

Appendix B.5:
Traffic Operations and Safety Evaluation Technical Memorandum

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Traffic Operations & Safety Evaluation
Technical Memorandum

Zavoral Property Mine and Reclamation Project

AECOM

August 12, 2011

Revised October 24, 2011

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1.0 Executive Summary

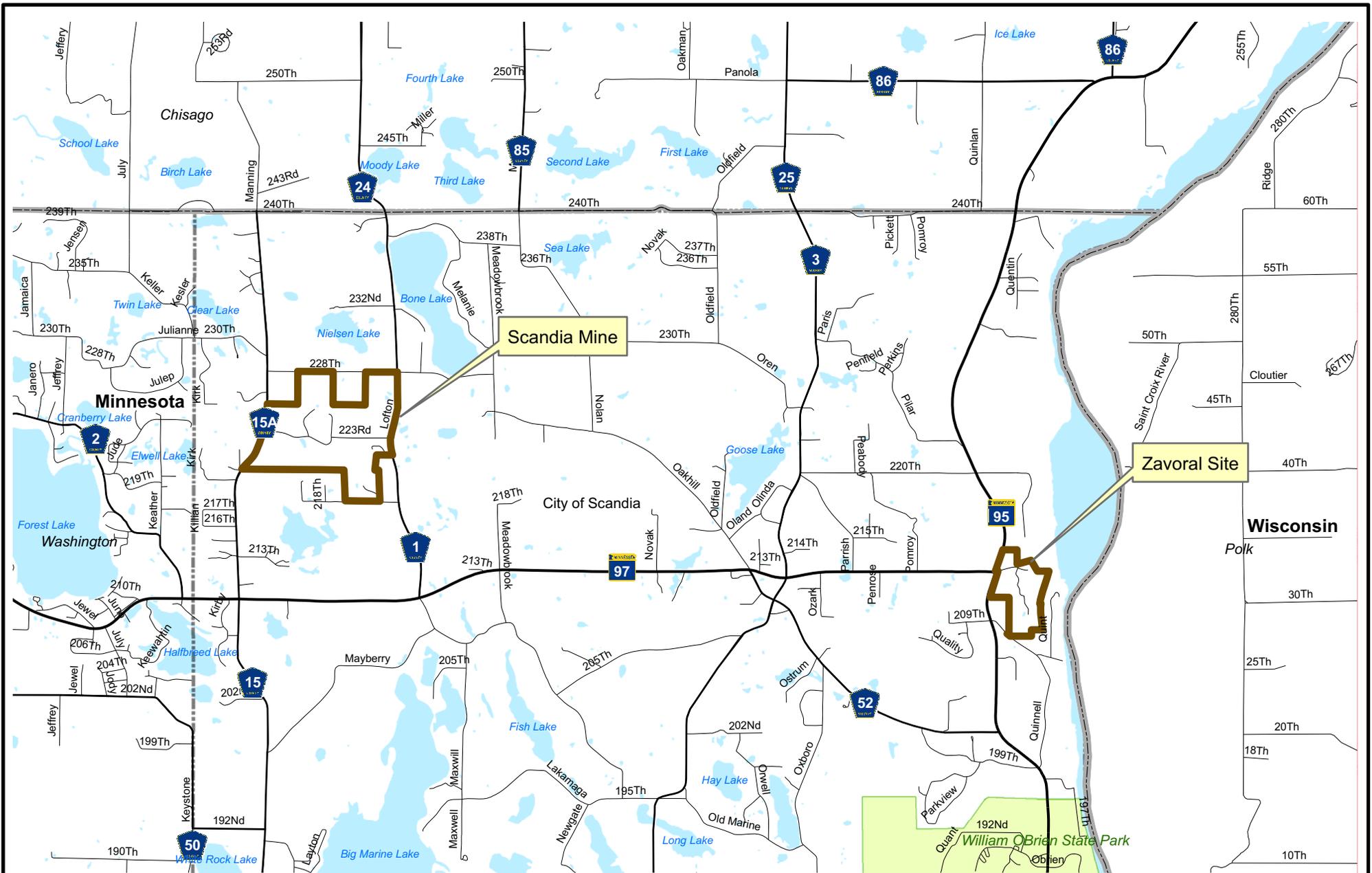
The Tiller Corporation, Inc. (Tiller) proposes to operate a sand and gravel mine on the site of a dormant, unreclaimed gravel mine in the City of Scandia, Washington County, Minnesota. The 114-acre site (Zavoral Site or Site) is located along St. Croix Trail North (State Trunk Highway [TH] 95), a State Scenic Byway near its intersection with TH 97 (Figure 1). Tiller proposes to mine and reclaim 64 acres of the 114-acre Site, predominately on portions of the Site that were previously disturbed by mining. An 8-acre area that has not been previously mined is included in the proposed mining area. Tiller is also proposing to restore approximately 4 acres of the previously mined area located within the St. Croix National Scenic Riverway and USA Scenic Easement Area.

This technical memorandum presents the evaluations completed for Task 21 – Traffic. It identifies potential environmental impacts related to the Project alternatives and identifies measures that could avoid, minimize, or mitigate for these potential impacts. This work was conducted as part of the Environmental Impact Statement (EIS) process to be completed under Minn. R. 4410.

The traffic evaluation task includes analysis of existing and alternative traffic operations impacts to the key roadway network serving the existing Scandia Mine (Mine) and the Zavoral Site. The study area is bounded by Manning Trail, 228th Street, State Scenic Byway Trunk Highway (TH) 95, and TH 97. The roadway links evaluated in the study area included: TH 97, TH 95, Manning Trail, Lofton Avenue, and Olinda Trail.

The Project scope incorporates the proposed Zavoral Site operation and includes the following EIS alternatives:

- Alternative 1 – Tiller’s Preferred Alternative. Mining and reclamation would occur over a 5 to 10-year period.
- Alternative 2 – No-Build Alternative. The Site would remain as vacant open space rather than be mined and reclaimed as part of the Project. The land use would not be altered. The gravel resource would not be used.
- Alternative 3 – Reduced Timeframe Alternative . Mining and reclamation would occur over an up to 5-year period.



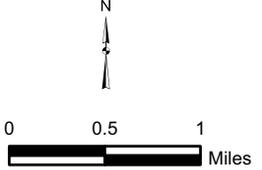
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PROJECT AREA ROADWAY NETWORK ZAVORAL MINING AND RECLAMATION EIS SCANDIA, MINNESOTA

Drawn: KLM 10/20/2011
 Approved: LK 10/20/2011
 Scale: 1" = 1 mile
 PROJECT NUMBER 09180095
 FIGURE NUMBER 1



The following are key findings from the traffic analysis and operations task efforts:

- Alternative 2 (No Build) is expected to maintain the current level of truck traffic. Class C add-rock would continue to be hauled from the Franconia, Minnesota and Osceola, Wisconsin, areas. The current range of loads per working day is 210 to 558 trips with a maximum of 560 trips a day. The hauling would continue to occur from 6 to 20 weeks a year for an estimated 20 to more than 30 years. The Class C add-rock haul routes currently used are:
 - Franconia Township, Minnesota – from the intersection of Sugar Bush Trail N. and State Scenic Byway TH 95 in Franconia Township, to south on TH 95, to west on TH 97, to north on CR 1 (Lofton Avenue), to the Lofton Avenue entrance of the Scandia Mine, with return trips reversing this route.
 - Osceola, Wisconsin, area – trucks typically cross the river at TH 243 from Polk County, which is the closest river crossing to south on State Scenic Byway TH 95, to west on TH 97, to north on CR 1 (Lofton Avenue), to the Lofton Avenue entrance of the Scandia Mine, with return trips reversing this route.
- Tiller has agreed not to haul Class C add-rock to the Scandia Mine from Franconia or Osceola during the period that the Zavoral Site is active. As a result, in Minnesota, TH 243 (including the bridge to Wisconsin), and State Scenic Byway TH 95 north of TH 97 would no longer carry this traffic, a distance of approximately 7 miles until material from the Zavoral Site is exhausted.
- Alternatives 1 and 3 have the same range of loads per working day (334 to 400 trips) and maximum of 600 trips a day, including both Class C add-rock and reclamation topsoil hauling. The difference from Alternative 3 is the length and duration of mining activity. Alternative 1 spreads the mining out over 5 to 10 years, but only operates hauls for a projected 6 to 12 weeks a year.
- Alternative 3 condenses the mining to a 3.3- to 5- year period and hauls are projected to occur for 12 to 18 weeks a year.
- The area existing roadway network is sufficient to handle the daily traffic volumes in the area. TH 97 and State Scenic Byway TH 95 are state highways designed to accommodate regional traffic. The peak hour truck volumes are also within the capacity of the roadways.
- Mn/DOT reviewed the proposed driveway location for the Zavoral Site and determined that the intersection sight distance met their requirements. A northbound right turn lane would be required to allow vehicles to reduce speed and move out of mainline traffic to turn. An acceleration lane on TH 97 was not recommended by Mn/DOT, as the trucks are not pulling into high speed traffic and the acceleration lane would be a high cost and high property impact.
- Scandia Elementary School is located on the south side of TH 97 near Oakhill Road. School representatives were contacted by the City and they provided information on school bus operations, parent drop-off/pickup, and bike/walk patterns. The traffic operation, capacity,

and safety were evaluated by AECOM for the school driveways (at TH 97 and Oakhill Road). No problems were identified with capacity or safety based on traffic volumes and turning movements out of the driveway. TH 97 includes a right-turn lane into the school and a bypass lane westbound around turning vehicles.

- The City of Scandia Trail Plan presents near- and long-term improvement plans for trails in the area and connections to regional trails. AECOM has identified some trail considerations related to the Project in Section 7-Potential Mitigation.
- The area along the St. Croix River is scenic and provides a range of recreational and scenic driving opportunities. The trunk highways have sufficient reserve capacity to handle the change in traffic volume for seasonal traffic. Periods of congestion may be experienced during peak weekend travel times or on a holiday weekend, with or without the proposed Project. Removing the current hauling traffic from the river crossing at TH 243 and the portion of State Scenic Byway TH 95 north of the Zavoral Site should be beneficial to vehicles using these roadways to get to the state park or enjoy other recreational opportunities in the area.

