Environmental Assessment Worksheet

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 or its agents to determine whether an Environmental Impact Statement (EIS) should be prepared. The project proposer must supply any reasonably accessible data for — but should not complete — the final worksheet. If a complete answer does not fit in the space allotted, attach additional sheets as necessary. 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: County State Aid Highway 81 Roadway Reconstruction Project

2. Proposer: Hennepin County

Contact person: Mr. Craig Twinem
Title: Design Division Engineer
Agency: Hennepin County
Address: 1600 Prairie Drive
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3. RGU: Hennepin County

Contact person: Mr. Craig Twinem
Title: Design Division Engineer
Agency: Hennepin County
Address: 1600 Prairie Drive
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4. Reason for EAW Preparation

Response: Mandatory EAW

If EAW or EIS is mandatory give EQB rule category subpart number and subpart name:

Response: Part 4410.4300 Subp. 22 (B) - construction of additional travel lanes on an existing road for a length of one or more miles.

5. Project Location

County: Hennepin

Cities: Robbinsdale, Crystal, Brooklyn Park, Osseo, Maple Grove

Section:	Township:	Range:
6	T 29 N	R 24 W
4, 5, 9	T 118 N	R 21 W
18, 19, 29, 30, 32	T 119 N	R 21 W
11, 12, 13, 14	T 119 N	R 22 W

Attach each of the following to the EAW:

- County map showing the general location of the project
  (See Figures 1 and 2 in Appendix A)

- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries
  (**See Figures 7A, 7B, 7C in Appendix A)**

- Site plan showing all significant project and natural features
  See Figures 3A through 3D in Appendix A)

6. Description

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

Response: The proposed project will reconstruct 7.5 miles of County State Aid Highway (CSAH) 81, between 47th Avenue North in Robbinsdale and CSAH 30 in Maple Grove, resulting ultimately in a six-lane divided urban roadway.

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.

Response:

Project Description

Within the study area, County State Aid Highway (CSAH) 81 is a four-lane divided roadway with at-grade signalized intersections. The corridor has an "urban" curb and gutter design south of Wilshire Boulevard, using limited storm sewer aputenances to convey stormwater. North of Wilshire Boulevard, the corridor has a "rural" design, using shoulders and ditches for stormwater conveyance. Access along the corridor consists of at-grade intersections with local and county roadways and interchanges with freeway facilities at Trunk Highway (TH) 100 and Interstate-94 (I-94). CSAH 81 is classified as an "A" Minor Arterial Augmentor between 41st Avenue North in Robbinsdale/Crystal and I-94 in Brooklyn Park. It is an "A" Minor Arterial Expander between I-94 in Brooklyn Park and CSAH 30 in Maple Grove. The roadway's status as an "A" Minor Arterial facility within the Twin Cities metropolitan area indicates that it should provide a high level of mobility and have limited access to facilitate the through movement of vehicular traffic. It also indicates that CSAH 81 is eligible to receive federal funding for proposed roadway improvements.

The CSAH 81 corridor serves as an important component of the regional transportation system, supporting local and regional economic development and servicing commuters between the rapidly developing northern areas and the southern urbanized areas within Hennepin County. CSAH 81 is an important roadway connecting high capacity

facilities (TH 100 and I-94, TH 169 and in the future TH 610) with the surrounding local roadway network. The portion of CSAH 81 within the project area carries an average of 22,000 vehiles per day. Segments of the roadway experience congestion due to traffic volumes at or near roadway capacity. Increasing traffic volumes, growth and development, and congestion along the corridor threaten the ability of CSAH 81 to deliver safe and efficient transportation service to its users. Currently, CSAH 81 crosses the Canadian Pacific (CP) Railroad between Corvallis Avenue and Wilshire Boulevard on a bridge which is classified as structurally deficient.

The proposed project involves reconstruction of CSAH 81 for ultimately a six-lane roadway throughout the entire corridor. The segment of CSAH 81 roadway from TH 100 to approximately Wilshire Boulevard will be striped for four lanes until traffic volumes warrant restriping the roadway segment for six lanes. The limits of the roadway reconstruction project are the 47th Avenue North intersection near the Robbinsdale and Crystal municpal border on the south and CSAH 30 in Maple Grove on the north.

As plans for the reconstruction of CSAH 81 were being prepared, a bus rapid transit (BRT) facility was inititally envisioned for the Bottineau Boulevard Corridor that would enhance the function of CSAH 81 as a high-speed, high-mobility corridor. However, the type, configuration, and mode of transit element within this corridor is being studied by Metro Transit in additional detail as part of the Bottineau Boulevard Transit Alternatives Analysis, currently underway. Therefore, the BRT component of the project was removed. As roadway improvements are required regardless of transit decisions, Hennepin County has continued with the EAW for roadway improvements. If BRT or another transit alternative is identified for the corridor as a result of the alternatives anslysis, a separate environmental document would be needed to allow the plan to proceed.

Alternatives

A. Preferred Alternative

The Preferred Alternative includes roadway reconstruction to a six-lane facility with intersection improvements and an urban section (curb, gutter, and storm sewer) from 47th Avenue North in Robbinsdale to CSAH 30 in Maple Grove. Improved access management and side street/frontage road connections will increase safety. Improved intersection capacity will reduce delay and congestion. The proposed design accommodates the forecast traffic volumes with acceptable LOS in 2030, except at the intersection with CSAH 130/CSAH 152. At this location there is a need for an additional through lane on the side street; this is discussed in Item 21 of the EAW.

Additional through lanes are proposed since intersection improvements alone are not possible due to intersection spacing. Further, continuous additional lanes result in improved design continuity over repeating turn lane transitions.

The roadway will improve water quality and stormwater conveyance systems with new curb, gutter, and sewer as well as new ponding locations.

To better communicate the proposed improvements for the roadway, the CSAH 81 corridor was divided into four segments. Roadway improvements are discussed for each segment of the corridor. See Figures 3A through 3D in Appendix A for a map of the project segments. It should be noted that funding will not necessarily follow a segment by segment basis.

Segment One (47th Avenue North to CSAH 10): County Project No. 0118

Segment One roadway improvements begin at the north side of TH 100 in Robbinsdale near 47th Avenue North and go to CSAH 10 in Crystal (See Figures 3A and 4A through 4C in Appendix A). Existing typical sections are shown on Figure 5A and proposed typical sections for the roadway are shown on Figure 6A in Appendix A.

Roadway Improvements

Segment One includes the reconstruction of CSAH 81 as ultimately a six-lane urban roadway. It also includes the construction of raised/depressed grass and concrete medians. Other improvements along CSAH 81 include intersection modifications, a new bridge over the Canadian Pacific/Soo Line Railroad, access management, and pedestrian/bicycle facilities. Improvements will be made to the at-grade BNSF Railway Company railroad crossing along the side street west of CSAH 81. These items are discussed below.

The stretch of roadway between TH 100 and Wilshire Boulevard would be constructed as a six-lane section but striped for four lanes with shoulders, on an interim basis, since traffic volumes on side streets in this stretch do not yet warrant six lanes. This is being done to address neighborhood concerns about the distance between the roadway and adjacent homes in this stretch. The provision of shoulders also provides refuge for disabled vehicles. The County will monitor traffic volumes along CSAH 81 and side streets and stripe this segment for six lanes when warranted.

Intersection improvements along CSAH 81 are proposed at the following locations. The CSAH 10 intersection with CSAH 81 operates at an unacceptable LOS using the year 2002 volumes.

- 47th Avenue North
- Corvallis Avenue North
- Wilshire Boulevard
- CSAH 10

At these locations, a number of geometric changes are proposed. Most of the intersections include a slight realignment to accommodate additional turn lanes and roadway width. Additionally, most of the cross streets are widened at their intersection with CSAH 81 to accommodate left- and right-turn lanes.

All existing traffic signal systems will be replaced with modern equipment. All unsignalized intersections within the construction limits will be evaluated to determine the appropriate traffic control during final design.

The existing structurally deficient bridge over the Soo Line Railroad is proposed to be replaced with two new bridges (one northbound and one southbound). The new bridges will be designed to accommodate pedestrians and bicyclists and the additional width of the new roadway.

Access along this segment of CSAH 81 will also change as part of the proposed improvements. Along the west side of CSAH 81 from 47th Avenue North to Corvallis Avenue North, the frontage road along CSAH 81 will be removed. Access to the side streets in this area will be limited to the parallel CSAH 8, located approximately 1/6 mile west of CSAH 81. Access from 49th Avenue North and Vera Cruz Avenue North to CSAH 81 will also be closed in this area. Along the east side of CSAH 81 from 47th Avenue North to 51st Avenue North the frontage road will be reconstructed with a greater setback from CSAH 81 at the intersections of 47th Avenue North and 51st Avenue North. Access from 49th Avenue North to CSAH 81 will also be closed in this area. The frontage road from CSAH 10 (Bass Lake Road) to the Crystal Airport will be removed and replaced with a backage road. The backage road will connect to CSAH 10 (Bass Lake Road) at Adair Avenue and follow Lakeland Avenue, Brunswick Avenue, and Colorado Avenue before resuming the frontage road alignment at the Crystal Airport. Airport Road will be realigned to intersect with the backage road.

In addition to roadway changes on CSAH 81 and at the cross streets, the proposed project also includes the construction of pedestrian and bicycle facilities. On the west side of CSAH 81, a trail is proposed from 47th Avenue North to Corvallis Avenue North and a sidewalk from Wilshire Avenue North to CSAH 10. On the east side of CSAH 81, trail segments are proposed from 47th Avenue North to Airport Road. Trail and sidewalk segments are also proposed on both sides of CSAH 10.

As part of the roadway reconstruction, railroad safety improvements, including signal and gates, will be made at the BNSF Railway Company crossing with CSAH 10/Bass Lake Road.

Ponding areas are proposed on the west side of CSAH 81 between Byron Avenue North and 48th Avenue North, at the northwest quadrant of CSAH 81 and Corvallis Avenue North, and on the east side of CSAH 81 south of Wilshire Boulevard.

Segment Two (CSAH 10 to 63rd Avenue North): County Project No. 0119

Segment Two roadway improvements begin at CSAH 10 (Bass Lake Road) in Crystal and go to 63rd Avenue North in Brooklyn Park (See Figures 3A, 3B, 4C, and 4D in Appendix A). Existing typical sections are shown on Figures 5A and 5B and proposed typical sections for the roadway are shown on Figures 6A and 6B in Appendix A.

Roadway Improvements

Segment Two includes the reconstruction of CSAH 81 as a six-lane urban roadway. It also includes the construction of grass and raised medians along the roadway. Other changes along CSAH 81 include intersection modifications, access management, and

pedestrian/bicycle facilities. Improvements will also be made to the at-grade BNSF Railway Company railroad crossing along the side streets west of CSAH 81. These items are discussed below.

Intersection improvements along CSAH 81 are proposed at 63rd Avenue North and at the intersection of Hampshire Avenue North and 63rd Avenue North. A number of geometric changes are proposed at the intersection of CSAH 81 and 63rd Avenue North The intersection includes a slight realignment to accommodate additional roadway width on CSAH 81 to accommodate the additional traffic lanes. The profile of CSAH 81 will be raised to improve the relationship between CSAH 81 and the railroad crossing at 63rd Avenue North. Additionally, 63rd Avenue North will be widened at its intersection with CSAH 81 to accommodate left- and right-turn lanes. An existing traffic signal at 63rd Avenue North will also be replaced.

Access along this segment of CSAH 81 will also change. On the east side of CSAH 81, right in/right out access from 60th Avenue North, 62nd Avenue North and 64th Avenue North will be closed. The frontage road south of 63rd Avenue North will be realigned to become the south leg of the intersection of 63rd Avenue North and Hampshire Avenue North. The frontage road north of 63rd Avenue North will no longer connect to 63rd Avenue North The frontage road will terminate with a cul de sac between 63rd Avenue North and 64th Avenue North. Access will be maintained to the frontage road via Hampshire Avenue North.

In addition to roadway changes to CSAH 81 and at the cross streets, the proposed project also includes the construction of pedestrian/bicycle facilities along the corridor. Trail and sidewalk segments are proposed along both the north and south sides of 63rd Avenue near CSAH 81.

A park and ride facility at in the northwest quadrant of CSAH 81 and 63rd Avenue North, which opened in 2007, has space for 550 vehicles. This facility replaces the park and ride facility at 85th Avenue North which was displaced by the construction of the TH 169 / CSAH 81 interchange by the Minnesota Department of Transportation.

As part of the roadway reconstruction, railroad safety improvements will be made at the BNSF Railway Company crossing with 63rd Avenue North.

Stormwater ponding areas are proposed in the northeast quadrant of CSAH 81 and 63rd Avenue North and in the southwest quadrant of the intersection of the realigned frontage road and 63rd Avenue North.

Segment Three (63rd Avenue North to TH 169 Interchange Area): County Project No. 0203

Segment Three roadway improvements begin at 63rd Avenue North in Brooklyn Park and go to TH 169 in Brooklyn Park (See Figures 3B, 3C, and 4D through 4G in Appendix A). Existing typical sections are shown on Figure 5B and proposed typical sections are shown on Figure 6B in Appendix A.

Roadway Improvements

Segment Three includes reconstruction of CSAH 81 as a six-lane urban roadway. It also includes the construction of grass and raised medians along the roadway. Other changes along CSAH 81 include intersection modifications, access management, and pedestrian/bicycle facilities. Improvements will also be made to the at-grade BNSF Railway Company railroad crossing along the side streets west of CSAH 81. These items are discussed below.

Intersection improvements along CSAH 81 are proposed at the following locations:

- Eastbound Ramp I-94/I-694
- Westbound Ramp I-94-/I-694
- CSAH 8
- 73rd Avenue North
- CSAH 130/CSAH 152
- 79th Avenue North
- Green Haven Drive North

At these locations, a number of geometric changes are proposed. Most of the intersections include a slight realignment to accommodate additional roadway width on CSAH 81. Additionally, most of the cross streets are widened at their intersection with CSAH 81 to accommodate left- and right-turn lanes. Existing traffic signals will also be replaced at all of the above locations.

The CSAH 130/CSAH 152 intersection operates at an unacceptable LOS using year 2002 volumes. Two additional intersections (I-94 South Ramp and CSAH 8) have p.m. peak hour traffic volumes exceeding 85 percent of the capacity. If traffic volumes continue to increase at a rate of one percent per year, these intersections would be over-capacity and begin to operate unacceptably between years 2008 and 2013.

Additional roadway improvements along CSAH 81 within Segment Three include ramp and loop revisions and the replacement of an existing traffic signal at the I-94/I-694 interchange, pending Mn/DOT approval. Roadway improvements are also proposed at the CSAH 81/TH 169 interchange; these improvements will be completed by Mn/DOT when funding and approvals for that project are acquired. The proposed CSAH 81 roadway improvements for Segment Three terminate at the southerly limits of the proposed CSAH 81/TH169 interchange project.

Access along this segment of CSAH 81 will also change. Two private right in/right out driveway accesses to CSAH 81 will be closed in the vicinity of CSAH 130. Both properties will have full access to the local street system.

In addition to roadway changes on CSAH 81 and at the cross streets, the proposed project also includes the construction of pedestrian and bicycle facilities. Trails are proposed on the west side of CSAH 81 from 71st Avenue North/West Broadway to 85th Avenue North. Trails are also proposed on the east side of CSAH 8 from

I-94/I-694 to TH 169 and on both sides of CSAH 130. Sidewalks are also proposed along other cross streets to make connections from the proposed intersections to local sidewalks.

As part of the roadway reconstruction, railroad safety improvements will be made at the BNSF Railway Company crossings with 71st Avenue North, 73rd Avenue North, Brooklyn Boulevard, and Green Haven Drive.

Stormwater ponding areas are proposed at the northeast quadrant of the CSAH 81 and I-94 intersection and just west of both the CSAH 8 and 79th Avenue North intersections with CSAH 81. Reconstruction of this segment of CSAH 81 will also require replacement of a box culvert crossing of Shingle Creek in the area north of 79th Avenue North.

Segment Four (TH 169 Interchange Area to CSAH 30): County Project No. 0226

Segment Four roadway improvements begin at TH 169 Interchange with CSAH 81 in Brooklyn Park and go to CSAH 30 in Maple Grove. This segment also passes through the community of Osseo (See Figures 3D and 4G through 4J in Appendix A). Existing typical sections are shown on Figures 5B and 5C and proposed typical sections are shown on Figures 6B and 6C in Appendix A.

Roadway Improvements

Segment Four includes the reconstruction of CSAH 81 to a six-lane urban roadway. Mn/DOT is responsible for the improvements to the CSAH 81/TH 169 interchange. CSAH 81 roadway improvements will begin north of 85th Avenue North. The construction of grass and raised medians is also proposed along the roadway. Other changes along CSAH 81 include intersection modifications, access management, and pedestrian/bicycle facilities. Improvements will also be made to the at-grade BNSF Railway Company railroad crossing along the side streets west of CSAH 81. These items are discussed below.

Intersection improvements along CSAH 81 are proposed at the following locations:

- 4th Avenue SE
- Jefferson Highway North
- Future 89th Avenue North Extension
- School Road
- Zachary Lane North
- CSAH 30

Improved and/or new turn lanes will be provided on the cross streets and on CSAH 81. At these locations, a number of geometric changes are proposed. Most of the intersection improvements will include a slight realignment to accommodate additional roadway width on CSAH 81. Additionally, most of the cross streets will be widened at their intersection with CSAH 81 to accommodate left- and right-turn lanes. Existing traffic signals will also be replaced at all of the above intersections, with the

exception of 4th Avenue SE, future 89th Avenue North extension, and School Road. These intersections are currently unsignalized and will be evaluated during final design to determine if signals are warranted.

The Jefferson Highway North intersection has p.m. peak hour traffic volumes exceeding 85 percent of the capacity. If traffic volumes continue to increase at a rate of one percent per year, this intersection would be over-capacity and begin to operate unacceptably sometime before 2013.

Access along this segment of CSAH 81 will also change. Full access will be removed at the intersections of CSAH 81 and 2nd Avenue SE., 1st Avenue NE. and Wellington Lane North. Both 2nd Avenue SE. and Wellington Lane North will be connected to reconstructed access points via frontage roads. First Avenue NW. will be connected to Central Avenue via 1st Street NW. Right in/right out access will be removed at the intersection of CSAH 81 and 89th Avenue. The existing full access of 4th Street at CSAH 81 will be reconstructed as a right in/right out access.

Motorists will be able to access CSAH 81 at Jefferson Highway North. A frontage road will also be constructed on the east side of CSAH 81 from the Osseo/Maple Grove border to Wellington Lane.

In addition to the roadway changes on CSAH 81 and at the cross streets, the proposed project also includes the construction of pedestrian/bicycle facilities along the corridor. Trails are proposed on both sides of CSAH 81 from 85th Avenue North to CSAH 30. Sidewalk connections are also proposed along several of the cross streets to provide pedestrian connections from the intersection to the local sidewalk system.

As part of the roadway reconstruction, railroad safety improvements will be made at the BNSF Railway Company crossings with 85th Avenue North, Jefferson Highway/Central Avenue, Zachary Lane, and 93rd Avenue North/CSAH 30.

A ponding area is proposed near TH 169 and CSAH 81 in Brooklyn Park. Additional ponding for this segment will be addressed in the Maple Grove Stormwater Management Plan as part of the City's comprehensive plan update and stormwater treatment areas will be identified and allocated as adjacent property develops or becomes available.

Intersection Improvements for all Segments along the CSAH 81 Corridor

Plans for reconstruction of CSAH 81 include improvements to major cross street intersections and portions of most cross streets. These improvements are identified along the length of the corridor and frequently include the addition of dedicated turn lanes. Pedestrian safety features, such as pedestrian refuges and crosswalk striping, are also included in the design for most intersections. Existing traffic signal systems will be replaced with new state-of-the-art systems including pedestrian phase "count-down" timers, except as prohibited by the proximity to the railroad. Existing and proposed intersection geometrics can be found in Tables 1 and 2. Proposed

intersection improvements are shown in Figures 4A through 4J in Appendix A. Other pedestrian improvements such as lighting, crossing timing, and connectivity to local systems will be addressed during the design phase of the project.

Construction Staging and Project Schedule

The project as currently proposed will be constructed in segments to limit impact to roadway users during construction and is dependent on the funding for each stage. Generally, each segment will be constructed in stages to keep the roadways open to traffic during construction as much as possible, except as specifically noted below. Specific details for each stage of construction will be determined during the final design of the project. The tentative schedule, dependent on funding, for each segment of the project is as follows:

- County Project No. 0118 is a segment of the CSAH 81 roadway stretching from TH 100 on the south to north of Bass Lake Road (CSAH 10) on the north. County Project No. 0118 falls within the Cities of Robbinsdale and Crystal. This segment is currently identified, and partially funded, in the County's Capital Improvement Program (CIP) for construction in 2010. This project will generally be staged to keep the roadways open to traffic during construction, but a road closure is being considered between Corvallis Avenue and Wilshire Boulevard to allow for replacement of the "structurally deficient" bridge over the Soo Line/Canadian Pacific Railroad. The traffic would be detoured if this closure is deemed appropriate during final design of the project.

- County Project No. 0119 is a segment of the CSAH 81 roadway stretching from north of Bass Lake Road/CSAH 10 on the south to north of 63rd Avenue North on the north. County Project No. 0119 falls within the Cities of Crystal and Brooklyn Park. This segment is currently identified as a provisional project in the County's CIP for construction in 2012.

- County Project No. 0203 is a segment of the CSAH 81 roadway stretching from north of 63rd Avenue North on the south to the connection with the TH 169 interchange project on the north. County Project No. 0203 falls entirely within the City of Brooklyn Park. County Project No. 0203 is not currently programmed in the County's CIP but would be constructed as a separate segment once funding becomes available.

- Mn/DOT, Hennepin County, and the Cities of Osseo and Brooklyn Park are currently under agreement for the construction of the TH 169/ CSAH 81 interchange, including a portion of CSAH 81 through the interchange area. Constructuction of this segment, County Project No. 9847, began in July 2008. The TH 169 interchange project is being designed and administered by Mn/DOT, separate from the other segments of the CSAH 81 project described here.

TABLE 1
EXISTING INTERSECTION GEOMETRICS

CSAH 81 at:	Southbound Number of Lanes			Northbound Number of Lanes			Eastbound Number of Lanes			Westbound Number of Lanes		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
CSAH 30 (93rd Ave.)	1	2	1	2	2	1	1	2	1	1	2	1
Zachary Ln.	1	2	1	1	2	1	1	2	1	2	2	1
Jefferson Hwy.	1	2	1	1	2	1	1	1	1		>2<	
Greenhaven Dr.	1	2	1	1	2	1	1	1 <		2	1 <	
79th Avenue	1	2			2	1				1		1
CSAH 130/152	2	2	1	1	2	1	1	2	1	1	2	1
73rd Ave./Winnetka Ave.	1	2	1	1	2	1	1	1	1	1	1 <	
CSAH 8	1	2	1	1	2	1	1	2 <		2	1 <	
I-94 North Ramp	1	2			2	1				1		1
I-94 South Ramp	1	2			2	1				1		1
63rd Ave.	1	2	1	1	2	1	1	2	1	1	2 <	
CSAH 10	1	2	1	1	2	1	2	2	1	1	2	1
Wilshire Blvd.	1	2	1	1	2	1		> 1	1		> 1	1
51st Ave./Corvallis Ave.	1	2	1	1	2	1		> 1	1		> 1 <	

LT is left-turn lane; TH is thru lane; RT is right-turn lane
< Denotes shared lane.

TABLE 2
PROPOSED INTERSECTION GEOMETRICS

CSAH 81 at:	Southbound Number of Lanes			Northbound Number of Lanes			Eastbound Number of Lanes			Westbound Number of Lanes		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
CSAH 30 (93rd Ave.)	2	3	1	2	3	1	1	2	1	1	2	1
Zachary Ln.	1	3	1	1	3	1	2	2	1	2	2	1
Jefferson Hwy.	1	3	1	1	3	1	1	1 <		1	1<	
Greenhaven Dr.	1	3	1	1	3	1	1	1 <		2	1 <	
79th Ave.	1	3			3	1				1		1
CSAH 130/152	2	3	1	2	3	1	2	2	1	2	2	1
73rd Ave./Winnetka Ave.	1	3	1	1	3	1	1	1	1	1	1 <	
CSAH 8	1	3	1	1	3	1	2	2	1	2	2	1
I-94 North Ramp	2	3			3	1				2		2
I-94 South Ramp	2	3			3	1				2		1
63rd Ave.	2	3	1	1	3	1	2	2	1	2	2	1
CSAH 10	2	3	1	2	3	1	2	2	1	1	2	1
Wilshire Blvd.	1	3	1	1	3	1		> 1	1		> 1	1
51st Ave./Corvallis Ave.	1	2[(1)]	1	1	2[(1)]	1	1	1	1	1	1	1

LT is left-turn lane; TH is thru lane; RT is right-turn lane
< Denotes shared lane.
[(1)] Design provides for wide shoulders which could be converted to an additional thru lane if, and when, it is needed.

- County Project No. 0226 is a segment of the CSAH 81 roadway stretching from the TH 169 interchange on the south to north of CSAH 30 on the north. County Project No. 0226 falls within the Cities of Brooklyn Park, Osseo, and Maple Grove. County Project No. 0226 is currently not programmed in the County's CIP but would be constructed as a separate phase once funding becomes available.

- Mn/DOT and Hennepin County cooperated on the reconstruction of CSAH 81 in the future common area of CSAH 81 and TH 610 in the City of Maple Grove. This segment of the roadway reconstruction is County Project No. 0115 and was undertaken in 2005 and 2006 as a project separate from the other segments of the CSAH 81 project and is already complete.

Temporary Construction Impacts

Complete closure of the project corridor will be minimized to the extent possible. It is possible that bridge reconstruction over the Soo Line Railroad in Segment One may require closure of the bridge for up to nine months. If bridge closure becomes necessary, a detour route will be provided for through traffic. Access to all properties along CSAH 81 would be maintained throughout reconstruction. A Traffic Management Plan will be created for each segment of the project. Construction activities, including tree removal and grading, are likely to result in noise and dust impacts typical to construction activities. The project as proposed is not anticipated to result in atypical earthborne vibrations. Construction would be limited to daytime hours in accordance with City and County ordinances. Also, construction equipment will be properly equipped to minimize noise. Dust generated will be minimized through standard dust control measures, such as watering. Permanent cover will be re-established as soon as practical.

All waste created by project will be reused/recycled in the project corridor or removed and disposed of in accordance with state and federal requirements.

B. Alternatives Considered But Rejected

1. No Build Alternative

The No Build Alternative would maintain the existing four-lane rural roadway, without intersection improvements. This alternative was not chosen as the Preferred Alternative as it would not address traffic operations, transit demand, safety concerns, or roadway conditions. However, the No Build Alternative is used for a basis of comparison throughout this document.

2. Design Alternatives

When this project was first initiated, a transit component, BRT, was included as one of its elements. Accordingly, several design alternatives were developed for roadway and busway configurations along the CSAH 81 corridor. These alternatives are discussed below.

Initially, it was assumed that proposed roadway project impacts to the BNSF Railway Company property were to be avoided. This was primarily due to the fact that the timeline necessary to acquire railroad property or easements for busway and roadway use would be greater than the proposed design and construction schedule. Therefore, several design alternatives were developed along the corridor with this restriction in mind. The alternatives developed were evaluated and recommendations were made by the Project Management Team, the Technical Advisory Committee, and the Community Advisory Committee. The following paragraphs summarize these alternatives.

Four-lane roadway with busway on outside lanes (six-lane footprint constrained on the east side of CSAH 81): A design alternative with four urban section roadway lanes and two adjacent bus lanes was developed. This alternative included two lanes in each direction, separated by a median and a bus lane along the outside lane of the roadway. Reconstruction of existing frontage roads was included, where appropriate. This alternative constrained the construction on the east side of CSAH 81 to match the existing easterly edge of the east frontage road, and expanded the roadway facility to the west. It would have required the acquisition, or negotiation for use, of a portion of the BNSF Railway Company property at several locations along the length of the corridor. This alternative was considered but rejected primarily due to the impact to the railroad corridor, which was to be avoided based on the design assumptions, and due to the need for six traffic lanes to meet traffic demand.

Four-lane roadway with busway on outside lanes (six-lane footprint constrained on the west side of CSAH 81): A design alternative with four urban section roadway lanes and two adjacent bus lanes was developed. This alternative was similar to the alternative described above except that the construction was constrained on the west edge to ten feet east of the existing BNSF Railway Company right of way and expanded the roadway facility to the east. This shift to the east would have required the acquisition of several additional properties along the east side of CSAH 81 to accommodate the construction of the roadway, busway, and frontage roads. Although this alternative had a relatively lower cost to construct than the other alternatives considered, several operational issues were created by this alternative. For example, the weaving of busses and general traffic at intersections creates confusion among right-turning motorists and busses that are turning to or from the bus lane. In addition, traffic analysis shows that when a busway "queue jump phase" is added to the traffic signal to give bus operation a travel time advantage, it causes a reduction in the intersection capacity by reducing mainline and side street green time. This alternative was rejected primarily for these reasons. The need for six lanes to meet the anticipated traffic demand also precluded this alternative.

