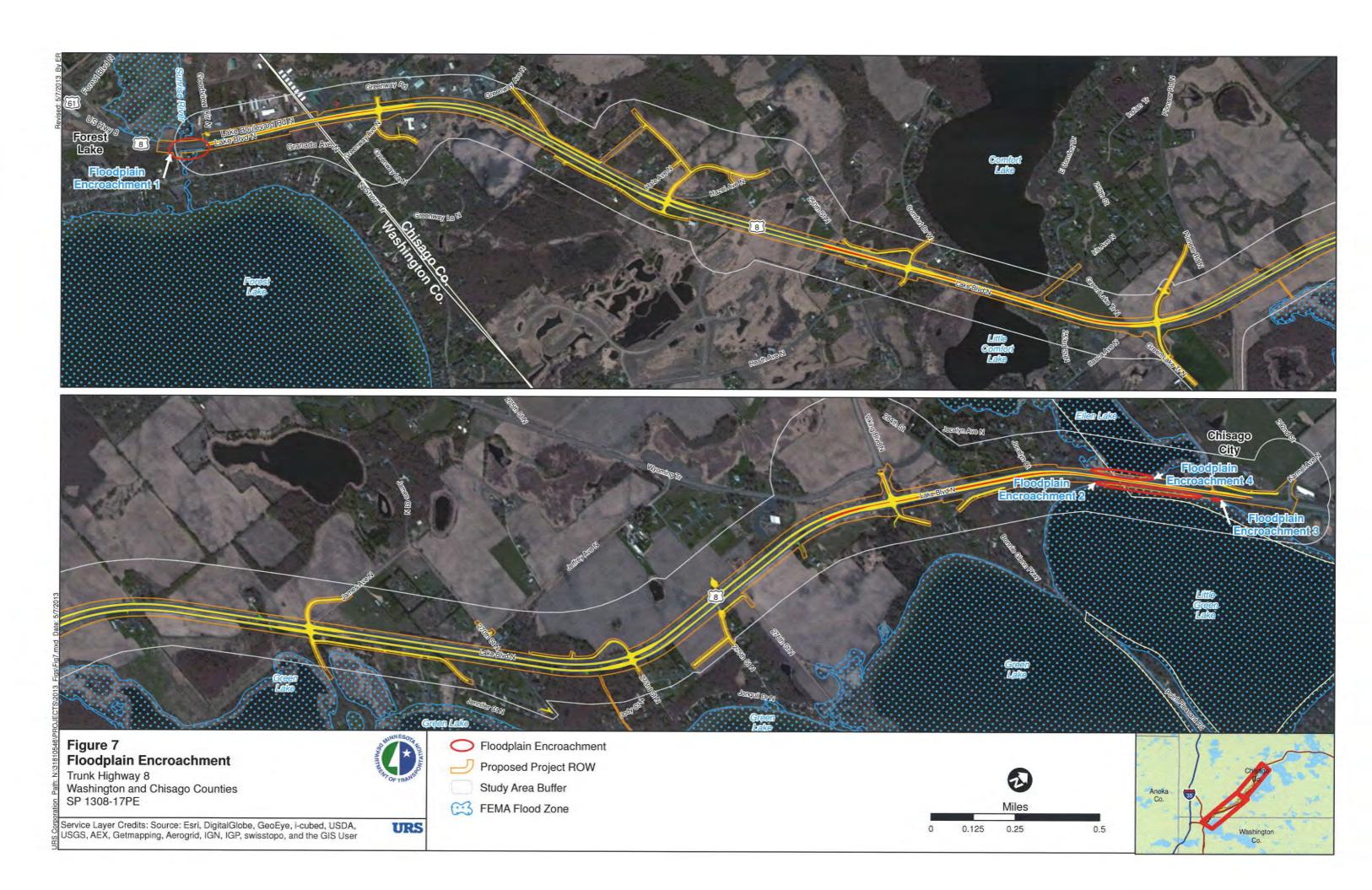


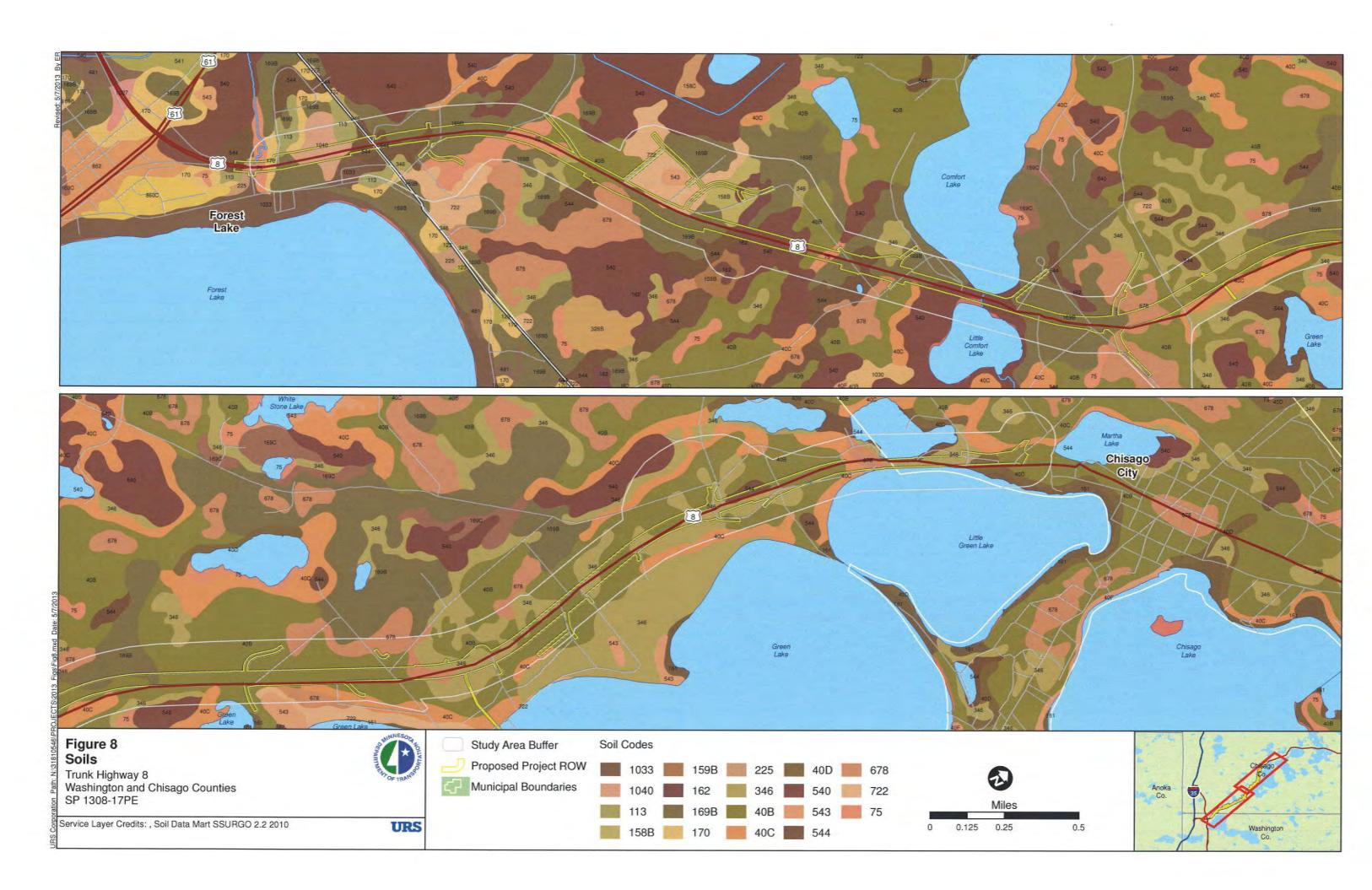


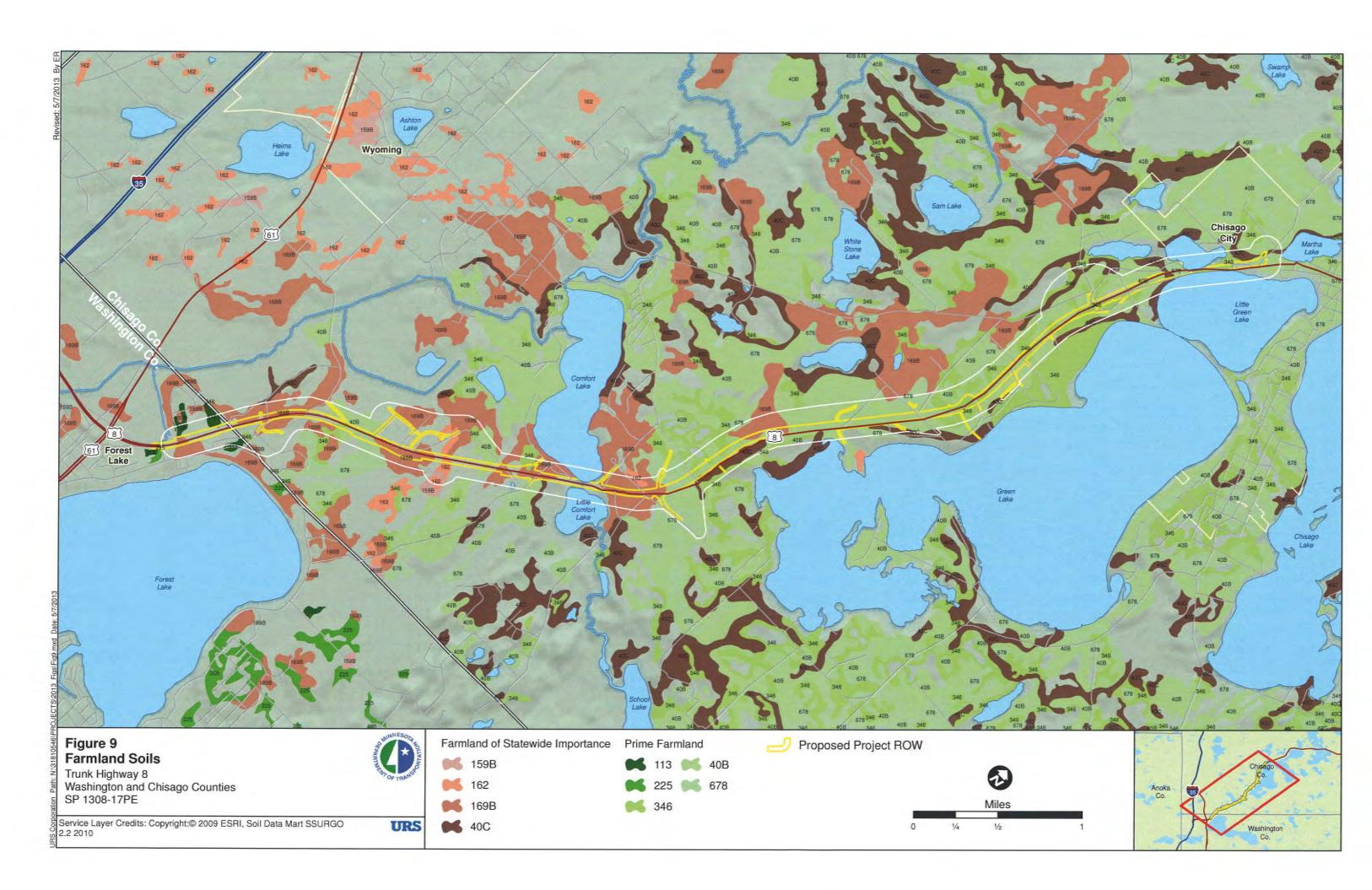












# Appendix B

Public and Agency Involvement



# SUMMARY OF PUBLIC AND AGENCY INVOLVEMENT

## TH 8 Environmental Assessment Worksheet

## PUBLIC INVOLVEMENT PLAN

A public and agency involvement plan was created early in the project development process. This plan helped to establish communication between MnDOT and the public. Elements of the public involvement plan include coordination and contact meetings, formation of a technical advisory committee, newsletters, a web-site, public open houses and the public comment period on during the environmental review. The purpose of the PIP is to proactively and effectively communicate the project scope, issues, and potential impacts and benefits while collecting valuable public, agency, and stakeholder input.

## TECHNICAL ADVISORY COMMITTEE

A Technical Advisory Committee (TAC) was formed in December 2008 to help provide community input into the project process and to encourage communications between MnDOT and the affected communities. The TAC held eleven (11) meetings between December 2008 and November 2012. The TAC is comprised of representatives from each county and city directly affected by the proposed project. TAC members represented the following agencies/organizations:

- Chisago County
- Washington County
- City of Wyoming
- City of Chisago
- Comfort Lake Forest Lake Watershed District
- TH 8 Task Force

## **PUBLIC OPEN HOUSES**

On June 8 and June 10, 2009, MnDOT hosted public open houses, both held at Lord of the Lakes Church at 25402 Itasca Avenue in Chisago City. The sessions were held at different times to accommodate different schedules of the public. MnDOT issued a news release on May 15, 2009 to announce the meetings. A project newsletter was also prepared to provide a project overview and to invite the public to attend the upcoming meetings. Over 800 newsletters were mailed to adjacent property owners.

The June 8 session was held from 6 to 8 p.m., while the June 10 session was held from 11 a.m. to 1 p.m. There were 43 participants who signed in on June 8, while there were 42 who signed in on June 10. A few attendees elected not to sign in. Project team members from MnDOT and the consulting team were present to answer questions and discuss the project. Participants submitted 20 comment sheets.

The open house included background information on the planning history of TH 8 as well as an overview of the preliminary design and environmental review process. Information about the purpose and need for the project was presented, including information on anticipated traffic growth, the need for access management, and traffic safety concerns. Another display presented information on how different types of roadways were evaluated in terms of their ability to address these needs. It showed that only a four-lane, divided highway would be able to address all of these needs.

The open house presented three concepts for a 4-lane, divided highway. Alternative 3 would use the existing roadway alignment for westbound traffic with new eastbound traffic lanes built to the south. One version would include an intersection at Hazel Avenue. A second version would move this intersection to Hamlet Avenue. Alternative 4 would use the existing roadway alignment for eastbound traffic, with new westbound traffic lanes built to the north. The option of having the intersection at Hamlet or Hazel could also apply to this concept. Alternative 5 would be built on an alignment that shifts according to existing conditions, attempting to avoid substantial property impacts. The option of having the intersection at Hamlet or Hazel could also apply to this concept. A sub-alternative Alternative 5A adds a frontage road between Pioneer Road and 270<sup>th</sup> Street on the south side by using the existing roadway as a frontage road. The new four lane divided roadway would be built completely to the north of the existing roadway for nearly two miles.

#### EAW PUBLIC COMMENT PERIOD AND PUBLIC OPEN HOUSE

Following publication of the Environmental Assessment Worksheet (EAW) in the EQB Monitor, a 30-day comment period will allow agencies and the public an opportunity to comment on the proposed project. A public open house meeting is anticipated during the public comment period on the EAW.

## **NEWSLETTER**

A project newsletter was also prepared to provide a project overview and to invite the public to attend the open house meetings held in June 2009. Over 800 newsletters were mailed to adjacent property owners. The newsletter provides information on the subjects of purpose and need, development and evaluation of project alternatives, and schedule.

## CITY COUNCIL, PLANNING COMMISSION AND TASK FORCE MEETINGS

During the month of August 2009, representatives from MnDOT attended planning commission meetings to present the concepts that were developed during the alternatives evaluation process and to respond to members' comments.

- Chisago City Planning Commission meeting on August 6, 2009
- Wyoming Planning Commission meeting on August 11, 2009
- TH 8 Task Force meeting on August 17, 2009

On October 9, 2012, representatives from MnDOT provided a project update to the Chisago City Council.

#### EARLY COORDINATION COMMENTS

Copies of agency correspondence are included in Appendix E, and are discussed in relevant sections of the EAW. The following agencies were contacted and provided input regarding the proposed project.

- Minnesota Department of Natural Resources, December 19, 2009
- MnDOT Roadside Vegetation Management Unit, October 6, 2009
- MnDOT Office of Environmental Services (T&E Section 7), October 16, 2009
- State Historic Preservation Office, April 21, 2011
- MnDOT Cultural Resources Unit, May 4, 2011

#### **COORDINATION MEETINGS**

During the study, meetings were held with the following agencies or groups:

- Pre-wetland delineation Technical Evaluation Panel (TEP) Meeting June 2, 2009
- U.S. Army Corps of Engineers and Board of Water and Soil Resources (Chisago Soil and Water Conservation District invited), November 9, 2011
- Federal Highway Administration, January 30, 2012

#### REPORT DISTRIBUTION

Copies of this document have been sent to agencies, local government units, libraries and others as per Minnesota Rule 4410.1500 (Publication and Distribution of an EAW).

# **Appendix C**



## **ALTERNATIVES EVALUATION**

## **TH 8 Environmental Assessment Worksheet**

## **INTRODUCTION**

The TH 8 study involved a two-tier screening process, including public involvement. A first-tier screening was used to identify broader transportation impacts and eliminate concepts that would not meet the purpose and need. Following first-tier screening, a more detail evaluation was completed for the remaining concepts.

#### TIER 1 – FATAL FLAW EVALUATION

## **Development and Screening of Roadway Cross-Section Alternatives**

A range of roadway cross-section alternatives were considered for TH 8 between Greenway Avenue North and Karmel Avenue, which were evaluated against broad criteria, including existing capacity, future capacity, consistency with MnDOT's Access Management Manual, MnDOT's goal for Interregional Corridors, and risk of head-on collisions along a higher speed (55 mph) rural highway (refer to Figure 1). The cross-section alternatives are listed below followed by the results of the first tier screening.

- Existing Two-Lane Roadway
- Three-Lane Roadway
- Five-Lane Roadway
- Four-Lane Divided Roadway with Continuous Concrete Median
- Four-Lane Divided Roadway with Wide Grassy Median

## Existing Two-Lane Roadway – Eliminated from further consideration

The role of TH 8 as an interregional corridor is to provide the safe, timely and efficient movement of goods and people. Leaving the existing roadway as it is was not considered further because it does not address aspects of the project's purpose to address needs related to traffic capacity, safety, and access control. A two-lane roadway neither meets existing nor future capacity needs. Also, an undivided roadway does not prevent high speed head-on collisions from occurring should a vehicle stray from its travel lane. The existing roadway does not meet the recommended spacing of one mile for primary intersections in MnDOT's Access Manual, which helps minimize conflicts with high speed traffic. The presence of multiple driveways and local street connections is also inconsistent in this regard.

## <u>Three-Lane Roadway – Eliminated from further consideration</u>

A three-lane roadway concept includes one driving lane in each direction with a continuous left turn lane in the center. Although the 3-lane roadway provides some additional capacity by removing turning vehicles from the flow of traffic, it was eliminated from further consideration for a number of reasons. A 3-lane roadway would not meet anticipated future traffic volumes. The unlimited ability to turn across oncoming traffic is inconsistent with MnDOT's Access Manual, the intent of which is to restrict the points of conflict to primary intersections spaced at one mile and secondary intersections (right-in, right-out) at one-half mile. Related to this, it does not provide a physical buffer between turning vehicles and oncoming traffic. As a result it does not meet MnDOT's goal for Interregional Corridors.

## Five-Lane Roadway – Eliminated from further consideration

A five-lane roadway concept includes two driving lanes in each direction with a continuous left turn lane in the center. Although the 5-lane roadway meets existing and future capacity by adding lanes and removing turning vehicles from the flow of traffic, it was eliminated from further consideration for three reasons. The unlimited ability to turn across oncoming traffic is inconsistent with MnDOT's Access Manual, the intent of which is to minimize the points of conflict to primary intersections spaced at one mile and secondary intersections (right-in, right-out) at one-half mile. Related to this, it does not provide a physical buffer between turning vehicles and oncoming traffic. As a result it does not meet MnDOT's goal for Interregional Corridors.

## <u>Four-Lane Divided Roadway with Continuous Concrete Median –</u> Eliminated from further consideration

A four-lane divided roadway concept with a concrete median provides two driving lanes in each direction with a continuous concrete median that is broken only at designated left turns. Although this concept meets existing and future capacity by adding lanes and removing turning vehicles from the flow of traffic, it was eliminated from further consideration for two reasons. A grassy median would provide a better buffer between opposing traffic flows that is desirable for a higher speed (55 mph) interregional corridor. As a result it was determined that it does not meet an aspect of MnDOT's goal for Interregional Corridors related to the safe movement of traffic.

## <u>Four-Lane Divided Roadway with Wide Grassy Median</u> – Carried forward for further consideration

A four-lane divided roadway concept with a wide grassy median provides two driving lanes in each direction with a continuous grassy median that is broken only at designated left turns. This concept meets existing and future capacity by adding lanes and removing turning vehicles from the flow of traffic. The median provides an improved buffer between opposing traffic flows that is required for a higher speed (55 mph) interregional corridor. As a result it meets all aspects of MnDOT's goal for Interregional Corridors related to the safe, timely and efficient movement of goods and people. Alignment and access alternatives for this cross-section concept were developed for evaluation in the second phase of development and screening of alternatives.