The following is a list of potential mitigation measures.

- Construct the new driveway access directly across from TH 97 as required item by Mn/DOT for safe access. In a review conducted by Mn/DOT in 2009, the agency required that the Zavoral Site access onto State Scenic Byway TH 95 be moved south to line up with TH 97 and that a northbound right-turn lane be constructed (Mn/DOT letter to City of Scandia, January 22, 2009). The right-turn lane would be consistent with the design of the existing left-turn lane. This would also match the design on the southbound approach. The sight distance requirements were met based on Mn/DOT reviews of the existing TH 97 and State Scenic Byway TH 95 intersection, and the 2007 and 2009 rehabilitation projects (June 29, 2011, letter to Anne Hurlburt, City of Scandia). In a recent review of the development this year, Mn/DOT reaffirmed that the improvements outlined in the 2009 letter would be required.
- To ensure that additional truck traffic would not result from hauling from the Zavoral Site at peak demand concurrently with other sites, the number of trucks hauling Class C add-rock to the Scandia Mine should be recorded and reported by Tiller and limited to the projected maximum level of 280 trucks (560 trips) per working day or below.
- Truck warning signs that are Minnesota Manual on Uniform Traffic Control Devices (MMUTCD) compliant are recommended on State Scenic Byway TH 95 to advise drivers of trucks crossing TH 97 in and out of the Zavoral Site. The installation of warning flashers is another option but should be discussed with Mn/DOT to evaluate the safety impacts.
- To accommodate the northbound State Scenic Byway TH 95 right-turn lane, the trail running along State Scenic Byway TH 95 would be affected and would need to be relocated or removed. The City may require Tiller to fund trail improvements and reconnection as mitigation to implement the City's trail plan.

2.0 Project Background

AECOM is completing tasks to analyze the potential for environmental impacts, and identify measures to mitigate for potential impacts for the identified alternatives related to the Zavoral Property Mining and Reclamation Project. This is part of the EIS process to be completed under Minn. R. 4410. This technical memorandum presents the analysis and evaluation completed for Task 21, Traffic.

The alternatives to be addressed in the EIS are summarized below. This Traffic Operations and Safety Evaluation Technical Memorandum addresses the three alternatives.

2.1 Alternative 1—5- to 10-year Operation

2.1.1 Zavoral Site Activities

The Project area includes 114 acres. Mining activity has previously disturbed approximately 56 acres. The proposed Project would involve mining and restoration of 64 acres located predominately on the previously disturbed portions of the site. The active mining area would include mining to an average depth of about 15 feet, and expanding the limits of mining by about nine acres. In addition, Tiller is proposing to restore approximately four acres of the previously-mined area located within the St. Croix Riverway and scenic easement area.

Tiller is proposing the following activities at the Zavoral Site:

- Clearing and grubbing the Site of vegetation, as necessary.
- Removal of overburden from areas to be mined, and stockpiling the material on the site for potential future use in reclamation.
- Excavation of raw aggregate materials.
- Transporting mined aggregate materials (pit-run, add-rock); the majority of which would likely be delivered to the Scandia Mine site near Manning Trail and 225th Street for use in material produced at that site.
- The existing well at the Zavoral Site would be utilized for dust suppression.
- Fuel storage and storage of related materials such as oil, anti-freeze, grease, and hydraulic fluid.
- Reclamation activities, including grading, placing topsoil and seeding.

Mining operations would be conducted on a seasonal basis, typically from April through mid-November. The Zavoral Site is proposed to be worked in phases, with the duration of the Project expected to be up to 10 years under this alternative.

In general, the reclamation of the Zavoral Site is proposed to progress in increments. Site reclamation would proceed as areas of mining are completed. The reclamation plan proposes that perimeter areas be sloped and the interior areas backfilled and graded to reclamation grades. Topsoil or other organic material would be applied to these areas and vegetation established to reduce

erosion. The Project analyzed in the Environmental Assessment Worksheet (EAW) prepared earlier for the Project proposed that the previously-mined area within the St. Croix Riverway be restored during the final phase of mining operations at the Site. Tiller's letter to the City (April 7, 2009) proposed revising the reclamation and phasing plan to include reclamation of the area within the St. Croix Riverway and Scenic Easement areas during the first years of operation. This technical memorandum therefore evaluates the Project that includes reclamation of the St. Croix Riverway and scenic easement areas during the first five years of mining operations on the Zavoral Site.

2.1.2 Scandia Mine Activities

Raw aggregate material mined at the Zavoral Site would be transported to the Scandia Mine for processing. Processing of aggregate materials is currently occurring at the Scandia Mine for materials mined at that site and materials that are transported to the Mine from Franconia, Minnesota and the Osceola, Wisconsin, area. The following activities would occur at the Scandia Mine.

- The aggregate material brought in from the Zavoral Site (add-rock) would be blended with aggregate material mined at the Scandia Mine or used in the production of hot mix asphalt.
- A portion of the aggregate material transported to the Scandia Mine may be processed as needed through a series of crushers, screens, conveyors, wash decks, and classifiers to produce commercial grade construction aggregates.
- The finished construction aggregate products would be stockpiled at the Scandia Mine until they are hauled off-site by trucks to various construction sites.

The Scandia Mine operates under a Conditional Use Permit (CUP) and an Annual Operating Permit (AOP) approved by the City of Scandia. The processing activities listed above are included in the activities authorized by these permits. No changes in operations at the Scandia site are expected.

2.2 Alternative 2--No-Build Alternative

The No-Build Alternative will be described in the EIS. The No-Build Alternative addresses the potential impacts, outcomes, constraints, benefits and disadvantages, and economics if the existing land uses on the Zavoral Site and Scandia Mine were to continue. The No-Build Alternative does not include the Reclamation Activities on previously mined areas that are included in Alternatives 1 and 3.

2.3 Alternative 3—Reduced Timeframe -3.3 to 5-year Operation

This Alternative focuses on the impacts of the proposed activities if the overall time frame for mining at the Zavoral Site is up to five years rather than up to ten years, as proposed in Tiller's Preferred Alternative.

3.0 Study Goals

The traffic operations and safety evaluation reviews existing conditions in the study area and determines the impacts to the roadway system of the three EIS alternatives. The tasks goals are to analyze the following conditions and prepare recommendations/potential mitigation that may be needed for each alternative. The following tasks and goals are included in the technical evaluation.

- Data Collection – obtained from Mn/DOT, city, county, and Tiller to provide input into the alternative analysis.
- Traffic Analysis and Evaluation – used Mn/DOT data and the Tiller mining and reclamation plans for the alternatives evaluate the impacts of trucking operations to the study roadway system.
- Safety Evaluation – used Mn/DOT and Department of Public Safety (DPS) crash data evaluate the crash reports and make recommendations as needed. This task will include a general roadway operations evaluation.
- Mitigation Measures - The traffic and safety analysis identifies recommendations to be included in the EIS.

The Project location map with the main roadway network and existing Scandia Mine and proposed Zavoral Site is shown in Figure 1.

4.0 Methodology

4.1 Data Collection

The traffic operations and evaluation included meetings and coordination with the City of Scandia and Tiller to obtain and analyze data and prepare a technical presentation to the Project Advisory Committee (PAC) on July 20, 2010. This presentation included an initial evaluation of the traffic impacts and provided an opportunity for PAC and citizen questions and input. There have been subsequent meetings and updates to the alternative plans by Tiller. These updates are addressed in this revised technical memorandum. The following data collection has been completed to prepare this technical memorandum:

- Conducted site reviews of the roadway network in the study area.
- Obtained updated mining and reclamation plan documentation from Tiller for Alternatives 1 and 3. This did not impact the planned daily traffic or routing and included.
 - Planned truck volumes from Tiller for Alternatives 1 and 3.
 - Planned employment or service data for the site (impact of additional vehicles).
- Obtained the most current three years of crash data from Mn/DOT (2008-2010). Standard practice is to review the most recent three years of data. The initial evaluation included data from 2006 through 2008 and updating the data through 2010 release in June 2011 by Mn/DOT allowed AECOM to review the entire timeframe to identify any changed conditions.
- Obtained traffic counts (link volumes) from the following sources:
 - AADT data from Mn/DOT.
 - Peak hour volumes (from the Automated Traffic Recorder on TH 97).
 - Existing truck counts from Mn/DOT, Washington County, and Tiller.

- Attended a meeting with Mn/DOT Metro District with City of Scandia, and Tiller representatives on May 26, 2011 to discuss the status of the driveway permit. Mn/DOT listed the following requirements in their letter (included in Appendix B):
 - A northbound TH 95 right turn lane into the Zavoral Site would be required.
 - A westbound acceleration lane would not be feasible to construct exiting the driveway.
 - The driveway must be aligned with TH 97. This would have a minimal change in sight distance.
 - The trail on the southeast side of TH 95 is owned by Mn/DOT (under review by Mn/DOT Metro District staff) and would need to be relocated for the turn lane.
- Mn/DOT addressed area residents' questions regarding the need for an acceleration lane on TH 97 as follows:
 - “This situation is significantly different than the site at Hwy 95 and 243. At that site, slow moving vehicles are pulling out into high speed southbound traffic and the acceleration lane that was provided allows for trucks to increase speed and then merge into southbound traffic. At the Hwy 95/97 intersection, the trucks from the mining site are not pulling into high speed traffic. Once they cross the intersection, all traffic on Hwy 97 is low speed and accelerating as they continue west up to the 55 MPH speed limit. The grade is fairly gradual in this area and trucks are able to accelerate as they go up this relatively gradual grade on Hwy 97. Mn/DOT does not support requiring the developer to install an acceleration lane due to limited benefits, high costs, and impacts to abutting properties along Hwy 97.”
- Collected roadway data: Lane configurations, speed limits, traffic control devices, bicycle and pedestrian facilities, and other features. The City of Scandia has recently published their city-wide trail plan. The plan is included in Appendix C.