Four-lane roadway with a separated busway on the west side of CSAH 81: A design alternative with four urban section roadway lanes separated by a median together with a two-lane urban section busway located west of the CSAH 81 roadway improvement and the reconstruction of existing frontage roads was also developed. The busway was separated from the southbound CSAH 81 traffic lanes by a proposed median and the easterly frontage road was

separated from the northbound CSAH 81 traffic lanes by a proposed median. This alternative was constrained by the existing easterly frontage road curb line and by the easterly BNSF Railway Company property, similar to the alternatives described above. Due to the increased width of the roadway, busway, and frontage road, this alternative affected more properties on the east side of the roadway and created more impact into the BNSF Railway Company property than the two alternatives described above. Although this alternative provides a strong permanent transit presence, demonstrates support for Transit Oriented Development, and provides for better pedestrian access to the park and ride facility at 63rd Avenue North, it creates several problems. Among these are the increased cost to construct and maintain the facility, the additional right of way impacts, and the need to negotiate with the BNSF Railway Company for easements. In addition, traffic conflicts are created between vehicles crossing the busway and busses turning into and from the busway, and intersection capacity is reduced, particularly for right-turning vehicles from CSAH 81. This alternative was rejected primarily for these reasons and the need for six lanes to meet the anticipated traffic demand also precluded this alternative.

Four-lane roadway with median busway: A design alternative with four urban section roadway lanes separated by medians and a two lane urban section busway in the center of CSAH 81 was developed. The busway and associated stations were located between medians that separated northbound and southbound CSAH 81 traffic. A median separating CSAH 81 traffic from the reconstructed frontage roads was also included in this alternative. Due to the increased width of the roadway, busway, and frontage road, this alternative affected more properties on the east side of the roadway and created more impact into the BNSF Railway Company property than the curb lane busway alternative described above. The construction cost of this alternative is greater than the alternative with the outside lane busway and less than the alternative with a separated busway on the west side of CSAH 81. This alternative provides a strong permanent transit presence and preserves intersection capacity by substantially reducing the need for bus turning movements.

This alternative, with the BRT component, was originally selected for development of a detailed preliminary design and layout in 2002 due to its reduction in negative traffic intersection impacts, compared to other alternatives, and the need to avoid the BNSF Railway Company property to the extent possible. As the preliminary detailed design progressed, concerns were raised about pedestrian access to the busway across CSAH 81. At the same time, renewed negotiations with the BNSF Railway Company for use of a portion of its corridor made the median busway a less desirable alternative. The alternative was subsequently rejected in favor of the alternative discussed below. It should be noted that traffic volume forecasts were updated during the preliminary design phase when the Metropolitan Council updated its regional model from year 2025 to 2030. The revised forecasts indicate that the four-lane roadway would be inadequate within the life of the project and that a six-lane facility would be needed to meet demand. If built, the busway would help alleviate the anticipated growth in traffic volumes and congestion.

Six-lane roadway with exclusive busway on BNSF Railway Company right of way: A design alternative with six urban section roadway lanes and a two-lane urban section busway located on BNSF Railway Company right of way was also developed. An exclusive busway on BNSF Railway Company right of way, immediately east of the railroad tracks, allows busses to avoid the delays and congestion that busses travelling with regular traffic would experience. This alternative was selected for development of a detailed design and layout in 2006 and an analysis of the impacts of the project was undertaken. However, in 2008 a Bottineau Boulevard Transit Alternatives Analysis was initiated to study in additional detail the type, configuration, and mode of a transit element within this corridor. Therefore, this alternative was subsequently rejected in favor of the Preferred Alternative as described above.

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.

Response: The portion of CSAH 81 within the project area carries an average of 22,000 vehiles per day. Segments of the roadway experience congestion due to traffic volumes at or near roadway capacity. Increasing traffic volumes, growth and development, and congestion along the corridor threaten the ability of CSAH 81 to deliver safe and efficient transportation service to its users.

1. Poor Intersection Operations and Roadway Capacity

As indicated in the introduction, segments along CSAH 81 are experiencing congestion due to traffic volumes at or near capacity of the roadway. Capacity and congestion concerns will continue as the corridor experiences growth in traffic volumes and congestion resulting from increased population and employment. When a roadway approaches capacity, it is likely that there will be congested intersections and segments along the corridor. To determine if this was the case on CSAH 81, a traffic operations analysis was conducted for the a.m. and p.m. peak hours at each of the key signalized intersections that impact mobility along the corridor.

All intersections were analyzed using Synchro, with SimTraffic simulation software to model the intersection operations. Capacity analysis results identify a Level of Service (LOS), which indicates the quality of traffic flow through an intersection. Intersections are given a ranking from LOS A through LOS F. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS F indicates an intersection where demand exceeds capacity or creates a breakdown in traffic flow. LOS A through D are generally considered acceptable by drivers. LOS E indicates that an intersection is operating at, or very near its capacity and that vehicles experience substantial delays. Results of the existing analysis (year 2002) shown in Table 3 indicate that two intersections with CSAH 81 currently operate with significant delay (LOS E or F) during the p.m. peak hour. This is due to high traffic demand on the mainline, which exceeds capacity and causes significant queuing. Intersections with poor LOS are shown in bold. Intersections on the border of poor LOS are shown in italics.

TABLE 3
EXISTING CAPACITY ANALYSIS A.M. AND P.M. PEAK HOUR LEVEL OF SERVICE RESULTS FOR CSAH 81 INTERSECTIONS

Intersection	Level of Service (LOS)	
	A.M. Peak	P.M. Peak
51st Ave. N./Corvallis Ave.	B	C
Wilshire Blvd.	C	B
CSAH 10 (Bass Lake Road)	*D*	**E**
63rd Ave. N.	*D*	*D*
I-94 South Ramp	C	*D*
I-94 North Ramp	B	B
CSAH 8 (71st Ave. N./W. Broadway)	*D*	*D*
Winnetka Ave./73rd Ave. N.	B	C
CSAH 130	*D*	**F**
79th Ave. N.	A	B
Greenhaven Dr. N.	B	C
Jefferson Hwy. N.	*D*	*D*
Zachary Ln. N.	C	C
CSAH 30 (93rd Ave. N.)	B	C

*Year 2002 was used because this is the most reliable and comprehensive traffic counts that were collected. Traffic counts collected in 2006 or later are impacted by the construction of CSAH 81 in the City of Robbinsdale.

Two intersections (CSAH 10 [Bass Lake Road] and CSAH 130/CSAH 152 [Brooklyn Boulevard]) operate at an unacceptable LOS using the existing year 2002 volumes. Three additional intersections (I-94 South Ramp, CSAH 8, and Jefferson Highway North) have p.m. peak hour traffic volumes exceeding 85 percent of the capacity. If traffic volumes continue to increase at a rate of one percent per year, these three intersections would be over-capacity and begin to operate unacceptably between years 2008 and 2013.

A traffic operations analysis was also completed for forecast year 2030 to determine how well the existing intersections would operate under future traffic volumes without the proposed improvements. All key intersections were analyzed with existing geometrics and traffic control. For purposes of this analysis, it was assumed that signal timing at existing signalized intersections would be updated before year 2030. The 2030 No Build levels of service results are shown in Table 4. Intersections with poor LOS are shown in bold. Intersections on the border of poor LOS are shown in italics.

As expected, under increasing future traffic volumes, about half of the intersections operate at a LOS E or F during the a.m., p.m., or both peak hours. Another four intersections are expected to be at LOS D by 2030.

TABLE 4
2030 NO BUILD CAPACITY ANALYSIS - A.M. AND P.M. PEAK HOUR LEVEL OF SERVICE RESULTS FOR CSAH 81 INTERSECTIONS

Intersection	Level of Service (LOS)	
	A.M. Peak	P.M. Peak
51st Ave. N./Corvallis Ave.	**E**	**E**
Wilshire Blvd.	*D*	*D*
CSAH 10 (Bass Lake Road)	**E**	**F**
63rd Ave. N.	**E**	**F**
I-94 South Ramp	C	**F**
I-94 North Ramp	C	C
CSAH 8 (71st Ave. N./W.Broadway)	**F**	**F**
Winnetka Ave./73rd Ave. N.	*D*	*D*
CSAH 130	**F**	**F**
79th Ave. N.	B	C
Greenhaven Dr. N.	C	**F**
Jefferson Hwy. N.	**F**	**F**
Zachary Ln. N.	*D*	*D*
CSAH 30 (93rd Ave. N.)	*D*	*D*

2. Safety

The Minnesota Department of Transportation (Mn/DOT) and the Department of Public Safety have adopted policies to move towards zero deaths (a goal to eliminate all transportation-related fatalities on all roadways). A number of segments along CSAH 81 currently experience safety concerns. A crash analysis was performed to assess the level of safety at these locations. Hennepin County maintains an extensive database with crash reports and summaries for all crashes that occur on county facilities. Crash data used in the analysis are for the years 2002, 2004, and 2005 (2003 crash data are excluded due to statewide problems with the crash information).

Table 5 shows the number of crashes, the 3-year crash rate, and the critical crash rate for study area segments and intersections. Actual and critical crash rates were calculated for intersections and segments within the corridor. A critical crash rate is used to determine whether or not the actual crash rate exceeds the average crash rate by a substantial amount. When the actual crash rate exceeds the critical crash rate, the segment or intersection could be a hazardous location. The critical crash rate is calculated by adjusting the average crash rate for an intersection of similar size based on the amount of vehicular exposure to the intersection; crash severity does not enter into this calculation**.**

The results of the analysis show that one segment (CSAH 109/85th Avenue North to Central Avenue) in Osseo and one intersection (CSAH 10 and CSAH 81) in Crystal have actual crash rates that exceed the critical crash rate.

TABLE 5
CRASH DATA ON CSAH 81 CORRIDOR, 2002, 2004, AND 2005 [(1)(2)]

Segment	Crashes									Actual 3-year Crash Rate	Critical Crash Rate	Actual Rate exceeds Critical Rate
	Year 2002			Year 2004			Year 2005					
	Total	Fatal	Personal Injury	Total	Fatal	Personal Injury	Total	Fatal	Personal Injury			
N. of TH 100 to S. of 47th Ave.	1	0	0	0	0	0	2	0	0	0.65	1.89	No
N. of 47th Ave. to S. of 51st Ave.	6	0	4	5	0	4	3	0	1	1.16	1.55	No
N. of 51st Ave. to S. of Wilshire	2	0	2	0	0	0	2	0	1	0.38	1.59	No
N. of Wilshire to S. of CSAH 10	1	0	0	0	0	0	2	0	1	0.58	1.85	No
N. of CSAH 10 to S. of 63rd Ave.	6	0	3	2	0	2	5	0	2	0.48	1.32	No
N. of 63rd Ave. to S. of I-94	0	0	0	1	0	1	2	0	2	0.23	1.53	No
I-94/E. Jct. Interchange	6	0	3	3	0	1	2	0	2	3.88	5.42	No
N. of I-94 to S. of CSAH 8	1	0	0	0	0	0	0	0	0	0.17	1.81	No
N. of CSAH 8 to S. of 73rd Ave.	0	0	0	0	0	0	0	0	0	0.00	1.85	No
N. of 73rd to S. of CSAH 130/152	2	0	2	2	0	2	2	0	2	0.48	1.54	No
N. of CSAH 130 to S. of 79th Ave.	0	0	0	0	0	0	0	0	0	0.00	1.87	No
N. of 79th Ave. to S. of Greenhaven	0	0	0	0	0	0	0	0	0	0.00	1.93	No
N. of Greenhaven to S. of TH 169	0	0	0	1	0	0	2	0	1	0.36	1.67	No
N. of TH 169 to S. of CSAH 109	1	0	0	2	0	1	1	0	0	1.08	1.99	No
N. of CSAH 109 to E. of Central	**10**	**0**	**6**	**6**	**0**	**1**	**10**	**0**	**6**	**1.69**	**1.48**	**Yes**
W. of Central Ave. to M.P. 10.81	2	0	0	5	0	2	1	0	0	1.48	1.84	No
M.P. 10.81 to E. of Co. Rd. 202	0	0	0	2	0	0	2	0	1	0.27	1.49	No
W. of Co. Rd. 202 to E. of CSAH 30	0	0	0	0	0	0	0	0	0	0.00	2.02	No
Intersection												
CSAH 81/47th Ave. N.	3	0	0	4	0	0	4	0	0	0.34	0.72	No
51st Ave./Corvallis Ave.	2	0	0	3	0	1	5	0	0	0.30	0.92	No
Wilshire Blvd./Service Rd.	3	0	3	2	0	1	4	0	2	0.32	0.82	No
CSAH 81/CSAH 10	**16**	**0**	**4**	**18**	**0**	**7**	**13**	**0**	**6**	**0.97**	**0.86**	**Yes**
CSAH 81/63rd Ave. N.	8	0	6	5	0	3	7	0	6	0.50	0.89	No
CSAH 81/I-94 E. Jct. South Ramp	1	0	0	5	0	2	5	0	3	0.32	0.98	No
CSAH 81/I-94 E. Jct. North Ramp	4	0	0	2	0	1	3	0	3	0.21	0.95	No
CSAH 81/CSAH 8	10	0	7	6	0	2	9	0	6	0.58	0.88	No
CSAH 81/73rd Ave. N.	6	0	3	2	0	2	2	0	2	0.35	0.81	No
CSAH 81/CSAH 130/152	14	0	10	11	0	6	7	0	4	0.66	0.86	No
CSAH 81/79th Ave.	3	0	2	1	0	1	1	0	1	0.18	0.50	No
CSAH 81/Greenhaven Dr.	3	0	0	1	0	0	1	0	1	0.17	0.95	No
CSAH 81/CSAH 109	10	0	5	10	0	7	12	0	7	0.75	0.88	No
CSAH 81/Central Ave.	7	0	1	8	0	1	9	0	4	0.71	0.79	No
CSAH 81/CSAH 30	3	0	2	6	0	3	4	0	2	0.42	0.93	No

*Critical Crash Rate is calculated by adjusting the Average Crash Rate for an intersection of similar size based on the amount of vehicular exposure to the intersection
(1) 2003 crash data is excluded due to data quality issues.
(2) Crash rates are reported per Million Vehicle Miles (MVM).

Under the No Build condition, safety would diminish as intersections become increasingly congested and transit vehicles mix with higher volumes of traffic. The existing vehicle carrying capacity of the CSAH 81 corridor is near its maximum with two main intersections already operating at unacceptable levels and three nearing their capacity. This limits the mobility in the corridor and on perpendicular routes. As intersections become near or over capacity and delays increase substantially, more crashes occur and the number of intersections whose actual crash rate exceeds the critical rate increase. It is not a coincidence that the one hazardous intersection (CSAH 130/CSAH 152) in the corridor (Table 5) is also operating poorly (Table 3). Under year 2030 No Build conditions, six intersections are expected to operate poorly in the a.m. peak hour and eight intersections are expected to operate poorly in the p.m. peak hour. In addition, many of the cross-streets have multiple movements from the same lane, which tends to increase crashes and limit the type of signal phasing.

3. Roadway Design and Condition

CSAH 81 is an aging four-lane divided roadway that was originally constructed as part of the state's Trunk Highway system. The roadway was turned back to the County in 1988. The roadway was last graded and paved in 1957 and is considered to be in fair to poor condition, according to a Hennepin County report on roadway condition, and is in need of reconstruction of the roadbed rather than repaving. Photographs taken along the corridor illustrate several locations where cracking of the roadbed is particulaly severe (see Appendix C).

In addition, the current rural roadway design, north of Wilshire Boulevard does not provide adequate treatment of stormwater runoff along the CSAH 81 corridor, which has experienced substantial urbanization since the roadway was first designed and built. South of Wilshire Boulevard, the stormwater is collected by limited storm sewer systems and conveyed essentially untreated to Twin Lake.

The roadway's status as an "A" Minor Arterial facility within the Twin Cities metropolitan area indicates that it should provide a high level of mobility and have limited access to facilitate the through movement of vehicular traffic. However, the current rural design with its limited number and length of turn-lanes and its multiple accesses to local streets is not in keeping with the roadway's "A" Minor Arterial designation nor with the roadway's setting in a fully developed urban area. Additional lanes at key interesections along the corridor are needed to provide the necessary through movement of vehicular traffic to enhance safety and provide lane continuity and reduction in delay for CSAH 81 and cross-streets.

In addition, the roadway currently crosses the Canadian Pacific Railroad on a bridge which has been classified as "Structurally Deficient". Replacement of the bridge is desireable to improve the safety of the deficient bridge.

4. Consistency with Regional and Local Plans

Roadway Improvements

Hennepin County has identified the need to improve capacity and address design deficiencies along CSAH 81 in a number of plans. The 2000 Hennepin County

Transportation Systems Plan identified areas where capacity deficiencies were anticipated and where roadway expansion was needed. CSAH 81 was documented as having "probable" and "potential" capacity deficiencies along the corridor for the entire study area.

To address capacity and other transportation deficiencies noted in the 2000 Hennepin County Transportation Systems Plan, the County prepared a Capital Improvement Program (CIP). The CIP outlines all of the projects that will receive funding in a five year period (2008-2012). Segment One of the CSAH 81 roadway reconstruction project (TH 100 in Robbinsdale to CSAH 10 in Crystal) is included in the 2009 element of the CIP as County Project Number 0118 (CP0118). Additionally, Segment Two, CP0119, from CSAH 10 in Crystal to 63rd Avenue North in Brooklyn Park, is identified in the CIP as a provisional project but is not yet funded.

In addition to having the first segment of the CSAH 81 roadway improvements in its CIP, Hennepin County has also applied for and received federal funding for these proposed roadway improvements. Funding for the Crystal segment of the project will be available in 2010.

d. Are future stages of this development including development on any outlots planned or likely to happen? _X_ Yes ___ No

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

Response: The EAW includes the reconstruction of CSAH 81 as a six-lane facility between TH 100 and CSAH 30. North of CSAH 30, CSAH 81 is expected to be widened to six lanes to future TH 610 as part of a Mn/DOT project. North of TH 610 to the City of Rogers, planned development may require future expansion of the roadway. Each of these segments has its own utility and is not dependent upon this project.

e. Is this project a subsequent stage of an earlier project? _X_ Yes __ No

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

Response: An EAW was completed for the CSAH 81 corridor within Minneapolis and Robbinsdale, south of the current project location. Construction of this stage began in the summer of 2006 and is expected to be complete in 2008.

7. Project Magnitude Data

Total project acreage: 259 (disturbed area)
Total project length: 7.5 miles

Number of residential units: N/A unattached: N/A attached: N/A
Maximum units per building: N/A

Commercial, industrial or institutional building area (gross floor space): total square feet: N/A

Indicate areas of specific uses (in square feet):

Office: N/A
Retail: N/A
Warehouse: N/A
Light industrial: N/A
Other commercial (specify): N/A

Manufacturing: N/A
Other industrial: N/A
Institutional: N/A
Agricultural: N/A
Building height: N/A
If over 2 stories, compare to heights of nearby buildings: N/A

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.**

Response: See Table 6 for the list of permit and approvals required.

TABLE 6
PERMITS AND APPROVALS

Permit	Agency	Action Required
Federal		
EA	FHWA	Approval
EIS Need Decision/FONSI	FHWA	Approval
Section 4(f) determination	FHWA	Approval
Section 106 (Historic/Archeological)	FHWA	Approval
Section 404 Permit – General Permit/Letter of Permission	U.S. Army Corp of Engineers	Approval
Section 404 Permit – General Permit #1 (permits associated with DNR Public Waters Permit)	U.S. Army Corp of Engineers	Approval
State		
Geometric Layout at Mn/DOT Interchanges	Mn/DOT	Approval
Interstate Access Modification Request	Mn/DOT	IAR
Right of Way Permit	Mn/DOT	Permit
Construction Plans	Mn/DOT	Approval
DNR Protected Waters Permit	DNR	Permit
Temporary Water Appropriation Permit (if needed)	DNR	Permit
Section 401	MPCA	Certification
National Pollutant Discharge Elimination System (NPDES)	MPCA	Permit
Noise Exemption	Mn/DOT and MPCA	Approval
Asbestos and Regular Waste Assessment for Bridge Removal	MPCA	Approval
Section 106(Historic/Archeological)	SHPO	Concurrence
Section 106	Mn/DOT CRU	Determination of Effect
Controlled Access	Metropolitan Council	Approval

TABLE 6 continued
PERMITS AND APPROVALS

Permit	Agency	Action Required
Local		
EAW	Hennepin County	EIS Need Decision
Municipal Approval	Cities of: Robbinsdale, Crystal, Brooklyn Park, Osseo, Maple Grove	Approval
Wetland Conservation Act	Cities of: Robbinsdale, Brooklyn Park, Osseo, Maple Grove, Shingle Creek WMC, and Elm Creek WMC, with review by BWSR and DNR	Approval
Flood Plain Permit	Shingle Creek Watershed Management Commission	Permit
Watershed Management Organization	Watershed Management Organizations: Shingle Creek, West Mississippi, and Elm Creek	Consultation

Hennepin County has sought federal funds for improvements to CSAH 81 from the Area Transportation Partnership. Hennepin County was awarded $5.5 million for the segment of CSAH 81 from 47th Avenue North to CSAH 10. The Cities of Robbinsdale and Crystal will also participate in the costs for this segment of the project. This contribution will be covered by a Joint Powers Agreement between the County and the Cities. Hennepin County will also seek federal funding for subsequent segments.

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.

Response:

Land Use and Compatibility

The proposed project area passes through five municipalities in the northwest metropolitan area: Robbinsdale, Crystal, Brooklyn Park, Osseo, and Maple Grove. Land uses adjacent to the corridor are varied and include predominantly commercial and industrial development, with limited institutional land use, such as North Memorial Medical Center in Robbinsdale, Osseo High School in Osseo, and Independent School District #279 offices in Maple Grove, as well as low and high density residential land uses clustered in the City of Crystal. In the southern portion of the corridor (including Robbinsdale and Crystal), most land is developed and has been urbanized for at least 30 years. North of I-94, suburban development patterns have been in place for at least 20 years. Some parcels in Brooklyn Park and Maple Grove are currently experiencing or anticipating development of previously undeveloped land. Osseo is a small center that has been settled as a town since 1875; commercial land abutting the corridor has been subdivided into smaller parcel sizes than in neighboring communities. Most of the land uses in the three communities north of I-94 are commercial or industrial in nature.

The function of CSAH 81 will not change as a result of the reconstruction project. CSAH 81 will retain its functional designation as a minor arterial. Access patterns to adjoining land uses will generally be more indirect, either by closing access, creating partial direct access (right in, right out) or by redirecting traffic to a system of frontage or backage roads.

Parcels adjacent to the roadway will be immediately affected by the reconstruction due to the fact that the roadway width will increase along the corridor. Land uses that are near the corridor, meaning those parcels located within 1,300 feet of the right of way, will also realize some change due to changes in access, intersection geometry, and traffic patterns on intersecting cross streets. However, the roadway project remains compatible with both the adjacent and nearby land uses because there are no significant conflicts caused by reconstructing the existing roadway as shown in the project design. Changes to roadway width, increased traffic volumes, redesigned intersections or access points, and the potential addition of busses will not create conflicts with either adjacent or nearby land uses.

The project corridor is contained within the limits of three watershed management organizations (WMOs): Shingle Creek Watershed Management Commission (WMC), West Mississippi River WMC, and Elm Creek WMC. Shingle Creek passes under the roadway north of 77th Avenue North. Wetlands are noted on the topographic map north of 77th Avenue North on the west side of the corridor. Twin Lake is located within the corridor, north and south of TH 100. No other rivers or creeks cross the corridor and no other wetlands are noted on the topographic maps. Wetlands identified through field observation were identified in additional areas along the corridor.

The BNSF Railway Company corridor generally runs parallel to the roadway over the length of the corridor. The Soo Line rail corridor crosses under the roadway north of 51st Avenue North in Crystal.

Potential Environmental Hazards

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 roadway projects because of potential liabilities associated with construction personnel encountering unexpected wastes, contaminated soil, or groundwater. Contaminated materials encountered during roadway construction projects must be properly handled and treated in accordance with state and federal regulations. Further, improper handling of contaminated materials can worsen their impact on the environment. Contaminated sites must be treated appropriately to avoid or minimize potential groundwater contamination. Contaminated materials also cause adverse impacts by increasing construction costs and causing construction delays, which can also increase project costs.

Two Phase I Environmental Site Assessments (ESAs) were completed for the broader roadway project corridor, in general conformance with the American Society of Testing and Materials standards. The first ESA (Phase I ESA – CSAH 81 from Xerxes Avenue to 85th Avenue North in Minneapolis, Robbinsdale, Crystal, and Maple Grove, Minnesota, DPRA Environmental Consulting, Inc.) was completed in June 2002. Data collected from Xerxes Avenue to TH 100 was used for the EAW that was completed for improvements to CSAH 81 within the Cities of Minneapolis and Robbinsdale. That project is currently

under construction. The second ESA was completed in July 2003 (Phase I ESA – CSAH 81 Corridor from 85th Avenue to CSAH 30, Osseo, and Maple Grove, Minnesota, DPRA Environmental Consulting, Inc.) The review area for environmental sites was limited to within approximately 500 feet of the outermost edge of the pavement of the proposed roadway improvements. Copies of the Phase I ESA reports have been placed on file and are available for review at Hennepin County.

Sites of potential concern identified by the Phase I ESAs can be categorized into three risk areas: high, medium, and low environmental risk. In general, high environmental risk sites are properties that have a documented release of chemicals or other strong evidence of contamination such as soil staining or storage of large volumes of petroleum or other chemicals, and sites enrolled in the Minnesota Pollution Control Agency (MPCA) Voluntary Investigation and Cleanup (VIC) program. These sites have the greatest potential for high cleanup costs and/or environmental liability and are the focus of the Phase 1 ESA report's recommendations. Medium and low potential sites do not merit additional investigation, but if contaminants are discovered while the roadway is under construction, they will be dealt with in accordance with the Construction Contingency Plan developed by Hennepin County Environmental Services.

The two Phase I ESAs identified 213 known or potentially contaminated properties in the total study area: 63 high environmental risk sites, 49 medium risk sites, and 101 low risk sites. The majority of the high potential sites along CSAH 81 are former filling stations or auto repair facilities. They are located within 300-500 feet of the roadway, and have amassed documented releases of pollutants to the subsurface, such as a leak or spill. Strategies for these sites were described on a case by case basis in the document, and most of the high potential sites recommended additional soil testing be done due to a record of spills, leaks from underground storage tanks, or discovery of other groundwater contaminants.

Hennepin County contracted for additional geotechnical testing at high potential sites within the anticipated construction limits. The remainder of the sites was determined to be of minimal concern since construction activities were not likely to disturb existing conditions.

Sites of high environmental risk that will likely be disturbed by construction activities are identified in Table 7 (Phase I ESA, Xerxes Avenue to 85th Avenue) and Table 8 (Phase I ESA, 85th Avenue to 93rd Avenue). These locations are depicted in 8A through 8D in Appendix A. It should be noted that only sites along the current project area are included in this analysis. Data for areas to the south of the project limit were collected and used for a previous EAW for a segment of CSAH 81 in Minneapolis and Robbinsdale that is presently under construction. Forty-seven of the 63 sites of high environmental risk identified in the Phase I ESA reports are likely to be disturbed by construction activities associated with the proposed project. The sites are numbered according to the site numbers assigned from each Phase I ESA. The letters "CS" were added to the site numbers to correspond with their identification as "contaminated sites" on Figures 8A through 8D in Appendix A. More detailed information about the history and documentation associated with each site can be found in the body of the Phase I ESA documents.

TABLE 7
POTENTIAL SITES OF CONCERN LIKELY TO BE IMPACTED BY CONSTRUCTION ACTIVITIES—XERXES AVENUE TO 85TH AVENUE (DETAILED IN PHASE I, JUNE 2002)

Site #	Location/Address	Reason for Ranking	Current Status
CS*-40	McDonalds Restaurant, 4601 Lake Dr.	Former filling station	No information about tank location.
CS-41	Oasis Market, 4180 Lakeland Ave.	LUST[(1)]	Underground tanks present, located away from corridor.
CS-42	Marathon Gas Station, 4200-4202 West Broadway	LUST	Underground tanks present, located away from corridor.
CS-43	Pilgrim Dry Cleaners, 4606 Lake Dr.	Former dry cleaning & filling station	No tanks present on site.
CS-47	Cavanagh Early Childhood Center, 5400 Corvallis	LUST	Tank basin located on north side of school building away from construction.
CS-55	Rise, 5353 Lakeland Ave.	LUST and Spills	Tank basin located on east side of building.
CS-56	Holiday Station, 5410 Lakeland Ave.	UST[(2)]	Historical contamination cleaned up. No subsurface investigation required.
CS-57	Hom Furniture, 5419 Lakeland Ave.	Former filling station	Spills recorded.
CS-66	Norling Motors, 5521 Lakeland Ave.	LUST, former filling station	Tanks removed, abandoned in place. Groundwater contamination encountered. Median of CSAH 81 is preferred location for additional soil borings.
CS-68	Undeveloped, 5551 Lakeland Ave.	Former filling station, VIC[(3)] site	No record of tanks.
CS-71	Valvoline Oil Change, 5602 Lakeland Ave.	LUST and Spills	Tanks have been removed.
CS-81	Jack's Auto Sales, 6030 Lakeland Ave.	Auto repair with poor housekeeping	Groundwater flow and contaminated soils away from the construction area.
CS-86	Marsh Park, 6224 Lakeland Ave.	VIC	No contaminants found in 1995 sampling.