Figure 1
First Tier or "Fatal Flaw" Evaluation

Thist fiel of Tatal Have Evaluation					
	EXISTING 2-LANE UNDIVIDED  ROADWAY	3-LANE ROADWAY WITH CONTINUOUS CENTER TURN LANE	5-LANE ROADWAY WITH CONTINUOUS CENTER TURN LANE	4-LANE DIVIDED HIGHWAY WITH CONCRETE MEDIAN	4-LANE DIVIDED HIGHWAY WITH WIDE GRASSY MEDIAN
					The state of the s
Does alternative serve existing traffic? <sup>1</sup>	NO	NO	YES	YES	YES
Does alternative serve future traffic? <sup>1,2</sup>	NO	NO	YES	YES	YES
Is alternative consistent with MnDOT's Access Management Manual? <sup>3</sup>	NO	NO	NO	YES	YES
Is alternative consistent with MnDOT's goal for Interregional Corridors? 4	NO	NO	NO	NO	YES
Does alternative address the risk of head-on collisions? 5	NO	NO	NO	NO	YES
Continue to study?	NO	NO	NO	NO	YES

<sup>&</sup>lt;sup>1</sup> The capacity of a roadway is the volume of traffic that can be accommodated before the speed and flow of traffic breaks down. Many factors influence a roadway's capacity, including the number of lanes and the number of interruptions or improvements to the traffic flow (e.g., signalized intersections, number of access points, turn lanes, bypass lanes). The following table compares existing daily traffic volumes between Greenway and Karmel with the capacity of each roadway alternative:

Existing Traffic	2-Lane Divided	3-Lane	5-Lane	4-Lane Divided
13,900 to 19,400	12,000 to 16,000	17,000	32,600	30,000 to 36,000

Source: MnDOT, Florida DOT

<sup>&</sup>lt;sup>2</sup> Preliminary analysis regarding future traffic volumes suggest that a 4-lane, divided roadway would meet long-term capacity needs.

<sup>&</sup>lt;sup>3</sup> Continuous center turning lanes allow vehicles to turn anywhere in the corridor, which is inconsistent with MnDOT's Access Management Manual for Interregional Corridors.

<sup>&</sup>lt;sup>4</sup> The primary goal for Interregional Corridors is to enhance the economic vitality of the state by providing safe <u>and</u> timely <u>and</u> efficient movement of goods and people.

<sup>&</sup>lt;sup>5</sup> Center turn lanes would not prevent vehicles traveling at high speeds from entering a lane of oncoming traffic. Concrete medians would not provide sufficient protection from this occurrence.

## TIER 2 -- DEVELOPMENT OF 4-LANE, DIVIDED ALTERNATIVES

Following first-tier screening, a more detailed evaluation was completed for the remaining concept carried forward for further consideration, a 4-lane divided roadway with a grassy median, with a number of alternatives developed that would address alignment and access. Preliminary evaluation results of potential impacts for each of the four alternatives under consideration and listed below are summarized in Table 1.

## 4-Lane Divided Roadway Concepts Under Consideration

A four-lane divided roadway concept was carried forward for further consideration, with a number of alternatives developed that address alignment and access.

## • South Alignment ("Alternative 3")

The existing roadway alignment would be used for westbound traffic. Eastbound traffic lanes would be built to the south. Therefore, most impacts would occur to the south of the existing roadway. One option would include an intersection at Hazel Avenue. A second option would move this intersection to Hamlet Avenue.

## • North Alignment ("Alternative 4")

The existing roadway alignment would be used for eastbound traffic. Westbound traffic lanes would be built to the north. Therefore, most impacts would occur to the north of the existing roadway. The option of having the intersection at Hazel Avenue or Hamlet Avenue could also apply to this alternative, as well.

## • Mixed Alignment ("Alternative 5")

The new roadway would be built on an alignment that shifts according to existing conditions, attempting to avoid property impacts. The option of having the intersection at Hazel Avenue or Hamlet Avenue could also apply to this alternative.

## • Mixed Alignment Plus Frontage ("Alternative 5A")

This concept to Alternative 5 adds a frontage road between Pioneer Trail and 270th Street on the south side by using the existing roadway as a frontage road. The new four-lane divided roadway would be built completely to the north of the existing roadway for nearly two miles.

Table 1			
Preliminary	/ Summary	of Potential	<b>Impacts</b>

## **Alternatives**

Premimary Summary of Potential impacts				
Environment	<b>3</b> South Alignment	<b>4</b> North Alignment	<b>5</b> Mixed Alignment	<b>5A</b> Mixed Alignment + Frontage Road
Total Acres of Wetland Impacts	16.5 ac.	16.4 ac.	17.1 ac.	17.3 ac.
Acres of Wetland Impacts by Quality Ranking <sup>1</sup> Low - includes roadside ditches and drainage ditches	1.9 ac.	2.1 ac.	2.1 ac.	2.1 ac.
Medium-Low - includes wet meadow reed canary grass and farmed wetlands	6.9 ac.	6.2 ac.	7.7 ac.	7.8 ac.
Medium – includes shallow marsh and jewelweed	2.5 ac.	3.4 ac.	2.5 ac.	2.6 ac.
Higher - includes forested wetlands	0.3 ac.	0.3 ac.	0.3 ac.	0.4 ac.
Highest – includes lakes and lakeshore	4.9 ac.	4.5 ac.	4.5 ac.	4.5 ac.
Floodplains	2.2 ac.	2.2 ac.	2.2 ac.	2.2 ac.
Noise  Number of Residential Structures <sup>2</sup> Number of Places of Common Use <sup>2</sup> Number of Commercial Structures <sup>3</sup>	111 2 11	104 2 11	111 2 11	101 2 11
Cultural and Historic Resources  Architecture/History – eligible properties  Archaeological – eligible properties <sup>4</sup>	None None	None None	None None	None None
Right of Way (ROW) (TH 8 + frontage)  Total ROW Needed  Net New ROW Needed  Partial Takes - Number of Parcels Affected  Full Takes - Number of Parcels Affected  Total Combined Parcels Affected	222.4 ac. 64.6 ac. 118 12 <b>130</b>	225.8 ac. 67.9 ac. 113 15 128	227.5 ac. 84.6 ac. 103 9 112	241.0 ac. 99.7 ac. 92 13 <b>105</b>
Residential Displacements	10	12	7	10
Community Facilities Displaced	None	1	None	None
Parklands / Section 4(f)/6(f)	None	None	None	None
Public Input <sup>5</sup>	•	0	0	0
Estimated Cost (in millions)  Estimated ROW Cost  Estimated Project Cost (excluding ROW)  Total	\$8.45M \$18.81M <b>\$27.26M</b>	\$12.80M \$18.81M <b>\$31.61M</b>	\$4.83M \$18.81M <b>\$23.64M</b>	\$5.57M \$18.81M <b>\$24.38M</b>

Source: URS Team, June 6, 2012

<sup>● =</sup> Higher public preference for alternative / ● = Some public preference for alternative / O = Lower public preference for alternative.

 $<sup>^{1}</sup>$ The defined quality ranking from "low" to "highest" is a unique classification system specific to the site and is intended for planning purposes only.  $^{2}$ Number of locations where noise sensitive land uses (residential and places of common use) are assessed a noise impact when project noise levels exceed the Minnesota State Noise Standard of 65 dBA (measured as  $L_{10}$  [h]).

<sup>&</sup>lt;sup>3</sup>Number of locations where noise sensitive land uses (commercial) are assessed a noise impact when project noise levels exceed the Minnesota State Noise Standard of 70 dBA (measured as L<sub>10</sub> [h]).

<sup>&</sup>lt;sup>4</sup>After selection of preferred alternative, Phase 1 Archaeological survey recommended for one site where land owner permission was denied.
<sup>5</sup>Fifteen persons filled out comment cards at the first public open house in June 2009. Alternative 3 was supported by six persons. Alternative 4 was supported by 2 persons. One of these individuals expressed concern about Alternative 3's impact on Little Comfort Lake by Concept 3, which has since been changed to have a similar alignment through the isthmus between Big and Little Comfort Lakes. Alternative 5 was supported by three persons. Alternative 5A was supported by three persons. One person expressed equal preference between Alternatives 3 and 5.

# **Appendix D**

Purpose and Need Statement



## PURPOSE AND NEED STATEMENT

May 3, 2013

## TH 8 Environmental Assessment Worksheet

#### INTRODUCTION

The purpose and need for the proposed project has been established based on the initial *Highway 8 Corridor Study*<sup>6</sup> completed in 1995 and the *TH 8 Major Scoping Study* completed in 2002<sup>7</sup>, which encompassed the 23-mile-long section of U.S. Trunk Highway 8 (TH 8) from the Chisago/Washington County border to the St. Croix River crossing in Taylors Falls, Minnesota. The 1995 corridor study objective was to establish "...recommendations which improve the safety of the transportation system, reduce congestion, improve pedestrian and bicycle circulation, maintain or enhance property values, and preserve or expand the economic vitality of the communities through which Highway 8 passes." The 2002 scoping study determined the need for improvements to TH 8 and represented the first step in the environmental review process. The goals and objectives created for the scoping study were used to guide the development of the purpose and need for the proposed roadway improvements between Greenway Avenue North and Karmel Avenue.

Establishing the purpose and need of a project is essential in the development of the range of reasonable alternatives required to meet environmental regulations and assists with the identification and eventual selection of a preferred alternative. The purpose and need will be reexamined and updated as appropriate throughout the project development process and after stakeholder and public involvement.

## PROJECT LOCATION AND SETTING

#### **Project Location**

In the study area, TH 8 is located in Chisago County approximately 35 miles north of Twin Cities Metropolitan Area and is the northernmost county of the eight counties that comprise the Minnesota Department of Transportation's (MnDOT's) Metro District. TH 8 runs diagonally through the southern portion of the county.

From west to east, the project limits extend from approximately one-half mile west of Greenway Avenue North to Karmel Avenue, a distance of approximately seven miles. The west project terminus was based on the highway's existing four-lane capacity immediately west of the Greenway/TH 8 intersection. The east project terminus was set at Karmel Avenue (County Road 80) with the completion of the intersection reconstruction with TH 8 and where the highway transitions from a rural roadway section to an urban roadway section.

<sup>&</sup>lt;sup>6</sup> Highway 8 Corridor Study, MnDOT, April 1995, can be viewed in MnDOT's EDMS doc 584312.

<sup>&</sup>lt;sup>7</sup> T.H. 8 Scoping Document, MnDOT, September 6, 2002, can be viewed in MnDOT's EDMS doc 522737.

## **Project Setting**

TH 8 is a rural undivided, two-lane roadway through the study corridor with a posted speed limit of 55 miles per hour (mph). TH 8 extends through the communities of Wyoming and Chisago City, although the city center of Wyoming is located outside of the project corridor and the project corridor terminates just west of and prior to the central business district of Chisago City. In the study corridor, the environment of TH 8 is mostly rural. Land use characteristics are predominately agricultural, low-density residential, and commercial.

At the western termini of the TH 8 study corridor near the signalized intersection of Greenway Avenue North, TH 8 transitions from an access-controlled four-lane roadway to a two-lane rural highway. For the remainder of the study corridor up to Karmel Avenue, the roadway cross-section is a two-lane rural section with additional lanes at major intersections. At the eastern terminus of Karmel Avenue, this intersection was recently reconstructed. East of Karmel Avenue, the highway transitions from a rural roadway section to a two-lane urban roadway section through downtown Chisago City.

The TH 8 corridor traverses through or near a number of different landscapes including, wetlands, floodplains, lakes, woodlands and farmlands. Locations of particular concern due to physical constraints of water resources include the area between Big Comfort Lake and Little Comfort Lake in Wyoming and the area between Little Green Lake and a wetland, known as Ellen Lake, in Chisago City.

## Population and Employment Growth

As population and employment growth occur, the transportation needs of the area will also increase. Chisago County is projected to be the fourth fastest-growing county in Minnesota. The 2000 Census identified the population of Chisago County as 41,101, which was an approximate 35 percent increase in population between 1990 and 2000. The population growth of the State of Minnesota during that time period was 12 percent. As shown in Table 1, Chisago County is projected to have continued growth in population of 89,330 in 2030, a 117 percent increase between 2000 and 2030. The most significant population growth over the next 20 years is projected in the southern and western portions of the county, which includes the TH 8 study corridor. 9

**Table 1: Chisago County Population Projections** 

2000	2010	2020	2030	% change 2000-2010	% change 2010-2020	% change 2020-2030	% change 2000-2030
41,101	59,180	75,630	89,330	44	28	18	117

Source: Minnesota State Demographic Center, January 1, 2008

<sup>&</sup>lt;sup>8</sup> Chisago County Transportation Plan, Draft dated January 2005.

<sup>9</sup> Ibid.

According to existing TAZ data for the county, employment is 10,148 jobs and is projected to increase to 20,332 by year 2030. Commercial growth in the county is expected to be concentrated along the Interstate 35 corridor.<sup>10</sup>

If population grows at the projected rate and residents continue to commute outside of the county for employment, more traffic demand will be placed on the corridor and in turn will decrease the operational capabilities of the roadway. The existing transportation system will be inadequate to accommodate east/west travel in the study area. Further, increased growth and development could decrease options for road improvements in the future.

## National Highway System Principal Arterial

TH 8 plays an important role in the regional transportation system. TH 8 is a National Highway System (NHS) route, principal arterial that is one of the major routes for east-west travel between the Twin Cities and the northern regions of Wisconsin. The primary purpose of TH 8, as defined by its role within the NHS and its function as a non-freeway principal arterial roadway, is to accommodate the movement of through traffic along the corridor. Over the years the travel demand on TH 8 has grown considerably. The percentage of commercial interstate traffic using this route is less today than when the highway was constructed, but the quantity and proportion of recreational travel through the corridor has increased. Chisago County is viewed by many as a reasonable commuting distance to the Twin Cities, particularly with Interstate 35 (I-35) and the growth of commercial development in the northern Twin Cities. In general, much of the existing population in the county resides in either small cities or unincorporated areas, which has transformed the traditionally agricultural and resort-based communities into the commutershed for the Twin Cities Metropolitan area.

## **Local Function**

TH 8 serves an important local function by providing mobility to residents, industry, farmers, and businesses within the study corridor and serving as a direct link to adjacent communities. Within the project limits, TH 8 serves the communities of Wyoming and Chisago City. Local traffic uses TH 8 to access points of interest including workplaces, schools, and residences.

The type and intensity of adjacent development has generated a high level of short distance local trips, a demand for a high level of access, and high volumes of turning traffic. These characteristics combined with the large volume of through traffic have resulted in concerns for the quality of traffic operations, slower travel speeds for through vehicles traveling along the corridor, and long delays for local traffic on the minor street approaches to TH 8. The number and density of access points along TH 8 has resulted in concerns relative to motorist safety.

 $<sup>^{10}</sup>$  Ibid.

#### PREVIOUS STUDIES ALONG TH 8 CORRIDOR

## Highway 8 Corridor Study (April 1995)

The initial Highway 8 Corridor Study conducted in 1995 addressed potential alternatives for reducing congestion, and thereby improving travel time on TH 8. The result of this study was a list of recommended short- and mid-term improvements, and a recommendation that some long-term improvements be studied, including alternative alignments off of TH 8.

#### Trunk Highway 8 Major Scoping Study (September 2002)

The 2002 Scoping Study considered long-term improvements for TH 8, as well as alignment alternatives off of the existing TH 8 alignment in both Minnesota and Wisconsin. The focus of the study was a section of TH 8 that extended from the Chisago-Washington County border in Minnesota beyond the St. Croix river crossing in Taylors Falls, Minnesota, to the western intersection of US 8 and Wisconsin 35. The justification for undertaking the scoping study was based on safety, congestion, regional access, population, environmental sensitivity, and a Wisconsin connection.

The original universe of alternatives developed in the fall of 2001 included eleven alignment alternatives, both north and south of TH 8, and on TH 8. The study applied a multi-step/phase screening of the original universe of alternatives based on their performance in meeting the defined purpose and need of the project. Key elements of the evaluation included the ability of the alternative to serve existing and future travel patterns and traffic volumes. Several alternatives were dropped as a result of the screening process, for example, those that showed only a negligible effect on TH 8 traffic volumes and patterns and did not meet the long-term need (approximately 20-year horizon) of relieving future traffic levels on TH 8. Other reasons included potential for significant impacts and not meeting the purpose and need. Other alignments were eliminated on the basis of planned county upgrades to these roadways.

This preliminary analysis resulted in four alternatives that were brought forward into the official public Scoping process, which consisted of two alternative alignments in southern Chisago County, a TH 8 upgrade alternative, and a Wisconsin Connection alternative. As a result of public participation and feedback during the TH 8 Scoping process, assessment of the proposed alternatives' ability to meet the defined purpose and need for long-term TH 8 improvements, and anticipated timing (20-year horizon) of the proposed improvements; the TH 8 upgrade alternative was selected as the only alternative to be carried forward for further consideration. Resounding public feedback during the 2002 scoping study opposed any alternative east/west parallel route north or south of TH 8 (a bypass-route concept) to relieve anticipated future deficiency levels on TH 8.

The scoping study determined the need for improvements to TH 8 and represented the first step in the environmental review process.

#### Trunk Highway 8 Prioritized Projects (July 2008)

The TH 8 Corridor Funding Study by MnDOT, along with support from the TH 8 Task Force, identified six priority projects along TH 8 from Greenway Avenue in Wyoming to Taylors Falls (Figure 1). Funding has not been identified for these projects, with the exception of the Lindstrom project.

- Greenway Avenue in Wyoming to Karmel Avenue (CR 80) in Chisago City. This project is currently the subject of this environmental review and includes Preliminary Design. Future phases of the overall capacity expansion project will include Right of Way and Final Design for the approximate seven-mile section of TH 8.
- Lindstrom Project from Shoquist to Chisago Lakes Middle School. The project provides additional capacity to accommodate traffic, and addresses access, safety and operational problems in Lindstrom as identified by partnership and scoping study. The 2.8-mile project includes a one-way pair concept through downtown Lindstrom. Municipal Consent Public Hearings on Layout Approval by the City of Lindstrom and Chisago City were held in June 2008. Construction is planned to start in spring 2012 and be completed in summer 2013.
- Hazelden Intersection Project TH 8 at County State Aid Highway (CSAH) 26/82. The project includes an intersection reconstruction between Center City and Shafer.
- Shafer Access Management Project. The project includes access management with backage roads within the Shafer city limits.
- Center City to the west junction of TH 8/95 Safety Improvements. The project includes safety improvements along a 5.7-mile section of TH 8 with the addition of left and right turn lanes on TH 8 at the local road connections of Quandam Lane, Rydeen Avenue, and Tern Avenue/TH 95. The project also includes realigning Tern Avenue and TH 95 at TH 8.
- Center City to Taylors Falls. The study will consider capacity improvements along this 9-mile section of TH 8.

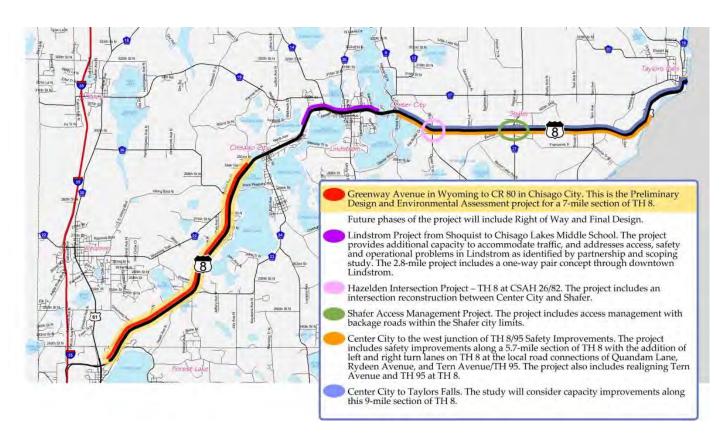


Figure 1 – Prioritized TH 8 Projects

#### **COMPLETED PROJECTS ALONG TH 8**

Numerous improvements along TH 8 from the Chisago/Washington County border to the St. Croix River crossing in Taylors Falls have already been implemented. Some of these projects include:

- TH 8 resurfacing and improvement project between I-35 in Forest Lake and Karmel Avenue in Chisago City. The project added two new westbound right turn lanes at Hale Avenue and Deer Garden Lane and pedestrian ramp accessibility updates at three intersections.
- Karmel Avenue intersection reconstruction.
- Reconstruction of a 0.9 mile segment of TH 8 in Center City. The project included access consolidation to the highway, the addition of left and right turn lanes and the construction of a new bridge to replace an existing culvert between North and South Center Lakes.

## PROJECT NEED

## **Primary Needs**

## <u>Increased Traffic Volumes / Capacity Needs</u>

Existing (2009) and forecast (2030) average daily traffic (ADT) volumes along TH 8 are shown in Table 2. Existing and 2030 forecast traffic indicate a need for capacity improvements to TH 8. MnDOT traffic volume data shows that the existing (2009) AADT volumes on TH 8 range from 14,300 to 19,600 with an average of 17,000. Projected traffic volumes in the Year 2030 are expected to range from 21,700 to 29,700 for these same areas. According to ADT volume thresholds in the *Highway Capacity Manual 2000*, a rural two-lane principal arterial with turn lanes is considered to have reached its capacity and is no longer considered to operate at an acceptable level at 13,500 vehicles per day.