4.2 Alternative Evaluation for Traffic Operations and Safety

Alternatives 1 and 3 include the same study area, haul facilities, and roadway network. The main difference is the duration of the “haul events” (total years and number of weeks for the add rock haul). The impacts of the action alternatives on traffic operations and safety were evaluated on the following roadways:

- TH 97 from Manning Trail to TH 95
- State Scenic Byway TH 95 from 220th Street to 209th Street
- Manning Trail & Lofton Avenue from TH 97 to the Scandia Mine entrance.
- Intersections within the roadway limits

4.3 Reference Documents

The following standards and reference documents were used for the Traffic Operations and Safety Evaluation:

- Mn/DOT Design Manual
- Minnesota Manual on Uniform Traffic Control Devices
- Mn/DOT AADT Maps
- Mn/DOT Crash Data GIS mapping for Scandia
- City of Scandia Trail Plan
- Tiller Mining and Reclamation Plans for Zavoral Site

5.0 Findings

5.1 Data Collection

The following are key data collection updates:

- Crash data was updated for the 2008 through 2010 years, which are the most recent data available from Mn/DOT.
- Tiller provided the data on the existing and planned truck haul volumes for all alternatives. AECOM and the City of Scandia reviewed this data and verified the information presented in this report coincides with the haul volume from Tiller's mining and reclamation plan.

5.2 Safety Evaluation

The following are key findings from the safety evaluation task efforts:

- The crash data for the 2008 – 2010 years was reviewed, mapped, and evaluated. There were no crashes recorded during this time that involved semi-trailers or haul trucks.
- The TH 97 intersection with CR 1 (Lofton Avenue) had the highest number of intersection crashes in the study area, but is not considered a hazardous intersection. It would be advised to monitor this intersection for potential increases in crashes during mining operations. The right angle crashes are most likely the result of drivers on Lofton Avenue misjudging the speed of vehicles on TH 97 before turning.
- In 2006, there was a fatal crash on TH 95 just north of the intersection of TH 97 and TH 95. A pedestrian was hit by a large truck. The crash was investigated by the State Patrol and it was determined that the pedestrian made a judgment error and did not get out of the path of the truck. The truck driver was not cited in the crash.

6.0 Impact Analysis

6.1 Traffic and Operations Analysis

The traffic evaluation task includes analysis of existing and alternative traffic operations impacts to the key roadway network serving the existing Scandia Mine and Zavoral Site. The study area is bounded by Manning Trail, 228th Street, State Scenic Byway TH 95, and TH 97. The roadway links to be evaluated in the study area include: TH 97, State Scenic Byway TH 95, Manning Trail, Lofton Avenue, and Olinda Trail.

The alternatives were evaluated based on a range of haul volumes that could be expected for the operation. The alternatives include a range in the minimum and maximum length of hauling operations.

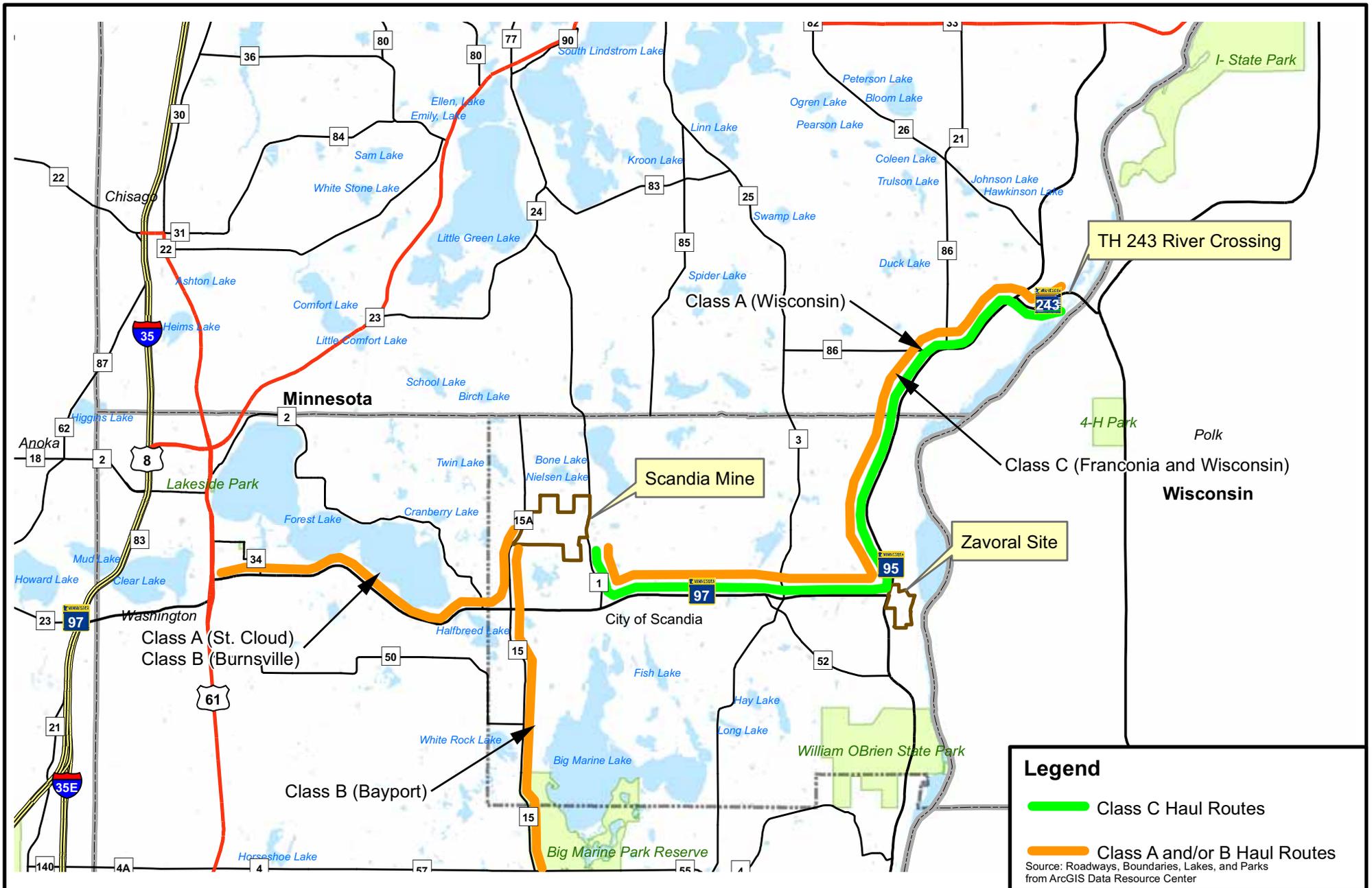
The Project area with the main roadway network and existing Scandia Mine site and proposed Zavoral site is shown in Figure 1.

Existing Conditions

Alternative 2 (No Build) is expected to maintain the current level of truck traffic. Class C add-rock would continue to be hauled from the Franconia, Minnesota and Osceola, Wisconsin, areas (Figure 2). The current range of loads per working day is 210 to 558 trips with a maximum of 560 trips a day. The hauling would continue to occur from 6 to 20 weeks a year for an estimated 20 to more than 30 years. The Class C add-rock haul routes currently used are:

- Franconia Township, Minnesota – from the intersection of Sugar Bush Trail N. and State Scenic Byway TH 95 in Franconia Township, to south on TH 95, to west on TH 97, to north on CR 1 (Lofton Avenue), to the Lofton Avenue entrance of the Scandia Mine, with return trips reversing this route.
- Osceola, Wisconsin, area – trucks typically cross the river at TH 243 from Polk County, which is the closest river crossing to south on State Scenic Byway TH 95, to west on TH 97, to north on CR 1 (Lofton Avenue), to the Lofton Avenue entrance of the Scandia Mine, with return trips reversing this route.

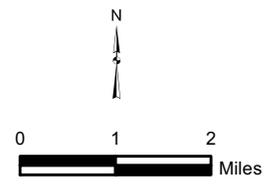
Tiller has agreed not to haul Class C add-rock to the Scandia Mine from Franconia or Osceola during the period that the Zavoral Site is active. As a result, in Minnesota, TH 243 (including the bridge to Wisconsin), and State Scenic Byway TH 95 north of TH 97 would no longer carry this traffic, a distance of approximately 7 miles until material from the Zavoral Site is exhausted. This is because the Zavoral Site is closer to the Scandia Mine than the Franconia or Osceola sources and, as a result, is less costly to haul.



Legend

- Class C Haul Routes
- Class A and/or B Haul Routes

Source: Roadways, Boundaries, Lakes, and Parks from ArcGIS Data Resource Center



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**CURRENT ADD-ROCK HAULING ROUTES
 TO SCANDIA MINE
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA**

Drawn:	KLM	10/20/2011
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Scale:	1" = 2 miles	
PROJECT NUMBER	09180095	
FIGURE NUMBER	2	