TABLE 7 continued
POTENTIAL SITES OF CONCERN LIKELY TO BE IMPACTED BY CONSTRUCTION ACTIVITIES—XERXES AVENUE TO 85TH AVENUE (DETAILED IN PHASE I, JUNE 2002)

Site #	Location/Address	Reason for Ranking	Current Status
CS-90	Stop-n-Go Tobacco, 6288 Lakeland Ave.	Former filling station	No tanks remain on site.
CS-94	Former Gasoline Station, 6300 Lakeland Ave.	LUST	Insufficient information to determine if tanks remain on property.
CS-99	Kennedy Transmission, 6400 Lakeland Ave.	LUST	Tanks removed.
CS-107	Inside Out Home Selection Center, 6973 West Broadway	LUST and Spills	No contaminants found after 1989 spill and clean up. No subsurface investigation recommended.
CS-108	Levitz Furniture, 7016 Lakeland Ave.	LUST	Tanks removed.
CS-134	Undeveloped lot, 7700 & 7706 Lakeland Ave.	VIC	Insufficient information to determine if tanks are under ground.
CS-135	Undeveloped lot, 7708 Lakeland Ave.	VIC	No contamination detected in borings, groundwater flows away from construction area. No additional subsurface investigation recommended.
CS-136	Undeveloped lot, / Joyners, 7716 Lakeland Ave.	VIC	No subsurface investigation recommended.
CS-137	Undeveloped lot, 7732 Lakeland Ave.	VIC	Contamination is decreasing, groundwater flows away from the construction area. No subsurface investigation recommended.
CS-142	Oasis Market, 7820 Lakeland Ave.	LUST	Three tanks remain on property. Insufficient data as to location of tank. No subsurface investigation recommended.
CS-143	Saturn of Brooklyn Park, 7910-7911 Lakeland Ave.	VIC	One tank remains on property. Contaminated soils documented next to CSAH 81.

Source: Phase 1 Environmental Assessment (June 2002), DPRA Environmental Consulting
* "CS" was added to the site numbers to correspond with their identification as "contaminated sites" on Figures 8A through 8D in Appendix A.
(1) LUST refers to Leaking Underground Storage Tank; (2) UST refers to Underground Storage Tank; (3) Voluntary Investigation and Cleanup Program

TABLE 8
POTENTIAL SITES OF CONCERN LIKELY TO BE IMPACTED BY CONSTRUCTION ACTIVITIES—85TH AVENUE TO 93RD AVENUE (DETAILED IN PHASE I, JULY 2003)

Site #	Location/Address	Reason for Ranking	Current Status
CS*-8	Osseo Radiator, 337 CSAH 81	Auto repair, commercial since 1964	No outside storage of chemicals observed.
CS-9	Northern Tractor & Equip., 335 CSAH 81	Engine repair, commercial since 1979	No outside storage of chemicals observed. No violations reported in RCRIS/SQG and FINDS databases.
CS-10	Furniture Manor Multi-Tenant, 300 Fifth Ave. SE	LUST(1) facility	One tank removed from property. Contaminated soils documented on southern portion of property near west boundary.
CS-11	Cermaic Industrial Coating, 325 CSAH 81	LQG, SPILLS, commercial since 1953	Property listed on RCIS-LQG, FINDS, SPILLS, and TRIS databases. Two violations reported.
CS-14	Marathon Gas, 408 Third St. SE	LUST, SPILLS, VIC(2)	Violations listed in several databases. Seven tanks have been removed, six tanks are active. Three monitoring wells on property.
CS-18	Osseo Automotive, 257 Fourth Ave. SE	Former filling station	Seven tanks removed.
CS-24	BPA Recycling Center, 201 CSAH 81	UST(3), poor housekeeping	One tank removed.
CS-25	Osseo Lumber Center, 202 CSAH 81	Former auto repair, commercial since 1953	Three rusted, open drums on property.
CS-27	Royal Blades/Action TV, 124 CSAH 81	Suspected former filling station	Identified on UST database. Four tanks removed.
CS-35	Multi-Tenant Medical Bldg., 10 Central Ave.	LUST	Identified on LUST database. Five tanks removed.
CS-37	Heinen and Mason, 15-33 Central Ave.	Auto repair since 1977	Identified in SQG and LUST databases. No violations reported.
CS-38	Bob & Carl's Multi Tenant Bldg., 107 Central Ave.	Auto repair since 1951	Three tanks remain on property. Nine tanks removed from site.

TABLE 8 continued
POTENTIAL SITES OF CONCERN LIKELY TO BE IMPACTED BY CONSTRUCTION ACTIVITIES—85TH AVENUE TO 93RD AVENUE (DETAILED IN PHASE I, JULY 2003)

Site #	Location/Address	Reason for Ranking	Current Status
CS-39	Heinen and Mason Motorcycles, 21 First St. NW	Former coal yard	Two soil borings on south and east sides of property recommended.
CS-40	Multi Tenant Office Bldg., 101 & 201 Broadway	VIC (Hans Foreign Auto)	Property identified on VIC database. A Phase I ESA was filed with MPCA in 1998. Contaminated soils were documented and an aboveground used oil tank and unused well were observed. One other well and septic system historically used on site. Fuel-oil fired boiler observed on site but no evidence of fuel-oil storage tank. Phase II examination found significant contamination. Remedial Action Plan (RAP) resulted in excavation of contaminated soils. Groundwater flow northeast toward CSAH 81.
CS-43	Vacant property, 200 Second Ave. NW	LUST (Osseo Brooklyn School Bus)	Listed on the LUST database. No violations reported. Two tanks removed. Recently graded for development.
CS-44	Texaco Multi Tenant, 9970 CSAH 81	LUST	Listed on the LUST and UST databases. Four underground tanks present. Monitoring well (MW-3) damaged and repaired. Located in CSAH 81 right of way.
CS-46	County Concrete, 10100 89th Ave.	LUST	Two underground storage tanks (one removed, one closed in-place) reported in LUST database. Two underground storage tanks removed from north end of property.
CS-48	Hanson Spancrete Midwest, 10655 CSAH 81	LUST	Listed on LUST, SQG, FINDS, SPILLS, and TRIS databases. Three spills reported. Six underground storage tanks present.

TABLE 8 continued
POTENTIAL SITES OF CONCERN LIKELY TO BE IMPACTED BY CONSTRUCTION ACTIVITIES—85TH AVENUE TO 93RD AVENUE (DETAILED IN PHASE I, JULY 2003)

Site #	Location/Address	Reason for Ranking	Current Status
CS-49	Maple II Business Center, 10500 CSAH 81	Former industrial use	Multi-tenant property. Several tenants listed on RCRIS-SQG and FINDS databases. No violations reported.
CS-50	Maple Business Park, 10650 CSAH 81	Former industrial use	Multi-tenant property. One tenant listed on SQG and FINDS databases. One aboveground storage tank present.
CS-51	Multi-tenant, 10730 CSAH 81	Auto repair/commercial since 1979	Multi-tenant property. Two tenants listed on SQG and FINDS databases. No violations reported.
CS-52	Multi-tenant, 10900 CSAH 81	Auto repair/commercial since 1982	Multi-tenant property. Several tenants listed on SQG and FINDS databases. No violations reported.
CS-55	O'Ryans Conoco, 11201 93rd Ave.	Filling station	Four underground storage tanks present.

Source: Phase 1 Environmental Assessment (July 2003), DPRA Environmental Consulting
* "CS" was added to the site numbers to correspond with their identification as "contaminated sites" on Figures 8A through 8D in Appendix A.
(1) LUST refers to Leaking Underground Storage Tank
(2) VIC refers to Voluntary Investigation and Cleanup Program
(3) UST refers to Underground Storage Tank

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

Response: See Table 9 for the before and after cover types.

TABLE 9
COVER TYPES

	Before Acres	After Acres
Types 1-8 wetlands	1.7	0.7
Wooded/forest	0	0
Brush/Grassland	0	0
Cropland	0	0
Lawn/landscaping	128.9	102.7
Impervious surfaces	125.8	145.2
Other: Ditch	2.2	4.7
Ponding Locations	0.4	5.7
TOTAL	**259**	**259**

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.

Response: The majority of the proposed roadway improvements will occur in developed areas that have been previously disturbed by residential, commercial, and industrial development and previous roadway construction. Wildlife in these areas is limited to those species that have adapted to urban areas. Typical examples of such species include whitetail deer, raccoons, squirrels, rabbits, and various birds. Since the project is fully within an urban area and does not include the conversion of open space to developed land, no substantial concerns regarding wildlife habitat have been identified.

The proposed project is in proximity to Twin Lakes, which provides fishery habitat. No impacts to fish are anticipated as a result of the project (see Item No. 12 for more information about impacts to lakes). Best management practices will minimize impacts in other areas of the proposed project to protect water quality during construction (see Item No. 16). Indirect effects of the project, such as increased runoff from impervious areas, will be addressed so as not to cause adverse effects to water quality. As described in Item No. 17, the project includes provisions to treat stormwater from the roadway prior to discharge into nearby water bodies.

b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site?

_X_ Yes __No

If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the DNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: Describe measures to minimize or avoid adverse impacts.

State-Listed

Response: According to the Minnesota Department of Natural Resources (DNR) Natural Heritage and Nongame Research Program review (NHNRP Contact # ERDB 20060855), there are six known occurrences of rare species or natural communities within or in proximity to the project area. However, based on the nature and location of the proposed project, it is not believed that the project will affect any known occurrences of rare features. Species noted in the inventory conducted by the DNR include water willow (*Decodon verticillatus*), least darter (*Etheostoma microperca*), bald eagle (*Haliaeetus leucocephalus*), and colonial waterbird nesting sites for Ring-billed gull and Herring gull. See correspondence dated May 10, 2006 in Appendix B. Since most of the reconstruction will generally take place within the existing right of way, proposed reconstruction is not expected to adversely impact the existing habitat of any of the species listed above.

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?

_X_ Yes __ No

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

Response: Preliminary data was gathered and reviewed to determine the locations of potential wetland habitats in the project area. These data sources included the following:

- The National Wetlands Inventory (NWI)
- The National Cooperative Soil Survey (NCSS) Web Soil Survey of Hennepin County, Minnesota
- The Hydric Soils List for Hennepin County, Minnesota
- The Minnesota Protected Waters Inventory (MnDNR)
- Recent Aerial Photographs
- U.S. Geological Service Quadrangle Maps

Wetlands along the project corridor were delineated in 2004 and verified during 2006 and Spring 2007 using criteria from the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation

Manual, Technical Report Y-87-1. U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS). Wetland areas are shown on Figures 3A through 3E and Figures 6A through 6E in Appendix A. Within the project area, there are 16 naturally occuring wetland areas along project corridor, including three MnDNR protected waters wetlands and the South Fork Rush Creek. Identified wetlands are also classified according to descriptions set forth in *Wetland Plants and Plant Communities of Minnesota & Wisconsin - Second Edition* (USCOE Publication; Eggers and Reed. 1997), as required by the Minnesota Wetland Conservation Act (WCA).

The proposed project will affect a portion of an existing DNR protected wetland (563W), other wetlands, roadside and stormwater conveyance systems (ditches and ponds), and Shingle Creek (DNR protected watercourse). The following sections describe: 1) the surface water resources identified (delineated) on site; 2) potential impacts based on conceptual development plans; 3) impact avoidance and minimization efforts utilized during site concept development; 4) opportunities for wetland replacement/ mitigation; and 5) permitting/regulatory coordination to be completed for the project.

Creeks

Shingle Creek

Within the project limits, a short reach of Shingle Creek flows from west of the project limits under existing CSAH 81 to the east, eventually to the Mississippi River. The existing CSAH 81 culvert through which Shingle Creek flows will be extended due to the new embankments, or will be replaced with the project. The design of the culvert will meet regulatory requirements for headwater/stage increases and flow rates.

Wetlands

Three wetlands, three constructed stormwater ponds, and eight constructed ditches, all with wetland characteristics, are located completely or partially in the project area. The topography is generally flat, and most of the wetlands adjacent to the roadway are ditch-like, serving mainly as stormwater conveyance systems. In general, the delineated ditch and wetland boundaries adjacent to the existing roadway have an abrupt boundary where they meet the steep road embankment. The wetland areas are generally dominated by cattails (*Typha sp.*), reed canary grass (*Phalaris arundinacea*), willows (*Salix sp.*) and box elder (*Acer negundo*). The vegetation changes abruptly from that in the wetland to mowed ditch banks and roadsides dominated by smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*), dandelions (*Taraxacum officinale)*, box elder and other weedy species.

Wetland W-1: North of Corvalis Avenue in Crystal, and bounded on the west by the BNSF Railway Company right of way, on the north by the Soo Line Railroad right of way and on the east by CSAH 81, Wetland W-1 is mapped on the National Wetlands Inventory (NWI) as a semi-permanently flooded deep marsh wetland (Type 4). W-1 is underlain by Seelyeville and Markey muck soils. Through the years, Wetland W-1 has become choked with cattails and does not have any open water area that is typical of a semi-permanently flooded deep marsh wetland, therefore it is now classified as a

shallow marsh (Type 3). There are inlets that discharge water into Wetland W-1, however there are no outlets. Therefore, Wetland W-1 is an isolated wetland. This wetland provides some wildlife habitat, flood storage and water quality improvement to the waters discharged into it.

Wetland W-2: North of 73rd Avenue in Brooklyn Park, a large DNR protected water wetland (563W), through which Shingle Creek flows, lies to the west of the BNSF Railway company right of way, and a bisected portion of this wetland (W-2) lies between the BNSF Railway Company right of way and CSAH 81. Wetland W-2 is a shallow marsh (Type 3) underlain with mucky soils, dominated by cattails and connected to the larger portion of DNR wetland 563W via culvert under the BNSF rails. This wetland mainly provides water quality protection to Shingle Creek as well as some flood storage.

Wetland W-1-Greenhaven: North of 77th Avenue North and west of CSAH 81 and the BNSF Railway Company right of way in Brooklyn Park, lies a large wetland complex (W-1-Greenhaven) that is identified on the DNR Protected Waters Invertory as #560W (note that this wetland was delineated subsequent to the delineation of W-1 and W-2 described above and was labeled W-1 in the delineation report; it has been relabeled W-1-Greenhaven for inclusion in the EA). Shingle Creek flows through the southeast corner of this wetland. The majority of the 28.85-acre wetland is classified as a seasonally flooded shallow marsh (Type 3), with shrub carr (Type 6), and hardwood swamp (Type 7) components. Vegetation is dominated by cattails, lake sedge (*Carex lacustris*) and reed canary grass within the shallow marsh portions. Willows and dogwood (*Cornus sp*.) dominate the shrub carr components and eastern cottonwood (*Populus deltoides*) and box elder dominate the hardwood swamp areas. This wetland provides water quality protection to Shingle Creek, flood storage, wildlife habitat and recreation opportunities because it is within Greenhaven Park.

As shown on Figures 4A through 4J in Appendix A, aside from Wetlands W-2 and W-1-Greenhaven noted above, linear stormwater conveyance structures and stormwater ponds with wetland characteristics are located throughout the corridor. These constructed ditches and storm ponds are located in areas mapped as upland soils according to the NCSS Web Soil Survey for Hennepin County, and are not located in any NWI mapped areas. Ditches along the corridor north of Shingle Creek predominantly flow to the south and into Shingle Creek, with a small section north of 93rd Avenue that may also flow to the north. Ditches along the corridor, south of Shingle Creek and north of I-94, flow to the north and into Shingle Creek. (see Item D of the EA).

Avoidance and Minimization Alternatives

Alternative road alignments were evaluated to determine if the wetlands and Shingle Creek could be avoided and to identify minimization opportunities. Those wetlands proposed for impact are located within the right of way, near or at the toe-of-slope of the existing roadway. Shingle Creek flows under the existing CSAH 81 corridor. Thus, aside from the No Build alternative which would not meet the project needs, complete avoidance is not feasible.

Impacts were minimized to the extent practicable with steeper side slopes through the highway sections that are adjacent to wetlands, thereby minimizing the roadway footprint where possible. Temporary impacts from adjacent grading for flood storage and stormwater treatment will be restored to preconstruction conditions through regrading to original contours and planting to appropriate wetland plant species following construction. In addition, construction in this area could be completed in the winter when the surface is frozen, thus minimizing compaction. The site will be restored to an equal or improved condition after grading. Further minimization is not feasible without compromising the project goals.

Impacts to wetland water quality functionality will be minimized by the use of water quality improvement features known as Best Management Practices (BMPs). Erosion prevention and sediment control during construction will include silt fences and traps, temporary seeding and mulching, and use of erosion control blankets on slopes. Permanent ponds will be constructed as early in the project as practicable in order to trap sediment during construction. Excess fill material will not be deposited in wetlands or other environmentally-sensitive areas.

Wetland Impacts

Table 10 shows the impacts to the wetlands within the project area, as well as the areas of stormwater features that will be affected. Figures 4B, 4F, and 4G in Appendix A depict the wetland locations. A total of 1.7 acres of wetland will be disturbed: 1.0 acre will be permanently filled upon completion of the project and 0.7 acres will be restored after disturbance. The stormwater ditches within the roadway corridor will be converted to underground storm sewer systems, and stormwater ponds will be modified to address the increased impervious surface.

Mitigation Considerations

Application for permits for wetland impacts must be made to the U.S. Army Corps of Engineers, the DNR, the City of Maple Grove, Shingle Creek WMC and Elm Creek WMC. See Appendix B for correspondence from the U.S. Army Corps of Engineers concurring with the need for a Section 404 permit for this project. Mitigation for wetland impacts is anticipated to be provided through a combination of on-site wetland restoration at Wetland W-1, other off-site mitigation efforts, and purchase of credits from the Board of Soil and Water Resources (BWSR) Wetland Banking Program, as appropriate.

Conclusion

Based upon the above factors and considerations, it is determined that there is no practicable alternative to the proposed construction in the identified wetlands, and the proposed action includes all practicable measures to minimize harm to the wetlands.

TABLE 10
WATER RESOURCE IMPACTS

Wetland ID and Topographic Setting*	Total wetland area (ac)	Wetland Type (Eggers & Reed/Circ 39)	Roadway Impact Area Impact area/% of total wetland area (ac)	Type of Impact
W-1 Isolated	1.0	Shallow marsh/Type 3	0/0%	N/A
W-2 Tributary	1.0	Shallow Marsh/Type 3	1.0/100%	Road fill
W-1-Greenhaven Flow-through	28.9	Shallow marsh/scrub shrub/forested/Type3/6/7	0.7/2%	Temporary impact for grading of adjacent flood/stormwater facilities
		Total Wetland Impacts	**1.7**	
Stormwater Ponds			Area of	
ST-1	N/A	N/A	<0.1	Pipe inlet
ST-2	N/A	N/A	0	N/A
ST-3	N/A	N/A	0.37	Part of reworking into a larger ponding area
		Total Stormwater Pond Impacts	**0.4**	
Ditches				
D-1**	N/A	N/A	0	
D-2**	N/A	N/A	0	
D-3	N/A	N/A	0	
D-4	N/A	N/A	0.13	Conversion to subsurface conveyance
D-5	N/A	N/A	0.5	Conversion to subsurface conveyance
D-6	N/A	N/A	0.62	Conversion to subsurface conveyance
D-7	N/A	N/A	0.26	Conversion to subsurface conveyance
D-8	N/A	N/A **Total Ditch Impacts**	0 **1.51**	

* Topographic setting included to help determine which wetlands may fall under COE jurisdiction (i.e., non-isolated - in **BOLD**).

* Impacts due to TH 169 interchange construction, not associated with this project.

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)? __Yes X 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.

Response: Coordination was completed with the Minnesota Department of Health to receive their well inventory. Mapped locations of the wells adjacent to and within the project area were identified from the Minnesota Geological Survey County Well Index database.

While several wells were identified in the inventory and confirmed with the corridor survey, it is not anticipated that the project will impact wells.

The County will complete its review for wells as part of final design. If additional wells are discovered during final design or during construction, measures consistent with the Department of Health and local well requirements will be adhered to. No new wells will be drilled as part of the proposed project.

If temporary dewatering is needed during project construction, the appropriate DNR groundwater appropriation permits would be obtained for any temporary dewatering activities.

Also, construction of the proposed roadway will be coordinated with the public utilities of the Cities of Robbinsdale, Crystal, Brooklyn Park, Osseo, and Maple Grove to ensure that their public water system facilities would not be impacted by construction activities. Any realignment of water lines for the proposed roadway would also be coordinated with these cities.

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.

Response: The proposed project includes widening of CSAH 81 and construction of a trail along the majority of the corridor. The proposed project will encroach upon the 100-year floodplain at the Shingle Creek crossing in Brooklyn Park near 79th Avenue North. The City of Brooklyn Park has mapped the floodway and flood fringe areas associated with Shingle Creek in the Flood Hazard Area Overlay within its code of ordinances. Roads,

bridges and railroad tracks are permitted in the floodway as long as their design and construction meet specific standards described by local ordinances. Sources of floodplain information include:

- Flood Insurance Rate Map (FIRM) for Hennepin County – community panel number 27053C0182E, with an effective date of September 2, 2004.

- Flood Insurance Study (FIS) for Hennepin County – FIS numbers 27053CV001A and 27053CV002A, dated September 2, 2004.

The FIRM indicates a Base Flood Elevation of 873.0 feet for the portion of Shingle Creek flowing between CSAH 81 and the railroad tracks to the west. The fill associated with the roadway widening and trail construction would create approximately 400 feet of transverse floodplain impacts as measured on the FIRM.

Furthermore, the project will fill a portion of an existing ditch that is tributary to Shingle Creek and which runs roughly parallel to CSAH 81 along the roadway's west side up to 85th Avenue North. In addition to acting as the conveyance system for roughly 2,300 acres of Maple Grove, Osseo, and Brooklyn Park, the ditch provides flood storage and attenuation. It will likely be necessary to replace the ditch with a pipe for the entire length between TH 169 and the Shingle Creek crossing (approximately 3700 feet). Therefore, new flood storage is proposed west of the railroad tracks, between Brooklyn Boulevard and Greenhaven Drive. See Item 17 for further discussion relating to this ditch.

As a result of the floodplain impacts, the following four areas are addressed per Executive Order 11988:

Area 1: No significant potential for interruption of a transportation facility which is needed for emergency vehicles or provides a community's only evacuation route.

The existing roadway elevation is above the 100-year flood elevation, and the finished grade of the proposed improvements in this area will be similar to the existing condition. Therefore, this project will have no significant potential for the interruption of a transportation facility or emergency vehicle access.

Area 2: No significant impact on natural and beneficial floodplain values.

Construction of the proposed CSAH 81 improvements is not anticipated to have adverse impacts on fisheries, plant materials, public boat access, boat passage, threatened or endangered species, or water quality within the existing floodplain.

Wetlands will be encroached upon within the Shingle Creek floodplain. These impacts are discussed in Item 12 of this EAW.

Erosion control and turf establishment measures will be implemented to minimize impacts on water quality and soil stability due to the extension or replacement of box culverts. Water quality is discussed in Item 17a of this EAW.

Area 3: No significant increased risk of flooding will result.

Any extension or replacement of box culverts at Shingle Creek will be designed so that they will not cause any significant increase in flood stages. The amount of flood storage provided in the ditch to be filled relative to the overall floodplain is minor. In addition, a stormwater pond is proposed upstream of the railroad tracks on the south side of Shingle Creek. Since the pond will be hydraulically connected to the floodplain via an outlet pipe and emergency spillway, the pond volume may be feasible as floodplain mitigation for the filling of the existing ditch. Therefore, it is not expected that the proposed project will result in any significant increase in flooding.

Area 4: Will the project support and/or result in incompatible floodplain development?

The proposed project expands upon an existing highway but will not provide any additional access to the floodplain area beyond what already exists.

Conclusion

Given the above analysis, no significant floodplain impacts are anticipated as a result of the proposed project. The design of any necessary mitigation measures, including culvert sizing, will be coordinated with the appropriate agencies during the final design and permitting processes.

15. Water Surface Use. Will the project change the number or type of watercraft on any water body? __Yes _X_ No

If yes, indicate the current and projected watercraft usage and discuss any potential over crowding 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:

Acres to be graded: approximately 259 acres
Cubic yards of soil to be moved: approximately 480,000 yd^3

Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

Response: The *EAW Guidelines* (Minnesota EQB, 2000) identify steep slopes as slopes of 12 percent or greater. There is one area of steep slopes in the project area (see Figure 10 in Appendix A and descriptions in Item No. 19). Construction activities that impact steep slope soils require appropriate erosion control measures.

According to the Natural Resource Conservation Service (NRCS), highly erodible land (HEL) and potentially highly erodible land (PHEL) are areas of land that have a high potential for erosion. These classifications are based on soil type and steep slope

characteristics. PHEL map units need to be field verified to confirm whether characteristics meet the HEL designation requirements. When disturbed through activities such as development these areas have a high potential for soil erosion. Particular attention should be paid to HEL areas as they can present unstable soil conditions that can result in erosion if not properly managed during construction activities.

As proposed, CSAH 81 is adjacent to areas of HEL, and passes directly over PHEL areas (Figure 10). The areas of potential impacts are at the northern limits in the vicinity of CSAH 30/CSAH 81 junctions, and extend north to the project terminus. The proposed road profiles have been designed to minimize disturbances to steep slopes. As the design of a Preferred Alternative is carried forward, it will be further refined to avoid and minimize impacts to areas of HEL.

Erosion and sedimentation of all exposed soils within the project corridor will be minimized by utilizing the appropriate BMPs during construction. Implementation of BMPs during final construction greatly reduces the amount of construction-related sedimentation and helps to control erosion and runoff. Ditches, dikes, siltation fences, bale checks, sedimentation basins, and temporary seeding will be utilized as temporary erosion control measures during construction grading. Temporary and permanent erosion control plans will be identified in the final site grading and construction plans for each stage as required by the National Pollutant Discharge Elimination System (NPDES) permitting for construction sites and in accordance with the Cities of Crystal, Brooklyn Park, Osseo and Maple Grove and the watershed regulators' erosion/sediment control standards. Erosion control measures will be in place and maintained throughout the entire construction period. Removal of erosion measures will not occur until all disturbed areas have been stabilized.

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.

Response: The proposed project will increase the total impervious surface area from about 126 acres to about 145 acres (a 15 percent increase). As a result, the peak flow and the total surface water runoff volume will increase along the majority of the corridor. To manage this increased runoff, a storm sewer network along the entire corridor will be designed to convey the water to stormwater treatment basins, proprietary stormwater quality treatment devices (hereinafter referred to as grit chambers), and infiltration areas where feasible. Following treatment, stormwater will be discharged at a rate equal to existing flow (to the extent practicable) to various receiving waters. Further discussion of the added impervious surface area and treatment strategies for each specific project segment can be found under Item 17b.

The proposed CSAH 81 project corridor is contained entirely within Hennepin County and impacts five cities (Robbinsdale, Crystal, Brooklyn Park, Osseo, and Maple Grove). Additionally, the project corridor is contained within the limits of three WMOs: Shingle Creek WMC, West Mississippi River WMC, and Elm Creek WMC. City, WMO, MPCA via the NPDES permit, and the Mn/DOT guidelines make up the regulatory

framework for stormwater management. The Cities of Robbinsdale, Brooklyn Park, and Maple Grove have water management plans that define a set of rules and regulations governing water resources. All three WMOs, along with the Crystal Airport, have water management plans that provide guidelines and policies for surface and groundwater management and conveyance. All sets of rules and policies will be considered when designing water resource features, such as storm sewers and treatment devices, that are associated with the CSAH 81 improvements. For preliminary planning purposes, the most stringent rule applicable to any given situation will typically be used as the governing framework for design of the whole corridor.

Where feasible along the entire project corridor, various BMPs will be implemented to treat runoff according to water quality guidelines established by the Nationwide Urban Runoff Program (NURP), WMOs, cities, and Hennepin County. These guidelines identify design practices that will substantially reduce sediment and nutrient loads contained within stormwater runoff. The most prominent BMPs will include: stormwater treatment ponds, grit chambers, and infiltration areas. Additionally, the proposed ponds and infiltration areas will act as rate control tools, which will maintain discharge at existing rates into low areas, wetlands, and other various receiving waters. Final locations for ponds, infiltration areas, and grit chambers will be coordinated with local municipalities, Hennepin County, watershed management personnel, and state permitting agencies. Figures 11A through 11J show their preliminary locations.