One measure of rating congestion on a roadway is to divide the number of vehicles that use or are expected to use the roadway by the number of vehicles the roadway can safely accommodate. This measure is known as the Volume-to-Capacity (V/C) ratio. If the ratio exceeds 1.0, the roadway is over capacity. As indicated in Table 2, TH 8 already exceeds typical capacity under existing conditions. The forecast traffic growth in 2030 on TH 8 will increase the existing congestion which will result in high delays and cause potential safety problems along the corridor under 2030 conditions if the capacity issue is not addressed

Table 2: Existing and Future No Build Traffic Volumes and V/C Ratio

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	Existing		Future				
	(2009 AADT)	V/C	(2030 ADT**)	V/C			
Segment of TH 8	(13,500 capacity*)	Ratio	(13,500 capacity*)	Ratio			
Between Greenway Ave N and CSAH 23	19,600	1.45	29,700	2.20			
Between CSAH 23 and CSAH 22	14,300	1.06	21,700	1.61			
Between CSAH 22 and Karmel Avenue	17,100	1.27	25,900	1.92			

Source: Highway Capacity Manual 2000 and MnDOT

<sup>\*</sup>Capacity of roadway at LOS D/E boundary

<sup>\*\*2030</sup> volumes determined by applying a 2% per year growth factor

A traffic analysis was performed to analyze the operational performance for three key intersections along TH 8 under existing, 2030 no-build, and 2030 build conditions in October 2009. These key intersections include TH 8 at Greenway Avenue, TH 8 at CSAH 23/Pioneer Road, and TH 8 at CSAH 36/Johnson Lane. The results indicated that these intersections operate at a Level of Service (LOS) D or better under 2009 volume conditions. However, the intersection of Greenway Avenue is expected to operate in an unacceptable manner (LOS F) with an intersection delay ranging from 84 seconds/vehicle to over 120 seconds/vehicle during AM and PM peak periods under 2030 no-build conditions (refer to Table 3). The intersection of CSAH 23 is expected to operate at LOS F with an intersection delay of 102 seconds/vehicle during the AM peak period under 2030 no-build conditions.

Table 3: 2030 Existing Geometry (No-Build) Conditions

	Intersection	Intersection LOS	Intersection Control Delay per Vehicle (seconds)
A.M.	Greenway Avenue Intersection	F	>120
Peak	CSAH 23/Pioneer Road Intersection	F	102
Hour	CSAH 36/Johnson Lane Intersection	В	14
P.M.	Greenway Avenue Intersection	F	84
Peak Hour	CSAH 23/Pioneer Road Intersection	D	46
rioui	CSAH 36/Johnson Lane Intersection	E	56

TH 8 provides access to many of the secondary north/south and east/west connections on parallel and intersecting roadways that serve the surrounding land uses. Along TH 8 at the intersections of Greenway Avenue N, CSAH 23, and CSAH 22 PM peak hour turn move counts were taken in 2000 and 2009. Overall intersection volumes have shown negligible change or have decreased. From 2000 to 2009, TH 8 PM peak through traffic has decreased while side street traffic has increased or remained the same. The approaches to these intersections operate at a LOS D or better under both year 2000 and year 2009 conditions. LOS A through LOS D is generally considered acceptable to drivers. However, as traffic volumes increase, as indicated in Table 2, the ability for traffic on adjacent roads to access or cross TH 8 will become increasingly difficult. Within the corridor, alternative parallel through routes are not available to help alleviate congestion along TH 8. As a result, the need for capacity improvement is essential at both intersection level and corridor level for the studied segment of TH 8 under 2030 conditions.

## Traffic Safety Needs

Traffic safety is an important factor in determining the need for improvements to the existing transportation system. The frequency, types, and severity of crashes are the key measures of safety. To assess the level of safety along TH 8, a crash analysis was conducted. The analysis results indicated that a total of 73 crashes occurred at major segments and key intersections along TH 8 from Greenway Avenue in Wyoming to Karmel Avenue in Chisago City from 2008 to 2010 (Table 4). Among these crashes, 49 percent were property damage crashes and 47 percent involved injuries. Three fatal crashes were reported.

Under the existing conditions, with an AADT ranging between 14,300 and 19,600, more than 60 percent of the total crashes were rear-end crashes, which are common in areas with congestion. Sideswipe and ran off road crashes made up the next highest crash types, with 10 percent of total crashes respectively. In addition, four right angle collisions and one head-on collision were reported.

The crash rate which represents crash frequency is 0.6 and the crash severity which indicates the degree of crashes is 1.09 along the corridor. Even though the crash rate and severity rate are currently below the state average for rural state highways (Table 5), improving safety along TH 8 should be considered an important need even under the current conditions. It is expected that an increase in traffic volumes will consequently increase the number of crashes at the listed locations under the 2030 no-build conditions.

Table 4: Crashes Along TH 8 from 2008 to 2010

Intersection/Segment	Fatal	Injury	Property Damage Only	Total Crashes	Crash Rate
Greenway Avenue Intersection	0	9	7	16	0.71 <sup>1</sup>
Greenway Avenue to CSAH 23	1	8	5	14	0.272
Hamlet Avenue Intersection	0	1	3	4	0.18 <sup>1</sup>
CSAH 23 Intersection	1	3	6	10	0.36 <sup>1</sup>
CSAH 23 to CSAH 36	0	5	2	7	0.15 <sup>2</sup>
270th Avenue Intersection	0	2	2	4	0.25 <sup>1</sup>
273rd Avenue Intersection	0	1	1	2	0.13¹
276th Avenue Intersection	0	1	2	3	0.19¹
CSAH 36 Intersection	1	4	6	11	0.59 <sup>1</sup>
CSAH 36 to Karmel Avenue	0	0	2	2	0.10 <sup>2</sup>
Total Crashes on TH 8	3	34	36	73	0.60 <sup>3</sup>

Source: MnDOT

<sup>&</sup>lt;sup>1</sup>Crashes per million entering vehicles

<sup>&</sup>lt;sup>2</sup>Crashes per million vehicle miles

<sup>&</sup>lt;sup>3</sup>Based on average volume of 17,100 over the 6.5-mile segment

Table 5: TH 8 Crash Rate Compared to Rural State Highways from 2008 to 2010

	Crash Rate (MVM) <sup>1</sup>	Severity Rate (100 MVM)
TH 8	0.6	1.09
Rural Two-Lane Highways <sup>2</sup>	1.3	2.0

Source: MnDOT

## Secondary Needs

The following secondary need has been identified in the project area.

## Pedestrian/Bicycle Connections

An increase in projected traffic volumes would potentially impact community bicycle and pedestrian connections across TH 8. These crossings could experience longer delays due to heavy traffic congestion along the TH 8 under 2030 no-build conditions. Therefore, a need exists to accommodate bicycles and pedestrians at existing crossings where there is a demand and at planned bicycle and pedestrian trails.

#### ADDITIONAL CONSIDERATIONS

#### Drainage

Storm water runoff would be another issue to consider. The study corridor has several lakes and wetlands adjacent to the roadway. Existing drainage from the western half of the project outlets to Comfort Lake and remainder of the project area drains to Green Lake/Little Green Lake. Untreated discharge containing roadway pollutants such as silt, sand, and oil negatively impacts water quality. As a result, there is a need to evaluate existing drainage capability along the corridor and identify whether storm water retention ponds are needed.

## Access Control

One of the main deficiencies contributing to traffic safety problems in this corridor is the lack of access control. The high number of commercial and residential driveways along the corridor creates more traffic conflict points. There are more than 50 access points along this segment of roadway. Of these access points, approximately 30 are commercial or residential driveways. Studies have indicated that an increase in the number of access points along a roadway decreases safety and travel speeds through a corridor and inhibits the quality of traffic operations. Access management is an approach to alleviate corridor congestion that focuses on limiting conflict points, mostly located at entrance/exit points along a corridor, by providing adequate spacing between residential/commercial driveways and the corridor, such as frontage roads, or managed right-turn only entrances/exits.

MnDOT's Access Management Manual determines primary and secondary spacing for all state highways based on functional classification and adjacent development. For TH 8, the spacing for primary intersections is one per mile. Secondary intersections, which have lower traffic volumes, could occur at

<sup>&</sup>lt;sup>1</sup>MVM = Million Vehicle Miles

<sup>&</sup>lt;sup>2</sup>Systematic Analysis—State Highways, Traffic Safety Fundamentals Handbook, 2008

the midpoint between primary intersections. Private driveways are discouraged and should be provided by exception or deviation only.

The high number of direct access points to TH 8 has been caused by historic growth patterns and lack of parallel routes through the corridor. When implemented in coordination with local land use requirements, access management should reduce the number of crashes and improve safety, reduce traffic congestion, preserve the flow of traffic, preserve the public investment in roads by managing the location, design and type of access to property and enhance the value of private land development.

#### PROJECT PURPOSE

The purpose of the proposed project is to address the transportation needs described above. The following statements describe the purpose for the project.

- Provide sufficient capacity to accommodate existing and future travel demand along the corridor and an acceptable LOS by reducing traffic congestions or reducing travel delays on roadways and at intersections.
- Address existing and future safety concerns within the study area that are anticipated to worsen with increased traffic volumes and future development.

Project alternatives will be developed and evaluated with respect to their ability to address primary transportation needs. In addition, secondary needs and other important considerations will also be taken into account in the alternative development/evaluation process to:

- Accommodate bicycles and pedestrians at existing crossings where there is a demand and at planned bicycle and pedestrian trails.
- Minimize potential impacts to adjacent lakes from the roadway.
- Provide improved access control to enhance traffic operations along the corridor by reducing numerous direct access points and better use of frontage roads, and strive to meet MnDOT's recommended access spacing guidelines.

# Appendix E

Additional Federal Issues

## ADDITIONAL FEDERAL ISSUES



TH 8 Environmental Assessment Worksheet

## INTRODUCTION

The following discussion provides background information regarding additional Federal issues that are considered in National Environmental Policy Act (NEPA) analyses. The purpose of this review is to identify existing resources and potential impacts associated with the TH 8 project that can form the basis for the analysis of impacts in the NEPA process. Formal findings and determinations will be completed under the future NEPA process.

#### **ACCESSIBILITY**

The proposed project must comply with provisions set by the Americans with Disabilities Act of 1990 or by state or local access codes if they contain more stringent requirements. The future project would comply with the required accessibility provisions.

#### **SOCIAL IMPACTS**

The EAW portion of this document addresses impacts due to noise and visual quality. Environmental Justice issues and right-of-way impacts are addressed below. The proposed project would occur along the existing TH 8 corridor; therefore, no adverse social impacts (e.g., access to community facilities/employment, separation of neighborhoods and community cohesion) have been identified associated with the proposed project. No categories of people uniquely sensitive to transportation (e.g., children, elderly, minorities, persons with mobility impairments) would be adversely impacted by the project.

Some businesses and residences within the study area would experience changes in access with the proposed project alternative. Although these access changes result in more circuitous travel routes for some property occupants, the increased travel distances are offset by improved safety and decreased delays at intersections within the study area (compared to the No-Build Alternative).

Community facilities in the study area and directly adjacent to the roadway include:

- Northwoods Animal Humane Society (7153 Lake Blvd., Forest Lake). Under the proposed project, less than one acre of this property would be impacted. Direct access from TH 8 would be eliminated and access would be provided from a new intersection at Hazel Avenue or Hamlet Avenue via a new frontage road.
- Lord of the Lakes Church (25402 Itasca Avenue, Forest Lake). Under the proposed project, less than one-half acre of this property would be impacted. No change in access would occur as access is currently provided from Itasca Avenue North.

Additional Federal Issues 1

- Chisago Lakes Baptist Church and School (9387 Wyoming Trail, Chisago City). Under the proposed project, less than one-half acre of this property would be impacted. No change in access would occur as access is currently provided from Wyoming Trail (County Road 22).
- Lakeside Elementary School (10345 Wyoming Avenue, Chisago City). No change in access would occur with the proposed alternative currently under consideration. No right-of-way impacts are anticipated.

## CONSIDERATIONS RELATING TO PEDESTRIANS AND BICYCLISTS

Although there are no existing facilities, such as trails, sidewalks or bike lanes designated for pedestrians and bicyclists along TH 8 within the study area, there are shoulders through the project area that are used by both bicycles and pedestrians. Therefore, future design plans will include safety considerations along TH 8 for bicyclists and pedestrians.

An increase in projected traffic volumes would potentially impact community bicycle and pedestrian connections across TH 8. These crossings could experience longer delays due to heavy traffic congestion along TH 8 under 2030 no-build conditions. Future design plans will also include accommodations for bicycles and pedestrians at existing crossings where there is a demand and at planned bicycle and pedestrian trails.

#### **ENVIRONMENTAL JUSTICE**

Presidential Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed in February 1994. It requires federal agencies to ensure that disproportionately high and adverse human health or environmental effects of proposed federally funded projects on minority and low-income communities are identified and addressed. The general principles of Executive Order (EO) 12898 are as follows:

- To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

In 1997 the U.S. Department of Transportation (U.S. DOT) issued the U.S. DOT Order 5610.2, *Order to Address Environmental Justice in Minority Populations and Low-Income Populations*, which describes the process for incorporating environmental justice principles into all existing DOT programs, policies, and activities. The U.S. DOT order defines "minority" as a person who is Black, American Indian and Alaskan Native, Asian, Native Hawaiian and other Pacific Islander, or of Hispanic origin. An individual is considered to be "Low income" by the U.S. DOT if the individual's median household income is at or below the Department of Health and Human Services poverty guidelines.

The U.S. DOT is also committed to Title VI of the Civil Rights Act of 1964, which provides that "no person in the United States shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

Additional Federal Issues 2

In addition, MnDOT published draft guidance for planning and project development activities in June 1997. The following preliminary environmental justice determination for the proposed project is modeled after and consistent with MnDOT's Environmental Justice Guidance.

Executive Order 12898 requires that the proposed actions be reviewed to determine if there are "disproportionately" high and adverse impacts on these populations. "Disproportionate" is defined in two ways: the impact is "predominantly borne" by the minority or low-income population group, or the impact is "more severe" than that experienced by non-minority or non-low-income populations. The steps for defining environmental justice impacts include the following:

- Identification of low-income and/or minority populations in the project area;
- Identification of the impacts of the project upon identified low-income and/or minority populations; and
- Determination of whether or not the impacts are disproportionately high and adverse.

## Project Area Demographics

The primary source of data for environmental justice analyses is the U.S. Census Bureau. Information on population characteristics of the project area was obtained from 2010 U.S. Census data (minority populations) and year 2007-2011 American Community Survey (ACS) 5-Year Estimates (low-income populations). For purposes of this analysis, data were examined at the block group level for minority populations and at the Census Tract level for low-income populations. The project is within Census Tract 1104.01 (Block Group 3), Census Tract 1105.02 (Block Group 3), Census Tract 701.03 (Block Group 1), and Census Tract 701.05 (Block Group 3).

Data concerning total population and racial composition within the project area are provided in Table 1. Data addressing income and poverty are provided in Table 2. Data used for the determination of low-income populations include two variables: median household income and the percentage of persons living below the poverty level. Tables 1 and 2 also provide the county and city data from the 2010 Decennial Census, which serve as a baseline for assessing the presence of racial minorities, Hispanics, or low-income populations.

#### **Identification of Minority Populations**

The term "minority" is defined using race and ethnicity definitions from Census 2010. Minority populations are identified when the minority percentage in a given block group exceeds the minority percentage of the county. As indicated in Table 1, the population of the project is predominately white. The minority percentages for Chisago and Washington counties are 5.3 percent and 14.3 percent, respectively. For identified block groups within the project area, Census 2010 data indicate minority populations from 1.8 to 9 percent. The minority percentages for identified block groups within the project area are less than those reported by Chisago County and Washington County, respectively.

#### Identification of Low-Income Populations

For the purposes of this study, the term "low-income" is defined as persons with incomes below the 2011 poverty level. Data for Table 2 came from the year 2007-2011 American Community Survey 5-year Estimates. Because this data is not available at the block group level, data from the census tracts within the project area are reported in Table 2. Low-income populations are identified when the percentage of low-income persons in a given census tract exceeds the percentage of low-income persons in the county.

TABLE 1 POPULATION AND RACE

										Chisago	County			Washingt	on County	
	Chisago	o County	Washing	ton County	Chisa	go City	City of V	Wyoming	Census T	ract 1104.1	Census Tr	act 1105.02	Census T	ract 701.03	Census T	ract 701.05
Demographic Group									Block	Group 3	Block	Group 3	Block	Group 1	Block	Group 3
	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population	Number	% of Population
Households	19,470	na	87,859	na	2,051	na	2,738	na	250	na	442	na	608	na	353	na
Population	53,887	100.0	238,136	100.0	4,967	100.0	7,791	100.0	704	100.0	1,170	100.0	1,687	100.0	951	100.0
White <sup>1</sup>	51,013	94.7	204,111	85.7	4,750	95.6	7,438	95.5	691	98.2	1,133	96.8	1,536	91.0	907	95.4
Minorities	4,874	5.3	34,025	14.3	217	4.4	353	4.5	13	1.8	37	3.2	151	8.95	44	4.6
Black	645	1.2	8,579	3.6	30	0.6	28	0.4	2	0.3	2	0.2	37	2.2	3	0.3
AIAN <sup>2</sup>	324	0.6	1,088	0.5	24	0.5	29	0.4	0	0	4	0.3	9	0.5	0	0
Asian	478	0.9	12,071	5.1	32	0.6	72	0.9	3	0.4	9	0.8	38	2.3	5	0.5
NHPI <sup>3</sup>	10	0.0	77	0.0	6	0.1	0	0.0	0	0	0	0	0	0	0	0
Other race	139	0.3	2,300	1.0	14	0.3	30	0.4	1	0.1	3	0.3	14	0.8	13	0.1
Two or more races	670	1.2	5,009	2.1	56	1.1	106	1.4	6	0.9	12	1.1	35	2.1	15	1.6
Hispanic Origin <sup>4</sup> 835		1.5	8,127	3.4	82	1.7	130	1.7	1	0.1	13	1.1	38	2.3	22	2.3

Source: Year 201 U.S. Census Demographic Profile Date (Table DP-1, P1, P8, P9, P18)

- (1) White alone, not Hispanic or Latino
- (2) AIAN = American Indian or Alaska Native
- (3) NHPI = Native Hawaiian and other Pacific Islander
- (4) Those of Hispanic Origin may also consider themselves white or of another race. Therefore, the population totals and percentages will be greater than 100 percent.

TABLE 2
INCOME AND POVERTY

Demographic Group	Chisago County	Washington County	Chisago City	City of Wyoming	Census Tract 1104.01	Census Tract 1105.02	Census Tract 701.03	Census Tract 701.05
Number of Households	19,540	87,446	2,197	2,752	3,181	2,953	1,947	1,680
Number of Families	14,495	64,299	1,462	2,096	2,525	1,915	1,193	1,332
Median household income (in 2011 inflation-adjusted dollars)	67,075	79,571	70,625	76,462	78,148	63,194	47,199	85,682
Median family income (in 2011 inflation-adjusted dollars)	76,082	92,497	87,839	77,877	78,922	82,969	59,336	97,500
Per capita income in 2009 (dollars)	27,626	36,786	33,699	29,550	29,972	32,791	24,892	39,076
Percent of people whose income in the past 12 months is below the poverty level	7.1	5.7	5.8	14.3	9.4	4.8	16.4	3.0
Percent of families whose income in the past 12 months is below the poverty	4.6	4.0	3.8	6.3	7.4	0.8	13.5	1.4

Source: 2007-2011 American Community Survey 5-year Estimates.

### **Environmental Justice Finding**

The purpose of Executive Order 12898 is to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low-income populations. If any minority or low-income population concentrations are found in the project area, Executive Order 12898 requires that the proposed action be reviewed to determine if there are disproportionately high and adverse effects on these populations. Disproportionate is defined in two ways: 1) the impact is "predominantly borne" by the minority or low-income population group or the impact is "more severe" than that experienced by non-minority or non-low-income populations.

Based on Census 2010 and 2007-2011 American Community Survey 5-year Estimates, there are minority and low-income populations within and adjacent to the proposed project area. However, potential impacts are distributed through the project area, and the proposed improvements will provide benefits for all travelers, including improved safety. Therefore, the proposed action is not anticipated to result in disproportionately high and adverse human health or environmental effects to minority or low-income populations. A final environmental justice determination will be made as part of future environmental reviews under the NEPA process.

#### **ECONOMICS**

The proposed project is expected to provide positive economic benefits. TH 8 from I-35 to the Wisconsin border is designated as a medium priority Interregional Corridor. The goal of this designation is to prioritize and maintain efficient connections between regional trade centers by ensuring safe, timely, and efficient movement of goods and people. The interregional corridors tie the State together by connecting people with jobs, distributors with manufacturers, shoppers with retailer, and tourists with recreational opportunities. TH 8 serves an important local function by providing mobility to residents, industry, farmers, and businesses within the study corridor and serving as a direct link to adjacent communities.

Future planned development in the area of the proposed project is anticipated to provide employment opportunities and increased tax revenues.