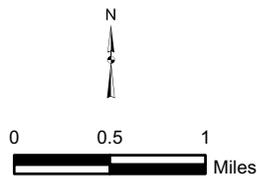
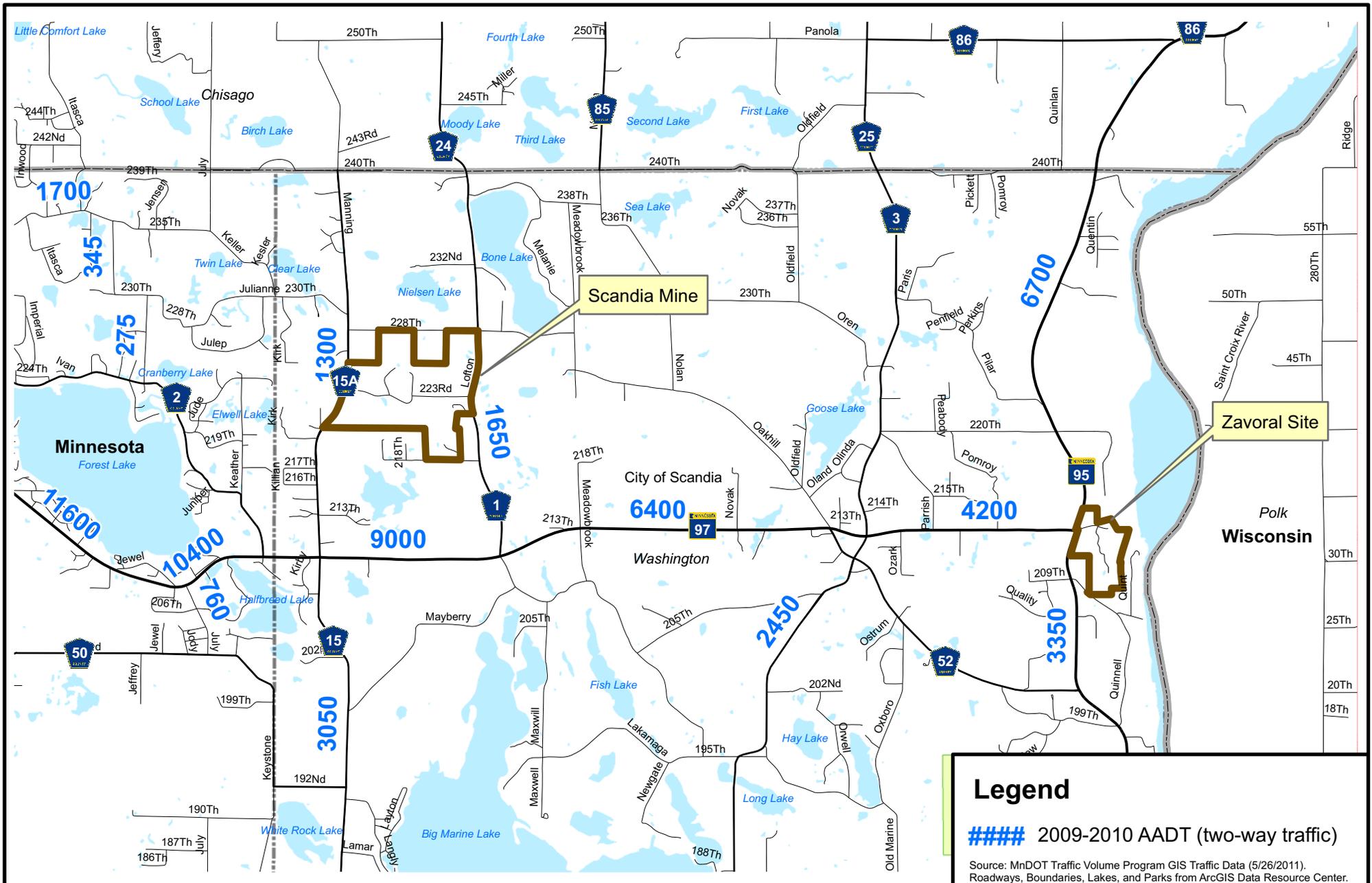
The current average daily traffic volumes (AADT) are shown in Figure 3. AADT volumes have remained fairly constant in the past several years on the main area roadways. TH 95 and TH 97 are two lane state highways that are designed for higher speed traffic (55 MPH speed limit) and regional travel. They include bypass lanes in some areas and turn lanes at some intersections (Appendix A) includes Geographic Information System (GIS) data for the existing intersections in the study area. The intersections at TH 97 at Manning Trail and Olinda Trail are 4-way stop intersections. TH 97 has stop control at TH 95. None of the intersections in the study area carry sufficient traffic volume to warrant a traffic signal.

The proposed haul route is shown in Figure 4. Add-rock would be hauled directly from the Zavoral Site to the Scandia Mine along this route. .

Under the two build alternatives, the truck traffic currently traveling to and from the Scandia Mine from Franconia Township, Minnesota and the Osceola, Wisconsin, area would be replaced by the haul route from the Zavoral Site to the Scandia Mine. This would reduce truck volumes on State Scenic Byway TH 95 (north of TH97), TH 243, a distance of approximately 7 miles until the resources from the Zavoral Site are exhausted. Trucks with other regional and local destinations would continue to operate on these trunk highways, however, the overall daily volumes would be reduced significantly during the mining season (typically from 210 to 558 round truck trips per working day).

Mn/DOT completed roadway improvements to TH 97 in 2007 and State Scenic Byway TH 95 in 2009. These were primarily pavement rehabilitation, drainage, and associated improvements for safety and maintenance. Washington County does not have improvements planned in their 5 year Capital Improvement Plan.

The City of Scandia trail plan presents near and long-term improvement plans for trails in the area and connections to regional trails, The trails are planned for both pedestrian and bicycle users. Safety for the pedestrian and bicycle users is an important component in the trail planning process.



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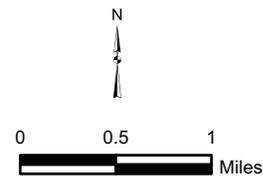
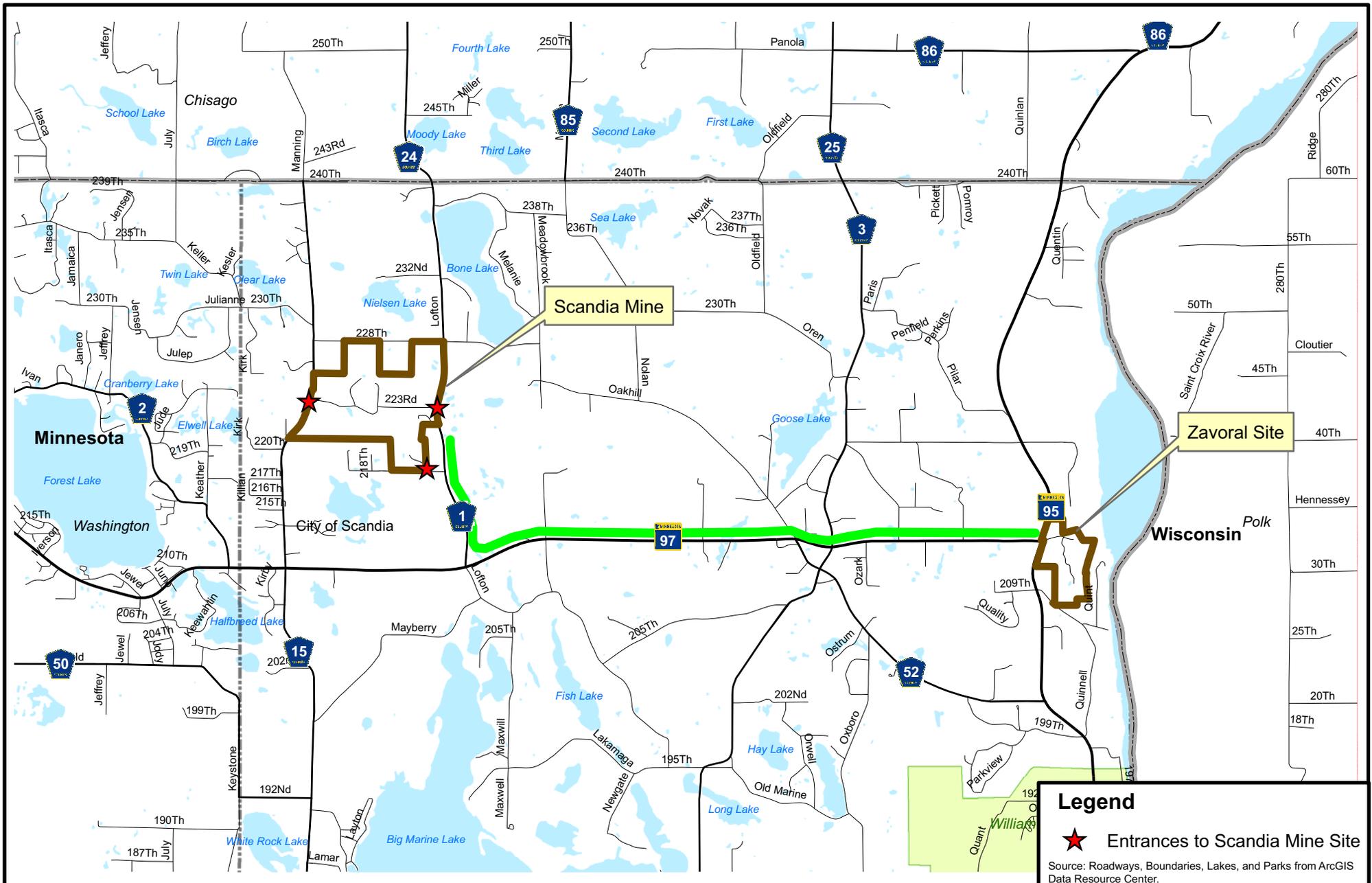
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Approved: LK 06/01/2011

Scale: 1" = 1 mile

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FIGURE NUMBER 3



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**PROPOSED CLASS C ADD-ROCK HAUL ROUTE
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA**