Rules for the Shingle Creek WMC and West Mississippi River WMC currently include infiltrating one-half inch of runoff from impervious surfaces within 72 hours where feasible using various accepted BMPs. It should be noted that Shingle Creek WMC is considering revisions to its volume-reduction rule. To the extent possible, the proposed design will incorporate features such as infiltration basins and infiltration trenches around pond fringes and between the roadway and the railroad tracks. Further coordination with the WMOs is needed regarding this requirement given the right of way and elevation constraints.

The most common waterborne pollutants associated with highway runoff are heavy metals, nutrients, organic matter, chlorides, and particulates. Additionally, mean pollutant concentrations in runoff from urban and rural highways contain nitrogen and phosphorus as byproducts of combustion and from atmospheric deposition, in precipitation or dust. Existing CSAH 81 is mainly a rural design; therefore, the drainage systems primarily consist of vegetated ditches and open channels that provide some water quality treatment by reducing the pollutant load conveyed by highway runoff. However, concentrations of pollutants in urban stormwater may be above the maximum standards defined by the MPCA under existing conditions. The proposed wet detention basins, grit chambers, and infiltration areas along the project corridor are expected to reduce pollutant concentrations in stormwater to within MPCA maximum standards, which are defined as the highest level aquatic organisms can be exposed to for a brief time with zero to slight mortality[1].

[1] Minnesota Pollution Control Agency, Protecting Water Quality in Urban Areas, March, 2000.

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 the impact of runoff on the quality of receiving waters.

Response: The proposed drainage patterns will be designed to emulate the existing drainage patterns to the extent practical. These drainage patterns are defined by stormwater routes to lakes and creeks via ditch flow, culverts, and storm sewer. The receiving water bodies along the project corridor include: Crystal Lake, Twin Lakes, Shingle Creek and various wetlands and low areas. Note that while the project crosses through the jurisdictional boundaries of the three WMOs previously listed, the entire project drains to Shingle Creek, except for a small portion of the project north of 93rd Avenue that may flow north to Elm Creek. Ultimately, all of the above mentioned water bodies drain to the Mississippi River. Table 11 provides a summary of treatment strategies and receiving water bodies within each segment, while the following discussion describes each of these water bodies in more detail.

TABLE 11
RECEIVING WATER BODIES AND TREATMENT STRATEGIES

Receiving Water Bodies	Roadway Segment	Treatment Strategies
Twin Lakes	1, 2	9 ponds[+] 2 grit chamber*
Shingle Creek	3, 4	9 ponds** 3 grit chambers*

[+] Includes one existing pond.
* Refers to proprietary stormwater quality treatment device.
** Includes three existing ponds.

In order to benchmark water quality in the proposed condition, it is important to understand the existing conditions of the receiving water bodies along the project corridor. Based on shallow Secci disk readings, high total phosphorus readings, high Chlorophyll-a readings, and high Total Kjeldahl Nitrogen readings, the utility of Crystal Lake and Twin Lakes for recreational uses is impaired. Additionally, Crystal Lake has a long-term average Trophic State Index (TSI) of 78 (Hypereutrophic), and Twin Lakes have a TSI of 75 (Hypereutrophic). Neither of these lakes is generally considered recreationally suitable[2]. Shingle Creek contains high chloride, total and dissolved phosphorus, and total and volatile suspended solids, which have negatively affected aquatic life in the creek[3].

In addition, Crystal Lake, Twin Lakes, and Shingle Creek are identified on the EPA 303(d) Total Maximum Daily Load (TMDL) list of impaired waters. Table 12 indicates the receiving waters and their associated impairments.

[2] Shingle Creek Watershed Management Organization, Second Generation Watershed Management Plan, July 2003.
[3] ibid.

TABLE 12
IMPAIRED RECEIVING WATER BODIES ALONG PROPOSED CSAH 81 IMPROVEMENTS

Receiving Water Body	Impaired Water Uses	Specific Impairments
Crystal Lake	• Aquatic Recreation	• Excess nutrients
Twin Lakes	• Aquatic Consumption • Aquatic Recreation	• Mercury FCA[1] • PCB FCA • Excess Nutrients
Shingle Creek	• Aquatic Life	• Chloride • Invertebrate IBI[2] • Low oxygen

[1] FCA - Fish Consumption Advisory
[2] IBI - Index of Biotic Integrity

Segment One (47th Avenue North to CSAH 10): County Project No. 0118

Land use within this segment consists mostly of industrial and residential areas, along with wetlands, parks, and open spaces. The majority of existing stormwater runoff in this segment is routed through several storm sewer trunk lines to Twin Lakes without any water quality treatment or rate control BMPs. A portion of CSAH 81 runoff in the existing condition is treated in a pond located in the southeast quadrant of CSAH 81 and the SOO Line railroad while another portion of this segment drains to a storm sewer system on Bass Lake Road; both ultimately discharge to Twin Lakes. The existing trunk storm sewer does not have adequate capacity for the drainage area. Therefore, an overflow relief system was constructed in an effort to address the problem. The existing storm sewer west of the BNSF railroad is routed through a series of stormwater ponds and wetlands before ultimately discharging to Twin Lakes.

The proposed improvements result in added impervious area, increasing both the total volume of runoff and the peak discharge from the existing condition. In order to address these impacts as well as treat potential increased pollutant and sediment loading, four stormwater ponds are proposed in this segment. These ponds will attenuate peak inflows prior to discharging to existing storm sewer connections. See Figures 11A through 11C in Appendix A for a graphical representation of the ponds and drainage patterns in this segment.

As will be discussed further in the next segment, a series of flow diversions are proposed in order to address the increase in runoff and the restrictions against ponds near the Crystal Airport property.

Segment Two (CSAH 10 to 63rd Avenue North): County Project No. 0119

Land use within this segment consists mostly of industrial and residential areas, along with wetlands, parks, open spaces, and the Crystal Airport. Currently, stormwater runoff between Bass Lake Road and just south of 62nd Avenue is directed to an infiltration area located on the airport property. This basin outfalls through a series of ditches and culverts within the airport property to a large wetland complex, and

ultimately to Twin Lakes. The remainder of the runoff within this segment drains to either a pond/wetland on the west side of CSAH 81 or directly to a lift station via ditches on the east side of CSAH 81. The lift station pumps the water through a storm sewer network to Twin Lakes.

The proposed improvements result in added impervious surface, increasing the total volume of runoff and the peak discharge from the existing condition. In order to address these impacts as well as treat potential increased pollutant and sediment loading, one dry pond, two stormwater ponds, and two grit chambers are proposed in this segment. See Figure 11C and 11D in Appendix A for a graphical representation of the ponds, grit chambers, and drainage patterns in this segment.

As discussed above, a portion of CSAH 81 runoff in the existing condition drains onto and through the Crystal Airport property. The increased pavement of the proposed project would result in a greater volume of runoff reaching the property and higher peak discharges. However, Federal Aviation Administration regulations and right of way constraints do not allow a pond upstream of the discharge point. Therefore, the project proposes to divert a portion of the drainage area at the southern end of the segment south to the Bass Lake Road system and a portion north of the airport to ponds at 63rd Avenue. Furthermore, due to the capacity constraints of the Bass Lake Road storm sewer system, the area of CSAH 81 immediately south of Bass Lake Road will be diverted to proposed ponds south of Wilshire Boulevard. The intent of these diversions is to maintain discharge rates to the airport basin and to the Bass Lake Road system at existing levels by diverting water to other systems where proposed ponds would be better able to control the peak discharges. Further coordination may be necessary during final design to ensure that the concerns of the cities, the Metropolitan Airports Commission, and the County are met.

Segment Three (63rd Avenue North to TH 169 Interchange Area): County Project No. 0203

Land use within this segment consists mostly of industrial areas, with some residential areas, wetlands, and open spaces. All runoff for CSAH 81 south of the I-94 interchange currently is routed through ditches or storm sewer south to 63rd Avenue, where a storm sewer trunk line conveys the water to Twin Lakes. Existing runoff from CSAH 81 within the I-94 interchange is routed to dry ponds within the interchange, which discharge ultimately into Shingle Creek. The remainder of this segment from I-94 to TH 169 is conveyed via storm sewer or ditches to Shingle Creek. The ditches between Shingle Creek and TH 169 provide storage and rate attenuation due to the small culverts under entrance roads and long, gentle ditch slopes.

The proposed improvements result in increased pavement for the roadway as well as eliminating ditches, resulting in an increase of both the total volume of runoff and the peak discharge from the existing condition. Therefore, five stormwater ponds and two grit chambers are proposed along this section of the alignment. One of the pond locations represents an expansion of an existing pond on private property. Further coordination between the County and the property owner may be necessary. Refer to Figures 11D through 11G in Appendix A for a graphical representation of the ponds,

grit chambers, and drainage patterns in this segment. Note that all CSAH 81 runoff within the proposed TH 169/CSAH 81 interchange will be treated in stormwater ponds designed and constructed under a separate Mn/DOT project.

With this project, the ditch between CSAH 81 and the railroad tracks from Shingle Creek north to roughly 84th Avenue would be filled by the road widening and proposed trail. As this ditch is the conveyance system for roughly 2,300 acres of Maple Grove, Osseo, and Brooklyn Park, coordination between the various municipalities, the Shingle Creek WMC, and Mn/DOT took place to discuss the appropriate design flow and replacement pipe size. The size will need to balance conveyance capacity, which could help the City of Osseo address flooding issues in their downtown area, with concern voiced by the City of Brooklyn Park regarding downstream impacts, as the replacement of the ditch with a closed conduit results in a loss of storage, infiltration capacity, and flood attenuation. The TH 169 interchange ponds will be used for additional flood storage and excavation within the Greenhaven Park is proposed to accommodate diversion of high flows. Further coordination between the above-mentioned entities may be required during final design of this area.

Segment Four (TH 169 Interchange Area to CSAH 30): County Project No. 0226

Land use within this segment consists mostly of industrial areas, along with residential areas, wetlands, open spaces, schools, and parks. Similar to Segment Three, existing CSAH 81 has a rural design with relatively flat profile slopes. Existing runoff within this segment is conveyed in wide, fairly deep ditches that run north-to-south along the existing railroad tracks, beginning at a high point near 93rd Avenue just north of the northern project terminus. The City of Maple Grove Stormwater Plan identifies the ditches along CSAH 81 as stormwater ponds. A timber weir outlet structure installed in the ditch just south of the dividing line between Maple Grove and Osseo limits peak flows prior to discharge into storm sewer carrying combined flow for the City of Osseo and CSAH 81. This storm sewer ultimately drains through the ditch south of TH 169 that was described in the previous segment. Although the majority of Segment Four drains to Shingle Creek, small portions at the north end fall within the boundaries for West Mississippi WMC and Elm Creek WMC.

The proposed improvements within this segment will result in an increase in impervious area for the roadway and an increase in both the total volume of runoff and the peak discharge. Treatment for the runoff from CSAH 81 north of 89th Avenue North will continue to occur in the existing ditches noted by Maple Grove to be treatment ponds. However, their volume will be reduced due to fill from the trail and expanded roadway section. A rate-control pond is required in the vicinity of 89th Avenue North to attenuate the increased discharge rate and act as an overflow for the ditches. The remaining ditch volume, augmented by the pond, provides treatment for the project area north of 89th Avenue North and approximately 83 acres of offsite city areas that currently receive some level of treatment in the existing ditches. Treatment strategies for CSAH 81 south of 89th Avenue North include one grit chamber and one stormwater pond. Refer to Figures 11G through 11J in Appendix A for a graphical representation of the pond, grit chambers, and drainage patterns in this segment.

18. Water Quality: Wastewaters

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

Response: N/A

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

Response: N/A

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.

Response: N/A

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

Response: N/A

19. Geologic Hazards and Soil Conditions

a. Approximate depth (in feet):
to ground water: 15 feet minimum 30 feet average
to bedrock: 50 feet minimum 145 feet average

Source: Geologic Atlas for Hennepin County, 1989 Minnesota Geological Survey

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.

Response: According the Geologic Atlas for Hennepin County (1989), there are no known geologic site hazards to ground water, such as karst or sinkholes, within the proposed project area.

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

Response: According to the Hennepin County Soils Survey (2006), the project area consists of mainly sandy loam/loamy sand soils. The soil types are mostly well-drained and nearly level to sloping, with a few areas of steep slopes. Table 13 includes a list of NRCS-classified soil types found in the project area.

Sensitivity to groundwater system pollution is identified in the Geologic Atlas for Hennepin County (1989). The Atlas identifies groundwater systems within the project area as ranging from moderate to very high sensitivity to pollution; the majority of the project area is identified as having high sensitivity. Susceptibility of the water table was rated on the basis of the depth to the water table and porosity of geologic materials.

The proposed project involves limited use of contaminants (primarily fuel for construction activities) and thus there is limited potential for soil contamination. If a spill were to occur during construction, appropriate action to remediate would be taken immediately in accordance with MPCA guidelines and regulations (see also Item No. 20, subpart C).

TABLE 13
SOIL TYPES

Soil Name	Soil Symbol	Slope (percent)
Isan sandy loam	D20A	0 - 2
Southhaven loam	D23A	0 - 2
Seelyeville and Markey soils, depressional	D30A	0 - 1
Urban land-Duelm complex	D31A	0 - 2
Urban land-Dorset complex	D33B	0 - 8
Urban land-Hubbard complex	D34B	0 - 8
Dorset sandy loam	D4A	0 - 2
Dorset sandy loam	D4B	2 - 6
Verndale sandy loam, acid substratum	D6A	0 - 2
Verndale sandy loam, acid substratum	D6B	2 - 6
Hubbard loamy sand	D7A	0 - 2
Hubbard loamy sand	D7B	2 - 6
Hubbard loamy sand	D7C	6 - 12
Sandberg loamy coarse sand	D8C	6 - 12
Muskego, Blue Earth, and Houghton soils, ponded	L16A	0 - 1
Lester loam, morainic	L22C2	6 - 12
Le Sueur loam	L25A	1 - 3
Hamel, overwash-Hamel complex	L36A	1 - 4
Angus loam, morainic	L37B	2 - 5
Nessel loam	L44A	1 - 3
Dundas-Cordova complex	L45A	0 - 3
Tomall loam	L46A	0 - 2
Koronis-Kingsley complex	L58C2	6 - 12
Koronis-Kingsley complex	L58D2	12 -18
Forestcity-Lundlake, depressional, complex	L59A	0 - 3
Urban land-Udorthents, wet substratum, complex	U1A	0 - 2
Udorthents, wet substratum	U2A	0 - 2
Udorthents (cut and fill land)	U3B	0 - 6
Urban land-Udipsamments (cut and fill land) complex	U4A	0 - 2

Source: Hennepin County Soil Survey (SSURGO), NRCS 2006

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.

Response: The only solid waste expected to be generated as a consequence of the project is the disposal of the existing roadway materials. The methods used to break apart, sort, and dispose of materials will be at the contractor's discretion. Disposal would occur in accordance with state guidelines and regulations.

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.

Response: No toxic or hazardous materials are anticipated to be used at the site. Construction activity is not anticipated to displace any of the sites where contamination is known to exist, as detailed in the Phase I ESA documentation of high potential sites. However, should contaminated soils or groundwater be encountered, these conditions will be managed in accordance with the Construction Contingency Plan developed by Hennepin County Environmental Services.

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.

Response: Temporary storage tanks for petroleum products may be located in the project area for the purpose of refueling construction equipment during roadway construction. Appropriate measures will 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 will be taken immediately in accordance with MPCA guidelines and regulations.

21. Traffic. Parking spaces added: N/A

Existing spaces (if project involves expansion): N/A

Estimated total average daily traffic generated:

Response: The proposed project will not generate traffic. However, it will provide additional capacity to accommodate the forecasted increase in vehicles. See Table 14 for future traffic volumes under Build conditions. These volumes are from the March 7, 2006 *Forecast Update Memorandum* prepared by SRF Consulting Group, Inc.

Estimated maximum peak hour traffic generated (if known) and time of occurrence: N/A.

Provide an estimate of the impact on traffic congestion on affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

TABLE 14
YEAR 2030 BUILD ANNUAL AVERAGE
DAILY TRAFFIC (AADT) SIX-LANE SCENARIO

Location on CSAH 81	Existing Volumes (AADT)	Estimated Build (AADT)
South of TH 100	21,100	25,000
47th Ave. N. to CSAH 10	25,700	36,000
CSAH 10 to 63rd Ave. N.	23,100	35,000
63rd Ave. N. to just south of I-94/I-694	27,300	36,000
South of I-94/I-694 to N. junction of I-94/I-694	30,200	46,000
N. junction of I-94/I-694 to W. 73rd Ave.	24,000	40,000
W. 73rd Ave. to CSAH 130/152	24,000	38,000
CSAH 130/152 to TH 169	24,400	39,000
TH 169 to CSAH 109	22,800	39,000
CSAH 109 to Broadway St.	24,400	36,000
Broadway St. to Zachary Ln.	18,100	30,000
Zachary Ln. to CSAH 30	15,000	24,000

Response:

Introduction

A traffic demand forecast was completed for the proposed project. A complete copy of the forecast memorandum from January 7, 2003 County Road 81 Traffic Forecast (Year 2025) and the March 7, 2006 Forecast Update (Year 2030) can be obtained from Hennepin County.

Existing Conditions

Currently CSAH 81 is a four-lane roadway within the study area. TH 100 intersects the 7.5 mile segment of CSAH 81 near the southern limit of the project and CSAH 30 intersects CSAH 81 near the northern limit of the project; there are numerous intersections in between these limits. Traffic operations for existing (2002) conditions were analyzed at the following intersections:

- 51st Avenue/Corvallis Avenue
- Wilshire Boulevard
- CSAH 10 (Bass Lake Road)

- 63rd Avenue
- I-94 South Ramp
- I-94 North Ramp
- CSAH 8 (71st Avenue/West Broadway Street)
- Winnetka Avenue/73rd Avenue
- CSAH 130 (Brooklyn Boulevard)
- 79th Avenue
- Green Haven Drive
- Jefferson Highway
- Zachary Lane
- CSAH 30 (93rd Avenue)

Year 2002 data was used because these are the most reliable and comprehensive traffic counts that were collected. Traffic counts collected in 2006 or later are impacted by the reconstruction of CSAH 81, south of TH 100 in the City of Robbinsdale.

Results of the traffic operations analysis of existing conditions, shown in Table 3 in item #6 of this EAW, indicate that two intersections with CSAH 81 (CSAH 10 and CSAH 130/152) currently operate with significant delay (LOS E or F) during the p.m. peak hours. Three additional intersections (I-94 South Ramp, CSAH 8, and Jefferson Highway) have p.m. peak hour traffic volumes exceeding 85 percent of the capcity. If traffic volumes continue to increase at a rate of one percent per year, these three intersections would be over-capacity and begin to operate unacceptably between years 2008 and 2013.

Year 2030 No Build Intersection Operations

A traffic operations analysis was also completed for forecast year 2030 to determine how well the existing intersections would operate under future traffic volumes without the proposed improvements. All key intersections were analyzed with existing geometrics and traffic control. For purposes of this analysis, it was assumed that signal timing at existing signalized intersections would be updated before year 2030. The 2030 No Build levels of service results are shown in Table 4 in item #6 of this EAW. As expected, under increasing future traffic volumes, eight intersections operate at an LOS E or F during the a.m., p.m., or both peak hours.

Year 2030 Build Intersection Operations

To assess intersection operations following the proposed improvements, an intersection operations analysis was conducted for year 2030 under Build conditions (six lanes). Results of the analysis, as listed in Table 15, indicate that all intersections are expected to operate at an acceptable LOS D or better during the a.m. and p.m. peak hours, except the CSAH 130/CSAH 152 intersection during the p.m. peak hour.

TABLE 15
2030 BUILD CAPACITY ANALYSIS – A.M. AND P.M. PEAK HOURS LEVEL OF SERVICE RESULTS CSAH 81 INTERSECTIONS (SIX-LANE SCENARIO)

Intersection	Level of Service	
	A.M. Peak	P.M. Peak
51st Ave/Corvallis Ave.	B	C
Wilshire Blvd.	C	B
CSAH 10 (Bass Lake Road)	D	D
63rd Ave.	D	D
I-94 South Ramp	B	C
I-94 North Ramp	B	C
CSAH 8 (71st Ave./W Broadway)	D	D
Winnetka Ave./73rd Ave.	B	B
CSAH 130/152	D	**E/F**
79th Ave.	A	B
Green Haven Dr.	B	C
Jefferson Hwy.	D	D
Zachary Ln.	C	D
CSAH 30 (93rd Ave.)	C	C

To improve the operations at the CSAH 130/152 intersection, a six-lane roadway would be needed on CSAH 130/152. No reasonable additional improvements are possible for CSAH 81, as the proposed geometrics already include dual left-turn lanes, three through lanes and right-turn lane. The design of this intersection should provide for expansion of CSAH 130/152 to six-lanes in the future. It is expected that this intersection, with the proposed improvements, will operate at an acceptable LOS and capacity until year 2020-2025.

The Build Alternative would provide a six-lane facility with an urban design, except for the TH 100 to CSAH 10/segment which would be constructed as a six-lane footprint and initially striped as four lanes between TH 100 and Wilshire Boulevard and constructed and striped as six lanes north of Wilshire Boulevard. An analysis was conducted to determine when the forecast demand volumes would likely exceed capacity of a four-lane facility. Results indicate that the CSAH 81 segment from TH 100 to I-94 would reach the capacity of a four-lane roadway between years 2020 and 2025.

The additional lanes and intersection improvements would provide increased capacity, help alleviate congestion, and improve traffic flow. Improved traffic flow would lead to improved safety of the roadway through a reduction in the number of crashes.

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. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

Response: 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 the Environmental Protection Agency (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 air toxics.

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 make people more susceptible to respiratory infection, result in lung inflammation, and aggravate preexisting respiratory diseases such as asthma. Ozone is not emitted directly from vehicles but is formed as 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.

A recent study conducted for the MPCA (Sonoma Technology Inc. Preliminary Assessment of Ozone Air Quality Issues in the Minneapolis/St. Paul Region, October 10, 2002) states:

> *Thus, overall trends in ozone show that the numbers of occurrences of higher ozone concentrations are on the rise. While the 1-hr ozone NAAQS level of 0.12 ppm has only been reached twice in the last ten years, the 8-hr NAAQS level of 0.08 ppm is reached on average twice per year at one or more sites. Note that during some years 8-hr ozone levels do not reach 0.08 ppm while in other years 8-hr ozone reaches that level 4 or 5 times. Increasing population and congestion will likely lead to further increases in ozone levels in the future.*

As a result of this trend, 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 state, 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 and the State of Minnesota is currently classified by the EPA as an ozone attainment area. Because of these factors, a quantitative ozone analysis was not conducted for this project.

Particulate Matter

Particulate matter (PM) is categorized by the size of particles being measured. For example, the $PM_{2.5}$ value is the measurement of particles smaller than 2.5 microns (a micron is a millionth of a meter) in a particular volume of air. Fine particles with very small diameters can move like gases and can be transported hundreds of miles from their source. Larger particles do not remain suspended and tend to settle out of the air relatively near their source.

The following summary of potential health impacts is excerpted from the EPA brochure Particle Pollution and Your Health (EPA document 452/F-03-001, September 2003):

> *Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems.*
>
> ***Long-term exposures,*** *such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis—and even premature death.*
>
> ***Short-term exposures*** *to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.*

The MPCA states on its web site:

> *Recent data suggests that particles 2.5 microns or smaller may pose the greatest threat to human health because, for the same mass, they absorb more toxic and carcinogenic compounds than larger particles and penetrate more easily deep into the lungs.*

Motor vehicles can influence particulate matter concentrations on a local scale by directly emitting fine particles and from wind turbulence that causes particles to be mixed into the air. On a regional scale, vehicular traffic can influence particle concentrations through emission of precursor compounds (nitrogen oxides, sulfur oxides and VOCs) as well as direct emissions. Vehicle related particulate matter tends to be smaller than 2.5 microns. The study *Transportation-Related Air Toxics: Case Study Materials Related to US 95 in Nevada*, March 7, 2003, completed by Sonoma Technology states:

> *With the exception of road dust, essentially all of the particulate matter attributed to vehicles (either as direct emissions or compounds which are emitted as gases and condense into particulate matter in the ambient air) is smaller than 2.5 mm in size (pm2.5).*

The concentration of fine particulates in the atmosphere is a complex function of direct local emissions, meteorological conditions, and concentrations of various precursor compounds. Modeling of particulate concentrations is an emerging science and is being done on a regional and nationwide scale. A recent study, Transportation-Related Air Toxics: Case Study Materials Related to US 95 in Nevada, March 7, 2003, completed by Sonoma Technology reviewed the limited data relating road proximity and fine particle concentrations and discussed the extent to which roadways might contribute to exceedances of $PM_{2.5}$ NAAQS:

> *However, these limited findings indicate that, relative to the 24-hour NAAQS of 65 mg/m^3, on-road vehicle $PM_{2.5}$ emissions may be a concern near a road (e.g., within 100 m) if background concentrations are already near the NAAQS. More research is needed to further understand the relationship between $PM_{2.5}$ concentrations and road proximity.*
>
> *There is currently a lack of guidance available to analysts regarding methodological approaches for analyzing the PM impacts of transportation projects at the micro scale.*

Widespread $PM_{2.5}$ monitoring began in Minnesota in 1999. An article published in the MPCA's *Minnesota's Environment* magazine, Volume 3, Number 3, Summer 2003, indicates that particulate concentrations rise to concentrations considered unhealthy for sensitive people only a few times per year. Based on recent $PM_{2.5}$ monitoring, it appears that the State of Minnesota will be in attainment of recently enacted $PM_{2.5}$ standards.

Based on the relatively low ambient concentrations observed in Minnesota and the lack of analysis methodology, no project level modeling for particulate matter was conducted for this project.

Nitrogen Dioxide (Nitrogen Oxides)

Nitrogen oxides, or NOx, are 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 Air and Water Emissions Report, March 2000, indicates that on-road mobile sources account for 31 percent of NOx emissions in Minnesota. In addition to being a precursor of ozone, NOx can cause respiratory irritation in sensitive individuals and contribute to acid rain.

Nitrogen dioxide (NO2) levels in the Twin Cities metropolitan area currently meet state and federal standards. Appendix C of the MPCA's 2001 Legislative Report Air Quality in Minnesota: Problems and Approaches states:

> *Monitored NO2 levels are currently about one third of the annual NO2 standard. Although NOx emissions have increased and may increase further due to increased vehicle travel and increased fuel combustion, it is unlikely that these increases will pose a threat to the annual NO2 standard.*

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.*

Based on the relatively low ambient concentrations of NOx in Minnesota and the long term trend of reduction in NOx emissions, it is unlikely that NOx standards will be approached or exceeded in the project area. Because of these factors, a specific analysis of nitrogen dioxide was not conducted for this project.

Sulfur Dioxide

Sulfur dioxide ($S0_2$) 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 aggravate heart disease. People with asthma are most at risk. Once emitted into the atmosphere, SO_2 can be further oxidized to sulfuric acid, a component of acid rain.

Over 65 percent of SO_2 released to the air comes from electric utilities, especially those that burn coal. The MPCA Air and Water Emissions Report, March 2000, indicates that on-road mobile sources account for just 4.8 percent of SOx emissions in Minnesota. 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.

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 State of Minnesota is classified by the EPA as an attainment area for sulfur dioxide. Sulfur dioxide levels in the Twin Cities metropolitan area currently meet NAAQS. Because of these factors, a quantitative 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 the traffic-related pollutant of most concern in urban areas. Concentrations of CO are generally highest at intersections with poor levels of service and, consequently, more idling vehicles. Air quality analysis of "worst-case" conditions was performed to estimate the effect of the proposed project on future CO concentrations at the intersections in the project area that operates at the lowest level of service. MPCA staff was consulted in the development of the scope, methods, and procedures used in performing CO analysis as described below.

Carbon Monoxide Modeling Methodology and Assumptions

Carbon monoxide concentrations near the worst case intersection were predicted using forecasted traffic volumes, proposed intersection geometrics, optimized signal timing, and with computer models, including the U.S. EPA MOBILE 6 emission model and the U.S. EPA CAL3QHC dispersion model. The scope of the air quality analyses was developed based on input from MPCA staff.

The modeling assumptions used in this analysis are described in Table 16.