#### RIGHT OF WAY AND RELOCATION

The proposed project would require additional right of way. Because the design process for the proposed project is still in the preliminary stage, the amount of permanent right of way to be acquired is approximate at this time. Specific right- of-way impacts and number of individual parcels affected by a roadway design will be identified with future NEPA studies. Based on the current conceptual design layout for the proposed project, it is estimated that the amount of new right of way needed would be approximately 85 acres, affecting 112 parcels (refer to Table 3). Of these affected parcels, 9 would be full acquisitions and 103 would be partial acquisitions. Of the 9 full acquisitions, 7 would result in residential property displacements and 2 would result in acquisition of land only, as shown in Table 4.

The acquisition and relocation of property due to the proposed project will be conducted in accordance with Federal and State rules and regulations in place at the time of project implementation.

TABLE 3 PROPOSED RIGHT OF WAY

Right of Way (TH 8 + frontage)	Proposed
Right of Way (1H 8 + Hontage)	Alternative 5
Total ROW Needed	227.5 ac.
Net New ROW Needed	84.6 ac.
Number of Partial Takes	103
Number of Full Takes	9

TABLE 4
POTENTIAL RELOCATIONS AND ACQUISITIONS

Land Use	Proposed Alternative 5
Residential Acquisition and Relocation	7
Residential Acquisition (land only)	1
Commercial (vacant parcel - land only)	1
Public/Semi Public	0
Total Full Takes	9

#### FARMLAND PROTECTION POLICY ACT

The Farmland Protection Policy Act (FPPA) requires federal agencies to examine the impact of projects that convert farmland to nonagricultural uses. If a federal agency, or its representative, determine that a project will impact agricultural lands, a Farmland Conversion Impact Rating Form (Form AD-1006) is completed to rate the relative impact of the project.

Soils that are classified by the NRCS as prime farmland and farmland of statewide importance are located within the proposed project footprint (refer to EAW Items 19 and 25 and Figure 9, Appendix A). Given that the communities in the project corridor have identified TH 8 as a growth area, primarily for commercial and mixed-use development, it cannot be determined at this time how much of the property within the study area will remain in farmland by the time the project is constructed.

The project will be reviewed for potential agricultural impacts as part of the future NEPA process and Form AD-1006 will be processed at that time.

#### **NOISE**

See section 4.24, Odors, Noise and Dust for results of the noise analysis.

#### CONSTRUCTION AND DEMOLITION

## **Construction Impacts**

Refer to EAW Item 6.b of the EAW for a description of construction impacts.

#### Demolition

As discussed above in the Right of Way and Relocation section, the proposed project may require the demolition of residential structures. Depending on the year of construction, these structures have the potential to contain asbestos since structures constructed prior to the 1970s were potentially built and/or insulated with products that contained asbestos. In addition, the residential structures should also be evaluated for the presence of asbestos-containing materials, due to the potential for asbestos in building components imported from other countries.

Prior to construction an asbestos inspection would be completed. Residential structure demolition may result in asbestos-containing waste, lead-based paint, fluorescent bulbs, or other hazardous materials. These would be handled in accordance with MnDOT guidelines. Only MnDOT certified and approved staff and contractors would be used on the project construction.

#### INDIRECT EFFECTS AND CUMULATIVE IMPACTS

The Council on Environmental Quality's (CEQ) regulations implementing the procedural provisions of NEPA (40 CFR Part 1500-1508) require federal agencies to consider the environmental consequences of their actions, including not only direct effects, but also indirect effects and cumulative impacts.

Future land use in the area surrounding the proposed project is guided toward commercial and mixed-use development. The cities of Forest Lake and Chisago City have adopted future land use maps and much of the corridor through Wyoming is already in commercial use (refer to Attachment 1). The outcome of this current TH 8 project is to identify and preserve a corridor footprint that will support the long-term growth and land use plans for adjacent development within the communities. Overall, the proposed project will be compatible with existing and planned land uses, as it provides for local access and circulation. Identification and preservation of the proposed project footprint will provide local governments, existing landowners, and future landowners with better guidance regarding land-use decisions.

During the preparation of the future NEPA document, separate analyses will be conducted to evaluate indirect effects of the proposed project and to evaluate project-related cumulative impacts.

Indirect effects are defined as those that are "caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR 1508.8). Generally, these impacts are induced by the proposed project, but occur outside of the project right of way. For example, in the context of the proposed TH 8 project, the assumption is that the project action could induce development at primary intersections along the TH 8 corridor that would cause indirect environmental impacts. Examples of indirect effects can include growth-inducing effects and other effects related to induced changes in land use patterns, population density and growth rates, and related effects on air and water quality and other natural systems.

While there are uncertainties about the indirect effects of the proposed project at this time, the future NEPA document will identify indirect effects that are known, and will make a good faith effort to explain the effects that are not known but are "reasonably foreseeable" (Section 1508.8(b)). The future NEPA document preparers will make judgments based upon reasonably foreseeable occurrences and about the eventual consequences of the proposed project. The study area boundaries for the analysis of indirect effects may be different for each resource evaluated but will generally be larger than the project study area used in determining direct effects. Political and natural boundaries and physical constraints will be considered when defining the study area for indirect effects on resources, as well as the timeframe that will be used in the analysis.

Cumulative impacts represent the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 CFR 1508.7)." For cumulative effects, in accordance with NEPA and to the extent reasonable and practical, the future NEPA document will consider the combined effect of the proposed project and other actions occurring or proposed in the vicinity of the proposed project corridor. An appropriate resource study area will be defined for each resource carried forward in the cumulative impacts assessment, based on the nature of direct and indirect effects and the overall health and distribution of the resource in question.

#### **SECTION 4(F)/6(F) EVALUATION**

The project has been reviewed for potential Section 4(f) involvement. The City of Chisago City has designated a parcel of land, known as Lindberg Point, as "future park and open space." The property is not parkland and not publically owned. The land is currently privately owned and not open to the public; therefore, the property does not meet the criteria for 4(f) involvement. The reconstruction of TH 8 is not anticipated for several years. The City of Chisago City does not anticipate acquiring this property prior to the letting/reconstruction of TH 8.

At this time, the proposed project will not affect properties covered by Section 4(f) involvement; therefore, no Section 4(f) involvement exists on this project. The project will be reviewed for potential 4(f) involvement as part of future environmental reviews.

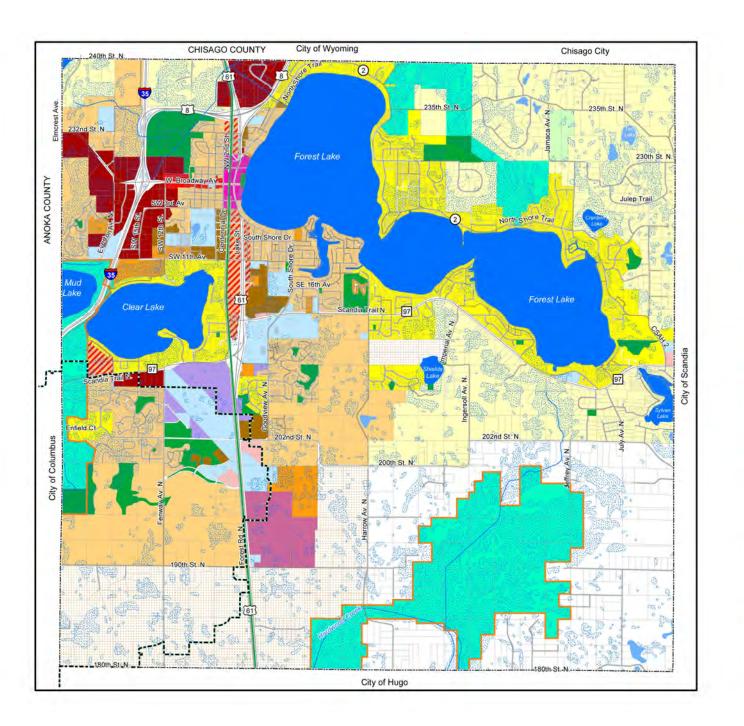
The project has been reviewed for potential Section 6(f) involvement. The project will not cause the conversion of any land acquired, planned or developed with funds from the Land and Water Conservation Fund (L&WCF). No Section 6(f) involvement currently exists on this project. The project will be reviewed for potential 6(f) involvement as part of future environmental reviews based on the DNR list of L&WCF properties available at that time.

# ATTACHMENT 1

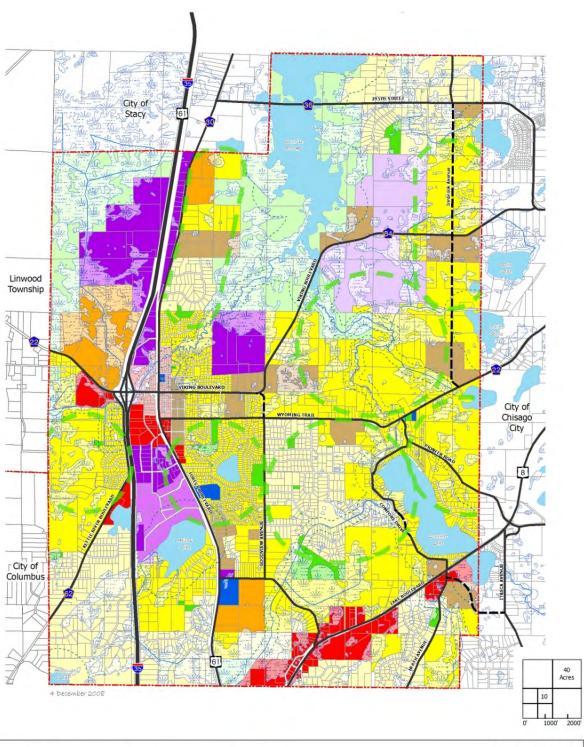
City of Forest Lake Future Land Use Map

City of Wyoming Land Use Map

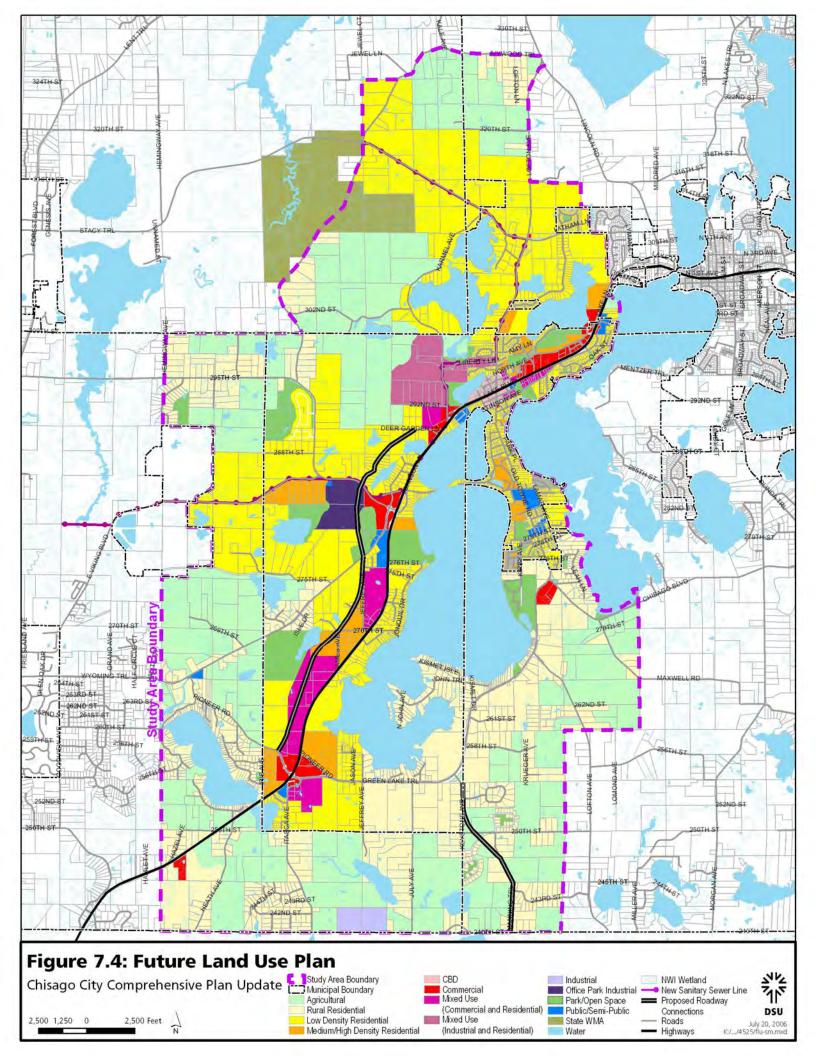
City of Chisago City Future Land Use Map











# Appendix F

# Correspondence

MnDOT OES Roadside Vegetation Management Unit - October 6, 2009

DNR-MnDOT OES Correspondence – December 19-21, 2009

MnDOT OES - October 16, 2009

State Historic Preservation Office – April 21, 2011

MnDOT CRU – May 4 2011

# **Minnesota Department of Transportation**



# **MEMO**

OFFICE OF ENVIRONMENTAL SERVICES Office Tel: (651) 366-3631
Roadside Vegetation Management Unit Fax: (651) 366-3603

MS 620

395 John Ireland Boulevard

St. Paul, MN 55155

Date: October 6th, 2009

To: Monty Hamri

Mn/DOT Metro District

From: Paul Voigt

Natural Resource Specialist - Program Coordinator

Roadside Vegetation Management Unit - Office of Environmental Services

Subject: S.P. 1308-17PE T.H. 8 - woody vegetation review for Early Notification Memo.

As requested, I reviewed the area referenced above to identify woody plant material that may be impacted by the proposed construction along T.H. 8 from Forest Lake to Chisago City. This review was based on the limited information supplied in the early notification memo dated July 28<sup>th</sup>, 2009. I reviewed this area on the morning and afternoon of September 11<sup>th</sup>, 2009.

#### General Description of Woody Vegetation

The area along T.H. 8 proposed for this project is mostly rural, with much of the area on existing Mn/DOT right of way void of woody vegetation, and larger areas of agricultural land and open fields on the adjacent private properties. There are however many "pockets" of woody vegetation scattered along this approximately 7 mile stretch, both on current right of way, as well as on adjacent private properties. The woody vegetation that is present is mainly a mixture of naturally occurring deciduous and coniferous trees, and some shrub materials. There is also a component of planted landscape trees and shrubs, primarily on those private properties that are adjacent to current Mn/DOT right of way.

#### Woody vegetation species mix – East bound T.H. 8 on south side of road

The woody vegetation located on the south side of T.H. 8 as you are traveling east includes Eastern Red Cedar, Green Ash, Willow, American Elm, Boxelder, White Birch, Basswood, Aspen, Cottonwood, Smooth & Staghorn Sumac, and Buckthorn (mainly along fence line). There is also several "wetland" type areas on this side of the road that seemed to be heavy in cattails, but likely would also include other herbaceous plants that grow in aquatic situations. I recommend a review specifically for this type of vegetation by a wetland specialist.

# Woody vegetation species mix - West bound T.H. 8 on north side of road

The woody vegetation located on the north side of T.H. 8 as you are traveling west pretty much mirrors that of the south side both in species mix and occurrences of the woody vegetation.

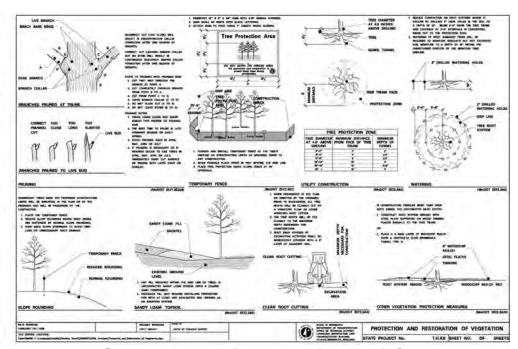
#### Protection of Vegetation

According to the information supplied in the early notification memo, there are currently several alternative alignments being considered. That being said, it also appears that the general impacts to the woody vegetation would be somewhat similar regardless of the chosen alignment. In each alignment choice, it is obvious that there would be vegetation impacts, including the removal of a fair amount of woody vegetation as part of the project. During the design process, once a preferred alternative is chosen, all reasonable efforts should be made to create a plan that will minimize these impacts and losses. When it

becomes clear what the precise limits of construction will be, and where vegetation impacts along those limits will occur, those areas should be clearly identified so that vegetation protection measures can be included as part of the Construction Plan which will help minimize the impacts. These vegetation protection measures should be based on Mn/DOT Standard Specification for Construction 2572 (Protection and Restoration of Vegetation). In order to protect vegetation that lies outside of the Construction limits, special attention should be paid to 2572.3A, including but not limited to the use of clean root cutting and temporary fence for tree protection. These areas should be identified in the Plan and Standard Detail Sheets that are available (see example below) for these items included in the Plan package. As the design process continues and the preferred alternative is chosen, I would recommend having either a consulting forester or a member of Mn/DOT's Roadside Vegetation Management Unit conduct a more thorough review and create a forestry plan that will help to ensure that these protection measures are incorporated into the Plan, and carried out during the Project, and also identify any potential transplant opportunities that may be an option with this project.

#### Vegetation Replacement

Due to the potential loss of woody vegetation as a result of this proposed project, I would recommend having plans in place to replace the loss of vegetation after construction is completed. As stated in Mn/DOT's HPDP guidelines for vegetation replacement for Category 1-Native Plant Community types, the roadsides should be re-vegetated with indigenous/native plant materials in the most cost effective and efficient manner that restores the impacts of construction in harmony with the surrounding native plant community. There should also be plans developed that would replace the more "urban" type plantings that could be lost on private properties along the proposed areas of construction.



**Standard Vegetation Protection Detail Sheet** 

Please feel free to contact us if you have any questions regarding our review, and thank you for the opportunity to review this project for woody vegetation concerns.

Cc. Frank Pafko, Roadside Vegetation Management Unit, Nancy Stavish (URS Corporation)



# Minnesota Department of Natural Resources

500 Lafayette Road St. Paul, Minnesota 55155-4010

December 19, 2009

Rick Dalton MnDOT Metro District 1500 West County Rd B-2 Roseville, MN 55113

RE: Response to MnDOT Early Notification Memo Requesting Information and Early Coordination Regarding TH 8 Reconstruction (SP1308-17), Chisago County

Dear Mr. Dalton:

The Minnesota Department of Natural Resources (DNR) has completed review of the information submitted in the MnDOT Early Notification Memo regarding a proposed reconstruction of TH8 into a 4 lane highway from Greenway Avenue (near TH 61 in the City of Forest Lake) and CR 80 (near Chisago City). At this point MnDOT has requested information on resources for the development of an Environmental Assessment (EA). As the project moves forward we will likely have additional comments as details are refined. The following resources should be identified as the project moves forward.

- 1. There are numerous Public Waters within the project area. I have attached a portion of the Chisago County Public Waters Map for your information. In the Washington County portion of the project, the Sunrise River is the only Public Water that could be directly impacted. It is unknown if any of these Public Waters will be impacted. Though the usual planning processes should avoid impacts to these waters as much as possible. Review a Public Waters Work Permit will be required at a later date should any of these waters have proposed impacts. Provisions found in DNR GP 2004-0001 and the manual "Best Practices for Meeting DNR General Public Waters Work Permit GP 2004-0001" will be applied to the projects permit conditions.
- 2. The Minnesota Natural Heritage Information System has been queried to determine if any rare plant or animal species, native plant communities, or other significant natural features are known to occur within an approximate one-mile radius of the TH 8 Reconstruction (S.P. 1308-17) project area. Based on this query, rare features have been documented within the search area (for details, see the cover email for database reports). Please note that the following rare features may be impacted by the proposed project:
  - a. The proposed project is within an area of statewide importance to the Blanding's turtle (Emydoidea blandingii), a state-listed threatened species. There are 15 such areas in the state. These areas are relied upon to maintain the species' security within Minnesota, and the DNR considers them of the highest priority for Blanding's turtle research and management activities. For your information, I have attached a Blanding's turtle fact sheet that describes the habitat use and life history of this species. The fact sheet also provides two lists of recommendations for avoiding and minimizing impacts to this rare turtle. The first list is relevant for all areas inhabited by Blanding's turtles while the second list contains additional protective measures for areas known to be of statewide importance to this species. Because the proposed project is within one of these areas, please refer to both lists of recommendations. The attached flyer should be given to all contractors working in the area.

If Blanding's turtles are encountered on site, please remember that state law and rules prohibit the destruction of threatened or endangered species, except under certain prescribed conditions. If turtles are in imminent danger they should be moved by hand out of harms way, otherwise they should be left undisturbed.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area.

If you have questions regarding this letter, please e-mail me at peter.leete@state.mn.us or call at (651) 366-3634.