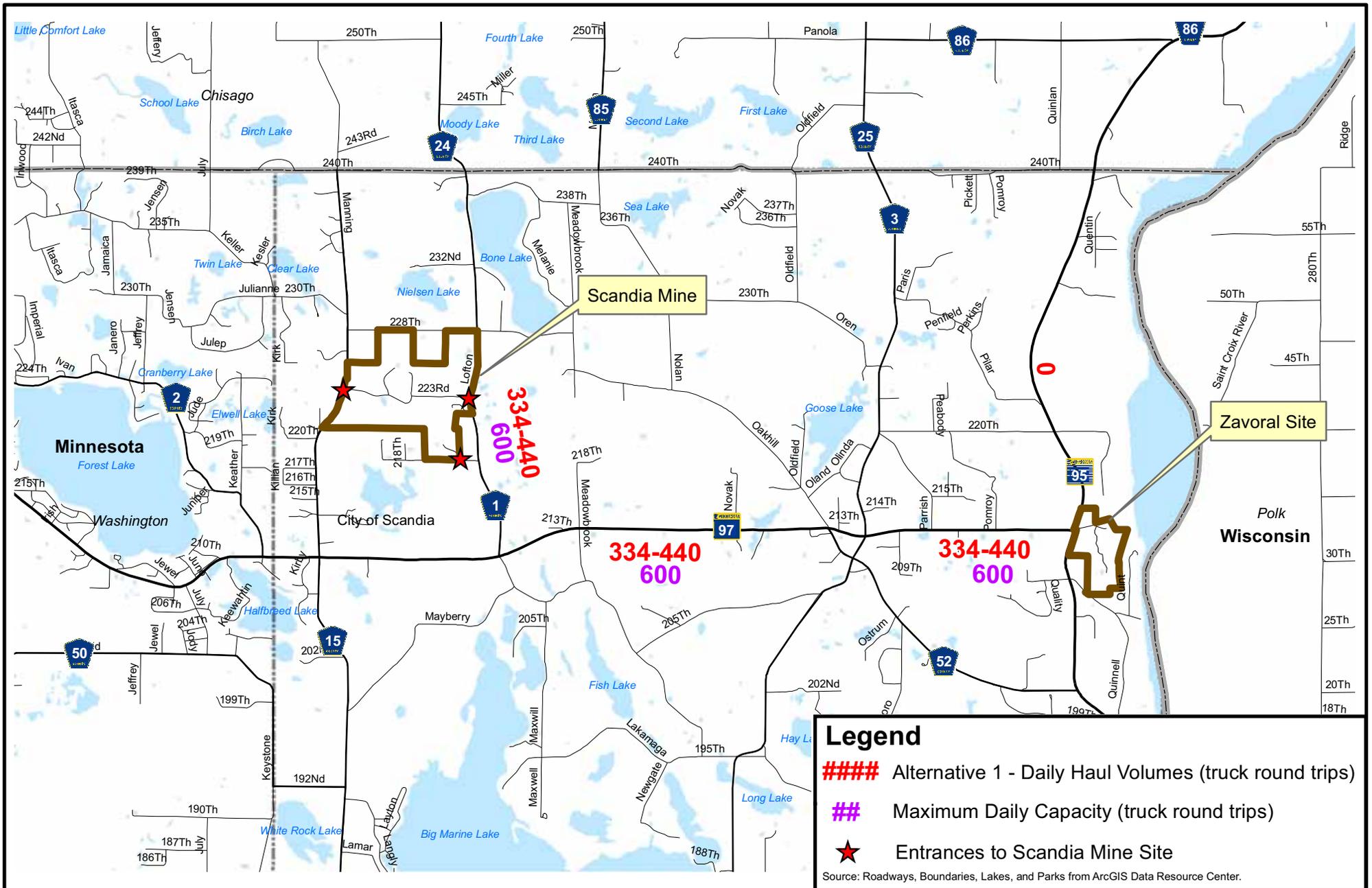
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 Approved: LK 10/20/2011
 Scale: 1" = 1 mile
 PROJECT NUMBER 09180095
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Alternative 1 – 5- to 10-year Operation

- Aggregate from the Zavoral Site would be transported to the Scandia Mine as shown in Figure 4. Tiller plans to use material from the Zavoral Site to replace material transported to Scandia Mine from Franconia, Minnesota and the Osceola, Wisconsin, area.
- The Site would be operating up to 10 years. Tiller provided the projected daily and peak hour truck volumes under this mining plan. These volumes were reviewed and determined to be representative of the Project based on the maximum capacity the Scandia Mine could handle.
- The projected traffic volumes for Alternative 1 are shown in Figure 5.

The projected traffic volumes for Alternative 1 were developed based on the proposed mining plan for Tiller Corporation. The projected daily truck volumes were calculated using the following data:

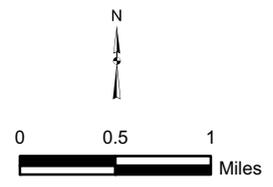
- Number of weeks scheduled for mining operations each year (6 to 12).
- Total projected aggregate mined each year for transport from the Zavoral Site to the Scandia Mine Site (120,000 to 240,000 tons).
- The number of loads per year is calculated based on the haul weight and typical weight transferred in one truckload (20 to 24 tons per truckload). The number of loads per year is then converted to “projected loads per day” based on the typical range of truckloads that can be transported during a working day. This calculates to 167 to 200 truckloads on a typical working day (334 to 400 round truck trips).
- Tiller has noted that production can vary and be lower than the 167 truckloads.
- The maximum number of trucks in one working day has been defined at 280 trucks (560 round trips). It takes approximately 2.15 minutes to load a truck. This includes time to periodically reposition excavating equipment and allow truck to move to the excavator to be loaded. As a result, no more than 28 trucks (60 minutes/2.15 minutes per truck) could be loaded and leave the Zavoral Site. This scenario is unlikely because trucks would need to run at full hourly capacity (28 loads per hour) for 10 consecutive hours to reach this level. However, it is analyzed in the memorandum because a major demand for gravel has the potential to reach this level.



Legend

- #### Alternative 1 - Daily Haul Volumes (truck round trips)
- ## Maximum Daily Capacity (truck round trips)
- ★ Entrances to Scandia Mine Site

Source: Roadways, Boundaries, Lakes, and Parks from ArcGIS Data Resource Center.



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**CLASS C ADD-ROCK HAUL TRUCK VOLUMES
 ALTERNATIVE 1 (5 TO 10 YEARS)
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA**

Drawn: KLM 10/20/2011
 Approved: LK 10/20/2011
 Scale: 1" = 1 mile
 PROJECT NUMBER 09180095
 FIGURE NUMBER 5

- Reclamation of the Zavoral Site would proceed in increments as areas of mining are completed. Topsoil or other organic material would be applied to these areas and vegetation established to reduce erosion. Reclamation at maximum levels would result in 40 round trips a day for topsoil. This level would only occur during Phase 1 reclamation but was used throughout the project life as a worst case peak. This reclamation hauling in combination with the add-rock hauling peak would result in a total “worst case” peak of 600 round trips per day. AECOM determined it appropriate to analyze a higher level of traffic volume to evaluate the potential impacts to the roadway system.

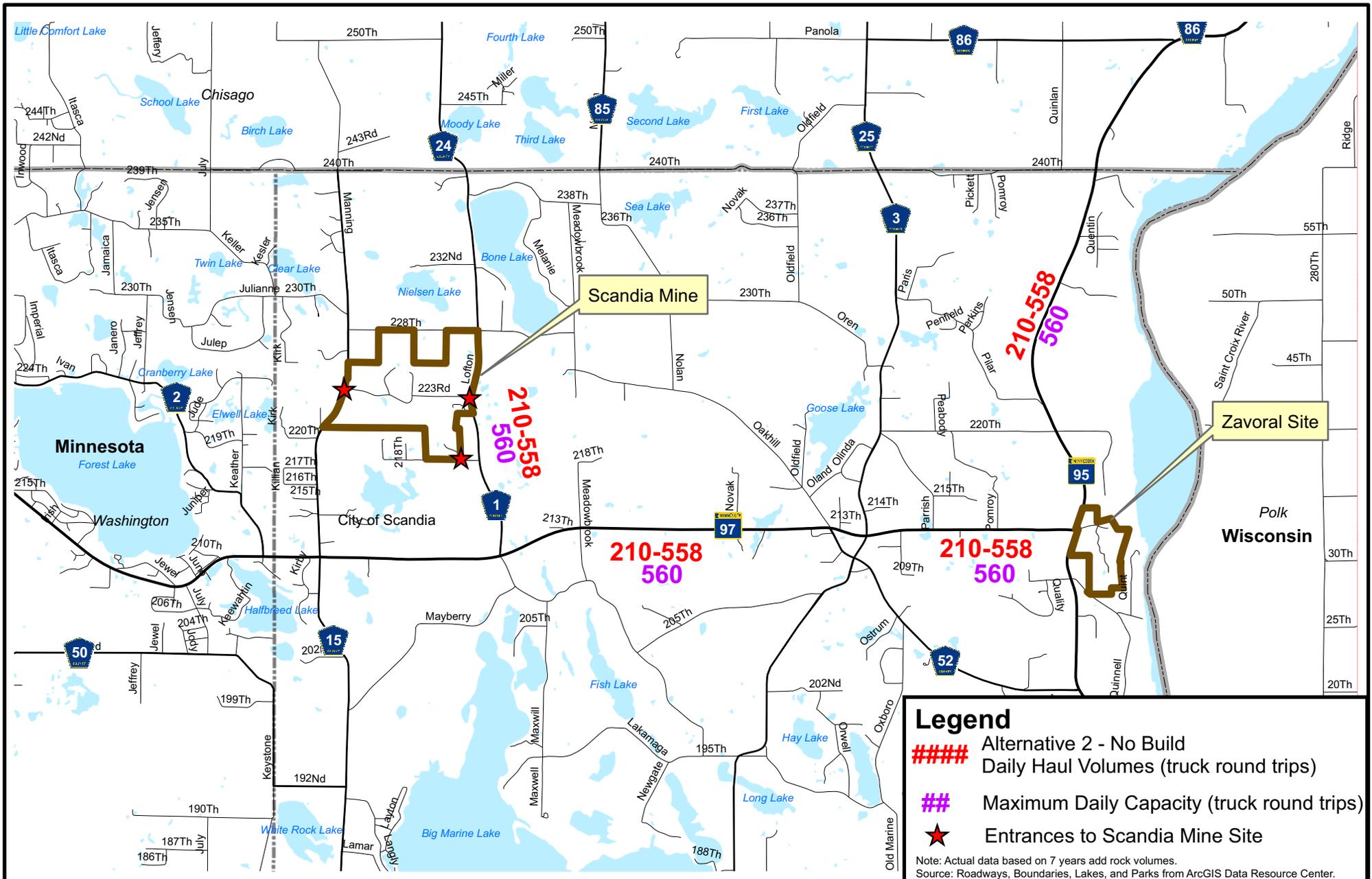
Alternative 2 – No Build Alternative (existing land uses)

- This is the No Build alternative and includes the current traffic levels in the area.
- The traffic volumes for Alternative 2 are shown in Figure 6.

The traffic volumes for Alternative 2 were developed based on Tiller’s plan to continue operations at the Scandia Mine Site under a No Build scenario. The range of projected loads is shown based on Tiller’s records over the past seven years of operation for the Scandia Mine.