TABLE 16
CARBON MONOXIDE MODELING ASSUMPTIONS

Analysis Year:	2011 and 2020
Cold Start Percentage:	20.6 percent for all traffic
Hot Start Percentage:	27.3 percent for all traffic
Cruising Speed:	• Posted Speed Limits for Streets • Modeled Peak Hour (Congested) Speeds for Freeways
Traffic Mix:	National Default Values
Wind Speed:	1 meter/second (3.3 feet/second)
Temperature:	-6.6 degrees Celsius (20 degrees Fahrenheit)
Surface Roughness(1):	108 centimeters (42.5 inches)
Stability Class(2):	D
Inspection Maintenance:	No
Oxygenated Fuel:	Yes
8-Hour Persistence Factor(3):	0.7
(a) Wind Direction:	**(b) 36 directions at 10 degree increments**

Notes:

The Surface Roughness, Stability Class and 8-Hour Persistence Factor are discussed in *Guidelines for Air Quality Maintenance Planning and Analysis Volume 9 (Revised): Evaluating Indirect Sources*, U.S. EPA, 1978, and are summarized below.

(1) Surface Roughness indicates the initial ground level turbulence into which the exhaust plume will be released. Generally, the higher the roughness, the lower the concentration. The number used here is conservatively low for the TH 169 corridor (results in a worst-case).

(2) Stability Class characterizes the mixing potential of the atmosphere. Stability Class D is used as a worst-case in suburban and urban areas.

(3) The 8-Hour Persistence Factor is used to determine 8-hour average CO contributions, and takes into account fluctuating wind directions, temperature and traffic, which will have a greater effect over eight hours than during one hour. The factor is multiplied by the 1-hour modeling result.

Background Carbon Monoxide Concentrations

Background CO concentrations are used in microscale carbon monoxide analysis to represent conditions without the influence of nearby vehicles. By definition, the background CO concentration in any particular area is that concentration which exists independently of direct contributions from nearby traffic. The background concentrations are added to intersection-scale modeled results to yield predicted CO levels.

Background CO concentrations were monitored by Mn/DOT in January 1999 at 9400 Winnetka Avenue North in Brooklyn Park, four miles north of the CSAH 81/ CSAH 10 intersection. Maximum monitored average concentrations of 1.62 ppm and 1.08 ppm for 1-hour and 8-hour averaging times, respectively, were measured.

For purposes of the 2011 and 2020 analyses, the background concentrations were adjusted for region-wide increases in traffic volumes and vehicle emissions. The adjustment factor for traffic growth was based on the regional travel forecast model. The adjustment factor for vehicle emission was based on the MOBILE 6 emissions model, which incorporates anticipated decreases in CO emissions from motor vehicles due to emission controls. The results are summarized in Table 17.

TABLE 17
CALCULATION OF CO BACKGROUND CONCENTRATIONS

Factor	2011		2020	
	1-Hour	8-Hour	1-Hour	8-Hour
Maximum 1999 Monitored Concentration (ppm)	1.62	1.08	1.62	1.08
Background Traffic Volume Adjustment Factor	1.43	1.43	1.86	1.86
Emission Adjustment Factor	0.89	0.89	0.89	0.89
Worst-Case Background Concentration (ppm)	2.1	1.4	2.7	1.8
State Standard (ppm)	**30**	**9**	**30**	**9**
Federal Standard (ppm)	**35**	**9**	**35**	**9**

Intersection Carbon Monoxide Modeling

Microscale carbon monoxide analyses were performed for years 2011 and 2020 (one and ten years after construction) at the CSAH 81/CSAH 30 and the CSAH 81/ CSAH 130 intersections. These intersections are expected to operate at the lowest levels of service in the CSAH 81 corridor. CO concentrations at these intersections would therefore be expected to be higher ("worst-case") than other intersections in the corridor. The intersection of CSAH 81 at TH 100 is not included in the project analysis because it is being reconstructed by Mn/DOT before the schedule of this project.

Locations of likely outdoor human activity adjacent to the analyzed intersection were selected for air quality modeling receptors. Table 18 describes the locations of these receptors.

TABLE 18
INTERSECTION RECEPTOR LOCATIONS

CSAH 81 and CSAH 10	Description of Receptor Location	Quadrant
Receptor 1	Sidewalk	SW
Receptor 2	Commercial Parking Lot	NW
Receptor 3	Commercial Parking Lot	NE
Receptor 4	Sidewalk	SE
CSAH 81 and CSAH 130		
Receptor 1	Pedestrian Refuge Island	NW
Receptor 2	Crosswalk Waiting Area	NE
Receptor 3	Pedestrian Refuge Island	SE
Receptor 4	Crosswalk Waiting Area	SW

Carbon monoxide concentrations modeled for Build peak traffic volumes for the years 2011 and 2020 are shown in Table 19. The CO concentrations shown for each receptor are the predicted maximum CO concentrations taken from the results of all modeled wind angles (0 – 360 degrees).

TABLE 19
CARBON MONOXIDE MODELING RESULTS[(1)] – P.M.

CSAH 81 and Bass Lake Road	2011		2020	
	1-hour	8-hour	1-hour	8-hour
Receptor 1	3.1	2.1	3.7	2.5
Receptor 2	3.0	2.1	3.3	2.3
Receptor 3	3.5	2.4	4.0	2.7
Receptor 4	3.2	2.2	3.5	2.4
CSAH 81 and CSAH 130	1-hour	8-hour	1-hour	8-hour
Receptor 1	3.7	2.5	3.7	2.8
Receptor 2	3.8	2.6	3.8	2.9
Receptor 3	3.6	2.5	3.7	2.8
Receptor 4	3.5	2.4	3.6	2.7
State Standard	**30**	**9**	**30**	**9**
Federal Standard	**35**	**9**	**35**	**9**

Note: [(1)] CO concentrations are in parts per million (ppm).

Summary of Carbon Monoxide Study Results

CSAH 81 and CSAH 10 Intersection

The worst-case carbon monoxide levels (3.5 ppm and 2.4 ppm for 2011 1-hour and 8-hour concentrations, and 4.0 ppm and 2.7 ppm for 2020 1-hour and 8-hour concentrations) are predicted at the northeast corner of the intersection; these concentrations are below both state and federal standards.

CSAH 81 and CSAH 130 Intersection

The worst-case carbon monoxide levels (3.8 ppm and 2.6 ppm for 2011 1-hour and 8-hour concentrations, and 3.8 ppm and 2.9 ppm for 2020 1-hour and 8-hour concentrations) are predicted at the northeast corner of the intersection; these concentrations are below both state and federal standards.

Conclusion

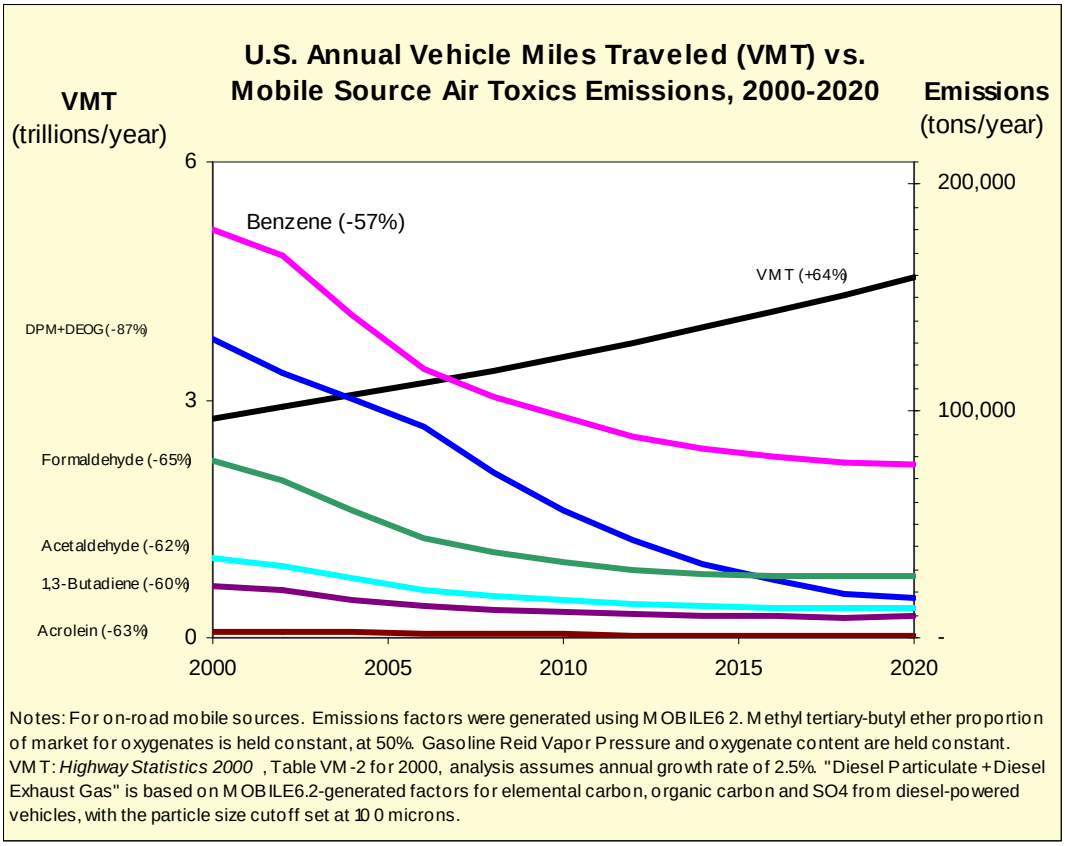
Carbon monoxide concentrations at all modeled receptor sites would be well below federal and state standards with the Build Alternative in 2011 and 2020. The intersections of CSAH 81 with Bass Lake Road and CSAH 130 are predicted to have the lowest levels of service; therefore these carbon monoxide concentrations are considered to be worst case and air quality is not expected to be an issue within the study area.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, the Federal Highway Administration (FHWA) projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph:



As a result, the EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of Clean Air Act Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Unavailable Information for Project Specific MSAT Impact Analysis

This document includes a basic analysis of the likely MSAT emission impacts of the proposed project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated

concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. Emissions. The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of SATs in the context of highway projects. While the MOBILE 6.2 emissions model is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model with emission factors that are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of particulate matter under the conformity rule, the EPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis.

   These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. Dispersion. The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure

assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

4. Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is on-going. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at **http://www.epa.gov/iris**. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary non-cancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes, particularly respiratory problems[4]. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community.

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.

[4] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

In this document, a qualitative analysis of MSAT emissions relative to the project alternatives has been provided. A qualitative assessment of this type is recommended by the FHWA for roadway widening projects where the average forecast AADT is less than 150,000 vehicles. The project alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

Mobile Source Air Toxics Analysis

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give 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 in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at **www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm**

For the No Build and Build Alternative in this EAW, the amount of MSATs emitted would be proportional to the average daily traffic (ADT) assuming that other variables such as fleet mix are the same for each alternative. The ADT on CSAH 81 is expected to be higher under the Build Alternative, while the ADT on other routes, such as Brooklyn Boulevard is expected to be lower. Small differences in emissions resulting from differences in ADT are offset somewhat by lower MSAT emission rates due to increased speeds under Build conditions compared to congested conditions anticipated under No Build conditions; according to EPA's MOBILE 6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset ADT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Regardless of the alternative chosen (No Build versus Build), 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 MSAT emissions by 57 to 87 percent between 2000 and 2020, as discussed previously. Local conditions may differ from these national projections in terms of fleet mix and turnover, ADT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for ADT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

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, under the Build Alternative, there may be localized areas where ambient concentrations of MSATs could be higher than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along CSAH 81 from TH 100 to Brooklyn Boulevard. Localized decreases in MSAT concentrations may occur in other locations. However, as discussed above, the magnitude and the duration of these potential increases and decreases compared to the No Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models.

In sum, when a highway is widened and, as a result, moves closer to receptors, 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, MSATs 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.

Transportation Conformity

The 1990 Clean Air Act Amendments require that a State Implementation Plan (SIP) demonstrate how a state will meet federal air quality standards. The EPA has designated all of Hennepin, Ramsey, Anoka, and portions of Carver, Scott, Dakota, Washington, and Wright counties as a maintenance area for carbon monoxide. The project area is included in this maintenance area.

The EPA issued final rules on transportation conformity that describe the methods required to demonstrate SIP conformity for transportation projects. These guidelines indicate that non-exempt transportation projects such as the CSAH 81 project may need to be included in a regional emissions analysis to demonstrate that the project will not increase regional emissions and would not increase the frequency or severity of existing violations. The regional analysis must be part of the metropolitan planning organization's long-range plan.

Accordingly, this project is included in the current 2007-2010 Twin Cities Transportation Improvement Program (TIP), which was used to complete the regional analysis. The transportation conformity section of the TIP also includes this project in Appendix B. The regional analysis shows that emissions are below the EPA-established emissions budget for the region. This project does not interfere with implementation of any transportation control measures included in the SIP. Therefore, this project conforms to the requirements of the Clean Air Act Amendments and to the Conformity Rules, 40 CFR 93.

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 (chloro-fluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

Response: N/A

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.)

Response:

Odors, Noise and Dust During Construction

The proposed project would not generate substantial odors during construction. Potential odors would include exhaust from diesel engines and fuel storage. 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 Hennepin County specifications. After construction is complete, dust levels are anticipated to minimal because all soil surfaces exposed during construction would be in permanent cover (i.e., paved or revegetated areas).

Construction Noise

The construction activities associated with implementation of the proposed project may result in increased noise levels relative to existing conditions. These impacts will primarily be associated with construction equipment and pile driving.

The following table (Table 20) shows peak noise levels monitored at 50 feet from various types of construction equipment. This equipment is primarily associated with site grading/site preparation, generally the roadway construction phase associated with the greatest noise levels.

TABLE 20
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS AT 50 FEET

Equipment Type	Manufacturers Sampled	Total Number of Models in Sample	Peak Noise Level (dBA)	
			Range	Average
Backhoes	5	6	74-92	83
Front Loaders	5	30	75-96	85
Dozers	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

Noise impacts/mitigation to the local communities during construction

Elevated noise levels are to a degree unavoidable for this type of project. Hennepin County will require that construction equipment be properly muffled and in proper working order. It is Hennepin County's practice to require that the contractor(s) comply with applicable local noise restrictions and ordinances to the extent that it is reasonable. Advance notice will be provided to affected communities for any abnormally loud construction activities. It is anticipated that nighttime construction may sometimes be required to minimize traffic impacts and improve safety. However, construction will be limited to daytime hours as much as possible. Segment One improvements (47th Avenue North to CSAH 10; County Project No. 0118) are anticipated to be under construction for two years (2010 to 2011). The duration of construction for remaining segments has not yet been determined due to the uncertainty of the timeline for construction and funding.

Any associated high-impact equipment noise such as pile driving, pavement sawing, or jack hammering will be unavoidable with construction of the proposed project. Pile driving noise is associated with any bridge construction and sheet piling necessary for any retaining wall construction. While pile driving equipment results in the highest peak noise level as shown in Table 20, it is limited in duration to the activities (e.g., bridge construction) noted above. The use of pile drivers will be prohibited during nighttime hours.

Traffic Noise Analysis

Background Information on Acoustics and Traffic 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 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 10 times the sound energy level over a reference level, then there is a 10 dBA increase and it is heard as twice as loud.

The following chart provides a rough comparison of the noise levels of some 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 Minnesota," Minnesota Pollution Control Agency, http://www.pca.state.mn.us/programs/pubs/noise.pdf and "Highway Traffic Noise," FHWA, http://www.fhwa.dot.gov/environment/htnoise.htm.

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 3 dBA over hard ground, such as pavement or water, and by 4.5 dBA over vegetated areas.

In Minnesota, traffic noise impacts are evaluated by measuring and/or modeling the traffic noise levels that are exceeded 10 percent and 50 percent of the time during the hours of the day and/or night that have the heaviest traffic. These numbers are identified as the L_{10} and L_{50} levels, respectively.

Modeling Methodology

Affected Environment

The purpose of this noise analysis is to determine the effect of the proposed project on traffic-generated noise levels. However, it is also important to note that the project setting includes other noise sources in the area that may have some effect on ambient noise levels.

The CSAH 81 project corridor is located in an urban/suburban area with both residential and commercial uses. Traffic noise is generated by vehicles traveling on CSAH 81 as well as other intersecting County and local roadways. Several major highways that run perpendicular to the CSAH 81 corridor also have an influence on noise levels near CSAH 81. Trunk Highway (TH) 100, Interstate 94, and TH 169 are the three largest intersecting roadways that contribute to the existing noise environment at locations near their interchanges or intersections with CSAH 81.

Aircraft using the Crystal Airport, located east of CSAH 81 and north of CSAH 10 in the City of Crystal, is an additional source of ambient noise within the project area. Airport noise levels would not be expected to change due to construction of the proposed project.

Other sources include noise generated by freight trains traveling on the Canadian Pacific Railway (CP Railway)/Soo Line Railroad and BNSF Railway lines. The CP Rail crosses CSAH 81 between TH 100 and CSAH 10 and carries approximately 20 trains per day at approximately 40 miles per hour (mph). The BNSF Railway line runs parallel to the CSAH 81 corridor and carries on average one train per day at approximately 25 mph.[5]

Traffic Noise Monitoring

Noise level monitoring is commonly performed during a noise study to document existing noise levels. Existing daytime noise levels were monitored at three sites in the project area, chosen to represent areas of outdoor human activity in representative areas along the CSAH 81 project corridor. Existing noise levels were monitored on June 1, 2007, for 15 minutes at each monitoring location from 4:00 p.m. to 5:30 p.m. Monitoring methods used in this study comply with State guidelines. A trained noise monitoring technician was present at each session for the entire monitoring session to ensure correct operation of the noise monitoring equipment.

The three noise monitoring locations are identified below and illustrated in Figures 9A through 9D:

- Receptor R6, representing residences along the west side of CSAH 81 at Fairview Avenue North in Crystal;
- Receptor R27, representing residences along the east side of CSAH 81 at 65th Avenue North in Brooklyn Park; and
- Receptor R43, representing residences along the east side of CSAH 81 at 1st Avenue NE and Jefferson Highway in Osseo.

Receptors were programmed into the noise model input files at the locations where noise levels were monitored in the field to determine the relationship between monitored and modeled traffic noise levels.

[5] Minnesota Department of Transportation. 2007. The Minnesota Department of Transportation Web Site (online). Freight Maps, Data, Tools and Resources. 2006 Metro Railroads Trains Volumes and Speeds Map accessed 2007-12-03 at http://www.dot.state.mn.us/ofrw/freightData html.

The computer model predicted a P.M. peak hour L_{10} noise level of 66.8 dBA at the first location (Receptor R6), 71.5 dBA at the second location (Receptor R27), and 68.2 dBA at the third location (Receptor R43). The existing noise level monitored during the P.M. peak hour was 66.0 dBA, 73.5 dBA, and 65.0 dBA, respectively (see Table 21). The monitored L_{10} and noise levels are within 3 dBA the modeled L_{10} noise levels.

Traffic Noise Modeling

Sixty-one (61) representative noise modeling receptor locations were initially identified along the CSAH 81 project corridor. Noise model receptor locations were identified to represent those areas most affected by potential traffic noise impacts resulting from construction of the proposed project (i.e., sites adjacent to CSAH 81). The receptors were placed between the CSAH 81 roadway and the residence (or commercial sites) in areas where frequent human use would be likely to occur and where noise impacts could be reasonably expected to be the greatest. At residential locations, receptors were programmed into the noise model input file in either the front or back yard, whichever was closest to CSAH 81, as a worst-case scenario, and located approximately half-way between the residential structure and the right of way limits.

Each noise model receptor was assigned a unique identification number from south to north for the entire project corridor from Crystal to Maple Grove. Land uses at each receptor location are indicated in the noise model results tables. Noise model receptor locations and corresponding identification numbers are illustrated in Figures 9A through 9D.

Traffic noise impacts for the project area were evaluated based on the four segments described in Item 6.B of this EAW. These four segments are summarized below.

Segment One (County Project No. 0118): Segment One includes roadway improvements from 47th Avenue North in Robbinsdale to CSAH 10 (Bass Lake Road) in Crystal.

Segment Two (County Project No. 0119): Segment Two includes roadway improvements from CSAH 10 in Crystal to 63rd Avenue in Brooklyn Park.

Segment Three (County Project No. 0203): Segment Three includes roadway improvements from 63rd Avenue to the TH 169 interchange area in Brooklyn Park.

Segment Four (County Project No. 0226): Segment Four improvements include roadway improvements from the TH 169 interchange area in Brooklyn Park to CSAH 30 in Maple Grove, including the community of Osseo.

Noise modeling was completed using the noise prediction program "MINNOISE", a version of the FHWA "STAMINA" model adapted by Mn/DOT. This model uses traffic volumes, vehicle speed, class of vehicle (i.e., cars, medium trucks, heavy trucks) and the typical characteristics of the roadway being analyzed. Receptor coordinates and elevations, as well as existing earthen berms, other topological features, or existing noise barriers

(e.g., TH 100 noise walls), were also programmed into the noise model input files. Traffic noise model input files were developed for existing conditions (i.e., as CSAH 81 and adjacent roadways exist today) and for future Build conditions (i.e., as the CSAH 81 roadway would be if it were reconstructed).

Noise level predictions were based on the following noise model input file assumptions:

- Annual average daily traffic (AADT) for existing conditions was evaluated using year 2005 Hennepin County and year 2006 Mn/DOT AADT counts.
- Average daily traffic data for future year 2030 are based on information provided in the March 7, 2006 *Forecast Update Memorandum* prepared by SRF Consulting Group, Inc (see Item 21). Year 2030 was evaluated for future conditions because this is the future design year of the proposed CSAH 81 reconstruction.
- Noise modeling for the proposed CSAH 81 reconstruction was completed for the p.m. peak traffic hour (4:30 p.m. to 5:30 p.m.) during the daytime period. The p.m. peak traffic hour was assumed to be the loudest hour of the daytime period because of the high commuter traffic volumes operating on CSAH 81 during this period.
- The p.m. peak traffic hour represents 10 percent of existng average daily traffic volumes. The p.m. peak traffic hour was assumed to be 10 percent of average daily traffic for No Build and Build conditions. The directional split on CSAH 81 during the p.m. peak hour was assumed to be 60 percent northbound and 40 percent southbound for existing and future No Build and Build conditions.
- Nighttime noise levels were modeled for the nighttime peak traffic time period (6:00 a.m. to 7:00 a.m.), when free-flow traffic conditions create the highest noise levels just prior to the morning rush hour.
- The 6:00 a.m. to 7:00 a.m. period represents seven percent of the existing average daily traffic volumes. The 6:00 a.m. to 7:00 a.m. period was assumed to be seven percent of average daily traffic for No Build and Build conditions. The directional split on CSAH 81 during this nighttime period was assumed to be 70 percent in the southbound direction and 30 percent in the northbound direction.
- Noise modeling was completed for the CSAH 81 mainline and also considered intersecting cross roadways. Local access roads/service roads were not evaluated as part of the noise modeling analysis. It was assumed that the corridor is fully developed, and there would be no land use changes along the corridor that would result in a high-volume local roadway under future No Build and Build conditions.
- The vehicle type mix (i.e., percent cars and light trucks, medium trucks, and heavy trucks) programmed into the noise model input files was based on 2002 Hennepin County traffic counts. The vehicle percentage assumed for CSAH 81 south of I-94 was as follows: 96.5 percent cars and light trucks; 2.5 percent medium trucks; and 1 percent heavy trucks. The vehicle percentage assumed for CSAH 81 north of I-94 was as follows: 94 percent cars and light trucks; 5 percent medium trucks; and 1 percent heavy trucks.

- Traffic noise level predictions were based on a constant operating speed of 45 miles per hour (mph) under existing and future No Build and Build conditions.
- The analysis assumed an accoustically soft ground cover between the modeled receptor locations and the modeled roadways (i.e., alpha=0.5).
- The analysis assumed that the proposed Mn/DOT interchange reconstruction at TH 169 and CSAH 81 (S.P. 2750-57) had been completed under the future No Build and Build conditions.

Noise Model Results

Traffic noise model results are tabulated in Table 21 (daytime noise model results) and Table 22 (nighttime noise model results).

Segment One (47th Avenue North to CSAH 10): County Project No. 0118

Noise modeling results for Segment 1 are tabluated in Table 21 (daytime noise levels) and Table 22 (nighttime noise levels). Existing daytime noise levels at modeled receptor locations in Segment 1 range from 57.0 dBA to 69.9 dBA (L_{10}). Existing nighttime noise levels at modeled receptor locations in Segment 1 range from 55.6 dBA to 67.8 dBA (L_{10}). Modeled daytime and nighttime noise levels are predicted to increase by 0.9 dBA to 1.3 dBA (L_{10}) from existing to future No-Build conditions.

Construction of the proposed CSAH 81 improvements is predicted to result in modeled future daytime noise levels from 58.2 dBA to 69.5 dBA (L_{10}). Nighttime noise levels in Segment 1 are predicted to range from 56.8 dBA to 68.8 dBA (L_{10}). Modeled daytime and nighttime noise levels are predicted to increase by 1.1 dBA to 3.8 dBA (L_{10}) from existing to future Build conditions. A small decrease is predicted at Receptor R5 where the CSAH 81 alignment is shifted by approximately 40 feet to the west under Build conditions.

Receptors R1 and R2 are located in the northwest and northeast quadrants, respectively, of the CSAH 81/TH 100 interchange. These receptors are protected by existing noise walls that were constructed with TH 100 improvements. As such, modeled noise levels at these locations are lower relative to other modeled receptor locations in Segment 1. The TH 100 noise barriers will remain in place with the proposed CSAH 81 reconstruction.

Segment Two (CSAH 10 to 63rd Avenue North): County Project No. 0119

Noise modeling results for Segment 2 are tabulated in Table 21 (daytime noise levels) and Table 22 (nighttime noise levels). Existing daytime noise levels at modeled receptor locations in Segment 2 range from 58.1 dBA to 67.6 dBA (L_{10}). Existing nighttime noise levels at modeled receptor locations in Segment 2 range from 56.8 dBA to 66.3 dBA (L_{10}). Modeled daytime and nighttime noise levels are predicted to increase by 1.0 dBA to 2.4 dBA (L_{10}) from existing to future No-Build conditions.

Construction of the proposed CSAH 81 improvements is predicted to result in modeled future daytime noise levels from 61.0 dBA to 70.2 dBA (L_{10}). Nighttime noise levels in Segment 2 are predicted to range from 56.9 dBA to 63.0 dBA (L_{10}). Modeled daytime and nighttime noise levels are predicted to increase by 1.2 dBA to 2.9 dBA (L_{10}) from existing to future Build conditions.

Segment Three (63rd Avenue North to TH 169 Interchange Area): County Project No. 0203

Noise modeling results for Segment 3 are tabulated in Table 21 (daytime noise levels) and Table 22 (nighttime noise levels). Existing daytime noise levels at modeled receptor locations in Segment 3 range from 60.5 dBA to 71.5 dBA (L_{10}). Existing nighttime noise levels at modeled receptor locations in Segment 3 range from 59.4 dBA to 69.5 dBA (L_{10}). Modeled daytime and nighttime noise levels are predicted to increase by up to 1.8 dBA (L_{10}) from existing to future No-Build conditions.

Construction of the proposed CSAH 81 improvements is predicted to result in modeled future daytime noise levels from 61.0 dBA to 72.2 dBA (L_{10}). Nighttime noise levels in Segment 3 are predicted to range from 57.2 dBA to 64.6 dBA (L_{10}). Modeled daytime and nighttime noise levels are predicted to increase by 0.5 dBA to 3.1 dBA (L_{10}) from existing to future Build conditions.

Segment Four (TH 169 Interchange Area to CSAH 30): County Project No. 0226

Noise modeling results for Segment 4 are tabulated in Table 21 (daytime noise levels) and Table 22 (nighttime noise levels). Existing daytime noise levels at modeled receptor locations in Segment 4 range from 62.8 dBA to 68.6 dBA (L_{10}). Existing nighttime noise levels at modeled receptor locations in Segment 4 range from 61.0 dBA to 67.6 dBA (L_{10}). Modeled daytime and nighttime noise levels are predicted to increase by up to 1.9 dBA (L_{10}) from existing to future No-Build conditions.

Construction of the proposed CSAH 81 improvements is predicted to result in modeled future daytime noise levels from 64.3 dBA to 70.3 dBA (L_{10}). Nighttime noise levels in Segment 4 are predicted to range from 62.6 dBA to 69.4 dBA (L_{10}). Modeled daytime and nighttime noise levels are predicted to increase by 0.7 dBA to 2.1 dBA (L_{10}) from existing to future Build conditions.

Future Build vs. Future No Build Conditions

In general, daytime modeled traffic noise levels are predicted to range from 0.1 dBA to up to 2.1 dBA (L_{10}) greater under future Build conditions compared to future No Build conditions at modeled receptor locations. Nighttime modeled traffic noise levels are predicted to be up to 2.5 dBA greater under future Build conditions compared to future No Build conditions at modeled receptor locations.

In a few limited locations, a decrease in noise levels of 0.3 dBA to 1.9 dBA (L_{10}) is predicted under future Build conditions compared to future No Build conditions. At most of these locations, the horizontal alignment for the proposed CSAH 81 roadway is shifted away from the modeled receptor locations, resulting in a decrease in noise levels under future Build conditions compared to future No Build conditions. Comparing future No Build to Build modeled noise levels indicates that traffic noise will increase with or without the proposed CSAH 81 project as background traffic volumes increase over time.