On behalf of the DNR

Sincerely,

Peter Leete

DNR Transportation Hydrologist (DNR-MnDOT OES Liaison)

@ Office of Environmental Services, mail stop 620

Minnesota Department of Transportation

395 John Ireland Blvd.

St. Paul, MN 55155

C: ERDB file 20100271

From:

Dalton, Rick (DOT)

To:

Nancy Stavish@urscorp.com

Cc:

Hamri, Monty (DOT); Goess, Marc (DOT)

Subject:

FW: DNR response to MnDOT Early Notification Memo, TH 8 rehabilitation (SP1308-17) Chisago Co

Date:

Monday, December 21, 2009 7:57:30 AM

TH8 reconstruction (SP1308-17) Chisago-comlet.pdf Attachments: 20100271-1ad.pdf

Ebflyer2008.pdf 20100271-1ai.pdf Ebfactsheet2008.pdf Explanation of Fields.pdf Projectarea PWI.pdf

Hi Nancy - FYI

From: Leete, Peter (DOT)

Sent: Saturday, December 19, 2009 11:24 AM

To: Dalton, Rick (DOT)

Cc: Hamri, Monty (DOT); Straumanis, Sarma (BWSR); Alcott, Jason (DOT); Troyer, Brett (DOT);

Stenlund, Dwayne (DOT); Homuth, Dale (DNR); Joyal, Lisa(DNR); Colvin, Steve E (DNR); North, Michael R (DNR); Hugill, Roger A (DNR); Reger, Martha J (DNR); Mueller, Mike L (DNR); Pauly, David C (DNR) Subject: DNR response to MnDOT Early Notification Memo, TH 8rehabilitation (SP1308-17) Chisago Co

#### Rick,

Attached is the DNR letter of concerns regarding the proposed reconstruction of TH8 into a 4 lane highway from Greenway Avenue (nearTH 61 in the City of Forest Lake) At this point MnDOT has requested information and CR 80 (near ChisagoCity). onresources for the development of an Environmental Assessment (EA). As the project moves forward we will likely have additional comments as detailsare refined (such as public Waters Crossing design). The usual GP2004-0001 can utilized should the project meet the conditions of thepermit... Regardless, at this point we do not have specific guidancefor the Public Waters, other than to avoid impacts if possible. Where that is not possible, please contact me later as the project moves forward....

Theenclosed results include an Index Report and a Detailed Report of records inthe Rare Features Database, the main database of the NHIS. To control therelease of location information, which might result in the destruction of arare feature, both reports are copyrighted. The Detailed Report mayinclude specific location information, and may not be reproduced withoutauthorization from the DNR.

Contact me if you have questions

peter

Peter Leete

**DNR Transportation Hydrologist** 

(DNR-MnDOT OES Liaison)

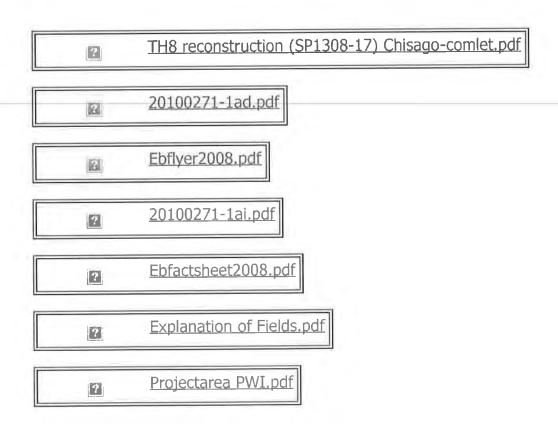
@ MnDOT Office of Environmental Services

395 John Ireland Blvd., MS 620

St. Paul, MN 55155

ph: 651-366-3634

peter.leete@state.mn.us



# Environmental Review Fact Sheet Series

## Endangered, Threatened, and Special Concern Species of Minnesota

# Blanding's Turtle

(Emydoidea blandingii)

Minnesota Status: Threatened State Rank<sup>1</sup>: S2 Federal Status: none Global Rank<sup>1</sup>: G4

#### **HABITAT USE**

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation (e.g., cattails, water lilies) are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands (those that dry up in the late summer or fall) are frequently used in spring and summer -- these fishless pools are amphibian and invertebrate breeding habitat, which provides an important food source for Blanding's turtles. Also, the warmer water of these shallower areas probably aids in the development of eggs within the female turtle. Nesting occurs in open (grassy or brushy) sandy uplands, often some distance from water bodies. Frequently, nesting occurs in traditional nesting grounds on undeveloped land. Blanding's turtles have also been known to nest successfully on residential property (especially in low density housing situations), and to utilize disturbed areas such as farm fields, gardens, under power lines, and road shoulders (especially of dirt roads). Although Blanding's turtles may travel through woodlots during their seasonal movements, shady areas (including forests and lawns with shade trees) are not used for nesting. Wetlands with deeper water are needed in times of drought, and during the winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing.

#### LIFE HISTORY

Individuals emerge from overwintering and begin basking in late March or early April on warm, sunny days. The increase in body temperature which occurs during basking is necessary for egg development within the female turtle. Nesting in Minnesota typically occurs during June, and females are most active in late afternoon and at dusk. Nesting can occur as much as a mile from wetlands. The nest is dug by the female in an open sandy area and 6-15 eggs are laid. The female turtle returns to the marsh within 24 hours of laying eggs. After a development period of approximately two months, hatchlings leave the nest from mid-August through early-October. Nesting females and hatchlings are often at risk of being killed while crossing roads between wetlands and nesting areas. In addition to movements associated with nesting, all ages and both sexes move between wetlands from April through November. These movements peak in June and July and again in September and October as turtles move to and from overwintering sites. In late autumn (typically November), Blanding's turtles bury themselves in the substrate (the mud at the bottom) of deeper wetlands to overwinter.

#### IMPACTS / THREATS / CAUSES OF DECLINE

- loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- loss of upland habitat through development or conversion to agriculture
- human disturbance, including collection for the pet trade\* and road kills during seasonal movements
- increase in predator populations (skunks, raccoons, etc.) which prey on nests and young

<sup>\*</sup>It is illegal to possess this threatened species.

#### RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided to help local governments, developers, contractors, and homeowners minimize or avoid detrimental impacts to Blanding's turtle populations. **List 1** describes minimum measures which we recommend to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat. **List 2** contains recommendations which offer even greater protection for Blanding's turtles populations; this list should be used *in addition to the first list* in areas which are known to be of state-wide importance to Blanding's turtles (contact the DNR's Natural Heritage and Nongame Research Program if you wish to determine if your project or home is in one of these areas), or in any other area where greater protection for Blanding's turtles is desired.

List 1. Recommendations for all areas inhabited by Blanding's turtles.	List 2. <i>Additional</i> recommendations for areas known to be of state-wide importance to Blanding's turtles.
GENI	ERAL
A flyer with an illustration of a Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.	Turtle crossing signs can be installed adjacent to road- crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.
Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed.	Workers in the area should be aware that Blanding's turtles nest in June, generally after 4pm, and should be advised to minimize disturbance if turtles are seen.
If a Blanding's turtle nests in your yard, do not disturb the nest.	If you would like to provide more protection for a Blanding's turtle nest on your property, see "Protecting Blanding's Turtle Nests" on page 3 of this fact sheet.
Silt fencing should be set up to keep turtles out of construction areas. It is <u>critical</u> that silt fencing be removed after the area has been revegetated.	Construction in potential nesting areas should be limited to the period between September 15 and June 1 (this is the time when activity of adults and hatchlings in upland areas is at a minimum).
WETL	ANDS
Small, vegetated temporary wetlands (Types 2 & 3) should not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer).	Shallow portions of wetlands should not be disturbed during prime basking time (mid morning to mid-afternoon in May and June). A wide buffer should be left along the shore to minimize human activity near wetlands (basking Blanding's turtles are more easily disturbed than other turtle species).
Wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50' wide. This area should be left unmowed and in a natural condition.
ROA	ADS
Roads should be kept to minimum standards on widths and lanes (this reduces road kills by slowing traffic and reducing the distance turtles need to cross).	Tunnels should be considered in areas with concentrations of turtle crossings (more than 10 turtles per year per 100 meters of road), and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. Contact your DNR Regional Nongame Specialist for further information on wildlife tunnels.
Roads should be ditched, not curbed or below grade. If curbs must be used, 4 inch high curbs at a 3:1 slope are preferred (Blanding's turtles have great difficulty climbing traditional curbs; curbs and below grade roads trap turtles on the road and can cause road kills).	Roads should be ditched, not curbed or below grade.

ROAD	S cont.								
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or greater in diameter, and elliptical or flat-bottomed.	Road placement should avoid separating wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details).								
Wetland crossings should be bridged, or include raised roadways with culverts which are 36 in or greater in diameter and flat-bottomed or elliptical (raised roadways discourage turtles from leaving the wetland to bask on roads).	Road placement should avoid bisecting wetlands, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details). This is especially important for roads with more than 2 lanes.								
Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.	Roads crossing streams should be bridged.								
UTIL	ITIES								
Utility access and maintenance roads should be kept to a minimum (this reduces road-kill potential).									
Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.									
LANDSCAPING AND VEG	ETATION MANAGEMENT								
Terrain should be left with as much natural contour as possible.	As much natural landscape as possible should be preserved (installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blanding's turtles).								
Graded areas should be revegetated with native grasses and forbs (some non-natives form dense patches through which it is difficult for turtles to travel).	Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.								
Vegetation management in infrequently mowed areas such as in ditches, along utility access roads, and under power lines should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).	Ditches and utility access roads should not be mowed or managed through use of chemicals. If vegetation management is required, it should be done mechanically, as infrequently as possible, and fall through spring (mowing can kill turtles present during mowing, and makes it easier for predators to locate turtles crossing roads).								

**Protecting Blanding's Turtle Nests:** Most predation on turtle nests occurs within 48 hours after the eggs are laid. After this time, the scent is gone from the nest and it is more difficult for predators to locate the nest. Nests more than a week old probably do not need additional protection, unless they are in a particularly vulnerable spot, such as a yard where pets may disturb the nest. Turtle nests can be protected from predators and other disturbance by covering them with a piece of wire fencing (such as chicken wire), secured to the ground with stakes or rocks. The piece of fencing should measure at least 2 ft. x 2 ft., and should be of medium sized mesh (openings should be about 2 in. x 2 in.). It is *very important* that the fencing be **removed before August 1** so the young turtles can escape from the nest when they hatch!

#### REFERENCES

<sup>&</sup>lt;sup>1</sup>Association for Biodiversity Information. "Heritage Status: Global, National, and Subnational Conservation Status Ranks." NatureServe. Version 1.3 (9 April 2001). <a href="http://www.natureserve.org/ranking.htm">http://www.natureserve.org/ranking.htm</a> (15 April 2001).

Coffin, B., and L. Pfannmuller. 1988. Minnesota's Endangered Flora and Fauna. University of Minnesota Press, Minneapolis, 473 pp.

## **REFERENCES** (cont.)

- Moriarty, J. J., and M. Linck. 1994. Suggested guidelines for projects occurring in Blanding's turtle habitat. Unpublished report to the Minnesota DNR. 8 pp.
- Oldfield, B., and J. J. Moriarty. 1994. Amphibians and Reptiles Native to Minnesota. University of Minnesota Press, Minneapolis, 237 pp.
- Sajwaj, T. D., and J. W. Lang. 2000. Thermal ecology of Blanding's turtle in central Minnesota. Chelonian Conservation and Biology 3(4):626-636.

# **CAUTION**







# **BLANDING'S TURTLES**

# MAY BE ENCOUNTERED IN THIS AREA

The unique and rare Blanding's turtle has been found in this area. Blanding's turtles are state-listed as Threatened and are protected under Minnesota Statute 84.095, Protection of Threatened and Endangered Species. Please be careful of turtles on roads and in construction sites. For additional information on turtles, or to report a Blanding's turtle sighting, contact the DNR Nongame Specialist nearest you: Bemidji (218-308-2641); Grand Rapids (218-327-4518); New Ulm (507-359-6033); Rochester (507-280-5070); or St. Paul (651-259-5764).

**DESCRIPTION**: The Blanding's turtle is a medium to large turtle (5 to 10 inches) with a black or dark blue, dome-shaped shell with muted yellow spots and bars. The bottom of the shell is hinged across the front third, enabling the turtle to pull the front edge of the lower shell firmly against the top shell to provide additional protection when threatened. The head, legs, and tail are dark brown or blue-gray with small dots of light brown or yellow. A distinctive field mark is the bright yellow chin and neck.

BLANDING'S TURTLES DO NOT MAKE GOOD PETS
IT IS ILLEGAL TO KEEP THIS THREATENED SPECIES IN CAPTIVITY

# SUMMARY OF RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS TO BLANDING'S TURTLE POPULATIONS

(see Blanding's Turtle Fact Sheet for full recommendations)

- This flyer should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.
- Turtles that are in imminent danger should be moved, by hand, out of harms way. Turtles that are not in imminent danger should be left undisturbed to continue their travel among wetlands and/or nest sites.
- If a Blanding's turtle nests in your yard, do not disturb the nest and do not allow pets near the nest.
- Silt fencing should be set up to keep turtles out of construction areas. It is <u>critical</u> that silt fencing be removed after the area has been revegetated.
- Small, vegetated temporary wetlands should not be dredged, deepened, or filled.
- All wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.
- Roads should be kept to minimum standards on widths and lanes.
- Roads should be ditched, not curbed or below grade. If curbs must be used, 4" high curbs at a 3:1 slope are preferred.
- Culverts under roads crossing wetland areas, between wetland areas, or between wetland and nesting areas should be at least 36 in. diameter and flat-bottomed or elliptical.
- Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.
- Utility access and maintenance roads should be kept to a minimum.
- Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.
- Terrain should be left with as much natural contour as possible.
- Graded areas should be revegetated with native grasses and forbs.
- Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1<sup>st</sup> and before June 1<sup>st</sup>).

From:

Richard Dalton

To:

Nancy Stavish@urscorp.com

Cc:

Jason Alcott; Marc Goess; Monty Hamri

Subject:

1308-17PE (TH 8 from Greenway to CR 80) - Early Notification Memo (ENM)/ T&E Section 7 Information

Date:

Friday, October 16, 2009 9:30:00 AM

FYI - see attached e-mail from Jason Alcott. A copy of this e-mail should be placed in the EA's appendix, and references in the EA text, when discussing federal threatened and endangered species.

I am keeping a file with the ENM responses in Mn/DOT's EDMS doc 676758; this file can be viewed by others in

MnDOT, and I can provide you with a copy of the file if you would like (although I may have to give it to you on

a CD; it's too big for an e-mail).

Rick Dalton 651-234-7677

Subject: S.P. 1308-17PE, Trunk Highway 8, Section 7 Information

Date: Fri, 16 Oct 2009 08:38:38 -0500 Message-ID: 4AD8310E020000910000C8EE

From: "Jason Alcott" <Jason.Alcott@dot.state.mn.us>
To: "Richard Dalton" <Richard.Dalton@dot.state.mn.us>
Cc: "Jennie Ross" <Jennie.Ross@dot.state.mn.us>
Content-Transfer-Encoding: quoted-printable
Content-Type: text/plain; charset=utf-8

Content-Disposition: inline Content-Language: Mime-Version: 1.0 X-Mailer: Groupwise 6.5

Section 7 Information (Federal Threatened and Endangered Species) S.P. 1308-17PE, Trunk Highway 8 Roadway Expansion Cities of Forest Lake, Chisago City Chisago County

In response to your request, the proposed action has been reviewed for potential effects to federally-listed threatened, endangered, proposed, candidate species and listed critical habitat.

As you are aware, Section 7 of Endangered Species Act of 1973, as amended, requires each Federal agency to review any action that it funds, authorizes or carries out to determine whether it may affect threatened, endangered, proposed species or listed critical habitat. Federal agencies (or their designated representatives) must consult with the U.S. Fish and Wildlife Service (Service) if any such effects may occur as a result of their actions. Consultation with the Service is not necessary if the proposed action will not directly or indirectly affect listed species or critical habitat. If a federal agency finds that an action will have no effect on listed species or critical habitat, it should maintain a written record of that finding that includes the supporting rationale.

In coordination with the Service and according to the official County Distribution of Minnesota?s Federally-Listed Threatened, Endangered, Proposed, and Candidate Species list, there are currently no known occurrences of federally listed endangered, threatened, proposed or candidate species in the general vicinity of the proposed action. At this time, there is no listed critical habitat in the project County. Since the proposed action is not currently scheduled and is not likely to be constructed for several years and because species information and habitat designation is subject to change, any determination of effect made at this point in time would be premature. Therefore, it is recommended that the action be reevaluated and consultation reinitiated within 3- years prior to the start of

## construction.

Jason Alcott Natural Resource Specialist, Program Coordinator Minnesota Department of Transportation Office of Environmental Services Mail Stop 620 395 John Ireland Boulevard St. Paul, MN 55155-1899 Phone: (651) 366-3605 Fax: (651) 366-3603



#### STATE HISTORIC PRESERVATION OFFICE

April 21, 2011

Mr. Dennis Gimmestad MnDOT Cultural Resources Unit Transportation Building, MS 620 395 John Ireland Boulevard St. Paul, MN 55155-1899

RF:

S.P. 1308-17PE

Reconstruction of Trunk Highway 8 Washington and Chisago Counties SHPO Number: 2011-1686

Dear Mr. Gimmestad:

Thank you for the opportunity to comment on the above project. Our review of this matter is based on the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the Advisory Council on Historic Preservation (36CFR800).

We have reviewed the Phase I and II Architectural History Evaluation prepared by Landscape Research LLC, including 41 inventory forms, along with the federal determinations contained in your letter of correspondence. Based on the information provided, we concur that none of the 41 properties surveyed are eligible for listing in the National Register of Historic Places. In regard to the Peter Magnus Peterson Farmstead, our negative determination of eligibility is based not only on the relatively typical (rather than significant) association of the farmstead with dairying in Minnesota, but also on the major alterations made to the dairy barn (removal of stanchions; replacement of roof and truss systems). We do, however, appreciate the careful evaluation work done with respect to this property.

Generally, we find the inventory sheets well done and complete, with the exception of photo quality in several instances. If you have better photos for the following sites, please use them: CH-WYT-049; CH-WYT-053; CH-WYT-054 and CH-WYT-061. Furthermore, for site CH-WYT-048, we need a photo of the house, not just the barn.

We look forward to receiving and reviewing the archaeological survey work for this project. Meanwhile, if you have any further questions about our review, I can be reached at (651) 259-3456.

Sincerely,

Mary Ann Heidemann, Manager

Government Programs and Compliance

cc: Landscape Research LLC

# Minnesota Department of Transportation



Office of Environmental Stewardship Mail Stop 620 395 John Ireland Boulevard

St. Paul, MN 55155

4 May 2011

Mary Ann Heidemann Minnesota State Historic Preservation Office 345 Kellogg Boulevard West St. Paul, MN 55102

RE: S.P. 1308-17PE; Reconstruction of Trunk Highway 8 from near Greenway Avenue in Forest Lake to County road 80 (Karmel Avenue) in Chisago City; Washington and Chisago Counties

Office Tel: (651) 366-4292

E-Mail: dennis.gimmestad@state.mn.us

Fax: (651) 366-3603

Dear Dr. Heidemann:

Thank you for your 21 April 2011 comments on the above referenced project.

As requested, we are forwarding an amended inventory form for CH-WYT-048 which includes photographs of the house and the barn.

You also requested better photographs for CH-WYT-049, CH-WYT-053, CH-WYT-054, and CH-WYT-061, if available. Unfortunately, access to these properties was limited, and the photos on the forms are the best we have.

We look forward to consulting with you further on this project when the results of the archaeological survey are available. Contact me at 651-366-4292 with any questions or concerns.

Sincerely,

Dennis Gimmestad

Mn/DOT Cultural Resources Unit

ennis Dimmetted

cc: Monty Hamri, Mn/DOT Metro Adam Josephson, Mn/DOT Metro Nancy Stavish, URS Joe Hudak, Mn/DOT CRU Mn/DOT CRU project file

# Appendix G

Traffic Analysis Technical Memorandum



# TRAFFIC ANALYSIS TECHNICAL MEMORANDUM

October 26, 2009

# **TH 8 Environmental Assessment Worksheet**

#### INTRODUCTION

The purpose of this technical memorandum is to summarize the traffic conditions on TH 8 prior to and after the proposed expansion and access management of the segment from Greenway Avenue North, east of Wyoming, MN to CR 80 in Chisago City, MN. The seven mile segment of TH 8 in Chisago County serves as a connection from I-35 east to TH 95 and one of the St. Croix River crossings (The TH 243 bridge at Osceola is 6 miles to the south and the TH 70 Bridge is 26 miles north as the crow flies).

The results from several different types of analyses are presented in this document in order to show the operation of the roadway under existing, future no-build and future reconstructed conditions.

The study area is shown in Figure 1.