Alternative 3 – Mining and Reclamation

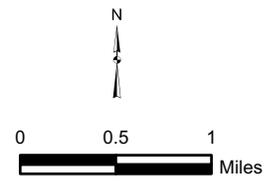
- Aggregate from the Zavoral Site would be transported to the Scandia Mine as shown in Figure 4. Tiller plans to use material from the Zavoral Site to replace material transported to Scandia Mine from Franconia, Minnesota and the Osceola, Wisconsin, area.
- The Site would be operating up to 10 years. Tiller provided the projected daily and peak hour truck volumes under this mining plan. These volumes were reviewed and determined to be representative of the Project based on the maximum capacity the Scandia Mine could handle.
- The projected traffic volumes for Alternative 3 are shown in Figure 7.
- Aggregate from the Zavoral Site would be transported to the Scandia Mine as shown in Figure 4.
- The Zavoral Site would be operating up to 5 years. Tiller provided the projected daily and peak hour truck volumes under this mining plan. These volumes were reviewed and determined to be representative of the Project based on the maximum capacity the Scandia Mine could handle.
- The projected traffic volumes for Alternative 3 are shown in Figure 7.



Legend

- #### Alternative 2 - No Build Daily Haul Volumes (truck round trips)
- ## Maximum Daily Capacity (truck round trips)
- ★ Entrances to Scandia Mine Site

Note: Actual data based on 7 years add rock volumes.
 Source: Roadways, Boundaries, Lakes, and Parks from ArcGIS Data Resource Center.

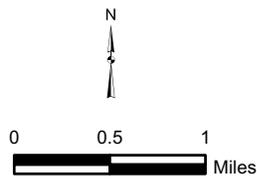
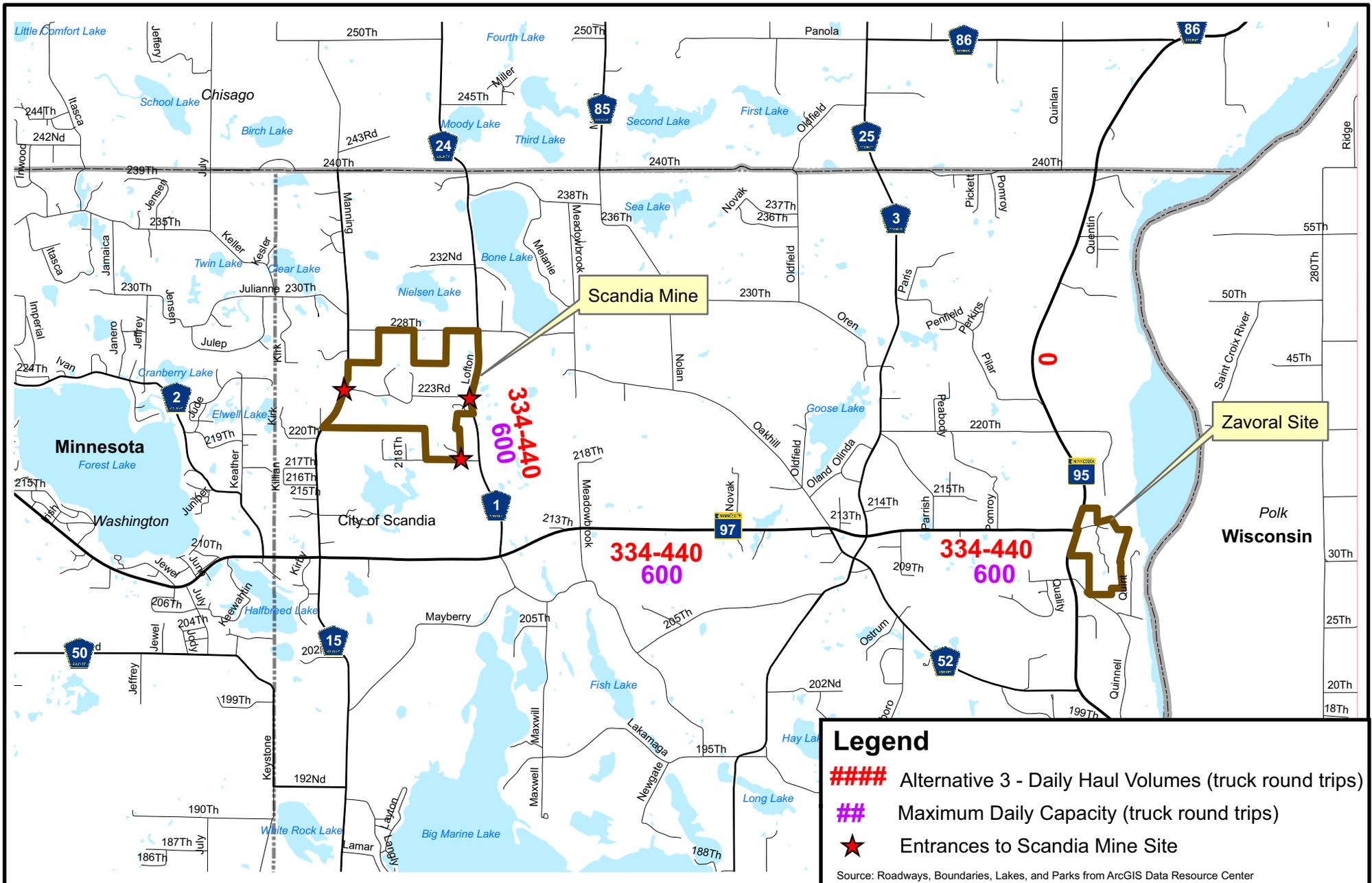


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**CLASS C ADD-ROCK HAUL TRUCK VOLUMES
 ALTERNATIVE 2 (NO BUILD)
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA**

Drawn: KLM 10/20/2011
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 FIGURE NUMBER 6



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**CLASS C ADD-ROCK HAUL TRUCK VOLUMES
 ALTERNATIVE 3 (5 YEARS OR LESS)
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA**

Drawn: KLM 10/20/2011
 Approved: LK 10/20/2011
 Scale: 1" = 1 mile
 PROJECT NUMBER 09180095
 FIGURE NUMBER 7

The based traffic volumes for Alternative 3 were developed based on proposed mining plan for Tiller. The projected daily truck volumes were calculated using the following data:

- Number of weeks scheduled for mining operations each year (12 to 18).
- Total projected aggregate mined each year for transport from the Zavoral Site to the Scandia Mine (240,000 to 360,000 tons).
- The number of loads per year is calculated based on the haul weight and typical weight transferred in one truckload (20 to 24 tons per truckload). The number of loads per year is then converted to “projected loads per day” based on the typical range of truckloads that can be transported during a working day. This calculates to 167 to 200 truckloads on a typical working day (334 to 400 round truck trips).
- Tiller has noted that production can vary and be lower than the 167 truckloads. Our team determined it appropriate to analyze a higher level of traffic volume to evaluate the potential impacts to the roadway system.
- The maximum number of trucks in one working day has been defined at 280 trucks (560 round trips). It takes approximately 2.15 minutes to load a truck. This includes time to periodically reposition excavating equipment and allow truck to move to the excavator to be loaded. As a result, no more than 28 trucks (60 minutes/2.15 minutes per truck) could be loaded and leave the Zavoral Site. This scenario is unlikely because trucks would need to run at full hourly capacity (28 loads per hour) for 10 consecutive hours to reach this level. However, it is analyzed in the memorandum because a major demand for gravel has the potential to reach this level. In order to ensure that additional truck traffic would not result from hauling from the Zavoral Site at peak demand and other sites, we recommend that the mitigation plan limit the number of trucks hauling add-rock to the Scandia Mine to this level or below and that documentation of this be required.
- Reclamation of the Zavoral Site would proceed in increments as areas of mining are completed. Topsoil or other organic material would be applied to these areas and vegetation established to reduce erosion. Reclamation at maximum levels would result in 40 round trips a day for topsoil. This level would only occur during Phase 1 reclamation but was used throughout the project life as a worst case peak . This reclamation hauling in combination with the add-rock hauling peak would result in a total “worst case” peak of 600 round trips per day
- The proposed haul traffic operations for the alternatives include a range in the mining activity and the duration. A summary of the alternatives and the associated activity data is shown in Table 1. Hauling traffic for the No-Build Alternative represents hauling levels from current add-rock sources to the Scandia Mine . Alternative 2 shown in Table 1 is based on a No Build scenario that is built off the existing mining operations at the Scandia Mine. Alternatives 1 and 3 present two options for operating the Zavoral Site with transport of add-rock to the Scandia Mine via TH 97.

The daily truck volume calculations were defined in the previous section and summarized in Figures 5, 6, and 7. The descriptions below highlight the process for data shown in Table 1.

- Mining activity: planned life of the Zavoral Site (under Alternatives 1 and 3)
- Tons per year mined: planned range of total aggregate weight that would be hauled each year. This is calculated for the number of years of mining activity and the typical haul weight per truck.
- Projected weeks operating per year: data provided by Tiller for their projected length of “haul season” each year. This is based on a five day week with a maximum of 10 working hours in one workday.
- Projected loads per year: calculated based on the range of “tons per year mined” and typical haul weight.
- Typical tons per truckload: weight of aggregate hauled by one truck (range provided).
- Projected loads per day: calculated truckloads hauled in a single day. This is based on the planned number of weeks of mining, tons mined in one year, and typical truck load. The loads are also shown as round trips (truck runs from the Zavoral Site to the Scandia Mine Site (and back).
- Maximum capacity loads per day: calculated based on an absolute peak capacity to run trucks between sites. This would require running 28 trucks every hour for 10 hours per day (the maximum haul rate).
- Maximum capacity loads per hour: the maximum number of trucks that could be hauled in one hour is 28.
- Reclamation topsoil loads are included in the Total Peak Estimate. The maximum loads per day would be 40 trips.