TABLE 21
CSAH 81 NOISE MODEL RESULTS: DAYTIME

Receptor*	Monitoring		Existing (2006)		No Build (2030)		Difference Between Existing (2006) and No Build (2030)		Build (2030)		Difference Between Existing (2006) and Build (2030)		Difference Between Build (2030) and No Build (2030)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
Segment One (County Project No. 0118): 47th Avenue North to CSAH 10														
R1 (R)(7)			58.3	56.3	59.3	57.6	1.0	1.3	59.5	57.8	1.2	1.5	0.2	0.2
R2 (P)			57.0	54.8	58.1	56.1	1.1	1.3	58.2	56.3	1.2	1.5	0.1	0.2
R3 (R)(9)			62.6	59.0	63.5	60.3	0.9	1.3	63.8	60.7	1.2	1.7	0.3	0.4
R3A (R)(4)			65.8	61.2	66.8	62.6	1.0	1.4	67.2	63.2	1.4	2.0	0.4	0.6
R4 (R)(2)			63.5	59.9	64.5	61.3	1.0	1.4	65.0	61.9	1.5	2.0	0.5	0.6
R5 (R)(10)			69.9	64.6	71.0	66.1	1.1	1.5	69.1	65.0	-0.8	0.4	-1.9	-1.1
R6 (R)(2)	66.0	66.5	66.8	62.4	67.8	63.8	1.0	1.4	69.5	65.2	2.7	2.8	1.7	1.4
R7 (R)(1)			67.9	63.2	68.9	64.6	1.0	1.4	69.2	65.0	1.3	1.8	0.3	0.4
R8 (S)			66.2	61.9	67.2	63.3	1.0	1.4	67.4	63.6	1.2	1.7	0.2	0.3
R9 (R)(5)			65.5	61.3	66.5	62.7	1.0	1.4	66.6	62.8	1.1	1.5	0.1	0.1
R10 (R)(7)			62.8	58.3	64.0	60	1.2	1.7	61.2	56.5	-1.6	-1.8	-2.8	-3.5
R11 (C)			61.7	57.7	62.9	59.4	1.2	1.7	64.7	59.7	3.0	2.0	1.8	0.3
R12 (R)(9)			64.2	59.1	65.5	60.9	1.3	1.8	64.1	59.7	-0.1	0.6	-1.4	-1.2
R13 (R)(1)			59.0	55.2	60.2	56.8	1.2	1.6	60.7	57.3	1.7	2.1	0.5	0.5
R14 (R)(7)			60.7	57.6	61.8	59.1	1.1	1.5	61.9	59.3	1.2	1.7	0.1	0.2
Segment Two (County Project No. 0119): CSAH 10 to 63rd Avenue														
R15 (R)(5)			61.5	58.5	62.5	59.9	1.0	1.4	62.8	60.2	1.3	1.7	0.3	0.3
R16 (R)(3)			62.7	59.6	63.8	61.1	1.1	1.5	63.9	61.2	1.2	1.6	0.1	0.1
R17 (R)(28)			64.3	60.1	65.4	61.6	1.1	1.5	65.5	61.9	1.2	1.8	0.1	0.3
R18 (R)(9)			62.7	58.8	63.7	60.3	1.0	1.5	63.9	60.6	1.2	1.8	0.2	0.3
R19 (R)(10)			65.1	60.6	66.1	62.2	1.0	1.6	66.3	62.5	1.2	1.9	0.2	0.3
R20 (R)(6)			67.4	62.4	68.5	64.0	1.1	1.6	69.3	64.8	1.9	2.4	0.8	0.8
R21 (R)(1)			58.1	55.3	60.5	58.2	2.4	2.9	61.0	58.8	2.9	3.5	0.5	0.6
R22 (R)(13)			64.0	60.4	65.1	62.0	1.1	1.6	65.3	62.3	1.3	1.9	0.2	0.3

(R) – Residence; (C) – Commercial; (S) – School; (H) – Hotel

* – Number in parentheses in this column is the number of receptors and/or commercial buildings represented by each receptor.

TABLE 21 – continued
CSAH 81 NOISE MODEL RESULTS: DAYTIME

Receptor*	Monitoring		Existing (2006)		No Build (2030)		Difference Between Existing (2006) and No Build (2030)		Build (2030)		Difference Between Existing (2006) and Build (2030)		Difference Between Build (2030) and No Build (2030)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
Segment Three (County Project No. 0203): 63rd Avenue to TH 169 Interchange Area														
R23 (R)(3)			63.0	58.8	63.7	59.5	0.7	0.7	64.2	60.5	1.2	1.7	0.5	1.0
R24 (R)(4)			60.5	57.9	60.7	58.3	0.2	0.4	61.0	58.8	0.5	0.9	0.3	0.5
R25 (R)(5)			69.7	64.7	70.1	65.4	0.4	0.7	71.0	66.2	1.3	1.5	0.9	0.8
R26 (R)(2)			66.4	62.3	66.7	62.9	0.3	0.6	67.0	63.4	0.6	1.1	0.3	0.5
R27 (R)(3)	73.5	69.5	71.5	66.0	72.0	66.8	0.5	0.8	72.2	67.2	0.7	1.2	0.2	0.4
R28 (R)(3)			68.4	65.2	69.0	66.0	0.6	0.8	69.0	66.1	0.6	0.9	0.0	0.1
R29 (R)(1)			67.0	64.5	67.7	65.4	0.7	0.9	67.7	65.4	0.7	0.9	0.0	0.0
R30 (R)(5)			65.7	63.2	66.5	64.3	0.8	1.1	66.8	64.6	1.1	1.4	0.3	0.3
R31 (H)(1)			65.3	63.1	65.9	63.9	0.6	0.8	65.9	64.0	0.7	1.0	0	0.1
R32 (C)(1)			66.2	61.3	66.6	62.1	0.4	0.8	66.7	62.2	0.5	0.9	0.1	0.1
R33 (C)(1)			63.9	59.8	65.3	61.7	1.4	1.9	64.7	61.5	0.8	1.7	-0.6	-0.2
R34 (C)(2)			67.9	63.7	69.5	66.0	1.6	2.3	68.6	65.6	0.7	1.9	-0.9	-0.4
R35 (R)(1)			64.3	60.0	66.1	62.5	1.8	2.5	66.7	63.3	2.4	3.3	0.6	0.8
R36 (R)(2)			64.7	60.3	66.5	62.9	1.8	2.6	67.3	63.8	2.6	3.5	0.8	0.9
R37 (R)(4)			63.4	59.6	65.2	62.1	1.8	2.5	66.4	63.2	3.0	3.6	1.2	1.1
R38 (R)(3)			61.6	59.2	63.4	61.5	1.8	2.3	64.7	62.5	3.1	3.3	1.3	1.0
R39 (C)(7)			64.4	61	66.1	63.2	1.7	2.2	64.5	62.3	0.1	1.3	-1.6	-0.9
Segment Four (County Project No. 0226): TH 169 Interchange Area to CSAH 30														
R40 (C)(1)			67.5	62.8	70.1	66.7	2.6	3.9	70.3	67	2.8	4.2	0.2	0.3
R41 (R)(2)			62.7	59.3	64.2	61.4	1.5	2.1	64.3	61.5	1.6	2.2	0.1	0.1
R42 (R)(2)			66.4	61.8	68.0	64.1	1.6	2.3	68.1	64.3	1.7	2.5	0.1	0.2
R43 (R)(1)	65.0	60.0	68.2	62.9	69.8	65.3	1.6	2.4	68.9	64.9	0.7	2.0	-0.9	-0.4
R44 (R)(6)			67.4	61.5	69.3	64.2	1.9	2.7	69.0	64.8	1.6	3.3	-0.3	0.6
R45 (S)			67.4	61.5	69.3	64.2	1.9	2.7	69.0	64.8	1.6	3.3	-0.3	0.6
R46 (C)(1)			65.3	60.1	67.0	62.6	1.7	2.5	67.3	63.6	0.5	2.3	0.3	1.0

(R) – Residence; (C) – Commercial; (S) – School; (H) – Hotel
* – Number in parentheses in this column is the number of receptors and/or commercial buildings represented by each receptor.

TABLE 22
CSAH 81 NOISE MODEL RESULTS: NIGHTTIME

Receptor*	Existing (2006)		No Build (2030)		Difference Between Existing (2006) and No Build (2030)		Build (2030)		Difference Between Existing (2006) and Build (2030)		Difference Between Build (2030) and No Build (2030)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
Segment One (County Project No. 0118): 47th Avenue North to CSAH 10												
R1 (R)(7)	56.8	54.4	57.8	55.7	1.0	1.3	58.0	55.9	1.2	1.5	0.2	0.2
R2 (P)	55.6	52.9	56.7	54.2	1.1	1.3	56.8	54.4	1.2	1.5	0.1	0.2
R3 (R)(9)	61.0	56.9	61.9	58.3	0.9	1.4	62.2	58.7	1.2	1.8	0.3	0.4
R3A (R)(4)	64.9	59.6	66.0	61.1	1.1	1.5	66.3	61.6	1.4	2.0	0.3	0.5
R4 (R)(2)	62.5	58.3	63.5	59.7	1.0	1.4	64.1	60.4	1.6	2.1	0.6	0.7
R5 (R)(10)	67.8	62.0	68.9	63.5	1.1	1.5	67.2	62.6	-0.6	0.6	-1.7	-0.9
R6 (R)(2)	66.0	60.8	67.0	62.3	1.0	1.5	68.8	63.9	2.8	3.1	1.8	1.6
R7 (R)(1)	67.1	61.6	68.1	63.1	1.0	1.5	68.1	63.4	1.0	1.8	0.0	0.3
R8 (S)	64.4	59.6	65.4	61.0	1.0	1.4	65.7	61.4	1.3	1.8	0.3	0.4
R9 (R)(5)	63.8	59.0	64.8	60.5	1.0	1.5	65.0	60.7	1.2	1.7	0.2	0.2
R10 (R)(7)	61.2	56.0	62.4	57.7	1.2	1.7	59.1	53.9	-2.1	-2.1	-3.3	-3.8
R11 (C)	60.7	56.0	61.9	57.7	1.2	1.7	64.0	58.2	3.3	2.2	2.1	0.5
R12 (R)(9)	62.3	56.7	63.5	58.4	1.2	1.7	62.3	57.4	0	0.7	-1.2	-1.0
R13 (R)(1)	57.4	53.2	58.6	54.8	1.2	1.6	59.1	55.4	1.7	2.2	0.5	0.6
R14 (R)(7)	59.6	55.9	60.7	57.5	1.1	1.6	60.8	57.7	1.2	1.8	0.1	0.2
Segment Two (County Project No. 0119): CSAH 10 to 63rd Avenue												
R15 (R)(5)	60.2	56.7	61.2	58.2	1.0	1.5	61.4	58.4	1.2	1.7	0.2	0.2
R16 (R)(3)	61.5	57.9	62.6	59.4	1.1	1.5	62.7	59.6	1.2	1.7	0.1	0.2
R17 (R)(28)	63.3	58.4	64.4	60.0	1.1	1.6	64.5	60.3	1.2	1.9	0.1	0.3
R18 (R)(9)	61.6	57.1	62.7	58.6	1.1	1.5	62.9	59.0	1.3	1.9	0.2	0.4
R19 (R)(10)	64.0	58.9	65.2	60.6	1.2	1.7	65.3	60.9	1.3	2.0	0.1	0.3
R20 (R)(6)	65.6	60.1	66.8	61.8	1.2	1.7	67.4	62.4	1.8	2.3	0.6	0.6
R21 (R)(1)	56.8	53.6	59.2	56.4	2.4	2.8	59.5	56.9	2.7	3.3	0.3	0.5
R22 (R)(13)	62.8	58.6	63.9	60.3	1.1	1.7	64.2	60.6	1.4	2.0	0.3	0.3

(R) – Residence; (C) – Commercial; (S) – School; (H) – Hotel

* – Number in parentheses in this column is the number of receptors and/or commercial buildings represented by each receptor.

TABLE 22 – continued
CSAH 81 NOISE MODEL RESULTS: NIGHTTIME

Receptor*	Existing (2006)		No Build (2030)		Difference Between Existing (2006) and No Build (2030)		Build (2030)		Difference Between Existing (2006) and Build (2030)		Difference Between Build (2030) and No Build (2030)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
Segment Three (County Project No. 0203): 63rd Avenue to TH 169 Interchange Area												
R23 (R)(3)	61.7	56.8	62.4	57.5	0.7	0.7	62.9	58.5	1.2	1.7	0.5	1.0
R24 (R)(4)	59.4	56.3	59.5	56.5	0.1	0.2	60.0	57.2	0.6	0.9	0.5	0.7
R25 (R)(5)	68.0	62.5	68.2	63.0	0.2	0.5	68.9	63.6	0.9	1.1	0.7	0.6
R26 (R)(2)	65.5	60.7	65.6	61.2	0.1	0.5	66.1	61.8	0.6	1.1	0.5	0.6
R27 (R)(3)	69.5	63.6	69.8	64.1	0.3	0.5	70.1	64.6	0.6	1.0	0.3	0.5
R28 (R)(3)	66.5	62.9	66.9	63.6	0.4	0.7	67.0	63.8	0.5	0.9	0.1	0.2
R29 (R)(1)	65.2	62.2	65.9	63.1	0.7	0.9	65.9	63.1	0.7	0.9	0.0	0.0
R30 (R)(5)	64.6	61.5	64.9	62.2	0.3	0.7	65.8	63.0	1.2	1.5	0.9	0.8
R31 (H)(1)	63.7	60.9	64.1	61.6	0.4	0.7	64.4	62.0	0.7	1.1	0.3	0.4
R32 (C)(1)	64.7	59.1	65.0	59.6	0.3	0.5	65.2	60.1	0.5	1.0	0.2	0.5
R33 (C)(1)	61.9	57.4	62.6	58.5	0.7	1.1	63.0	59.4	1.1	2.0	0.4	0.9
R34 (C)(2)	66.0	61.5	67.0	63.2	1.0	1.7	66.9	63.6	0.9	2.1	-0.1	0.4
R35 (R)(1)	63.6	58.6	64.6	60.4	1.0	1.8	65.9	61.9	2.3	3.3	1.3	1.5
R36 (R)(2)	64.0	58.9	65.0	60.8	1.0	1.9	66.6	62.4	2.6	3.5	1.6	1.6
R37 (R)(4)	62.6	58.1	63.6	60.0	1.0	1.9	65.6	61.8	3.0	3.7	2.0	1.8
R38 (R)(3)	60.6	57.6	61.9	59.6	1.3	2.0	63.7	61.0	3.1	3.4	1.8	1.4
R39 (C)(7)	62.6	58.9	63.7	60.6	1.1	1.7	63.0	60.5	0.4	1.6	-0.7	-0.1
Segment Four (County Project No. 0226): TH 169 Interchange Area to CSAH 30												
R40 (C)(1)	67.5	62.8	68.5	64.6	1.0	1.8	69.4	65.4	0.4	1.6	0.9	0.8
R41 (R)(2)	60.9	57.2	61.8	58.7	0.9	1.5	62.6	59.5	1.7	2.3	0.8	0.8
R42 (R)(2)	64.3	59.2	65.2	60.7	0.9	1.5	66.2	61.9	1.9	2.7	1.0	1.2
R43 (R)(1)	65.9	60.1	66.8	61.8	0.9	1.7	66.9	62.3	1.0	2.2	0.1	0.5
R44 (R)(6)	65.0	58.6	66.0	60.3	1.0	1.7	66.7	61.9	1.7	3.3	0.7	1.6
R45 (S)	63.2	57.5	64.1	59.1	0.9	1.6	65.3	60.9	2.1	3.4	1.2	1.8
R46 (C)(1)	64.7	57.3	64.8	57.5	0.1	0.2	66.1	59.8	1.4	2.5	1.3	2.3

(R) – Residence; (C) – Commercial; (S) – School; (H) – Hotel
* – Number in parentheses in this column is the number of receptors and/or commercial buildings represented by each receptor.

Noise Mitigation Analysis

Minnesota has established State noise standards for daytime and nighttime periods. For residential land uses (identified as Noise Area Classification 1 in Table 23), the Minnesota State standards for L_{10} are 65 dBA for daytime and 55 dBA for nighttime; the standards for L_{50} are 60 dBA for daytime and 50 dBA for nighttime. The MPCA defines daytime as 7:00 a.m. to 10:00 p.m. and nighttime from 10:00 p.m. to 7:00 a.m. State noise standards are depicted in Table 23.

TABLE 23
MINNESOTA STATE NOISE STANDARDS

MPCA State Noise Standards					
Land Use	**Code**	**Daytime (7 a.m. – 10 p.m.) dBA**		**Nighttime (10 p.m. – 7 a.m.) dBA**	
Residential	**NAC-1**	L_{10} of 65	L_{50} of 60	L_{10} of 55	L_{50} of 50
Commercial	**NAC-2**	L_{10} of 70	L_{50} of 65	L_{10} of 70	L_{50} of 65
Industrial	**NAC-3**	L_{10} of 80	L_{50} of 75	L_{10} of 80	L_{50} of 75

Minnesota Statute 116.07, Subd. 2a. states that municipal and county roads, except for roadways for which full control of access has been acquired, and for roads in the cities of Minneapolis and St. Paul, are exempt from State noise standards. CSAH 81 is a County State Aid Highway maintained by Hennepin County. Hennepin County has not acquired full control of access for a majority of the CSAH 81 project corridor. The project area is located in the cities of Robbinsdale, Crystal, Brooklyn Park, Osseo, and Maple Grove. As such, a majority of the the CSAH 81 project corridor is exempt from State noise standards. General areas along the CSAH 81 project corridor that are not exempt from State noise standards and are described below.

A traffic noise analysis that compares traffic noise model results to the Federal noise abatement criteria, and that addresses noise mitigation under the Federal criteria, will be completed by Hennepin County and documented in a separate Environmental Assessment (EA) for the proposed project.

There are four general areas (represented by five locations) along CSAH 81 where controlled access right of way remains in place, as identified on Hennepin County right of way maps, from when the CSAH 81 roadway (formerly US 52 and TH 152) was owned and operated by Mn/DOT. Traffic noise at these areas along the CSAH 81 roadway was therefore compared to State daytime and nighttime noise standards. These five locations are identified below and illustrated in Figures 9A through 9D:

Segment One (47th Avenue North to CSAH 10): County Project No. 0118

- Location A: West side of CSAH 81 from Corvallis Avenue to Wilshire Boulevard (Crystal); and
- Location B: East side of CSAH 81 from Bernard Avenue to Wilshire Boulevard (Crystal).

Segment Two (CSAH 10 to 63rd Avenue North): County Project No. 0119

- There are no locations along CSAH 81 in Segment 2 where controlled access right of way remains in place as identified on Hennepin County right of way maps.

Segment Three (63rd Avenue North to TH 169 Interchange Area): County Project No. 0203

- Location C: East side of CSAH 81 south of 70th Avenue in the northwest quadrant of the I-94/CSAH 81 interchange (Brooklyn Park);

Segment Four (TH 169 Interchange Area to CSAH 30): County Project No. 0226

- Location D: North side of CSAH 81 from 85th Avenue North to 3rd Street S (Brooklyn Park and Osseo); and
- Location E : North side of CSAH 81 from 89th Avenue North (Broadway Avenue) to CR 202 (Osseo and Maple Grove).

Noise Abatement Criteria and Methodology

Due to the nature of the proposed CSAH 81 roadway improvements and existing and proposed conditions along the CSAH 81 project corridor, the only reasonable and feasible alternative for noise mitigation would be the construction of noise barriers (i.e., noise walls).

The following criteria are used for determining reasonable and feasible noise abatement measures, and for establishing the noise level that equates to a substantial noise reduction. These criteria are consistent with Mn/DOT's noise abatement policy for Mn/DOT trunk highway facilities and Federal-Aid highway projects.[6]

Substantial Noise Reduction. In order for a noise barrier to be considered acoustically effective, reasonable efforts should be made to obtain a substantial noise reduction. A substantial noise reduction is defined as 5 dBA or more (see Item C below).

Noise Barrier Reasonable and Feasible Criteria. The following criteria must be met for construction of a noise barrier to be considered with a project as it relates to State noise standards:

a) The receptors shall have predicted future noise levels that exceed the State daytime and/or nighttime noise standards.

b) The cost-effectiveness of the barrier shall not exceed $3,250/dBA/residence in 1997 dollars for residential receptors.

c) A receptor's inclusion in the cost-effectiveness calculation shall be contingent on the receptor receiving a minimum or 5 dBA reduction due to the construction of the barrier.

d) Housing density must be a minimum of 10 dwelling units per half mile.

e) The municipality where affected residents reside supports the installation of a barrier.

[6] Minnesota Department of Transportation. 2007. The Minnesota Department of Transportation Web Site (online). Office of Environmental Services. Noise Analysis. Mn/DOT Noise Policy for Type I and Type II Federal Aid Projects as per 23 CFR 772 accessed 2007-12-03 at http://www.dot.state.mn.us/environment/noise_analysis/policy.html.

State standards (daytime and nighttime L_{10}) are predicted to be exceeded under Build conditions at the modeled locations where controlled access right of way remains in place. Commercial land uses west of CSAH 81 from Corvallis Avenue to Wilshire Boulevard (Location A) and east of CSAH 81 from CSAH 8 (71st Avenue) to the TH 169 interchange area (Location C) are predicted to be below State daytime and nighttime standards. As such, noise abatement measures were evaluated at residential land uses only (NAC 1) for the four locations along the CSAH 81 corridor listed below:

- Location B: East side of CSAH 81 from Bernard Avenue to Wilshire Boulevard;
- Location C: East side of CSAH 81, south of 70th Avenue, in the northeast quadrant of the I-94/CSAH 81 interchange;
- Location D: North side of CSAH 81 from 85th Avenue North to 3rd Street South; and
- Location E: North side of CSAH 81 from 89th Avenue North to CR 202.

Noise barrier construction decisions are based on a study of feasibility and reasonableness. Feasibility is determined by physical and/or engineering constraints (i.e., whether or not a noise wall could feasibly be constructed on site). Reasonableness is a more subjective criterion and is based on a number of factors. Economic reasonableness, as determined by the cost-effectiveness index, is the first consideration in determining the reasonableness of proposed noise barriers. If noise mitigation is found to be cost-effective, additional reasonableness factors such as aesthetics and the desires of affected property owners and local communities are considered.

The feasibility of noise barrier construction is sometimes dependent on design details that are typically not known until the final design phase of the project. The following analysis assumes that noise walls could be feasibly constructed up to 20 feet high within the proposed CSAH 81 right of way throughout the project corridor.

For a noise barrier to be considered acoustically effective, it must achieve a noise reduction of 5 dBA or more. Using the criteria described above, for the construction of a noise barrier to be considered cost-effective, it must provide receptors a minimum 5 dBA reduction and must have cost-effectiveness that does not exceed $3,250/dBA/residence. The following formula can be used to determine the cost-effectiveness of the barrier:

The cost-effectiveness index is equal to the cost of the noise barrier[1] divided by the product of the average noise level reduction based on those residences that had noise level reductions of 5 dBA or more and the number of residences that have noise level reductions of 5 dBA or more.

[1]The cost of a noise wall is calculated using $15 per square foot of wall, except on bridges, where the cost is $18 per square foot.

There are several steps to assessing the cost-effectiveness of noise barriers. First, the cost-effective noise wall height is determined for each segment of the project area. For this study, three heights of potential noise barriers were analyzed: 10, 15 and 20 feet. If a 10-foot noise barrier meets the reasonableness criteria and is feasible, it would be proposed for construction. If the 10-foot barrier does not meet the criteria, a 15-foot barrier is evaluated. Likewise if a 15-foot barrier does not meet the criteria, a 20-foot barrier is studied. If a 20-foot noise barrier meets the reasonableness criteria and is feasible, it would be re-evaluated during final design and proposed for construction.

Table 24 shows the dBA (L_{10}) reduction achieved for 10-foot, 15-foot, and 20-foot modeled walls along the CSAH 81 project corridor where controlled access right of way remains in place. For purposes of calculating cost-effectiveness, modeled receptor locations were sub-divided into multiple representative receptor locations.

TABLE 24
NOISE MITIGATION ANALYSIS RESULTS

	Build (2030) – No Wall	**Build (2030) 10' Wall**		**Build (2030) 15' Wall**		**Build (2030) 20' Wall**	
Receptor	**L_{10}**	**L_{10}**	**Difference**	**L_{10}**	**Difference**	**L_{10}**	**Difference**
Location B: Wall B-1 (1,082-foot wall north of CP Railroad along CSAH 81 retaining wall)							
R10*	61.2	59.8	1.4	59.6	1.6	59.5	1.7
R10A*	61.0	57.4	3.6	56.8	4.2	56.6	4.4
R12*	64.1	58.0	6.1	56.1	8.0	55.2	8.9
R12A*	61.0	56.0	5.0	54.9	6.1	54.5	6.5
R12B*	63.7	60.0	3.7	58.3	5.4	57.6	6.1
Location B: Wall B-2 (1,074-foot wall north of CP Railroad at bottom of slope, east of stormwater pond)							
R10*	61.2	61.2	0.0	61.2	0.0	61.2	0.0
R10A*	61.0	61.0	0.0	61.0	0.0	60.9	0.1
R12*	64.1	64.1	0.0	62.6	1.5	58.3	5.8
R12A*	61.0	61.0	0.0	60.8	0.2	56.1	4.9
R12B*	63.7	63.5	0.2	61.9	1.8	59.7	4.0
Location C: Northeast quadrant of CSAH 81/I-94 interchange							
R31	**65.9**	**65.1**	0.8	64.0	1.9	63.2	2.7
Location D: East side of CSAH 81 at 4th Street SE							
R41*	64.2	62.9	1.3	62.4	1.8	62.1	2.1
Location E: Wall E-1 (1,012-foot wall)							
R44	**68.5**	63.3	5.2	60.0	8.5	57.7	10.8
R44A	66.9	64.1	2.8	63.0	3.9	62.5	4.4
R44B	**65.5**	62.1	3.4	59.8	5.7	58.4	7.1
Location E: Wall E-2 (810-foot wall)							
R44	**68.5**	64.2	4.3	62.5	6.0	61.8	6.7
R44A	66.9	66.9	0	66.8	0.1	66.7	0.2
R44B	**65.5**	62.1	3.4	59.8	5.7	58.5	7.0
Location E: Wall E-3 at Osseo Senior High Athletic Fields							
R45	**67.3**	63.6	3.7	60.3	7.0	58.0	9.3

Bold numbers exceed State daytime noise standards.
* These receptors exceed State nighttime L_{10} standards under Build conditions.

Cost-effectiveness for modeled barriers was calculated based on the reductions shown above in Table 24. Cost-effectiveness results for all modeled noise barriers are shown in Tables 25A through 25C.

Location B (east side of CSAH 81 between Bernard Avenue and Wilshire Boulevard)

Location B represents residential land uses along the east side of CSAH 81 from the CP Railroad to Wilshire Boulevard (Receptors R10 and R12). There are 16 first-row residences in Location B.

Under current conditions, the topography in Location B is such that it slopes down and away from CSAH 81 to Location B residences. The elevation of the CSAH 81 roadway is greater than the residences represented by Location B because of the vertical profile necessary for CSAH 81 to bridge over the CP Railroad. Under proposed Build conditions, a retaining wall will be constructed along CSAH 81, resulting in a longer path for sound to travel from the roadway to Location B modeled receptors. As such, modeled noise levels are predicted to lower (less than 3 dBA) at Receptors R10 and R12 under future Build conditions compared to existing conditions (see Table 21). Modeled noise levels for receptor locations in Location B are predicted to be below State daytime L_{10} noise standards under future Build conditions, and are predicted to exceed State nighttime L_{10} noise standards by 4.1 to 7.3 dBA under future Build conditions.

Two noise walls were modeled in Location B between the CP Railroad and Wilshire Boulevard. The first wall was modeled within Hennepin County right of way adjacent to the proposed CSAH 81 roadway (Wall B-1). The second wall was modeled at the bottom of the slope between a proposed stormwater pond and the CSAH 81 right of way limits (Wall B-2) (see Figure 9E).

Wall B-1

A 1,082-foot noise wall (Wall B-1) was modeled within Hennepin County right of way along the proposed retaining wall from the CP Railroad bridge to a point located approximately 150 feet south of Wilshire Boulevard. The 1,082-foot wall does not shield the commercial property at the southeast quadrant of the CSAH 81/Wilshire Boulevard intersection (see Figure 9E). This evaluation assumed that a noise wall could feasibly be constructed up to 20 feet tall on top of the retaining wall.

The 1,082-foot long noise wall along the proposed retaining wall is not reasonable at this location. The 10-foot, 15-foot, and 20-foot modeled noise walls exceed the criteria of $3,250/dBA/residence (see Tables 25A through 25C). As such, a noise barrier will not be constructed at this location.