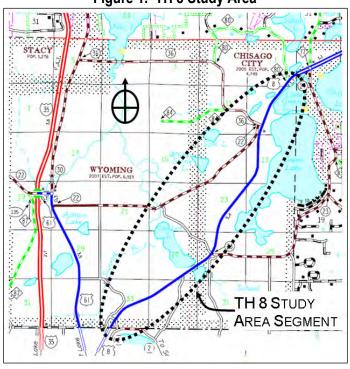


Figure 1. TH 8 Study Area

#### **EXISTING CONDITIONS**

Throughout the study location TH 8 is a two-lane highway with paved shoulders. The roadway has many minor-approach stop controlled intersections with public and private roads. At some of these, exclusive turn lanes and/or left turn bypass lanes are provided. The speed limit on TH 8 throughout the study area is 55 mph. TH 8 has three traffic signal controlled intersections in the study area. The following describes the geometry and traffic control at the three traffic signal controlled intersection:

- TH 8 and Greenway Avenue This is a four-legged intersection. The TH 8 approaches are served by exclusive left turn, through and right turn lanes. The Greenway Avenue approaches each provide an exclusive left turn lane and a shared through/right turn lane.
- TH 8 and CSAH 23 This is a four-legged intersection. The TH 8 approaches are served by exclusive left turn, through and right turn lanes. The CSAH 23 approaches each provide a shared left turn/through lane and an exclusive right turn lane.
- TH 8 and CSAH 36/Johnson Lane This is a four-legged intersection. The TH 8 approaches are served by exclusive left turn, through and right turn lanes. The Johnson Lane approach provides one shared left turn/through/right turn lane and the CSAH 36 approach provides two unmarked lanes, which generally work as exclusive left turn and right turn lanes as there is very little through traffic.

#### INTERSECTION ANALYSIS PROCESS

The purpose of this analysis is to determine the existing and future year traffic operations within the study segment. The following summarizes the study process and evaluation results.

## **Analysis Tool**

Synchro7 is a traffic operations analysis software package that implements the methodologies of the Highway Capacity Manual (HCM). Data from Synchro7 can be transferred to SimTraffic7, a detailed microscopic model that considers vehicle driver behavior, detailed interaction of vehicles with each other and the roadway between adjacent intersections, random behavior of drivers, and the delay for individual vehicles throughout the peak hour. Synchro7 uses the HCM methodology to analyze intersection operations through one cycle of a traffic signal while SimTraffic7 simulates the operation of the network of traffic signals through multiple cycles over a specified period of time (e.g., 60 minutes).

#### **Intersection Level of Service**

The ability of an intersection to process traffic is affected by the number and type of vehicles, desired turning movements, intersection geometrics, and traffic control devices. Intersection level of service (LOS) differs from segment LOS in that the quality of traffic operations is defined as the delay to vehicles caused by the intersection's traffic control rather than the ratio of vehicle volumes to roadway capacity. Intersection LOS typically focuses on operations during the periods of the day with the highest traffic volumes whereas segment LOS is based on traffic volumes over an average 24-hour period. Thus, the intersection LOS analysis gives a "worst-

case" result for each intersection and more clearly identifies operational problems at the intersections.

The intersection operational analysis process includes determining the LOS for the traffic signal controlled intersections under the existing peak hour traffic conditions. LOS D/E is generally considered an acceptable operating condition during peak hours.

#### STUDY SCENARIOS

The traffic signal controlled intersections on this segment of TH 8 were analyzed in three scenarios. These scenarios included the following:

- 1) Year 2009: Existing Transportation Network.
- 2) Year 2030: Existing Transportation Network
- 3) Year 2030: With Proposed Roadway Improvements.

# **Year 2009: Existing Transportation Network – No Development**

The existing conditions establish a baseline from which to compare future traffic operations.

- Turn movement volumes for this scenario were established through actual counts taken on a typical weekday in April 2009, during the a.m. and p.m. peak hours. These counts were taken at the following locations:
  - o TH 8 and Greenway Avenue
  - o TH 8 and CSAH 22
  - TH 8 and CSAH 36/Johnson Lane

A Synchro/SimTraffic Model was developed to analyze current traffic conditions at the traffic signal controlled intersections. Table 1 displays the 2009 a.m. (7:00 - 8:00) and p.m. (4:30 - 5:30) peak hour turning movement volumes. Also shown in these tables are the existing level of service, average delay per vehicle and average queue lengths by movement and for the overall intersection. All movements operate at LOS D or better in this scenario.

Table 1. 2009 Existing Peak Hour Level of Service, and Average Delay and Queue Lengths

	2009 EXISTING CONDITIONS													
			EASTBOUND*	*(	8	WESTBOUND*	*(	Ž	NORTHBOUND	Q	S	SOUTHBOUND	Q	INT
	Intersection	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
	Greenway Avenue Intersection													
	Movement Volume	20	304	18	12	966	64	162	28	21	2	13	99	
	Level of Service (LOS)	۵	4	∢	۵	ပ	4	۵	a		ပ		В	ပ
	Control Delay per Vehicle (sec)	46	<10	<10	42	28	<10	25	18	8	26	1	12	24
	Average Queuing Length (ft.)	<50	09	<50	<50	520	<50	80	<i>~20</i>	0.	<50	*	<50	
ınc	CSAH 23/Pioneer Road Intersection													
Н	Movement Volume	2	278	53	4	902	5	332	42	8	9	23	38	
le9	Level of Service (LOS)	۵	8	4	۵	ပ	۷		S	4	_	В	∢	ပ
d V	Control Delay per Vehicle (sec)	36	14	<10	38	32	<10	6	32	<10	-	16	<10	26
A.A	Average Queuing Length (ft.)	<50	90	<50	<50	280	<50	1,1	150	<50	v	<50	<50	
	CSAH 36/Johnson Lane Intersection													
	Movement Volume	10	298	-	0	299	184	က	0	2	115	0	27	
	Level of Service (LOS)	ပ	4	۷	∢	4	۷		8			c	В	4
	Control Delay per Vehicle (sec)	34	<10	<10	<10	<10	<10		18		7	28	12	<10
	Average Queuing Length (ft.)	<50	<50	<50	<50	80	<50		<50		Ÿ	<50	<50	
	Greenway Avenue Intersection													
	Movement Volume	20	1052	101	1	514	25	26	33	29	32	38	52	
	Level of Service (LOS)	۵	ပ	4	۵	В	۷	۵	8	_	ပ		8	ပ
	Control Delay per Vehicle (sec)	48	33	<10	46	12	<10	36	16	9	34	1	18	24
	Average Queuing Length (ft.)	<50	540	<50	<50	160	<50	<50	<i>~20</i>	0.	<50	*	<50	
ınc	CSAH 23/Pioneer Road Intersection													
Н	Movement Volume	30	824	326	4	144	9	111	34	6	7	69	12	
69	Level of Service (LOS)	၁	၁	٧	၁	Я	4	•	c	В		В	٨	В
d V	Control Delay per Vehicle (sec)	32	24	<i>~10</i>	30	12	<10	2	22	10	1	18	<10	16
И.Ч	Average Queuing Length (ft.)	<50	220	05>	<i>~20</i>	08	<20	>	<50	<50	Ÿ	<50	<20	
	CSAH 36/Johnson Lane Intersection													
	Movement Volume	38	792	3	2	428	118	4	0	5	217	2	19	
	Level of Service (LOS)	၁	В	٧	C	В	А		В			D	Α	В
	Control Delay per Vehicle (sec)	34	16	<10	32	12	<10		14		4	42	<10	18
	Average Queuing Length (ft.)	<50	200	<50	<50	200	<50		<50		11	180	<50	
*	* - TH 8 is considered the East-West Street at all intersections													

FH 8 is considered the East-West Street at all intersection

# Year 2030 with Existing Transportation Network

State, County and City staff and project team members consulted to identify the appropriate growth rate based on regional origins and destinations and planned land uses along the TH 8 corridor. For this traffic study a growth rate of 1.02 (or 2 percent) per year for 21 years was applied to all traffic movements in the area. The results are represented as the forecasted 2030 volumes.

For this scenario, the 2030 volumes were used with the existing 2009 intersection geometry and traffic control. The analyses were then performed for both peak hour periods at each of the three traffic signal controlled intersections. The forecasted 2030 volumes, level of service, average delay per vehicle and average queue lengths by movement and for the overall intersection are shown in Table 2. Movements that operate at LOS E or worse are highlighted.

Table 2. 2030 Existing Geometry Level of Service, and Average Delay and Queue Lengths

	1	EASIBOUND	k_	5	WESTBOUND*	*	ž	NORTHBOUND	Q	SC	SOUTHBOUND		INT
Intersection	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
Greenway Avenue Intersection													
Movement Volume	98	470	30	20	1520	100	250	50	40	10	20	110	
Level of Service (LOS)	Э Е	В	٧	4	4	٧	4		٥	٥	3		н
Control Delay per Vehicle (sec)	>120	12	<10	84	>120	<10	>120	4	40	48	22		>120
Average Queuing Length (ft.)	120	210	<50	<50	>1300	<50	340	9	09	<50	<50	0	
CSAH 23/Pioneer Road Intersection													
Movement Volume	10	430	06	10	1080	10	510	20	20	10	40	09	
Level of Service (LOS)	<b>L</b>	ပ	4	ш	ш	В		L	8		S	۷	ш
Control Delay per Vehicle (sec)	84	24	<10	84	>120	12	>120	20	18	30	0	<10	102
Average Queuing Length (ft.)	(20	260	<50	<50	1300	<50	39	089	<50	<50	0:	<50	
CSAH 36/Johnson Lane Intersection													
Movement Volume	50	460	10	0	1020	280	10	0	10	180	0	20	
Level of Service (LOS)	٥	4	4	4	В	A		ပ		٥		В	a
Control Delay per Vehicle (sec)	20	<10	<10	<10	91	<10		22		38	8	12	14
Average Queuing Length (ft.)	(20	09	<50	<50	240	<50		<50		<50	0:	<50	
Greenway Avenue Intersection													
Movement Volume	98	1600	160	20	200	40	06	09	110	20	09	80	
Level of Service (LOS)	<b>E</b>	ш	4	ш	8	٧	ш			ш	Ш		ш
Control Delay per Vehicle (sec)	282	120	<10	102	14	<10	>120	9	99	>120	09	_	84
Average Queuing Length (ft.)	08	>1300	<50	<50	420	<50	120	1	140	09	120	0	
CSAH 23/Pioneer Road Intersection													
Movement Volume	9 20	1260	200	10	089	10	170	09	20	20	06	20	
Level of Service (LOS)	<b>H</b>	ш	4	ш	8	A		L	8	٥		В	۵
Control Delay per Vehicle (sec)	94	89	<10	84	18	<10	92	2	16	20	0	16	46
Average Queuing Length (ft.)	20	>1300	<50	<50	400	<50	22	220	<50	100	0	<50	
CSAH 36/Johnson Lane Intersection													
Movement Volume	09	1210	10	10	099	180	10	0	10	330	10	30	
Level of Service (LOS)	ъ	ш	4	ш	ပ	٧		ပ			L	В	ш
Control Delay per Vehicle (sec)	84	64	<10	84	22	<10		28		>120	50	91	26
(4) thene I eniman occurrent													

\* - TH 8 is considered the East-West Street at all intersections

The analyses for Scenario 2 show that the existing intersection capacity would not be sufficient to handle the forecasted 2030 volumes. The Intersection at Greenway Avenue and would fail during both peak hours with the left turn movement not having enough green time for the volume of traffic. The intersection at CSAH 23 would fail during the a.m. peak hour, and several movements, including the highest volume movement (eastbound TH 8 through trips) would operate at LOS E or worse during the p.m. peak hour. The intersection at CSAH 36/Johnson Lane is expected to operate acceptably during the a.m. peak hour, but would operate at LOS E during the p.m. peak, with the left turn movements and the high volume eastbound TH 8 through trips suffering extended delays.

## Year 2030 with Proposed Roadway Improvements

This scenario uses the same forecasted 2030 volumes that were used in the previous scenario. However, this analysis scenario used improved geometries for each of the three traffic signal controlled intersections that provide more capacity based on the planning alternatives. The intersection improvements are as follows:

- TH 8 and Greenway Avenue This intersection would now provide an additional through lane for the TH 8 approaches so they are served by exclusive left turn, and right turn lanes, and two through lanes. The Greenway Avenue approaches would stay the same, each providing an exclusive left turn lane and a shared through/right turn lane. The TH 8 left turns are protected only, while the Greenway Avenue left turns are permissive.
- TH 8 and CSAH 23 This intersection would be expanded so that the TH 8 approaches are served by exclusive left turn and right turn lanes, and two through lanes. The CSAH 23 approaches now each provide exclusive left turn, through and right turn lanes. The TH 8 left turns would be protected only, while the CSAH 23 left turns would be protected/permissive.
- TH 8 and CSAH 36/Johnson Lane The only changes to this intersection would be to provide an additional through lane for TH 8 so that the approaches are served by exclusive left turn and right turn lanes, and two through lanes. The minor approaches stay the same with the Johnson Lane approach providing one shared left turn/through/right turn lane and the CSAH 36 approach providing a shared left turn/through lane and an exclusive right turn lane. The left turn signaling would remain the same with TH 8 being protected. The minor approaches, with shared left turn lanes, are permissive.

Table 3 shows the results of the analyses for the 2030 Improved Intersection Geometry scenario, including volumes (same as the previous scenario) LOS, average delay per vehicle and average queue length.

Table 3. 2030 Improved Geometry Level of Service, and Average Delay and Queue Lengths

0	30	ln	ıρ	rc	<b>)</b> V	ec	10	эe	or	ne	tr	y l	_e	VE	<u>)  </u>	of	S	er	/ic	e,	aı	nd	Α	V	era	ag	е	De	ela	ıy	ar	<u>ıd</u>	Q	u
	!	L				၁	26				ပ	26				∢	10				В	14				В	18				В	18		
			Right		110	٧	<10	<50		09	∢	<10	<i>~20</i>		20	∢	<10	<50	E	80	В	14	<50		20	В	12	<50		30	٧	<10	<50	
		SOUTHBOUND	Through		20	•	v	*		40	ပ	24	<50		0	S	30	90		09		1	*		06	၁	30	<20		10	Q	44	140	
			Left		10	В	20	<50		10	ω	14	<i>~20</i>		180		.,	9		20	ပ	56	~20		20	В	20	<50		330		4	1.	
			Right		45	В	14	<50		20	4	<10	<20		10					115	8	14	<50		20	В	12	<20		10				
		NORTHBOUND	Through		20			v		20	ω	14	> 20		0	В	12	<50		09			v		09	၁	22	<50		0	В	12	<i>~20</i>	
			Left		255	٥	25	120		210	ပ	56	160		10					105	ပ	32	<50		170	ပ	22	09		10				
			Right		100	٧	<10	<50		10	∢	10	<20		280	∢	<10	<50		40	4	<10	<20		10	٧	<10	<20		180	٧	<10	<50	
		WESTBOUND*	Through		1515	၁	28	360		1080	ပ	32	240		1020	∢	<10	80		775	8	12	100		089	В	18	140		099	В	14	120	
			Left		25	၁	æ	<50		10	۵	40	<i>~20</i>		0	∢	<10	<50		25	ပ	34	<50		10	۵	44	<50		10	၁	32	<50	
			Right		20	٧	ot>	<50		6	∢	<10	<20		10	∢	<10	<50		165	4	<10	<50		200	٧	<10	<20		10	٧	<10	<50	
		EASTBOUND*	Through		420	¥	10	<50		430	ω	18	80		460	4	<10	<50		1595	m	12	160		1260	ပ	20	260		1210	В	16	180	
			Left		80	۰ (	48	(20		10	۵	40	(20		50	ပ	34	·		80	ပ	32	(20		9	۰ (	97	(20		09	<b>D</b>	36	(20	
	2030 WITH IMPROVEMENTS CONDITIONS		Intersection	Greenway Avenue Intersection	Movement Volume	Level of Service (LOS)	Control Delay per Vehicle (sec)	Average Queuing Length (ft.)	CSAH 23/Pioneer Road Intersection	Movement Volume	Level of Service (LOS)	Control Delay per Vehicle (sec)	Average Queuing Length (ft.)	CSAH 36/Johnson Lane Intersection	Movement Volume	Level of Service (LOS)	Control Delay per Vehicle (sec)	Average Queuing Length (ft.)	Greenway Avenue Intersection	Movement Volume	Level of Service (LOS)	Control Delay per Vehicle (sec)	Average Queuing Length (ft.)	CSAH 23/Pioneer Road Intersection	Movement Volume	Level of Service (LOS)	Control Delay per Vehicle (sec)	Average Queuing Length (ft.)	CSAH 36/Johnson Lane Intersection	Movement Volume	Level of Service (LOS)	Control Delay per Vehicle (sec)	Average Queuing Length (ft.)	
	N								ınc	H >	69	d .N	Λ.Α											ınc	)H	63	d .N	И.Ч						ı

\* - TH 8 is considered the East-West Street at all intersections

With the improved capacity at the traffic controlled intersections, all three are expected to operate in an acceptable manner with the forecasted 2030 volumes.

In addition to analyzing the traffic signal controlled intersection, this study also looked at two other components of the planned roadway improvements. These components are minor stop controlled intersections and the lane drop at the east end of the study area.

#### MINOR INTERSECTION TRAFFIC SIGNAL WARRANTS

One element of the roadway improvements is access management. Where possible, low volume public roads and private accesses will be linked using frontage and backage roads, and traffic will be concentrated to less frequent intersections with TH 8. In addition to the three traffic signal controlled intersections, there will be several stop controlled intersections. Generally, in order to perform a traffic signal warrant study, hourly approach volumes are required for all legs of the subject intersections. Because minor approach traffic volumes are unknown for both existing and future conditions, traffic signal warrant evaluations were performed in a different manner than usual. Instead of determining how many hours of each warrant is met based on volumes, the minor approach threshold for the warrant to be met was determined based on major street volumes.

Hourly directional volumes were collected at two locations on TH 8 during a 48-hour period from September 16-18, 2009. The collection locations were on the segment west of CSAH 23 near Hazel Avenue, and on the segment east of CSAH 23 near 270<sup>th</sup> Street. The two days worth of volumes were averaged to get hourly volumes for each direction for a 24-hour period. Upon entering the volumes from the two segments into the warrant criteria, it was determined that the threshold results are the same at both locations. The results based on this method are as follows:

- In order for the Eight-Hour Vehicular Volume Warrant (Warrant 1) to be met, the highest volume approach of the minor street of an unsignalized intersection must have a minimum of 70 vehicles per hour for eight different hours of the day
- In order for the Four-Hour Vehicular Volume Warrant (Warrant 2) to be met, the highest volume approach of the minor street of an unsignalized intersection must have a minimum of 80 vehicles per hour (for a two lane approach) or a minimum of 60 vehicles per hour (for a one lane approach) for four different hours of the day.
- Warrant 3 does not pertain to any of these locations because there is not an intense traffic generator that would discharge a large number of vehicles over a short time.
- Warrant 4 does not pertain to any of these locations because it involves a high number of pedestrians in the vicinity of the intersection.
- Warrant 5 does not pertain to any of these locations because it deals with a school crossing.
- Warrant 6 does not pertain to any of these locations because it deals with a coordinated signal system.

• Warrant 7 is not met, as it deals with a level of injury crashes that has not been experienced at these locations.

# EAST END LANE DROP

At the east end of the study area and proposed roadway improvements, the 4-lane roadway will taper back into a 2-lane roadway. This will occur east of the CSAH 36/Johnson Lane intersection, and west of CR 80 and Chisago City. Analyses were performed to determine the impact of the eastbound lane drop on traffic during the weekday p.m. peak hour.

The roadway network, from west of the CSAH 36/Johnson Lane intersection through the lane drop, was modeled using Synchro. The signal timing and geometry of the intersection were modeled so that the correct platooning would be represented for the simulation. Forecasted 2030 volumes were entered for the intersection and the lane drop area, and the network was simulated using the SimTraffic program.

The result for the 2030 volumes was a zipper type merge with an extended queue and long delay. The average queue during the peak hour was over 1/3 of a mile, with average speeds at the lane drop down to 5 mph. With the results identifying that the lane drop will not work under 2030 conditions, incremental analyses were performed to determine what year the lane drop is expected to break down during the p.m. peak hour period. Results of the incremental analyses are shown in Table 4. Figure 2 shows a graphical representation of the results.

Table 4. TH 8 Lane Drop – P.M. Peak Hour Analysis Results

YEAR	EB Volume	WB Volume	AVG EB Queue	AVG EB Speed
2009	1014	551	5'	43 mph
2015	1142	621	55'	36 mph
2020	1261	685	125'	31 mph
2022	1312	713	190'	25 mph
2024	1365	742	430'	17 mph
2026	1420	772	480'	15 mph
2028	1477	803	1160'	8 mph
2030	1537	835	1940'	5 mph

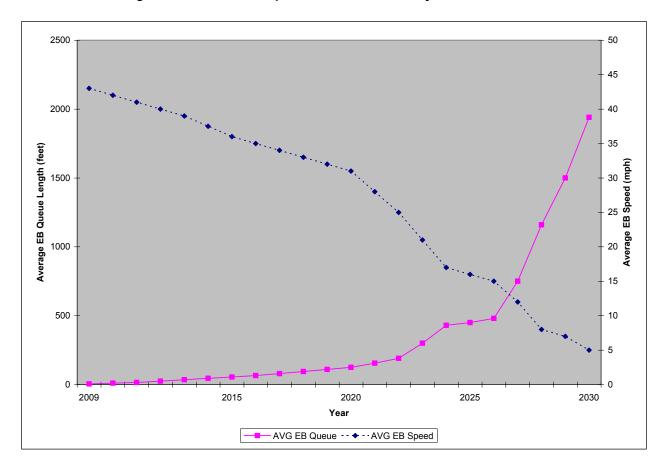


Figure 2. TH 8 Lane Drop - P.M. Peak Hour Analysis Results Chart

Based on the results from the simulation, it appears that the lane drop will start to break down sometime around the year 2024, and will start to fail in 2024. By 2027 the queues become far too unmanageable for this type of roadway.