Table 1 – Add Rock Haul Traffic for Each Alternative

	Alternatives		
	Alternative 1 (5 to 10 Years)	Alternative 2 No-Build (hauling from current Class C add-rock sources)	Alternative 3 (5 Years or Less)
Mining activity	5 to 10 years	20 to 30+ Years	3.3 to 5 years
Tons per year mined	120,000–240,000	120,000–400,000	240,000–360,000
Projected weeks operating per year	6–12	6–20	12–18
Projected loads per year	5,000–12,000	5,000–20,000	10,000–18,000
Typical tons per truckload	20–24	20–24	20–24
Projected loads per day (range)	167–200 trucks 334–400 trips	105–279 trucks 210–558 trips	167–200 trucks 334–400 trips
Reclamation topsoil loads per day	0–20 trucks 0–40 trips	Not Applicable	0–20 trucks 0–40 trips
Projected loads per day (range) Add-rock + reclamation	167–220 trucks 334–440 trips	105–279 trucks 210–558 trips	167–220 trucks 334–440 trips
Maximum capacity loads per day	280 trucks 560 trips	280 trucks 560 trips	280 trucks 560 trips
Maximum capacity loads per hour	28 trucks 56 trips	28 trucks 56 trips	28 trucks 56 trips
Maximum reclamation topsoil loads per day	20 trucks 40 trips	0	20 trucks 40 trips
Total peak (add-rock + reclamation topsoil)	300 trucks 600 trips	280 trucks 560 trips	300 trucks 600 trips

The following summarizes the results of the traffic and operations analysis:

- The area existing roadway network is sufficient to handle the daily traffic volumes in the area. TH 97 and State Scenic Byway TH 95 are state highways designed to accommodate regional traffic. The peak hour truck volumes are also within the capacity of the roadways.
- Mn/DOT reviewed the proposed driveway location for the Zavoral Site and determined that the intersection sight distance met their requirements. A northbound right turn lane would be required to allow vehicles to reduce speed and move out of mainline traffic to turn. An acceleration lane on TH 97 was not recommended by Mn/DOT, as the trucks are not pulling into high speed traffic and the acceleration lane would be a high cost and high property impact.
- Scandia Elementary School is located on the south side of TH 97 near Oakhill Road. School representatives were contacted by the City and they provided information on school bus operations, parent drop-off/pickup, and bike/walk patterns. The traffic operation, capacity, and safety were evaluated by AECOM for the school driveways (at TH 97 and Oakhill Road). No problems were identified with capacity or safety based on traffic volumes and turning movements out of the driveway. TH 97 includes a right-turn lane into the school and a bypass lane westbound around turning vehicles.
- The City of Scandia presents near- and long-term improvement plans for trails in the area and connections to regional trails. AECOM has identified some trail considerations related to the Project in Section 7-Potential Mitigation.
- The area along the St. Croix River is scenic and provides a range of recreational and scenic driving opportunities. The trunk highways have sufficient reserve capacity to handle the change in traffic volume for seasonal traffic. Periods of congestion may be experienced during peak weekend travel times or on a holiday weekend, with or without the proposed Project. Removing the current hauling traffic from the river crossing at TH 243 and the portion of State Scenic Byway TH 95 north of the Zavoral Site should be beneficial to vehicles using these roadways to get to the state park or enjoy other recreational opportunities in the area.

6.2 Safety Evaluation

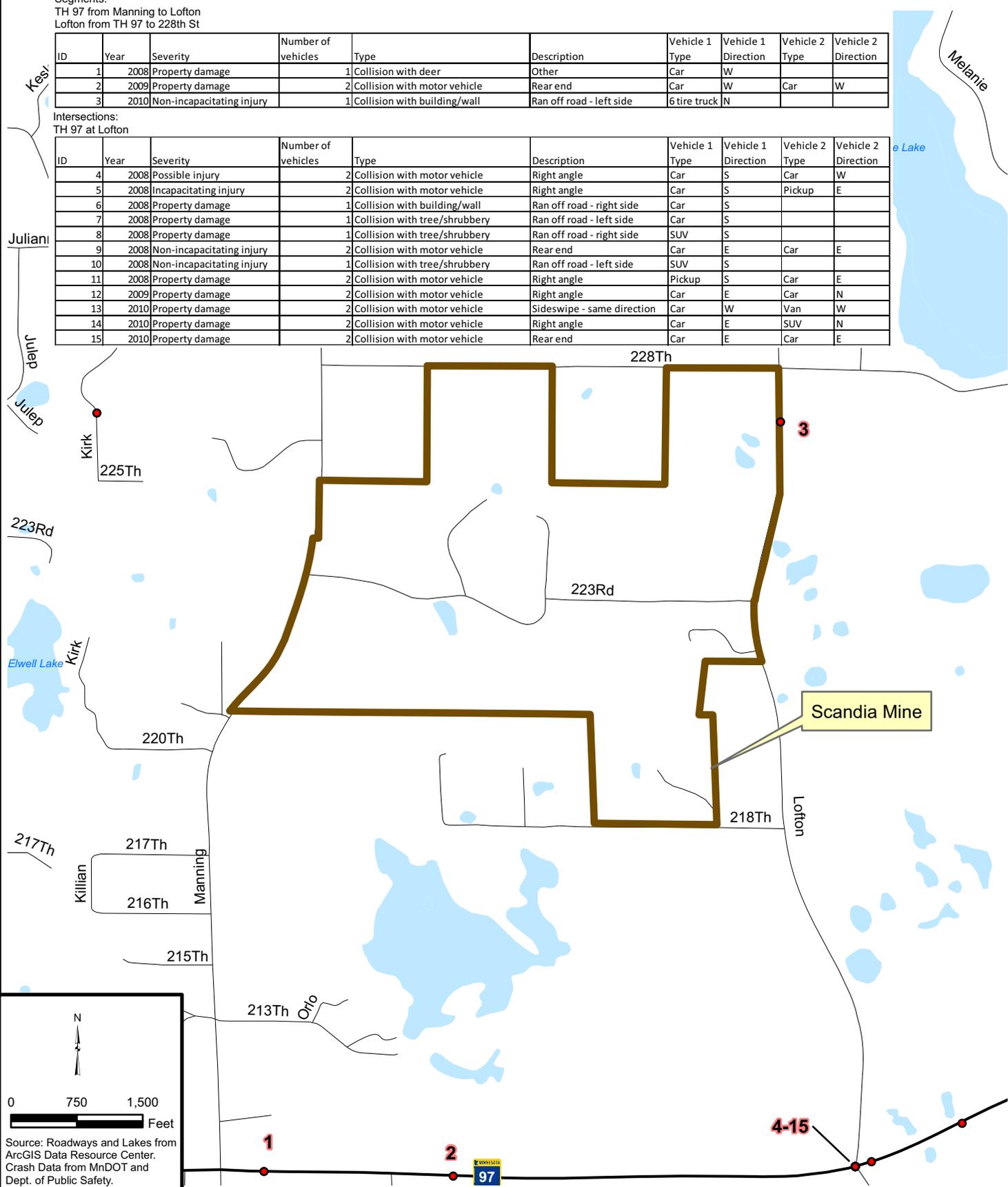
The crash data collected for the key roadways in the study area was collected for the years 2008, 2009, and 2010. Mn/DOT provided updated crash data for the Scandia area for roadway segments and intersections. The data is mapped and details included in the tables shown on Figures 8, 9, and 10.

Segments:
 TH 97 from Manning to Lofton
 Lofton from TH 97 to 228th St

ID	Year	Severity	Number of vehicles	Type	Description	Vehicle 1 Type	Vehicle 1 Direction	Vehicle 2 Type	Vehicle 2 Direction
1	2008	Property damage	1	Collision with deer	Other	Car	W		
2	2009	Property damage	2	Collision with motor vehicle	Rear end	Car	W	Car	W
3	2010	Non-incapacitating injury	1	Collision with building/wall	Ran off road - left side	6 tire truck	N		

Intersections:
 TH 97 at Lofton

ID	Year	Severity	Number of vehicles	Type	Description	Vehicle 1 Type	Vehicle 1 Direction	Vehicle 2 Type	Vehicle 2 Direction
4	2008	Possible injury	2	Collision with motor vehicle	Right angle	Car	S	Car	W
5	2008	Incapacitating injury	2	Collision with motor vehicle	Right angle	Car	S	Pickup	E
6	2008	Property damage	1	Collision with building/wall	Ran off road - right side	Car	S		
7	2008	Property damage	1	Collision with tree/shrubbery	Ran off road - left side	Car	S		
8	2008	Property damage	1	Collision with tree/shrubbery	Ran off road - right side	SUV	S		
9	2008	Non-incapacitating injury	2	Collision with motor vehicle	Rear end	Car	E	Car	E
10	2008	Non-incapacitating injury	1	Collision with tree/shrubbery	Ran off road - left side	SUV	S		
11	2008	Property damage	2	Collision with motor vehicle	Right angle	Pickup	S	Car	E
12	2009	Property damage	2	Collision with motor vehicle	Right angle	Car	E	Car	N
13	2010	Property damage	2	Collision with motor vehicle	Sideswipe - same direction	Car	W	Van	W
14	2010	Property damage	2	Collision with motor vehicle	Right angle	Car	E	SUV	N
15	2010	Property damage	2	Collision with motor vehicle	Rear end	Car	E	Car	E



Source: Roadways and Lakes from
 ArcGIS Data Resource Center.
 Crash Data from MnDOT and
 Dept. of Public Safety.