Wall B-2

A 1,074-foot noise wall (Wall B-2) was modeled within Hennepin County right of way between a proposed stormwater pond and the CSAH 81 right of way limits. The 1,074-foot noise wall was modeled from the CP Railroad to a point located approximately 290 feet south of Wilshire Boulevard. This modeled barrier also does not shield the commercial

property at the southeast quadrant of the CSAH 81/Wilshire Boulevard intersection. The noise barrier was located approximately 4 feet inside of the Hennepin County CSAH 81 right of way limits (see Figure 9E).

A noise barrier is not reasonable at this location. The 10-foot and 15-foot modeled noise walls do not meet the minimum 5 dBA reduction threshold to be considered acoustically effective. The 20-foot modeled noise wall exceeds the criteria of $3,250/dBA/residence (see Tables 25A through 25C). As such, a noise barrier will not be constructed at this location.

Location C (east side of CSAH 81 – northwest quadrant of I-94/CSAH 81)

A hotel (Receptor R31) is located in the northeast quadrant of the I-94/ CSAH 81 interchange. An existing noise wall is located to the east of Receptor R31 along the north side of I-94 within the I-94 right of way. Modeled noise levels are predicted to exceed State daytime and nighttime noise standards at this location under future Build conditions.

A 1,200-foot noise wall was modeled in the northeast quadrant of the CSAH 81/ I-94 interchange between the interchange ramps and Lakeland Avenue N (CSAH 130), extending from the existing I-94 wall northwest to commercial property at the corner of CSAH 81 and 70th Avenue N. This wall was modeled outside of Hennepin County right of way and assumes a wall could be constructed in the I-94/CSAH 81 interchange area right of way. The east end of the modeled wall would match an existing noise wall along the north side of I-94, between I-94 and Lakeland Avenue N, east of the I-94/CSAH 81 interchange area (see Figure 9F).

A driveway is located along Lakeland Avenue N that provides access to a commercial property at the southwest corner of the CSAH 81/Lakeland Avenue N intersection. A driveway is located along Lakeland Avenue North that provides access to a commercial property at the southwest corner of the CSAH 81/Lakeland Avenue N intersection. This analysis assumes that a gap in the noise wall is not necessary to accommodate this driveway and that access to the commercial property could be accommodated at other existing driveway locations along Lakeland Avenue N.

The 1,200-foot long modeled noise wall is not reasonable at this location. The 10-foot, 15-foot, and 20-foot modeled noise walls do not meet the minimum 5 dBA reduction threshold to be considered acoustically effective (see Tables 25A through 25C). As such, a noise barrier will not be constructed at this location.

TABLE 25A
NOISE MITIGATION ANALYSIS (CSAH 81) – COST- EFFECTIVENESS RESULTS (10-FOOT WALL)

Receptors	Daytime L_{10} Noise (dBA)		Reduction (in dBA) with 10 ft noise wall	Number of residences	Number of affected residences	Length of wall (feet)	Total cost of wall $15/sq ft[(1)]	Cost/dBA/ residence
	Build (2030) (no wall)	Build (2030) (10 ft wall)						
Location B: Wall B-1 (1,082-foot wall north of CP Railroad along CSAH 81)								
R10 (R)	61.2	59.8	1.4	3	0	1,082	$159,300	$4,159
R10A (R)	61.0	57.4	3.6	3	0			
R12 (R)	64.1	58.0	6.1	3	3			
R12A (R)	61.0	56.0	5.0	4	4			
R12B (R)	63.7	60.0	3.7	3	0			
Location B: Wall B-2 (1,074-foot wall north of CP Railroad between stormwater pond and right of way limits)								
R10 (R)	61.2	61.2	0	3	0	1,074	$161,100	N/A
R10A (R)	61.0	61.0	0	3	0			
R12 (R)	64.1	64.1	0	3	0			
R12A (R)	61.0	61.0	0	4	0			
R12B (R)	63.7	63.5	0.2	3	0			
Location C: NE Quadrant of CSAH 81/I-94 interchange								
R31 (H)	**65.9**	65.1	0.8	1	0	1,200	$178,500	N/A
Location D: East side of CSAH 81 at 4th Street SE								
R41 (R)	64.2	62.9	1.3	2	0	760	$108,000	N/A
Location E: Wall E-1 (1,012-foot wall west of 1st Avenue NW)								
R44 (R)	**68.5**	63.3	5.2	6	6	1,012	$148,800	$4,769
R44A (C)	66.9	64.1	2.8	1	0			
R44B (P)	**65.5**	62.1	3.4	1	0			
Location E: Wall E-2 (810-foot wall west of 1st Avenue NW)								
R44 (R)	**68.5**	64.2	4.3	6	0	810	$118,500	N/A
R44A (C)	66.9	66.9	0	1	0			
R44B (P)	**65.5**	62.1	3.4	1	0			
Location E: Wall E-3 (North of CSAH 81 at Osseo High School)								
R45 (S)	**67.3**	63.6	3.7	1	0	1,264	$186,600	N/A

Bold numbers exceed State noise standards.
N/A = not applicable because all receptors adjacent to the modeled wall did not meet the minimum 5 dBA threshold to be considered acoustically effective.
(R) – Residence; (C) – Commercial; (P) – Recreation Area/Park; (S) – School; (H) – Hotel
(1) Surface area for modeled walls includes tapers at wall ends.

TABLE 25B
NOISE MITIGATION ANALYSIS (CSAH 81) – COST- EFFECTIVENESS RESULTS (15-FOOT WALL)

Receptors	Daytime L_{10} Noise (dBA)		Reduction (in dBA) with 15 ft noise wall	Number of residences	Number of affected residences	Length of wall (feet)	Total cost of wall $15/sq ft[(1)]	Cost/dBA/ residence
	Build (2030) (no wall)	Build (2030) (15 ft wall)						
Location B: Wall B-1 (1,082-foot wall north of CP Railroad along CSAH 81)								
R10 (R)	61.2	59.6	1.6	3	0	1,082	$236,700	$3,664
R10A (R)	61.0	56.8	4.2	3	0			
R12 (R)	64.1	56.1	8.0	3	3			
R12A (R)	61.0	54.9	6.1	4	4			
R12B (R)	63.7	58.3	5.4	3	3			
Location B: Wall B-2 (1,074-foot wall north of CP Railroad between stormwater pond and right of way limits)								
R10 (R)	61.2	61.2	0.0	3	0	1,074	$241,650	N/A
R10A (R)	61.0	61.0	0.0	3	0			
R12 (R)	64.1	62.6	1.5	3	0			
R12A (R)	61.0	60.8	0.2	4	0			
R12B (R)	63.7	61.9	1.8	3	0			
Location C: NE Quadrant of CSAH 81/I-94 interchange								
R31 (H)	**65.9**	64.0	1.9	1	0	1,200	$266,625	N/A
Location D: East side of CSAH 81 at 4th Street SE								
R41 (R)	64.2	62.4	1.8	2	0	760	$157,500	N/A
Location E: Wall E-1 (1,012-foot wall west of 1st Avenue NW)								
R44 (R)	**68.5**	60.0	8.5	6	6	1,012	$220,950	$3,897
R44A (C)	66.9	63.0	3.9	1	0			
R44B (P)	**65.5**	59.8	5.7	1	1			
Location E: Wall E-2 (810-foot wall west of 1st Avenue NW)								
R44 (R)	**68.5**	62.5	6.0	6	6	810	$175,500	$4,209
R44A (C)	66.9	66.8	0.1	1	0			
R44B (P)	**65.5**	59.8	5.7	1	1			
Location E: Wall E-3 (North of CSAH 81 at Osseo High School)								
R45 (S)	**67.3**	60.3	7.0	1	1	1,264	$277,650	$39,664

Bold numbers exceed State noise standards.
N/A = not applicable because all receptors adjacent to the modeled wall did not meet the minimum 5 dBA threshold to be considered acoustically effective.
(R) – Residence; (C) – Commercial; (P) – Recreation Area/Park; (S) – School; (H) – Hotel
(1) Surface area for modeled walls includes tapers at wall ends.

TABLE 25C
NOISE MITIGATION ANALYSIS (CSAH 81) – COST- EFFECTIVENESS RESULTS (20-FOOT WALL)

Receptors	Daytime L_{10} Noise (dBA) Build (2030) (no wall)	Daytime L_{10} Noise (dBA) Build (2030) (20 ft wall)	Reduction (in dBA) with 20 ft noise wall	Number of residences	Number of affected residences	Length of wall (feet)	Total cost of wall $15/sq ft[(1)]	Cost/dBA/ residence
Location B: Wall B-1 (1,082-foot wall north of CP Railroad along CSAH 81)								
R10 (R)	61.2	59.5	1.7	3	0	1,082	$314,100	$4,424
R10A (R)	61.0	56.6	4.4	3	0			
R12 (R)	64.1	55.2	8.9	3	3			
R12A (R)	61.0	54.5	6.5	4	4			
R12B (R)	63.7	57.6	6.1	3	3			
Location B: Wall B-2 (1,074-foot wall north of CP Railroad between stormwater pond and right of way limits)								
R10 (R)	61.2	61.2	0.0	3	0	1,074	$311,700	$17,914
R10A (R)	61.0	60.9	0.1	3	0			
R12 (R)	64.1	58.3	5.8	3	3			
R12A (R)	61.0	56.1	4.9	4	0			
R12B (R)	63.7	59.7	4.0	3	0			
Location C: NE Quadrant of CSAH 81/I-94 interchange								
R31 (H)	**65.9**	63.2	2.7	1	0	1,200	$354,750	N/A
Location D: East side of CSAH 81 at 4th Street SE								
R41 (R)	64.2	62.1	2.1	2	0	760	$207,000	N/A
Location E: Wall E-1 (1,012-foot wall west of 1st Avenue NW)								
R44 (R)	**68.5**	57.7	10.8	6	6	1,012	$293,100	$4,076
R44A (C)	66.9	62.5	4.4	1	0			
R44B (P)	**65.5**	58.4	7.1	1	1			
Location E: Wall E-2 (810-foot wall west of 1st Avenue NW)								
R44 (R)	**68.5**	61.8	6.7	6	6	810	$232,500	$4,926
R44A (C)	66.9	66.7	0.2	1	0			
R44B (P)	**65.5**	58.5	7.0	1	1			
Location E: Wall E-3 (North of CSAH 81 at Osseo High School)								
R45 (S)	67.3	58.0	9.3	1	1	1,264	$368,700	$39,645

Bold numbers exceed State noise standards.
N/A = not applicable because all receptors adjacent to the modeled wall did not meet the minimum 5 dBA threshold to be considered acoustically effective.
(R) – Residence; (C) – Commercial; (P) – Recreation Area/Park; (S) – School; (H) –Hotel
(1) Surface area for modeled walls includes tapers at wall ends.

Location D (east side of CSAH 81 from 85th Avenue North to 3rd Street S)

Receptor R41 represents residential land uses along the east side of CSAH 81 at 4th Street SE in Osseo. Commercial land uses are located between CSAH 81 and Receptor R41 at the northeast quadrant of the CSAH 81/85th Avenue North intersection, and along CSAH 81 west of 6th Avenue SE. Noise levels at Receptor R41 are predicted to be below State daytime noise standards but exceed State nighttime noise standards by 7.6 dBA (L_{10}) under future Build conditions.

A 760-foot long noise wall was modeled along the east side of CSAH 81 from a point approximately 200 feet north of 85th Avenue North to the right-in/right-out access to the East Frontage Road north of 4th Avenue SE. A gap was included in this modeled noise wall to accommodate the CSAH 81/4th Avenue SE intersection (see Figure 9G).

A noise barrier is not reasonable at this location. The 10-foot, 15-foot, and 20-foot modeled noise barriers do not meet the minimum 5 dBA reduction threshold to be considered acoustically effective (see Tables 25A through 25C). As such, a noise barrier will not be constructed at this location.

Location E (north side of CSAH 81 from 89th Avenue North to CR 202)

A total of three noise walls were evaluated at two different sites in Location E between 89th Avenue North and CR 202. The first site was located along the north side of CSAH 81 to the west of 1st Street NW and 1st Avenue NW. Two different wall lengths were considered at this first site (Wall E-1 and Wall E-2). The second side was located along the north side of CSAH 81 at Osseo Senior High athletic fields between a commercial driveway and the driveway to the Osseo Ice Arena (Wall E-3) (see Figures 9H and 9I).

Location E is comprised of commercial land uses at the 1st Street NW and 1st Avenue NW intersection and residential land uses to the west. A baseball field associated with Osseo Senior High is located to the west of these residential land uses. Modeled noise levels at this location are predicted to exceed State daytime noise standards by 3.5 dBA (L_{10}) and exceed State nighttime noise standards by 11.7 dBA (L_{10}) under future Build conditions.

<u>Wall E-1</u>

The 1,012-foot noise wall (Wall E-1) was modeled along the north side of CSAH 81 from the point where the 1st Avenue NW sidewalk connects to the CSAH 81 trail to the driveway access to commercial properties to the west (see Figure 9H). The wall was modeled within Hennepin County right of way between the trail and right of way limits. Receptor R44 represents newly-constructed condominiums that face to the south to CSAH 81. These buildings do not have outdoor uses (i.e., patios) associated with the condominium units. However, there is an outdoor area (e.g., gazebo) located between CSAH 81 and the buildings. As a worst-case scenario, this gazebo was assumed to represent the six first-floor units that face CSAH 81. The post office at the 1st Street NW/1st Avenue NW intersection and the Osseo Senior High baseball field would be shielded by this modeled wall.

The 1,012-foot long noise wall is not reasonable at this location. The 10-foot, 15-foot, and 20-foot modeled noise walls exceed the criteria of $3,250/dBA/residence (see Tables 25A through 25C). A noise barrier will not be constructed at this location.

Wall E-2

The 810-foot noise wall (Wall E-2) was modeled along the north side of CSAH 81 from a point approximately 200 feet west of 1st Avenue NW to the driveway access to commercial properties to the west. The wall was modeled within Hennepin County right of way between the trail and right of way limits. This wall would not shield the post office at the corner of the 1st Street NW/1st Avenue NW intersection, but would shield the Osseo Senior High baseball field to the west (see Figure 9H).

The 810-foot long noise wall is also not reasonable at this location. The 10-foot, 15-foot, and 20-foot modeled noise walls exceed the criteria of $3,250/dBA/residence (see Tables 5A-5C). A noise barrier will not be constructed at this location.

Wall E-3

Receptor R45 represents Osseo Senior High athletic facilities north of CSAH 81. Receptor R45 was located at a point adjacent the School property boundary behind two softball fields as a worst-case scenario. Modeled noise levels at this modeled location under Build conditions are projected to exceed State daytime noise standards by 2.3 dBA (L_{10}), and are projected to exceed State nighttime noise standards by 0.3 dBA (L_{10}).

A 1,264-foot noise wall (Wall E-3) was modeled along the north side of CSAH 81 adjacent to Osseo High School property. This modeled wall extends from a commercial driveway to the Osseo Ice Arena driveway. The wall was modeled within Hennepin County right of way between the sidewalk and the right of way limits. The modeled wall was located approximately 10 feet from the edge of the proposed sidewalk (see Figure 9I).

A noise barrier is not reasonable at this location. The 10-foot modeled barrier does not meet the minimum 5 dBA reduction threshold to be considered acoustically effective. The cost-effectiveness of the 15-foot and 20-foot modeled barriers exceed the criteria of $3,250/dBA/residence (see Tables 25A through 25C). As such, a noise barrier will not be constructed at this location.

Conclusions

Construction of the project would generally result in increases in noise levels due to increased traffic. In general, modeled residential receptor locations along the CSAH 81 corridor where access control right of way remains in place are predicted to exceed State daytime and nighttime noise standards under future Build conditions. Modeled commercial receptor locations along the CSAH 81 corridor where access control right of way remains in place are predicted to be below State daytime and nighttime noise standards under future Build conditions.

The reasonableness (i.e., cost-effectiveness) of noise barriers was evaluated at four general areas (represented by five locations) along CSAH 81 where controlled access right of way remains in place and where modeled noise levels were predicted to exceed State daytime and nighttime noise standards. For the purposes of this analysis, it was assumed that all barriers were feasible. None of the modeled walls at locations along CSAH 81 where access control right of way remains in place that met the minimum 5 dBA reduction threshold were found to be cost-effective. Noise barriers will not be constructed with the proposed project.

25. Nearby Resources. Are any of the following resources on or in proximity to the site?

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? _X_ Yes __ No

Response: In early 2006 Hennepin County began coordination with the Mn/DOT Cultural Resources Unit (CRU). The Mn/DOT CRU determined that no archeological work was necessary for this project and that a Phase I survey would be required (See Appendix B). The *Phase I Architectural History Survey for the CSAH 81 Reconstruction Project* (Phase I Report) was completed by The 106 Group Ltd., (The 106 Group), in December 2006 to identify properties potentially eligible for the National Register of Historic Places (NRHP). The *Phase II Architectural History Survey for the CSAH 81 (Bottineau Road) Reconstruction Project* (Phase II Report) was completed by The 106 Group in March 2007 to evaluate further and fully determine the eligibility status of the Phase I properties. The surveys included a review of a 2004 cultural resources assessment, documents on previously inventoried properties, and surveys conducted within the project area as a well as a field survey to identify and evaluate properties within the area of potential effect (APE) that contain buildings or structures constructed prior to 1961. Because the project will take several years to complete, 1960 was established as the general cutoff date for properties to be considered eligible for the NRHP.

The APE for architectural history, determined by the Mn/DOT CRU, accounts for any physical, auditory, or visual impacts to historic properties. It includes all areas of road reconstruction activity, areas of proposed property takings, and all parcels within and immediately adjacent to the project area. The area around the intersection of CSAH 81 and TH 169 was omitted from the APE since this stretch of CSAH 81 was rebuilt as part of the TH 169 reconstruction project and no additional work is anticipated in this area. It should be noted that when the APE for the project was defined and the Phase I and II studies were conducted, a BRT was included as part of the project and was therefore included in the APE. The project was subsequently revised to remove the BRT component; the project APE was revised accordingly as well.

Phase I Report Recommendations

In December 2006, a meeting was held with Mn/DOT CRU to review The 106 Group's Phase I Report. The report covered 585 properties within the APE with buildings or structures constructed before 1960, 533 of which were recommended as not eligible due to a lack of significance or integrity. Of the remaining properties that are within the CSAH 81 roadway reconstruction project area, two are railroads previously determined to be eligible (Minneapolis & Pacific Railway Company Line and Minneapolis & Northwestern Railroad Company Line, commonly known as the Soo Line and BNSF Railroad respectively) and one is an individual properties (house) that was determined to be potentially eligible.

Phase II Report Recommendations

During the Phase II survey, the individual property that was identified by the Phase I survey as being potentially eligible for the NRHP was fully evaluated. Based on the results of the Phase II Report research, the house was recommended as not eligible for the NRHP by the 106 Group.

Mn/DOT CRU made its effects determination for eligible properties in a letter to the SHPO dated May 12, 2008; the SHPO subsequently concurred with this determination in a letter dated June 9, 2008 (see Appendix B). The SHPO letter states that the project will have no adverse effects on historic properties.

Findings of Phase II Report

The Phase II survey was conducted in five segments as described below. Note that these segments do not correspond with the roadway project segments identified in the discussion of alternatives Item# 6 of this EAW. Figure 12A depicts the APE; Figure 12B shows the historic properties along the project corridor.

Segment One (TH 100 to CSAH 10)

One property in this segment, the Minneapolis & Pacific Railway Company Line (commonly known as the Soo Line), has been previously determined eligible for the NRHP. There will be some visual effects on the railway but these effects will not change its function.

Segment Two (CSAH 10 to 63rd Avenue North)

No properties in this segment are recommended as eligible for listing on the NRHP.

Segment Three (63rd Avenue North to TH 169)

No properties in this segment are recommended as eligible for listing on the NRHP.

Segment Four (TH 169 to CSAH 30)

No properties in this segment are recommended as eligible for listing on the NRHP.

Multiple Segments

One property extends across multiple segments, the Minneapolis and Northwestern Railroad (commonly known as BNSF), and has been previously determined eligible for listing on the NRHP. There will be some visual effects. It was recommended that there are no adverse effects.

Prime or unique farmlands or land within an agricultural preserve?
__Yes _X_ No

Designated parks, recreation areas or trails? _X_ Yes __No

Response: Four existing parks are located in the vicinity of the project corridor (see Figures 13A-13C). A future park site is located in the project area as well. A discussion of impacts to these resources occurs later in this section.

Existing Parks:

- Cavanagh Early Childhood Learning Center, Crystal
- Becker Park, Crystal
- Greenhaven Park, Brooklyn Park
- Independent School District 279 park property, Osseo

Future Park:

- Future Park, Osseo

Park Impacts

Cavanagh Early Childhood Learning Center

This facility, located on the east side of CSAH 81 between Corvallis Avenue North and 51st Avenue North in the City of Crystal, includes a preschool, early childhood family education program, and alternative high school. There is a fenced-in outdoor play area on the western side of the building that is not open for public use. Ball fields on the eastern side of the building are open to the public and used as a park in the Cavanagh neighborhood.

A chain link fence and a number of coniferous trees along the fence buffer the outdoor play area on the western side of the property from the frontage road on the east side of CSAH 81. The proposed road reconstruction includes a new frontage road alignment and intersection with 51st Avenue further east of its present day location. This involves taking a portion of the site on the west side of the building. Since the outdoor play area on the western portion of the site is not open to the public it is not a Section 4(f) resource. Therefore, no park impacts are expected.

During a coordination meeting with Robbinsdale Area Schools (ISD 281), school district staff expressed concern about the loss of buffer between the playground and the road; however, they noted that there is no good alternative to the plan and added that the frontage road and intersection improvements were in everyone's best interest for better traffic alignment. The school is planning other improvements to the school and is coordinating those improvements with the proposed roadway reconstruction plans. Therefore, from a safety and engineering standpoint, they are supportive of the reconstruction plans.

Becker Park

Becker Park is a 12+ acre community park located in the southwest quadrant of CSAH 81 and CSAH 10 in the City of Crystal (See Figure 14 in Appendix A). It offers athletic fields, tennis courts, basketball courts, playground equipment, walking trails, and a shelter structure. It is directly adjacent to the BNSF Railway Company right of way which is west of the CSAH 81 roadway. Temporary impacts to the trail on the northern edge of the park along CSAH 10 are anticipated during reconstruction of the intersection. The area will be restored after construction to an improved condition with additional trees. The City of Crystal is considering an entrance monument for this area as well.

The roadway widening along CSAH 10 will likely require a permanent easement, overlapping an existing City of Crystal drainage and utility easement, on park property. The proposed permanent easement for the CSAH 81 project would require less area than the existing permanent easement. There are no recreational facilities located in the proposed easement area. The proposed project will not impact the function of Becker Park or park activities. See Appendix B for correspondence from the City of Crystal regarding its concurrence with the proposed impacts

Greenhaven Park

Greenhaven Park, 7880 Mt. Curve Boulevard N, in the City of Brooklyn Park, is a neighborhood park (See Figure 15 in Appendix A). This 29-acre park provides a picnic shelter, playground, basketball, picnic area, and natural areas. It is located west of the BNSF Railway Company right of way and north of Brooklyn Boulevard. The recreational portion of the park, about one acre of the total 29-acre park, is about 800 feet west of the CSAH 81 right of way and is surrounded by open space and wetlands. The CSAH 81 project proposes grading of approximately one acre of parkland adjacent to the BNSF Railway Company right of way to lower the elevation to match that of the surrounding area to accommodate anticipated overflow from the culvert proposed in replacement of the ditch along CSAH 81. Impacts to the park will be temporary and the area will be restored to an equal or improved condition after construction. See Appendix B for correspondence from the City of Brooklyn Park regarding its concurrence with the proposed impacts and mitigation.

Independent School District #279 Property

The school property is immediately adjacent to CSAH 81 on the east side. The outdoor recreational facilities at the high school property in the City of Osseo are available for use by the public as a community park facility when not being used for school purposes. No project impacts are anticipated to occur on the outdoor recreational areas of the site. The

proposed roadway design includes improving access and connecting a frontage road to the access. The connection of the frontage road will require right of way acquisition for highway purposes at the intersection overlapping the existing access.

Future Park Site

A future park is proposed in the City of Osseo at the northwest corner of Jefferson Avenue and CSAH 81. This site is owned by the City but has not been officially designated as parkland and is not listed as such in the City's comprehensive plan. The City's plans for the site include a gateway/landscaped area with a fountain and benches. Trails and sidewalks are proposed to connect a pedestrian system between different districts in the City. The site will need to be acquired for CSAH 81 right of way for the proposed project. However, there will be adequate space to install the planned improvements once construction of the roadway is complete. The City does not intend to designate the site as parkland until after the right of way needs of the proposed project have been determined.

Scenic views and vistas? __Yes _X_ No

If yes, explain.

Response: There are no scenic views or vistas along the CSAH 81Corridor, which is bordered by urban development.

Other unique resources? __Yes _X_ No

If yes, explain.

Response: N/A

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? ___Yes _X_No

If yes, explain.

Response:

Improvements in the City of Crystal include two bridges over the Soo Line railroad. The two roadway bridges, one in each direction, would replace the existing bridge. While these improvements introduce new elements to the visual landscape, they will occur along an existing transportation corridor and do not represent a change in land use or create adverse visual impacts. Lighting will be considered in the final design of each roadway segment.

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?

_X_ Yes ___No

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

Response: Each of the five municipalities within the project area adopted a comprehensive plan, approved by Metropolitan Council, between 1998 and 2002. They are referenced as follows and are available for review at the offices of each municipality:

- City of Robbinsdale Comprehensive Plan Vision 2020, July 1999
- Crystal Comprehensive Plan 2000-2020, October 2000
- Brooklyn Park Comprehensive Plan Update, March 2002
- Maple Grove Comprehensive Plan, 1999
- City of Osseo Comprehensive Land Use Plan, 1997-2020, 1997.

The compatibility of roadway reconstruction with each city's comprehensive plan policies is described below. The findings focus on comprehensive plan recommendations in the areas of land use /redevelopment, transportation, and parks/open space/natural resources. It should be noted that these communities are required to submit updates of their comprehensive plans to the Metropolitan Council in 2008.

Robbinsdale

Land Use

Little change is anticipated for land use patterns adjacent to CSAH 81 in the portion of Robbinsdale that falls within the project area. The City anticipates that excess public right of way from TH 100 construction will be turned back to the City. This property has been identified as a potential site for low-density (single family) and medium-density (town homes) residential but is largely outside of the project area.

Transportation

CSAH 81 is designated a principal arterial as it passes through the City. One of the stated policies directly applicable to the roadway is to support a redesign of the street that "provides efficient movement for traffic yet promotes pedestrian safety and facilitates vehicle travel within posted speed limits." The proposed reconstruction of CSAH 81 is in keeping with these policies.

Parks and Trails

Robbinsdale has no parks immediately adjacent to the portion of the CSAH 81 corridor that is in the project area. Existing and proposed bikeways/walkways are located within the CSAH 81 corridor project area, including a proposed trail adjacent to the BNSF Railway right of way north of TH 100.

Crystal

Land Use

The predominant land use adjacent to CSAH 81 in Crystal is low density residential. The Cavanagh Oaks, Twin Oaks, Skyway, and Lions Park neighborhoods are all guided for low density residential uses. The comprehensive plan emphasizes conservation and preservation of housing stock associated with low density residential neighborhoods. Impacts associated with the roadway project are not incompatible with low density residential neighborhoods.

The Mixed-Use West Broadway/CSAH 81 district described in the comprehensive plan emphasizes a high quality visual image along CSAH 81. Permitted uses include office, hospitality, institutional, public facility, light industrial, employment and those commercial uses that do not compete with Community Commercial areas. This segment of the corridor is seen as an important area for employment and jobs base. The preferred land uses are employee-intensive light industrial and office uses with integrated retail and service as accessory uses. A second category of uses allowed in the district are automobile service establishments and motor fuel stations, intended to serve the customer traffic passing through Crystal on CSAH 81. These properties will access CSAH 81 from side streets or redesigned frontage roads, all of which are compatible with the City's future land use plan for the area. Reconfiguration of frontage and backage roads and changed access for some parcels as shown in the roadway redesign are compatible with these uses.

The Crystal Airport, located at approximately 60th Avenue North on the east side of CSAH 81, operates as a minor airport in the Metropolitan Airports Commission (MAC) system. The airport's runway clear zone extends over CSAH 81 and places some constraints on intersection geometry and roadway access points. While the City's comprehensive plan calls for the closure and/or relocation of the airport when MAC determines that this can be done, the plan also states that it is likely the Crystal Airport will continue to operate at its present location at least through 2020. MAC is in the process of developing a Long Term Comprehensive Plan (LTCP) for the Crystal Airport. The draft plan was released for public review in March 2008 and states that the preferred alternative recommended for adoption by the Commission for the Crystal Airport is to maintain a primary runway and a crosswind runway. The LTCP draft acknowledges the CSAH 81 project and states that the CSAH 81 project is not impacted by any of the airport LTCP alternatives.