These analyses results represent the busiest one hour period in the day, and thus, an event that is likely to occur less than 5% of the time until 2025 and beyond when queuing and delay would occur in the 2<sup>nd</sup> and 3<sup>rd</sup> busiest hours of the day.

#### **SUMMARY**

This technical memorandum evaluated the traffic conditions on TH 8 under existing and forecasted 2030 volumes using the existing roadway conditions and with planned improvements. The analysis consisted of an evaluation of traffic signal controlled intersection operation, minor intersection signal warrant thresholds and the proposed lane drop on the east end of the study area.

The following is a summary of the information and analyses presented in this memo:

- Turning movement counts were collected at the three traffic signal controlled intersections during the peak periods on a typical weekday in April 2009. Hourly directional volumes were collected at two locations on TH 8 over a 48-hour weekday period in September 2009.
- Using a 2% per year growth rate over 21 years, 2030 a.m. and p.m. peak hour volumes were forecasted.
- The three traffic signal controlled intersections in the study area are expected to operate in an unacceptable manner under 2030 conditions with existing geometry and traffic control.
- When intersection capacity is expanded based on the planned improvements, each operates at an acceptable manner during both peak hour periods.
- Minor cross streets would need 70 vehicles per hour for eight individual hours, and 60 or 80 vehicles per hour for four individual hours to meet eight-hour and four-hour traffic signal warrants respectively.
- The lane drop at the east end of the planned improvement area is expected to operate in an acceptable manner until around the year 2024, where it starts rapidly deteriorating until becoming unmanageable during the p.m. peak hour by the year 2027.

# **Appendix H**

Traffic Noise Analysis Report



# TRAFFIC NOISE ANALYSIS REPORT

May 3, 2013

# **TH 8 Environmental Assessment Worksheet**

#### 1.0 INTRODUCTION AND PROJECT DESCRIPTION

### **Project Description**

The Trunk Highway 8 (TH 8) project from Greenway Avenue North to Karmel Avenue (S.P. 1308-17PE) is a colaborative effort led by the Minnesota Department of Transportation (MnDOT). The proposed project is considered an expansion project to provide design year 2030 capacity on the existing alignment. As the TH 8 project is in the pre-NEPA stage of the project development process, a preferred alternative has not yet been selected. As such, future studies and environmental reviews will be required as part for the NEPA review process to provide for the determination of a preferred alternative.

Following a two-tiered screening process, Transportation Advisory Committee (TAC) members of the project along with input from city councils of Wyoming and Chisago City reached a consensus in fall 2012 on recommending the "Alternative 5" concept footprint to guide future development along the corridor. The Alternative 5 concept consists of a 7-mile four-lane divided roadway footprint generally located within the existing TH 8 corridor that shifts north and south of the existing roadway according to existing conditions. The footprint also identifies direct private access to TH 8 that will be redirected to frontage roads as well as intersection improvements at signalized and unsignalized intersections along the corridor. The purpose of this planning-level noise study is to provide guidance in future land-use development along the proposed TH 8 expansion corridor.

#### Background Information on Noise

Noise is defined as any unwanted sound. Sound travels in a wave motion and produces a sound pressure level. This sound pressure level is commonly measured in decibels. Decibels (dB) represent the logarithm of the ratio of a sound energy relative to a reference sound energy. For highway traffic noise, an adjustment, or weighting, of the high- and low- pitched sound is made to approximate the way that an average person hears sound. The adjusted sound levels are stated in units of "A-weighted decibels" (dBA). A sound increase of 3 dBA is barely perceptible by the human ear, a 5 dBA increase is clearly noticeable, and a 10 dBA increase is heard as twice as loud. For example, if the sound energy is doubled (i.e., the amount of traffic doubles), there is about a 3 dBA increase in noise, which is just barely noticeable to most people. On the other

hand, if traffic increases to where there is an increase of 10 times the sound energy, then there is about a 10 dBA increase in level and it is heard as twice as loud.

In Minnesota, traffic noise impacts are evaluated by measuring and/or modeling the traffic noise levels that are exceeded 10 percent of the time during the hours of the day that have the loudest traffic. These numbers are identified as the  $L_{10}$  sound level metric. Similarly, the  $L_{50}$  sound level metric is defined as traffic noise level that is exceeded 50 percent of the time. **Table 1** provides a rough comparison of the noise levels of some common noise sources.

# TABLE 1 COMMON NOISE SOURCES

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 75 feet)
130	Jet Aircraft (at 300 feet)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper
Source: "A guide to Noise Control in Minhttp://www.pca.state.mn.us/programs/pub	nnesota," Minnesota Pollution Control Agency, s/noise.pdf and "Highway Traffic Noise,"

FHWA, <a href="http://www.fhwa.dot.gov/environment/htnoise.htm">http://www.fhwa.dot.gov/environment/htnoise.htm</a>.

Along with the volume of traffic and other factors (e.g., topography of

Along with the volume of traffic and other factors (e.g., topography of the area and vehicle speed) that contribute to the loudness of traffic noise, the distance of a receptor from a sound's source is also an important factor. Sound level decreases as distance from a source increases. The following rule of thumb regarding sound decreases due to distance is commonly used. Beyond approximately 50 feet, each time the distance between a line source (such as a road) and a receptor is doubled, sound levels decrease by approximately 3 dBA over hard ground, such as pavement or water, and by approximately 4.5 dBA over grassy and vegetated areas.

# Federal and State Noise Standards

This study was conducted in accordance with the 2011 Minnesota Noise Policy, which is an implementation of the FHWA Noise Standard found at 23 CFR 772. MnDOT must address both the FHWA Noise Standards and the Minnesota State Noise Standards (Minn. R. 7030). Minnesota State Noise Standards are regarded as absolute limits which carry the weight of law;

however, Minnesota Statute 116.07 Subd. 2a. lists certain exemptions from the state noise standards, including the following:

"No standards adopted by any state agency for limiting levels of noise in terms of sound pressure level which may occur in the outdoor environment shall apply to (1) segments of trunk highways constructed with federal interstate substitution money, provided that all reasonably available noise mitigation measure are employed to abate noise, (2) an existing or newly constructed segment of a highway, provided that all reasonably available noise mitigation measures, as approved by the commissioners of the department of transportation and pollution control agency, are employed to abate noise and (3) except for the cities of Minneapolis and St. Paul, an existing or newly constructed segment of a road, street, or highway under the jurisdiction of a road authority of a town, statutory or home rule charter city, or county, except for roadways for which full control of access has been acquired."

Noise impacts are assessed when predicted worst hourly  $L_{10}$  noise levels for future build alternatives either:

- 1) Exceed existing noise levels by 5 dBA or more,
- 2) Exceed Minnesota State Noise Standard noise levels in **Table 2**, or
- 3) Approach (within 1 dBA) or exceed the FHWA Noise Abatement Criteria (NAC) in **Table 3**

In addition, the FHWA allows states to define *approach* and *substantially exceed*. In Minnesota, approach is defined as being 1 dB less than the NAC, and substantially exceed is defined as being 5 dB greater than existing noise levels.

TABLE 2 MINNESOTA STATE NOISE STANDARD

		Exterior Hourly Noise Level Limit, dBA				
	Code	Day	time	Night	ttime	
	NAC: Noise Area	7:00 a.m. to	10:00 p.m.	10:00 p.m. to 7:00 a.m.		
Land Use	Classification	L <sub>10</sub>	L <sub>50</sub>	L <sub>10</sub>	L <sub>50</sub>	
Residential	NAC-1	65	60	55	50	
Commercial	NAC-2	70	65	70	65	
Industrial	NAC-3	80	75	80	75	

#### Notes

- 1. NAC-1 includes household units, transient lodging and hotels, education, religious, cultural entertainment, camping and picnicking land uses
- 2. NAC-2 includes retail and restaurants, transportation terminals, professional offices, parks, recreational and amusement land uses.
- 3. NAC-3 includes industrial, manufacturing, transportation facilities (except terminals), and utilities land uses
- 4. From Minnesota Pollution Control Agency, Minn. Rules sec. 7030.0040

TABLE 3
FEDERAL NOISE ABATEMENT CRITERIA

	Activity Criteria (1,2)	Evaluation	
Activity Category	L <sub>10</sub> (h), dBA	Location	Activity Description
А	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B(3)	70	Exterior	Residential
C(3)	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, place of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	55	Interior	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E(3)	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F			Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G			Undeveloped lands that are not permitted

#### Notes

Source: MnDOT 2011 Noise Policy

# 2.0 ANALYSIS METHODOLOGY

The purpose of this planning-level noise analysis is to determine the setback distances from the project footprint to which State noise standards and Federal NAC are exceeded under 2030 build worst case traffic conditions.

# **Noise Monitoring**

Noise measurements were conducted in five representative locations across the study area, and are illustrated in **Figure 1**. The noise measurements were performed in accordance with FHWA-PD-96-046 and Minnesota Statute 7030.0060. The noise monitoring was completed with a Type

<sup>(1)</sup> L10(h) shall be used for impact assessment.

<sup>(2)</sup> The L10(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

<sup>(3)</sup> Includes undeveloped lands permitted for this activity category.

II sound meter (see **Table 4**). The noise measurements were made on May 21, 2009 and June 4, 2009 (see **Table 5**). Wind speeds varied between 2 and 13 mph, and Relative Humidity varied between 28 and 46 percent. The sound level meter was calibrated before use according to MnDOT and FHWA policy.

TABLE 4 NOISE MEASUREMENT EQUIPMENT

	Serial			Certificate
Model	Number	Туре	Calibration Date	Number
DB 2000	4029BD3080	DOSIMETER	05/13/2009	1068008402
DB-3080	4023603060	DOSIMETER	05/15/2009	9DB3080

These field measurements were used provide background noise information adjacent to the proposed alignment.

TABLE 5 MEASURED NOISE LEVELS, DBA

		Distance	
Location		To Nearest	Measured
Identifier	Time of Day	Centerline (ft.)	$L_{10}$ (dBA)
NM 1	14:50-15:20	100	71
NM 2	13:20-13:35	65	70
NM 3	14:00-14:25	140	63
NM 4	15:00-15:30	180	70
NM 5	14:10-14:35	130	65

## 3.0 PREDICTED NOISE LEVELS

# **Noise Modeling**

The traffic noise analysis conducted for the TH 8 Alternatives Evaluation used a simplified planning-level approach in conjunction with Minnesota's traffic noise model MINNOISE, a modified version of FHWA's STANIMA 2.0 traffic noise model. This model uses traffic volumes, speed, class of vehicle, and the typical characteristics (e.g., roadway alignment) of the roadway being analyzed. The simplified analysis assumes the project area is completely flat and calculates noise levels at selected distances from the roadway. An acoustically "soft" surface was assumed. This analysis does not take into account hills and other terrain features that can reduce noise.

The TH 8 project corridor is located in an area with a mix of residential, commercial, and agricultural land uses. Residences, places of worship, and commercial properties are located adjacent to either side of the roadway throughout the length of the corridor.

The analysis was performed for existing (2009), No Build and Build (Alternative 5) (2030) worst case traffic conditions.

The model was used to predict the noise-levels at various locations for each alternative. For purposes of this noise study discussion, the metric used was the daytime  $L_{10}$ , while the daytime  $L_{50}$  and nighttime  $L_{10}$  and  $L_{50}$  values are tabulated at the end of this study.

The project was divided into three sections to account for different traffic volumes on each of the sections, and are described below. The noise levels were modeled for each of these sections.

- Section 1: TH 8 between Greenway Avenue and CSAH 23: Existing TH 8 is a two-lane roadway at this location. Land use north of TH 8 is a mix of residential and commercial. Land use south of TH 8 is mostly residential. There are a number of unsignalized and signalized intersections along this section.
- Section 2: TH 8 between CSAH 23 and Johnson Lane. Existing TH 8 is a two-lane roadway at this location. Land use north and south of TH 8 is a mix of residential and agricultural. There are a number of unsignalized intersections along this section, with signalized intersections at CSAH 23 and Johnson Lane.
- Section 3: TH 8 between Johnson Lane and Karmel Avenue. Existing TH 8 is a twolane roadway at this location. Land use north and south of TH 8 is a mix of residential, commercial, and agricultural. There are a number of unsignalized intersections along this section, with signalized intersections at Johnson Lane and Karmel Avenue.

A MINNOISE input file was developed for each of the three sections described above for the existing (2009), No Build and Build (Alternative 5) (2030) worst case traffic conditions. Noise levels were modeled at receptors at 50-foot intervals from the roadway footprint centerline out to 400 feet. Past 400 feet noise levels were modeled at 200-foot intervals up to 1000 feet from the roadway footprint centerline. See **Figure 1** for modeled receptor locations.

The daytime and nighttime traffic volumes and vehicle mixes (auto, medium truck, and heavy truck) for existing (2009) and future (2030) build and no-build conditions were assumed to be the highest volume hours for the corridor with free-flowing traffic. The highest free-flowing volumes occur between 7:30 a.m. and 8:30 a.m. for daytime and between 6:00 a.m. and 7:00 a.m. for nighttime. These traffic conditions are presented in **Table 11** and **Table 12** at the end of this report.

#### Model Resuls

Noise levels were modeled at setback distances of up to 1000 feet from the centerline of the roadway footprint for the existing (2009), No-Build (2030), and Build (2030) conditions to determine the setback distance at which State and Federal noise standards are exceeded. **Table 7** summarizes the noise model results for each condition.

Daytime  $L_{10}$  noise modeling results along TH 8 are presented for each section of the project corridor in **Tables 6a through 6c.** Nighttime  $L_{10}$  and  $L_{50}$ , and Daytime  $L_{50}$  noise modeling results are presented in **Tables 8a through 10c** at the end of this report. State standards and Federal NAC for land uses are also shown in each table.

TABLE 6a DAYTIME  $L_{10}$  NOISE PREDICTION RESULTS FOR SECTION 1, DBA TH 8 BETWEEN GREENWAY AVENUE AND CSAH 23

	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	54.6	56.1	57.3	2.7
	800	56.4	57.9	59.3	2.9
	600	58.7	60.2	61.8	3.1
	400	61.7	63.3	65.1	3.4
North	350	62.8	64.3	66.2	3.4
NOTUI	300	63.9	65.5	67.4	3.5
	250	65.3	66.9	68.8	3.5
	200	66.9	68.5	70.6	3.7
	150	68.9	70.5	72.8	3.9
	100	71.7	73.4	76.2	4.5
	100	72.0	73.7	76.0	4.0
	150	69.2	70.9	73.0	3.8
	200	67.2	68.8	70.8	3.6
	250	65.7	67.2	69.1	3.4
South	300	64.4	65.9	67.8	3.4
South	350	63.3	64.8	66.6	3.3
	400	62.3	63.8	65.5	3.2
	600	59.3	60.8	62.4	3.1
	800	57.1	58.6	60.1	3.0
	1000	55.4	56.9	58.3	2.9
Federal NAC	B and C	70	70	70	
rederal NAC	E	75	75	75	
MN Standards	NAC-1	65	65	65	
IVIIV Stallualus	NAC-2	70	70	70	

**Bold** indicates noise levels exceed Minnesota State Standards *Italic* indicates noise levels approach or exceed Federal NAC <u>Underline</u> indicated project noise levels substantially exceed existing noise levels

TABLE 6b DAYTIME  $L_{10}$  NOISE PREDICTION RESULTS FOR SECTION 2, DBA TH 8 BETWEEN CSAH 23 AND JOHNSON LANE

	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	54.0	55.5	57.3	3.9
	800	55.7	57.2	59.1	3.9
	600	57.9	59.4	61.3	4.0
	400	60.9	62.4	64.5	3.9
North	350	61.8	63.4	65.6	4.1
NOTE	300	63.0	64.6	66.8	4.0
	250	64.2	65.8	68.3	4.1
	200	65.8	67.4	69.9	4.2
	150	67.7	69.5	72.2	4.4
	100	70.5	72.3	75.7	4.8
	100	70.4	72.2	74.2	4.2
	150	67.8	69.5	71.2	4.0
	200	65.8	67.5	69.2	3.9
	250	64.2	65.8	67.5	3.9
South	300	62.9	64.5	66.2	3.8
South	350	61.8	63.4	65.1	3.8
	400	60.9	62.4	64.2	3.8
	600	57.8	59.4	61.1	3.8
	800	55.6	57.1	58.9	3.9
	1000	53.9	55.4	57.2	3.9
Fodoval NAC	B and C	70	70	70	
Federal NAC	Е	75	75	75	
MN Standards	NAC-1	65	65	65	
iviiv Standards	NAC-2	70	70	70	

**Bold** indicates noise levels exceed Minnesota State Standards *Italic* indicates noise levels approach or exceed Federal NAC

<u>Underline</u> indicated project noise levels substantially exceed existing noise levels

TABLE 6c DAYTIME  $L_{10}$  NOISE PREDICTION RESULTS FOR SECTION 3, DBA TH 8 BETWEEN JOHNSON LANE AND KARMEL AVENUE

	Distance	<u>- · · · · · · · · · · · · · · · · · · ·</u>			Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	54.0	55.5	57.9	3.9
	800	55.8	57.3	59.7	3.9
	600	58.1	59.7	62.1	4.0
	400	61.3	62.8	65.2	3.9
North	350	62.2	63.8	66.3	4.1
North	300	63.4	65.0	67.4	4.0
	250	64.7	66.3	68.8	4.1
	200	66.3	67.9	70.5	4.2
	150	68.3	70.0	72.7	4.4
	100	71.0	72.8	<i>75.8</i>	4.8
	100	71.0	72.8	<i>75.2</i>	4.2
	150	68.3	70.0	72.3	4.0
	200	66.3	67.9	70.2	3.9
	250	64.7	66.3	68.6	3.9
South	300	63.4	65.0	67.2	3.8
South	350	62.3	63.8	66.1	3.8
	400	61.3	62.8	65.1	3.8
	600	58.2	59.7	62.0	3.8
	800	55.9	57.4	59.8	3.9
	1000	54.1	55.6	58.0	3.9
Federal NAC	B and C	70	70	70	
rederal NAC	E	75	75	75	
MN Standards	NAC-1	65	65	65	
IVIIV Stalldards	NAC-2	70	70	70	

**Bold** indicates noise levels exceed Minnesota State Standards *Italic* indicates noise levels approach or exceed Federal NAC

<u>Underline</u> indicated project noise levels substantially exceed existing noise levels

The results of the daytime and nighttime traffic noise contours calculations for each section of the TH 8 project corridor are discussed below.

Section 1: TH 8 between Greenway Avenue and CSAH 23 – For the No-Build condition,  $L_{10}$  daytime State noise standards were exceeded along this segment up to approximately 300 feet from centerline, and  $L_{50}$  up to 400 feet. For the Build condition,  $L_{10}$  standards were exceeded up to approximately 400 feet of the footprint centerline, and the  $L_{50}$  up to 400 feet. For both the build and the no-build scenario, nighttime standards were exceeded beyond 1000 feet.

Section 2: TH 8 between CSAH 23 and Johnson Lane – For the No-Build condition,  $L_{10}$  daytime State noise standards were exceeded along this segment up to approximately 250 feet from centerline, and  $L_{50}$  up to 300 feet. For the Build condition,  $L_{10}$  standards were exceeded up to approximately 350 feet of the footprint centerline, and the  $L_{50}$  up to 400 feet. For both the build and the no-build scenario, nighttime standards were exceeded beyond 1000 feet.

Section 3: TH 8 between Johnson Lane and Karmel Avenue – For the No-Build condition,  $L_{10}$  daytime State noise standards were exceeded along this segment up to approximately 250 feet from centerline, and  $L_{50}$  up to 300 feet. For the Build condition,  $L_{10}$  standards were exceeded up to 400 feet of the footprint centerline, and the  $L_{50}$  up to 400 feet. For both the build and the no-build scenario, nighttime standards were exceeded beyond 1000 feet.

It is important to note that the results shown above and described below illustrate approximate worst case traffic noise levels, given the model assumptions and traffic volumes that were used to generate the model input files and the model output. The noise analysis results describe distances from the TH 8 roadway centerline where state and federal regulated noise thresholds are anticipated to be exceeded for residential and commercial land uses, based on the assumptions used to generate the model input files and the traffic volumes used with each model run. These distances should only be used as a reference guide in community planning and do not necessarily represent distances from the TH 8 corridor where state and federal regulatory noise thresholds would be exceeded based on final roadway design.

#### 4.0 CONSIDERATION OF NOISE ABATEMENT

This EAW for this project provides background data for consideration of the proposed solution alternative to be evaluated during the future National Environmental Policy Act (NEPA) phase of the project if funding for project construction is identified. The goal of this current TH 8 study is to identify a footprint for right of way preservation that would guide future development along the corridor. When the project enters into the NEPA review process, evaluation of noise abatement is to be conducted in accordance with the applicable MnDOT noise policy at the time of the NEPA review.

#### 5.0 CONCLUSION / INFORMATION FOR LOCAL OFFICIALS

A planning-level noise analysis calculated the potential noise impact contours for the no-build and build alternatives for the TH 8 expansion solution. **Table 7** below provides approximate setbacks to noise impact contours for purposes of planning future development along the project corridor until the full NEPA process is intiated.

A more detailed noise analysis should be completed with the next phase of the environmental documentation for the project. This analysis should include noise modeling at specific receiver locations along the project corridor, along with an analysis of noise abatement measures if necessary.

TABLE 7 APPROXIMATE DISTANCES TO DAYTIME  $L_{10}$  65 DBA RECEPTOR FOR NAC-1

Alternative	Greenway Avenue to CSAH 23	CSAH 23 to Johnson Lane	Johnson Lane to CR 80
No-Build	300 feet	250 feet	300 feet
Alternative 5	400 feet	350 feet	400 feet

TABLE 8a NIGHTTIME  $L_{10}$  NOISE PREDICTION RESULTS FOR SECTION 1, DBA TH 8 BETWEEN GREENWAY AVENUE AND CSAH 23

	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	53.9	55.4	56.4	2.5
	800	55.7	57.2	58.4	2.7
	600	58.0	59.5	61.0	3.0
	400	61.1	62.6	64.3	3.2
North	350	62.1	63.7	65.5	3.4
NOTH	300	63.3	64.8	66.7	3.4
	250	64.6	66.2	68.2	3.6
	200	66.2	67.8	70.0	3.8
	150	68.2	69.9	72.3	4.1
	100	71.0	72.7	75.8	4.8
	100	71.3	73.0	74.3	3.0
	150	68.6	70.2	71.5	2.9
	200	66.6	68.2	69.5	2.9
	250	65.0	66.6	67.9	2.9
South	300	63.7	65.3	66.5	2.8
South	350	62.6	64.1	65.4	2.8
	400	61.6	63.1	64.4	2.8
	600	58.6	60.1	61.3	2.7
	800	56.5	57.9	59.0	2.5
	1000	54.8	56.2	57.2	2.4
MN Standards	NAC-1	65	65	65	
IVIIV Stallualus	NAC-2	70	70	70	

TABLE 8b NIGHTIME  $L_{10}$  NOISE PREDICTION RESULTS FOR SECTION 2, DBA TH 8 BETWEEN CSAH 23 AND JOHNSON LANE

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	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	53.5	55.0	56.9	3.4
	800	55.2	56.7	58.7	3.5
	600	57.4	58.9	61.0	3.6
	400	60.4	61.9	64.3	3.9
North	350	61.4	62.9	65.4	4.0
NOILII	300	62.5	64.1	66.6	4.1
	250	63.8	65.4	68.1	4.3
	200	65.3	67.0	69.8	4.5
	150	67.3	69.0	72.2	4.9
	100	70.1	71.8	75.8	5.7
	100	70.0	71.7	72.9	2.9
	150	67.3	69.0	70.3	3.0
	200	65.3	67.0	68.3	3.0
	250	63.8	65.4	66.7	2.9
South	300	62.5	64.1	65.5	3.0
South	350	61.4	62.9	64.4	3.0
	400	60.4	61.9	63.5	3.1
	600	57.4	58.9	60.5	3.1
	800	55.2	56.6	58.4	3.2
	1000	53.4	54.9	56.7	3.3
MN Standards	NAC-1	55	55	55	
IVIIV Stallualus	NAC-2	70	70	70	

TABLE 8c NIGHTTIME  $L_{10}$  NOISE PREDICTION RESULTS FOR SECTION 3, DBA TH 8 BETWEEN JOHNSON LANE AND KARMEL AVENUE

	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	53.9	55.4	57.7	3.8
	800	55.8	57.3	59.5	3.7
	600	58.1	59.6	61.8	3.7
	400	61.2	62.8	65.0	3.8
North	350	62.2	63.8	66.0	3.8
North	300	63.4	64.9	67.2	3.8
	250	64.7	66.3	68.6	3.9
	200	66.3	67.9	70.3	4.0
	150	68.3	69.9	72.5	4.2
	100	71.1	72.8	75.6	4.5
	100	71.0	72.8	74.8	3.8
	150	68.3	70.0	71.9	3.6
	200	66.3	67.9	69.9	3.6
	250	64.7	66.3	68.3	3.6
South	300	63.4	65.0	67.0	3.6
South	350	62.2	63.8	65.8	3.6
	400	61.2	62.8	64.8	3.6
	600	58.2	59.7	61.7	3.5
	800	55.9	57.4	59.5	3.6
	1000	54.1	55.6	57.7	3.6
MN Standards	NAC-1	55	55	55	
IVIN Standards	NAC-2	70	70	70	

TABLE 9a DAYTIME  $L_{50}$  NOISE PREDICTION RESULTS FOR SECTION 1, DBA TH 8 BETWEEN GREENWAY AVENUE AND CSAH 23

	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	51.3	53.3	54.0	2.7
	800	52.8	54.9	55.8	3.0
	600	54.8	56.9	58.0	3.2
	400	57.3	59.5	60.9	3.6
North	350	58.1	60.3	61.9	3.8
NOTE	300	59.0	61.3	62.9	3.9
	250	60.0	62.3	64.1	4.1
	200	61.3	63.6	65.5	4.2
	150	62.8	65.2	67.1	4.3
	100	64.9	67.3	69.5	4.6
	100	65.2	67.7	69.0	3.8
	150	63.2	65.6	67.1	3.9
	200	61.7	64.1	65.5	3.8
	250	60.5	62.8	64.3	3.8
South	300	59.5	61.8	63.2	3.7
South	350	58.7	60.9	62.3	3.6
	400	57.9	60.1	61.4	3.5
	600	55.5	57.6	58.8	3.3
	800	53.8	55.8	56.8	3.0
	1000	52.4	54.4	55.3	2.9
MM Standards	NAC-1	60	60	60	
MN Standards	NAC-2	65	65	65	

TABLE 9b DAYTIME  $L_{50}$  NOISE PREDICTION RESULTS FOR SECTION 2, DBA TH 8 BETWEEN CSAH 23 AND JOHNSON LANE

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	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	50.5	52.6	54.3	3.8
	800	51.9	54.0	55.7	3.8
	600	53.7	55.8	57.6	3.9
	400	56.0	58.3	60.1	4.1
North	350	56.8	59.0	60.9	4.1
North	300	57.6	59.9	61.8	4.2
	250	58.6	60.9	62.9	4.3
	200	59.7	62.1	64.1	4.4
	150	61.2	63.6	65.7	4.5
	100	63.3	65.8	68.0	4.7
	100	63.2	65.7	66.7	3.5
	150	61.2	63.7	64.9	3.7
	200	59.7	62.1	63.5	3.8
	250	58.6	60.9	62.3	3.7
South	300	57.6	59.9	61.4	3.8
South	350	56.7	59.0	60.5	3.8
	400	56.0	58.2	59.8	3.8
	600	53.6	55.8	57.4	3.8
	800	51.8	53.9	55.7	3.9
	1000	50.4	52.5	54.2	3.8
MM Standards	NAC-1	60	60	60	
MN Standards	NAC-2	65	65	65	

TABLE 9c DAYTIME  $L_{50}$  NOISE PREDICTION RESULTS FOR SECTION 3, DBA TH 8 BETWEEN JOHNSON LANE AND KARMEL AVENUE

	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	50.4	52.5	55.0	4.6
	800	52.0	54.1	56.6	4.6
	600	53.9	56.1	58.6	4.7
	400	56.5	58.7	61.2	4.7
North	350	57.3	59.5	62.0	4.7
NOTE	300	58.2	60.5	63.0	4.8
	250	59.2	61.5	64.0	4.8
	200	60.4	62.8	65.3	4.9
	150	61.9	64.4	66.9	5.0
	100	64.0	66.5	69.1	5.1
	100	64.0	66.5	68.6	4.6
	150	62.0	64.4	66.6	4.6
	200	60.5	62.8	65.1	4.6
	250	59.2	61.6	63.9	4.7
South	300	58.2	60.5	62.8	4.6
South	350	57.3	59.6	61.9	4.6
	400	56.5	58.8	61.1	4.6
	600	54.0	56.2	58.6	4.6
	800	52.2	54.3	56.7	4.5
	1000	50.7	52.7	55.2	4.5
MN Standards	NAC-1	60	60	60	
IVIN Standards	NAC-2	65	65	65	

TABLE 10a NIGHTTIME  $L_{50}$  NOISE PREDICTION RESULTS FOR SECTION 1, DBA TH 8 BETWEEN GREENWAY AVENUE AND CSAH 23

THO BETWEEN GREENWAY AVENUE AND COMM 25						
	Distance				Difference	
	from	Existing	No-Build	Build	Build -	
Direction	Centerline	(2009)	(2030)	(2030)	Existing	
	1000	50.6	52.6	53.1	2.5	
	800	52.1	54.2	54.9	2.8	
	600	54.1	56.2	57.2	3.1	
	400	56.6	58.7	60.1	3.5	
North	350	57.4	59.6	61.1	3.7	
NOTH	300	58.3	60.5	62.1	3.8	
	250	59.3	61.6	63.3	4.0	
	200	60.6	62.9	64.7	4.1	
	150	62.1	64.5	66.5	4.4	
	100	64.1	66.6	69.0	4.9	
	100	64.5	67.0	67.3	2.8	
	150	62.5	64.9	65.7	3.2	
	200	61.0	63.3	64.3	3.3	
	250	59.8	62.1	63.1	3.3	
South	300	58.8	61.1	62.0	3.2	
South	350	58.0	60.2	61.1	3.1	
	400	57.2	59.4	60.3	3.1	
	600	54.8	56.9	57.7	2.9	
	800	53.1	55.1	55.8	2.7	
	1000	51.7	53.7	54.2	2.5	
MM Standards	NAC-1	50	50	50		
MN Standards	NAC-2	65	65	65		

TABLE 10b NIGHTTIME  $L_{50}$  NOISE PREDICTION RESULTS FOR SECTION 2, DBA TH 8 BETWEEN CSAH 23 AND JOHNSON LANE

	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	50.0	52.1	53.8	3.8
	800	51.4	53.5	55.3	3.9
	600	53.1	55.3	57.2	4.1
	400	55.5	57.7	59.8	4.3
North	350	56.2	58.5	60.6	4.4
NOTE	300	57.1	59.4	61.6	4.5
	250	58.0	60.3	62.7	4.7
	200	59.2	61.6	63.9	4.7
	150	60.7	63.1	65.7	5.0
	100	62.7	65.2	68.2	5.5
	100	62.6	65.1	65.3	2.7
	150	60.7	63.1	63.9	3.2
	200	59.2	61.6	62.7	3.5
	250	58.0	60.4	61.5	3.5
Courth	300	57.1	59.3	60.7	3.6
South	350	56.2	58.4	59.8	3.6
	400	55.5	57.7	59.2	3.7
	600	53.1	55.2	56.8	3.7
	800	51.3	53.4	55.1	3.8
	1000	49.9	51.9	53.6	3.7
MM Standards	NAC-1	50	50	50	
MN Standards	NAC-2	65	65	65	

TABLE 10c NIGHTTIME  $L_{50}$  NOISE PREDICTION RESULTS FOR SECTION 3, DBA TH 8 BETWEEN JOHNSON LANE AND KARMEL AVENUE

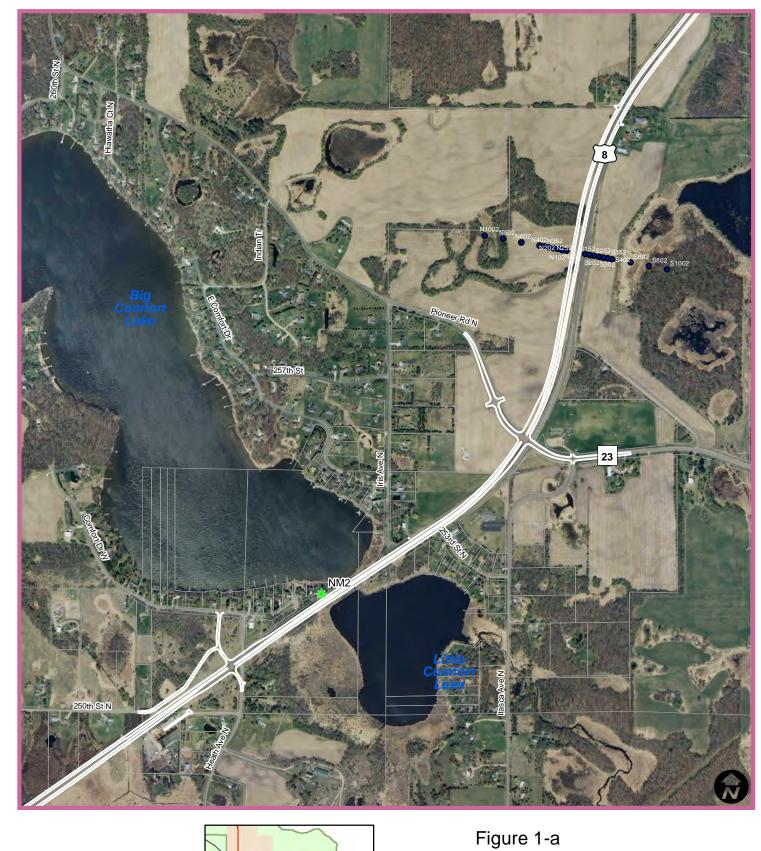
	Distance				Difference
	from	Existing	No-Build	Build	Build -
Direction	Centerline	(2009)	(2030)	(2030)	Existing
	1000	50.4	52.5	54.6	4.2
	800	52.0	54.1	56.2	4.2
	600	54.0	56.1	58.2	4.2
	400	56.6	58.8	60.8	4.2
North	350	57.4	59.6	61.7	4.3
North	300	58.3	60.6	62.6	4.3
	250	59.3	61.6	63.7	4.4
	200	60.6	62.9	65.0	4.4
	150	62.1	64.5	66.6	4.5
	100	64.1	66.6	68.8	4.7
	100	64.1	66.6	67.7	3.6
	150	62.1	64.5	65.9	3.8
	200	60.6	62.9	64.5	3.9
	250	59.4	61.7	63.3	3.9
South	300	58.3	60.6	62.3	4.0
South	350	57.4	59.7	61.4	4.0
	400	56.6	58.8	60.6	4.0
	600	54.1	56.2	58.2	4.1
	800	52.2	54.3	56.3	4.1
	1000	50.7	52.7	54.8	4.1
MN Standards	NAC-1	50	50	50	
ivin Standards	NAC-2	65	65	65	

TABLE 11 DAYTIME (7:00 A.M. TO 10:00 P.M.) EXISTING (2009) AND FUTURE (2030) TRAFFIC CONDITIONS

TOTORE (2000) TRAITIC CONDITIONS						
Scenario	Volume	Auto %	Medium	Heavy		
			Truck %	Truck %		
Existing						
Section 1	1304	88.4	7.4	4.2		
Section 2	971	88.7	8.2	3.1		
Section 3	1110	88.7	8.2	3.1		
2030 No-Build						
Section 1	1976	88.4	7.4	4.2		
Section 2	1472	88.7	8.2	3.1		
Section 3	1682	88.7	8.2	3.1		
2030 Build						
Section 1	1979	91.5	5.7	2.8		
Section 2	1474	88.0	9.2	2.8		
Section 3	1886	88.0	9.2	2.8		

TABLE 12 NIGHTTIME (10:00 P.M. TO 7:00 A.M.) EXISTING (2009) AND FUTURE (2030) TRAFFIC CONDITIONS

Scenario	Eastbound	Auto %	Medium Truck %	Heavy Truck %
			Truck %	Truck %
Existing				
Section 1	1322	91.4	5.3	3.3
Section 2	935	90.3	7.8	1.9
Section 3	1200	90.3	7.8	1.9
2030 No-Build				
Section 1	2004	91.4	5.3	3.3
Section 2	1417	90.3	7.8	1.9
Section 3	1819	90.3	7.8	1.9
2030 Build				
Section 1	2007	94.3	3.3	2.4
Section 2	1420	90.6	7.8	1.6
Section 3	1664	90.6	7.8	1.6



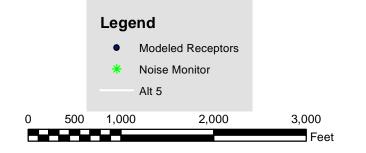
TRUNK HIGHWAY 8 PRELIMINARY DESIGN & ENVIRONMENTAL ASSESSMENT Greenway Avenue North to County Road 80





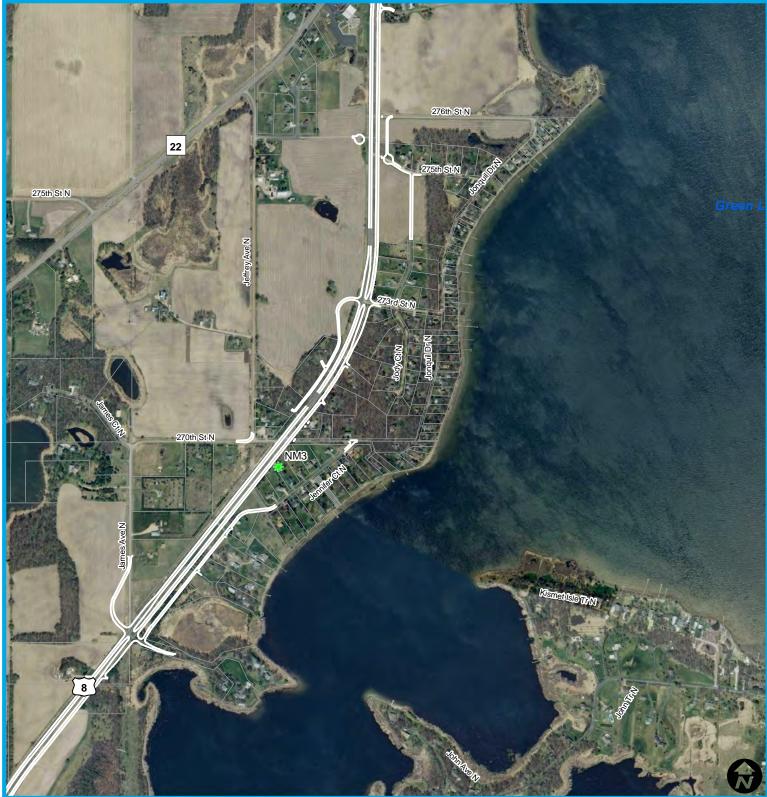


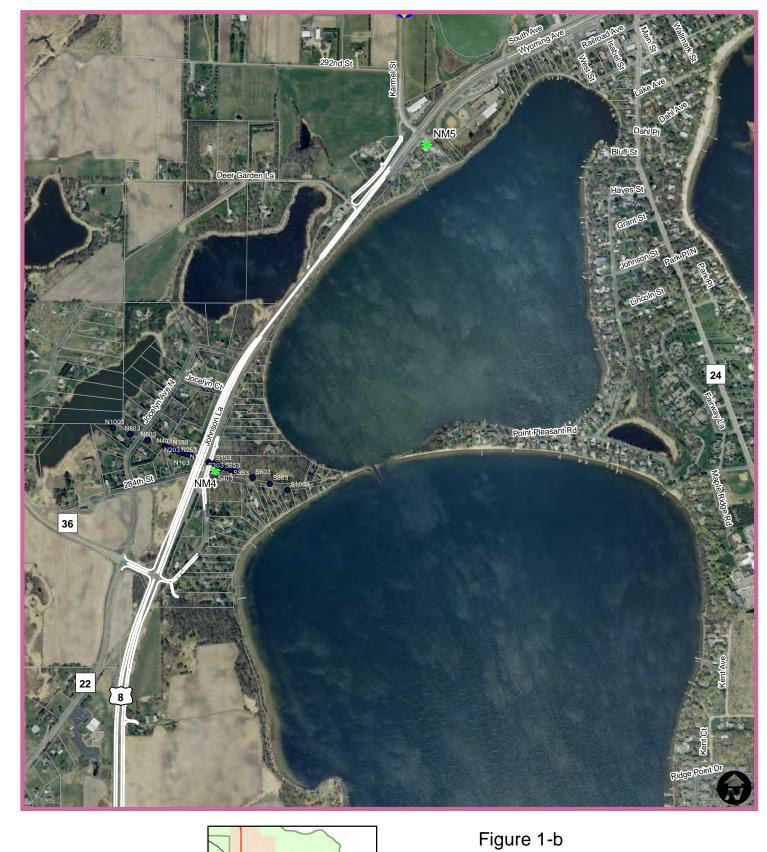






Noise Planning Analysis Modeled Receptor Locations Noise Monitor Locations Alternative 5





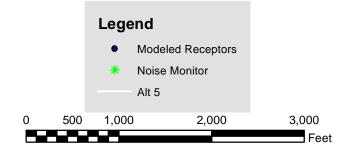
TRUNK HIGHWAY 8 PRELIMINARY DESIGN & ENVIRONMENTAL ASSESSMENT
Greenway Avenue North to County Road 80













Noise Planning Analysis Modeled Receptor Locations Noise Monitor Locations Alternative 5