Transportation

CSAH 81 is classified as an A-Minor Arterial in the City's street network. Growth in traffic on the roadway is expected by 2020. These volumes are the highest of all Crystal's minor arterials in the forecast year 2020.

The comprehensive plan identifies a number of issues along the CSAH 81 roadway that need to be addressed as traffic levels increase:

- Frontage road intersections which are too close to the mainline roadway (at 47th Avenue, 49th Avenue, Corvallis/51st Avenue, 58th Avenue and Airport Access Road, 60th Avenue and 62nd Avenue).

- Increase green space, where possible, between the main line roadway and existing houses (between 47th Avenue and Corvallis Avenue).

- Create roadway design elements that reflect surrounding uses: preserve and enhance the existing parkway appearance in residential areas (47th Avenue to Corvallis); establish a gateway feature near 56th Avenue, where surrounding uses are more commercial/industrial in nature, and create a more attractive entrance to the airport at 58th Avenue.

The roadway design as currently proposed addresses all of the issues, though details and funding for the gateway feature discussed above remain undecided.

Parks and Trails

Reconstruction of the roadway will impact Becker Park, requiring a permanent easement, overlapping an existing City of Crystal drainage and utility easement, on park property. The impacts are discussed in Item 25, Nearby Resources, Parks. City-designated bike routes cross the corridor at 47th Avenue and 51st Avenue. These crossings are important to link Crystal neighborhoods to each other and to recreational destinations such as Twin Lakes, on the east side of the roadway. Full crossing of CSAH 81 will be provided at these two locations and will assist in preserving the City's trail continuity. The CSAH 81 roadway reconstruction project includes construction of a trail segment along the corridor from 47th Avenue North to CSAH 10; the CSAH 81 bicycle corridor is designated on County and regional trail system plans.

Brooklyn Park

Land Use

The proposed land use along the CSAH 81 corridor is predominantly commercial, with some mixed-use/residential and industrial uses. High density residential development is recommended at a number of locations (62nd to 63rd Avenue, 71st Avenue, and 73rd Avenue) along or near CSAH 81 as part of the City's efforts to encourage transit-oriented development along the corridor. A number of areas along the CSAH 81 corridor offer opportunities for redevelopment.

The new roadway will not change the compatibility of adjacent land uses with the roadway, as there is no direct access to the roadway and there is sufficient land area to plan for physical and visual buffers when residential development takes place. Other land uses are predominantly industrial and commercial in character between I-94 and TH 169. Again, present day compatibility between land uses and the roadway will be preserved.

Transportation

The Transportation Plan element of the Brooklyn Park's comprehensive plan identifies congestion as a constraint on the operational capacity of CSAH 81 by 2020. Comprehensive Plan policy calls for a special study to be undertaken by the City and the County to increase capacity and improve traffic operations in the corridor. The proposed improvements address this concern by adding turn lanes at key intersections (such as 93rd Avenue North and Brooklyn Boulevard) where turning movements contribute to congestion.

CSAH 81 is classified as an A Minor Arterial in the City's functional classification system. Reconstructing the roadway to maintain safe conditions and acceptable operations at intersections is consistent with this element of the comprehensive plan.

Parks and Trails

Greenhaven Park is adjacent to the roadway on the west side of CSAH 81. The CSAH 8 1 project proposes grading on parkland adjacent to the BNSF Railway Company right of way to lower the elevation to match that of the surrounding area to accommodate anticipated overflow from the culvert proposed as replacement for the ditch along CSAH 81. Impacts to the park will be temporary and the area will be restored to an equal or improved condition after construction. Impacts are discussed in Item 25, Nearby Resources, Parks. The proposed roadway reconstruction will not impact the function of the park. The proposed roadway reconstruction is compatible with the park use.

Osseo

Land Use

Osseo's comprehensive plan notes that the City's manufacturing and industrial area, located on the south side of CSAH 81, is reserved for uses suited to highway commercial character. These uses also buffer residential neighborhoods, which are to be preserved, from any impacts associated with CSAH 81. The roadway reconstruction is compatible with this land use pattern. Changes to access on a site-by-site basis will require use of frontage roads. These frontage roads are included in the roadway design.

The future land use plan calls for a replacement of industrial land uses north of the BNSF Railway Company right of way with commercial uses along both sides of CSAH 81. The comprehensive plan is supplemented by recently adopted design guidelines, organized by zoning districts. The Central Business District (along Central Avenue); the Highway Commercial District (along CSAH 81) and the Manufacturing and Industrial District (south of the BNSF Railway Company right of way) stipulate architectural and urban design guidelines that will result in more pedestrian oriented, attractive, and easily accessed business districts. It should be noted that the City adopted a Redevelopment Master Plan in spring 2007 which included a preliminary land use plan. The land use plan lays the foundation for the comprehensive plan update which is being prepared presently and will be submitted to the Metropolitan Council in late 2008. The draft plan calls for a greater emphasis on retail, office, office showroom, and light industrial uses along the CSAH 81 corridor than on industrial uses. Mixed-use, with a focus on retail at the ground level, is planned along Central Avenue north of CSAH 81. The roadway reconstruction is compatible with this land use pattern.

Transportation

CSAH 81 is designated as an A Minor Arterial in Osseo, placing greater emphasis on mobility than on land access. A project reconstructing service roads flanking CSAH 81 and providing limited access to the principal roadway was concluded in 1995. The corridor serves as the principal highway and commercial district for the City. Consequently, business visibility and access to the service roads is important to the economic vitality of this area. The proposed roadway reconstruction is compatible with the transportation system.

Parks and Trails

The City's draft *Redevelopment Master Plan/Comprehensive Plan Update* identifies as one of its key issues, "creating a stronger community entrance/identity/gateway along Highway 81/Bottineau Boulevard, particularly at the intersection with Central Avenue." This is the site of a proposed park. The site is owned by the City but it has not yet been officially designated a park. The City has plans to create a gateway green area with a fountain and benches on the site. Trails and sidewalks are proposed to connect a pedestrian system between different districts in the City. The comprehensive plan maps pedestrian access points along Central Avenue, Broadway, and 3rd Street North, which would provide pedestrian access to CSAH 81 at the intersection of CSAH 81 and Broadway Avenue, close to Central Avenue. The proposed roadway reconstruction is compatible with these plans.

Maple Grove

Land Use

Existing land uses along the CSAH 81 corridor are predominantly commercial and industrial in nature. No significant land use changes are anticipated for the portion of the City within the project area, though some redevelopment of existing uses is expected. A small amount of low and medium density residential is planned for the south side of CSAH 81 north of (CSAH 30), and parkland is also located at this intersection, close to the Elm Creek Park Reserve.

The City has prepared a special area plan to guide redevelopment of the 2,000-acre gravel mining area generally located southwest of CSAH 81: south of 85th Avenue North between approximately I-94 and TH 169. This plan recommends compact and mixed-use development types, including a range of residential densities (5,100 units with an average density of 10 dwelling units per acre), commercial office and services, retail, neighborhood commercial nodes, and community parks and parkways. While none of this redevelopment will require direct access to CSAH 81, increased traffic in the general vicinity will have consequences on CSAH 81. Since 1999 approximately 400 acres have been developed. The expected timeframe to complete this redevelopment is 2020.

Transportation

CSAH 81 is designated as an A Minor Arterial through Maple Grove. Official City policy emphasizes mobility over access by controlling access points, limiting driveways and secondary intersections, and relying on a series of service roads to serve adjoining properties. The reconstruction of CSAH 81 is compatible with this policy and will deliver limited access and an improved frontage road system to preserve the capacity of the roadway while ensuring access to neighboring properties.

Parks and Trails

There are no parks adjacent to CSAH 81 within the project area. No future trails are planned for the area around CSAH 81. Regional trail connections are made at Elm Creek. A connector trail, established by the City, crosses CSAH 81 at Zachary Lane making this an important intersection for transit passengers and pedestrians who are transferring to bus service. The proposed CSAH 81 reconstruction includes this crossing and is compatible with these uses.

Regional Plans and Requirements

Hennepin County Bicycle Transportation Plan

Hennepin County has designated CSAH 81 as a primary bicycle route from the City of Rogers to Theodore Wirth Parkway. This designation suggests full bicycle accommodation for Class A (advanced and experienced), B (recreational and casual riders) and C (children and others needing trail separation) bicyclists. The plan states that on-road (striped lanes) and off-road bituminous facilities are the preferred facilities to meet this goal. Only off-road facilities are planned for CSAH 81. Implementation of the complete interconnected trail system is not programmed in the County's Capital Improvements Program. Individual municipalities have advanced segments of this trail within their borders. The proposed design for reconstruction of CSAH 81 provides for continuous trails on either side of the roadway wherever feasible; trails are not feasible where there are right of way constraints. A detailed description of walkways and trails planned for each segment of the project can be found in item #6 of this EAW. The Three Rivers Park District has been provided with plans for the project.

28. Impact On Infrastructure and Public Services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project?

_X_ Yes ___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.)

Response: No large scale changes to existing infrastructure or public services are anticipated for the project. Minimal impacts to sanitary sewer, water main, fire hydrants, and man-hole covers are expected and all will be replaced in-kind. Stormwater drainage features will be improved with the new frontage road system including enhanced treatment of stormwater runoff as described in item #17 of this EAW. During reconstruction of CSAH 81, cities along the corridor may choose to replace facilities, such as sewer pipes, while the roadway is under construction.

29. Cumulative Impacts. 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 impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts *(or discuss each cumulative impact under appropriate item(s) elsewhere on this form)*.

Response: Cumulative impacts are also defined by the Council on Environmental Quality (CEQ) as "Impacts on the environment that result 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" (40 CFR 158.7).

Cumulative impacts are not causally linked to the reconstruction of CSAH 81, but are the total effect of all known actions (past, present and future) in the vicinity of the proposed action with similar impacts to the proposed action. The purpose of cumulative impacts analysis is to look for impacts that may be minimal, and therefore, neither significant nor adverse when examined within the context of the proposed action, but that may accumulate and become significant and adverse when combined with other actions.

Scope of Cumulative Impacts Analysis

The cumulative impacts analysis is limited to those resources, ecosystems, and human communities affected by the proposed project - land development, floodplains, wetlands, stormwater quality and quantity, floodplains, traffic noise, and parkland. While the proposed action may affect several resources either directly or indirectly, the purpose of the cumulative impacts analysis is to narrow the focus to the project-related impacts that could potentially have the largest cumulative impacts.

The geographic scope of this analysis varies by the resource under examination, but in general is limited to an area within the project limits.

The temporal scope of the analysis attempts to consider previous impacts to the resources that occur over time. The year 2020 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 impact assessment.

Past and Recent Actions

Past actions in the project area include decades of residential and commercial/industrial development, as well as highway and other infrastructure construction, that have created the existing built urban environment. Existing residential, commercial, and industrial development along the CSAH 81 corridor in Robbinsdale, Crystal, Brooklyn Park, and Osseo has been in place for more than 30 years. Commercial and industrial development along the corridor in Maple Grove is more recent and has been in place for about 20 years.

Recent actions considered for this assessment of the potential for cumulative impacts include:

- The City of Robbinsdale has experienced higher density housing developments and some commercial infill and redevelopment.
- Redevelopment of commercial and industrial properties in the City of Crystal has occurred just south of CSAH 10 in the past ten years and the area north of CSAH 10 has seen expansion of commercial uses in recent years.
- The City of Osseo has experienced modest infill development and redevelopment.
- Reconstruction of CSAH 81 in Robbinsdale from Lowry Avenue to TH 100 and construction of a new interchange at TH 100 in the City of Robbinsdale.

Future Actions Anticipated

The projects, listed below, that were considered for this analysis are consistent with the recent Minnesota State Supreme Court Ruling regarding cumulative potential effects inquiry under state statute, i.e., the projects: 1) are either existing, actually planned for, or for which a basis of expectation has been laid; 2) are located in the surrounding area; and 3) might reasonably be expected to affect the same natural resource.

- Construction of infill housing is anticipated on excess right of way acquired after completion of the TH 100 interchange project in the City of Robbinsdale.
- Street reconstruction in the City of Crystal is anticipated in 2008.
- Construction of a new park and ride facility has recently been completed at 63rd Avenue North in the City of Brooklyn Park.
- Construction of a new interchange at TH 169 in the Cities of Brooklyn Park and Osseo is planned to begin as soon as funding and approvals can be acquired.
- An upgrade to the Central Avenue/Jefferson Highway with mill and overlay is anticipated in the City of Osseo in 2007.
- Construction of new senior housing, 64 units, on the east side of CSAH 81 is underway in the City of Osseo.
- High density housing is proposed along Central Avenue near CSAH 81 in the City of Osseo for 2010-2040.
- Commercial redevelopment (restaurant, office, RV sales) is proposed for a site on the west side of CSAH 81 in the City of Osseo for 2010-2040.
- The extension of TH 610 from TH 169 to I-94 in Maple Grove is proposed but is not yet funded. Induced residential, commercial, and industrial development is anticipated as a result.
- Construction of North Memorial/Fairview Hospital in Maple Grove is underway.

As discussed in previous sections of this EAW, the Cities of Robbinsdale, Crystal, Brooklyn Park, Osseo, and Maple Grove are anticipating future growth within their communities. In Robbinsdale, Crystal, and Osseo most growth will be accommodated through redevelopment of existing land uses. The future land use map for the City of Brooklyn Park shows the majority of the City's growth occurring northwest of the CSAH 81 corridor. The future land use plan for the City of Osseo calls for replacement of industrial land uses north of BNSF Railway Company right of way with commercial land uses along both sides of the CSAH 81 corridor. Future growth in Maple Grove is expected to occur west of CSAH 81.

City of Crystal staff anticipates that the Crystal airport, owned by the Metropolitan Airports Commission, will cease operation some time in the next 30 years. No plans are underway to determine the future use of the property.

Evaluation of Potential Cumulative Impacts

Land Development

Existing Conditions

The land adjacent to the project corridor is fully developed or in public use. Future development will occur in the form of redevelopment.

Impacts from Proposed Action

The proposed project will result in direct impacts to adjacent land with the proposed acquisition of right of way or easements, including land that is currently used for residential, commercial, industrial, recreational, and institutional uses. This right of way will be converted to transportation uses. The project will not result in the induced development of any currently undeveloped area adjacent to the project.

Impacts from Other Actions

Substantial land use changes are not expected within the five communities along the CSAH 81 project corridor as the majority of adjacent land is already developed. Redevelopment activities initiated by the cities along the project corridor may change land use slightly. City of Crystal staff indicated that some commercial redevelopment may occur along CSAH 81 north of CSAH 10, prompted by the highway reconstruction. In addition, the future land use plan in the City of Osseo calls for replacement of industrial land uses north of the BNSF Railway Company right of way with commercial uses along both sides of the CSAH 81 corridor.

Any changes in traffic patterns resulting from the CSAH 81 improvements and other roadway improvements recommended by the cities are not expected to be substantial enough to induce land use changes within the area of the project.

Potential for Cumulative Impacts

Land development is guided by cities' comprehensive planning efforts. As part of comprehensive planning efforts, communities consider the beneficial and negative impacts of land development and prescribe patterns of development that are conducive to the goals of their community. The purpose of comprehensive planning is to reduce the negative cumulative effects of land development through orderly growth. Through zoning regulations, these same entities can control the intensity of development and protect natural resource areas from further development. For example, the City of Crystal zoning code has specific provisions for the preservation, protection, and enhancement of natural resources by regulating land-disturbing activities related to land development. Transportation facilities are also a component of comprehensive planning and the need, design character, and location of these roadways are based on their consistency with the communities' overall plan. Cumulative impacts of urbanization can be minimized by local governments through land use controls.

The proposed reconstruction of CSAH 81 will increase the attractiveness of commercial and industrial land uses in the corridor because it will facilitate ease of movement and trip making between destinations. Residential uses immediately adjacent to the corridor may experience impacts such as access changes, additional noise, and visual disruption compared to current conditions. However, the transportation and travel benefits associated with the road reconstruction will also accrue to residents who will find it easier, safer, and more convenient to move through the CSAH 81 corridor.

As the area surrounding the project is fully developed and no substantial redevelopment activities in the area are planned by the adjacent communities, there is minimal potential for cumulative impacts to land and development.

Wetlands

Existing Conditions

Wetlands within the study area provide a range of functions and vary in terms of their quality. These wetlands, stormwater ponds, and ditches have been previously impacted or degraded by development and roadway construction. The value of these degraded wetlands for wildlife habitat and water quality protection is limited.

Impacts from Proposed Action

As described in item #12 of this EAW, the proposed project will result in approximately 1.0 acres of permanent wetland impacts. These impacts will be mitigated at a 2:1 ratio, resulting in the need to provide approximately 2.0 acres of wetland mitigation (at least half of which must be new replacement wetlands created through restoration activities).

Impacts from Other Actions

Wetlands within the project area are either adjacent to fully developed areas (residential, commercial, and industrial development or roadways) or are located within existing parkland where no new development is planned. Therefore, no future actions are anticipated to occur to the wetlands in the project area.

Potential for Cumulative Impacts

As discussed in item #12 of this EAW, wetlands in Minnesota are protected by Federal law (the Clean Water Act – Section 404) and State law (Minnesota Wetland Conservation Act and Executive Orders) that mandate the "no net loss" concept of wetland functions and values. These laws require the avoidance of wetland impacts when possible, and when avoidance is not possible, impacts must be minimized and mitigated. Both the DNR and the Wetland Conservation Act require mitigation of wetland impacts on at least a 2:1 ratio. Given the extensive regulations protecting wetlands and the 2:1 replacement requirement for lost wetlands, there is a low potential for adverse cumulative impacts on wetlands.

Floodplains

Existing Conditions

Currently Shingle Creek passes underneath CSAH 81 via two box culverts in series, with ditch storage area between the two culverts considered floodplain. Shingle Creek, beyond the project area, runs through large flat wetland complexes that serve as flood storage both up- and downstream of the project area.

Impacts from Proposed Action

The CSAH 81 roadway reconstruction will encroach on a delineated 100-year floodplain at the Shingle Creek crossing, north of Brooklyn Boulevard. The road widening and proposed trail would fill the ditch between the two culverts.

Impacts from Other Actions

According to City of Brooklyn Park staff, there have been no impacts to this floodplain in the past 30 or more years, aside from ditch maintenance about 20 years ago at Brooklyn Boulevard and CSAH 81. In addition, City staff stated that no future impacts to the floodplain are anticipated.

Potential for Cumulative Impacts

Adverse cumulative impacts are not anticipated to result from the CSAH 81 reconstruction project with the implementation of the proposed mitigation measures. As no further impacts are anticipated from other activities in the area, there is little or no potential for cumulative impacts.

Stormwater Quality and Quantity

Existing Conditions

As discussed in item #17 of this EAW, the stormwater within the project area is conveyed via ditch flow, culverts, and storm sewer to receiving waters that include Crystal Lake, Twin Lakes, Shingle Creek, and various wetlands and low areas. Ultimately, all of the above water bodies drain to the Mississippi River. In general, most of the runoff generated today from the existing highway right of way does not receive water quality treatment prior to discharging to the respective receiving water.

Impacts from Proposed Action

The proposed project will increase the total impervious surface area from about 126 acres to about 145 acres (15 percent increase). As a result, the peak flow and the total surface water runoff volume will increase along the majority of the corridor. In an effort to manage this increased runoff, a storm sewer network along the entire corridor will be designed to convey the water to stormwater treatment basins, proprietary stormwater quality treatment devices, and infiltration areas where feasible. Following treatment, stormwater will be discharged at a rate equal to existing flow (to the extent practicable) to various receiving waters. Impacts and proposed mitigation are discussed in detail in item #17 of this EAW.

Impacts from Other Actions

The proposed project lies within the limits of three watershed management organizations: Shingle Creek WMC, West Mississippi River WMC, and Elm Creek WMC. Past actions (CSAH 81 in Robbinsdale, I-94 Interchange), and future roadway improvements (TH 169 Interchange) or commercial, residential, or industrial redevelopment may also result in increased impervious surface area within the three watershed organizations and thus increase in stormwater runoff. If not properly managed, increased runoff could result in a variety of negative impacts on receiving bodies. These potential negative impacts include increased chances of flooding, erosion of streambanks and drainage ways, and decreased ground water flow due to less infiltration. Stormwater management practices are used to reduce the magnitude of these potential impacts.

Potential for Cumulative Impacts

As discussed in item #17 of this EAW, there are federal, state, regional, and local surface and groundwater management regulations in place that require mitigation in conjunction with proposed development and roadway improvements. Given the design standards and management controls available for protecting the quality of surface waters, it is likely that potential impacts of the project, along with other foreseeable actions, will be minimized or mitigated to a substantial degree, and adverse cumulative impacts on water quality and quantity are not anticipated.

Traffic Noise

Existing Conditions

The majority of the CSAH 81 project corridor is exempt from State noise standards, as discussed in Item #24 of this EAW. Where State noise standards do apply, existing noise levels within the project area exceed State daytime and/or nighttime L_{10} standards at many receptors. Existing noise levels are influenced by vehicles traveling on CSAH 81 as well as by traffic on adjacent roadways, including Broadway Avenue, TH 100, I-94, and TH 169.

Traffic noise is a common complaint in the City of Robbinsdale according to City staff. Helicopter traffic is also an issue for residences near North Memorial Medical Center. According to City of Crystal staff, traffic noise has been mentioned as a concern by some residents in City neighborhoods adjacent to the CSAH 81 corridor; train whistle noise is an issue for residences in neighborhoods abutting the railroad right of way. According to City staff from Osseo and Maple Grove, traffic noise is not a common complaint.

Impacts from Proposed Action

Compared to existing conditions, noise levels under year 2030 Build conditions are projected to be higher as a result of increased traffic; these increases range from approximately 1 dBA to 4 dBA. In general, modeled residential receptor locations along the CSAH 81 corridor where access control right of way remains in place are predicted to exceed State daytime and nighttime noise standards under future Build conditions. Modeled commercial receptor locations along the CSAH 81 corridor where access control

right of way remains in place are predicted to be below State daytime and nighttime noise standards under future Build conditions. None of the modeled walls at locations along CSAH 81 where access control right of way remains in place that met the minimum 5 dBA reduction threshold were found to be cost-effective.

Impacts from Other Actions

As noise tends to disperse quickly as it moves further away from the source, the resources potentially affected by the project as well as other actions are limited to areas within one-quarter mile of the project corridor. Therefore, only actions occurring within this corridor have the potential to generate cumulative affects.

The area surrounding the proposed project is almost fully developed and no future development plans have been identified that would add additional sensitive receptors to the area.

Potential for Cumulative Impacts

As addressed in Item #24 of this EAW, State standards are in place to regulate traffic-related noise. Since there are no other future actions planned that have the potential to increase traffic noise levels that have not been considered in the noise analysis for this project, the potential for adverse cumulative traffic noise impacts is minimal. Noise barriers have been previously constructed at the TH 100 and I-94 interchanges and will remain in place with the proposed CSAH 81 improvements. Noise barriers are planned to replace the existing in-place walls at the TH 169 interchange.

Parkland

Becker Park

Existing Conditions

Becker Park in the City of Crystal is a 12+acre community park located in the southwest quadrant of the CSAH 81 and CSAH 10 intersection. It offers athletic fields, tennis courts, basketball courts, playground equipment, walking trails, and a shelter structure.

Impacts from the Proposed Action

Reconstruction of the CSAH 81/CSAH 10 intersection will require permanent easements as the wider roadway will bring additional travel lanes closer to the northern boundary of the park. Temporary impacts to the trail on the northern edge of the park along Bass Lake Road are anticipated during reconstruction of the intersection. The area will be restored after construction to an improved condition with additional trees. The City of Crystal is considering an entrance monument for this area as well. The roadway widening along Bass Lake Road will require a permanent easement overlapping an existing City of Crystal drainage and utility easement on park property.

Impacts from Other Actions

There is an existing drainage and utility easement on parkland property; no recreation facilities are located in the easement area. Efforts have been made to minimize project impacts on parkland by confining impacts to an area that is already impacted by a drainage and utility easement, and the project will not encroach onto additional parkland. None of the future actions anticipated that were described previously will impact Becker Park, including street reconstruction in the City of Crystal in 2008.

Potential for Cumulative Impacts

Since no other projects will affect this park, no cumulative impacts to the park are anticipated.

Greenhaven Park

Existing Conditions

Greenhaven Park in the City of Brooklyn Park is a neighborhood park that provides a picnic shelter, playground, basketball, picnic area and natural areas. It is located west of the BNSF Railway Company right of way and north of Brooklyn Boulevard. The recreational portion of the park, about one acre of the total 29-acre park, is about 800 feet west of the CSAH 81 right of way and is surrounded by open space and wetlands.

Impacts from the Proposed Action

The CSAH 81 project proposes grading on parkland adjacent to the BNSF Railway Company right of way to lower the elevation to match that of the surrounding area to accommodate anticipated overflow from the culvert proposed to replace the ditch along CSAH 81. Impacts to the park will be temporary and the area will be restored to an equal or improved condition after construction.

Impacts from Other Actions

According to Recreation and Parks Department staff, a building was recently removed and replaced with an open-sided picnic shelter. There have been no other changes to the park and none are anticipated. The recreational portion of the park is surrounded by natural areas, including wetlands. None of the future actions anticipated that were described previously will impact Greenhaven Park.

Potential for Cumulative Impacts

Since no other projects will affect this park, no cumulative impacts to the park are anticipated.

Conclusion

Based on information reviewed to date, the proposed project has no potential for cumulative impacts to the resources directly or indirectly affected by the project.

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.

Response: No potential impacts are anticipated other than those discussed above.

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.

Response: The following outlines the impacts and issues that will require further action. Where applicable, mitigation measures have been identified.

Threatened and Endangered Species

The Mn/DOT Office of Environmental Services (OES) was contacted to review the project area for federally threatened and endangered (T & E) species. In a letter dated June 6, 2006, Mn/DOT OES concluded that the project has little to no potential to have any measurable influence on federally-listed threatened and endangered species, candidate species, or listed critical habitat. However, Mn/DOT added that since the proposed action is not scheduled to begin for several years, the project will need to be re-evaluated closer to the time of construction (2009).

Wetland Impacts

The proposed project has been designed to avoid or minimize impacts to existing wetlands to the greatest extent possible. Wetland impact minimization for the project will be considered further and applied more effectively during the detail design phase for the project. The estimated total permanent wetland impact for this project is 1.0 acres.

Application for permits for wetland impacts must be made to the U.S. Army Corps of Engineers, the DNR, the City of Maple Grove, Shingle Creek WMC and Elm Creek WMC. Mitigation for wetland impacts is anticipated to be provided through a combination of on-site wetland restoration at Wetland W-1, other offsite mitigation efforts, and purchase of credits from the BWSR wetland mitigation bank, as appropriate.

Water Quality/Increased Impervious Surface Area/ Floodplain

An increase in impervious surface area throughout the corridor will result in an increase in discharge rates and pollutant loading. However, discharged stormwater will be conveyed to existing or additional water quality ponds that will substantially reduce pollutant loading and provide rate control in order to meet NPDES requirements. The project will be reviewed for consistency with the Shingle and Elm Creek WMCs, NURP, MPCA, and Mn/DOT requirements.

A number of water resource issues will require further coordination as design of the project proceeds. Examples include: need to determine if proposed changes to the box culvert will require a CLOMAR (Conditional Letter of Map Revision); need to address concerns of the Metropolitan Airports Commission, areas cities, and County; need to ensure balance of conveyance capacity issues among cities; need for a hydraulic study in Maple Grove; and flooding concerns in Osseo resulting from lack of storm sewer capacity.

Water Use

No wells have been identified; however, the County will finalize well identification as part of final design. If additional wells are discovered during final design or during construction, measures consistent with the Department of Health and local well requirements will be adhered to. No new wells will be drilled as part of the proposed project.

Noise

State daytime and/or nighttime standards are currently exceeded at many of the receptors where access control right of way remains in place. Noise levels for 2030 No Build conditions are projected to be higher as a result of increased traffic. In most cases, the noise level between Build and No Build conditions is imperceptible (an increase of less than 3 dBA). Noise walls were not found to be cost-effective for traffic noise levels resulting from the CSAH 81 reconstruction project.

Parks

The proposed project will impact approximately 0.08 acres of Becker Park in Crystal and one acre of Greenhaven Park in Brooklyn Park.

Hennepin County and the City of Crystal have reviewed the impacts to Becker Park and have agreed that impacts have been minimized to the extent possible (see correspondence in Appendix B).

Hennepin County and the City of Brooklyn Park have reviewed the impacts to Greenhaven Park and have agreed that impacts have been minimized to the extent possible (see correspondence in Appendix B). Temporary impacts to Greenhaven Park will be appropriately mitigated with the resource being restored to its original condition or better.

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 _____ **Date** _____

Title _____

Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at Minnesota Planning. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-291-2480, or **www.mnplan.state.mn.us**

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