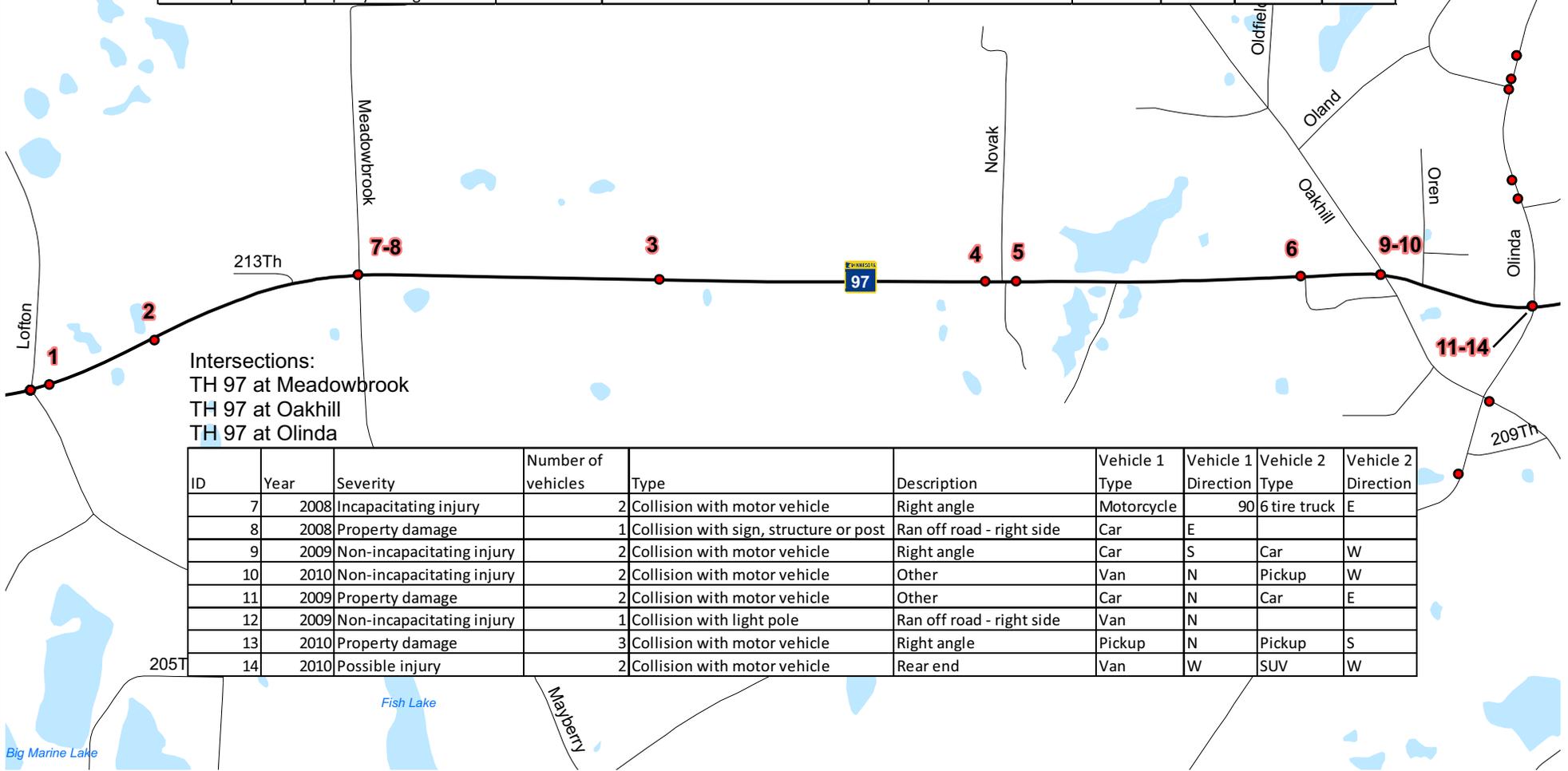
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CRASH DATA
ZAVORAL MINING AND RECLAMATION EIS
SCANDIA, MINNESOTA

Drawn: KLM 10/20/2011
 Approved: LK 10/20/2011
 Scale: 1" = 1,500 feet
 PROJECT NUMBER 09180095
 FIGURE NUMBER 8

Segments:
TH 97 from Lofton to Olinda

ID	Year	Severity	Number of vehicles	Type	Description	Vehicle 1 Type	Vehicle 1 Direction	Vehicle 2 Type	Vehicle 2 Direction
1	2009	Property damage	1	Overturn / rollover	Ran off road - right side	SUV	E		
2	2008	Property damage	1	Collision with sign, structure or post	Ran off road - right side	Car	E		
3	2009	Property damage	1	Collision with deer	Other	Car	W		
4	2009	Incapacitating injury	2	Collision with motor vehicle	Head on	Car	E	Car	W
5	2009	Property damage	1	Collision with deer	Head on	Car	W		
6	2009	Property damage	2	Collision with motor vehicle	Sideswipe - same direction	Car	E	Car	E



ID	Year	Severity	Number of vehicles	Type	Description	Vehicle 1 Type	Vehicle 1 Direction	Vehicle 2 Type	Vehicle 2 Direction
7	2008	Incapacitating injury	2	Collision with motor vehicle	Right angle	Motorcycle	90	6 tire truck	E
8	2008	Property damage	1	Collision with sign, structure or post	Ran off road - right side	Car	E		
9	2009	Non-incapacitating injury	2	Collision with motor vehicle	Right angle	Car	S	Car	W
10	2010	Non-incapacitating injury	2	Collision with motor vehicle	Other	Van	N	Pickup	W
11	2009	Property damage	2	Collision with motor vehicle	Other	Car	N	Car	E
12	2009	Non-incapacitating injury	1	Collision with light pole	Ran off road - right side	Van	N		
13	2010	Property damage	3	Collision with motor vehicle	Right angle	Pickup	N	Pickup	S
14	2010	Possible injury	2	Collision with motor vehicle	Rear end	Van	W	SUV	W

Source: Roadways and Lakes from ArcGIS Data Resource Center.
Crash Data from MnDOT and Dept. of Public Safety.

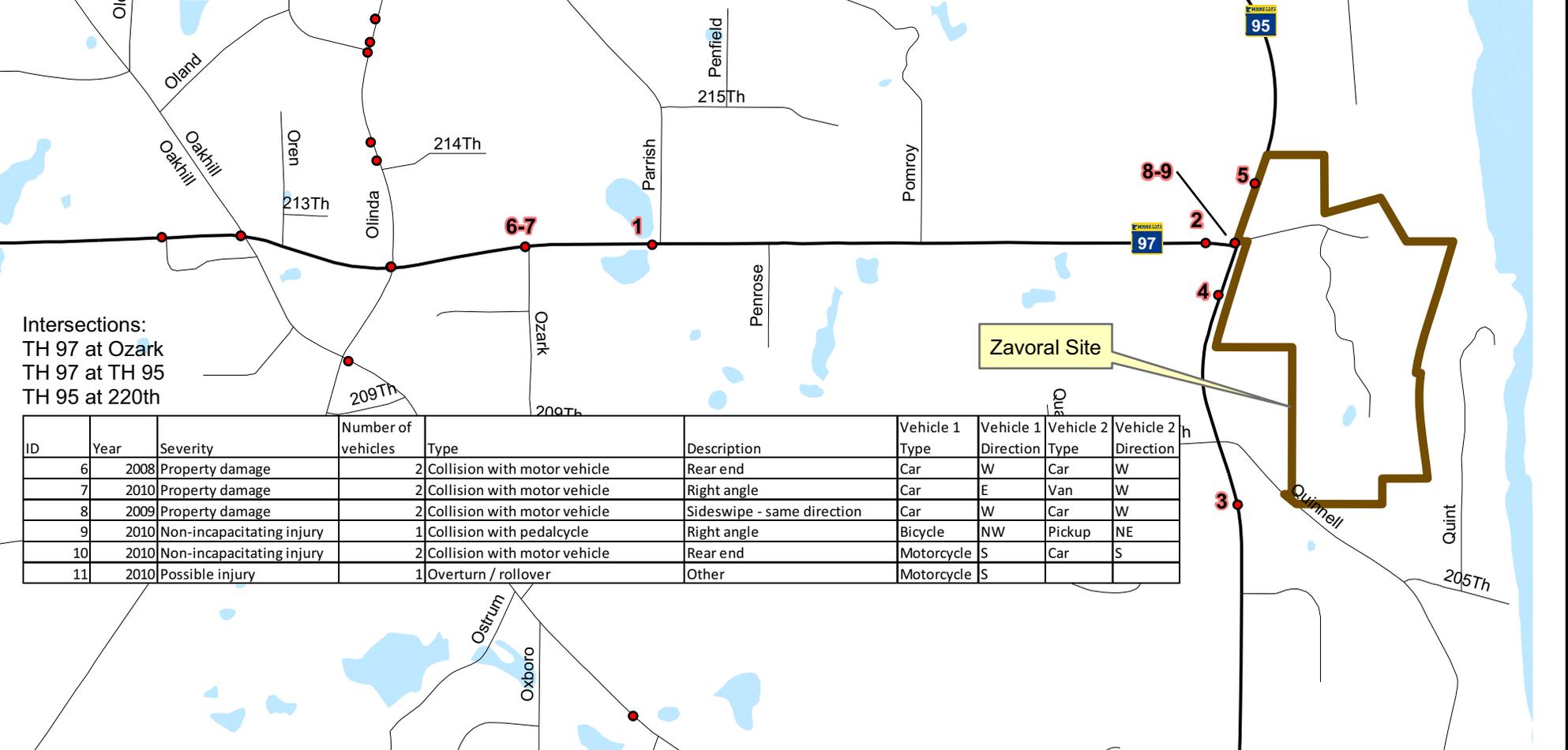
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PROJECT NUMBER 09180095
FIGURE NUMBER 9

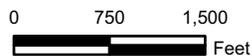
Segments:
 TH 97 from Olinda to TH 95
 TH 95 from 220th to Oakhill

ID	Year	Severity	Number of vehicles	Type	Description	Vehicle 1 Type	Vehicle 1 Direction	Vehicle 2 Type	Vehicle 2 Direction
1	2010	Property damage	2	Collision with motor vehicle	Not applicable	SUV	E	Pickup	E
2	2008	Property damage	1	Other type of collision	Other	Van	E		
3	2009	Possible injury	2	Collision with motor vehicle	Officer left field blank	Pickup		Van	N
4	2010	Property damage	1	Collision with embankment/ditch/curb	Other	Car			
5	2009	Property damage	1	Collision with embankment/ditch/curb	Other	Car	S		



Intersections:
 TH 97 at Ozark
 TH 97 at TH 95
 TH 95 at 220th

ID	Year	Severity	Number of vehicles	Type	Description	Vehicle 1 Type	Vehicle 1 Direction	Vehicle 2 Type	Vehicle 2 Direction
6	2008	Property damage	2	Collision with motor vehicle	Rear end	Car	W	Car	W
7	2010	Property damage	2	Collision with motor vehicle	Right angle	Car	E	Van	W
8	2009	Property damage	2	Collision with motor vehicle	Sideswipe - same direction	Car	W	Car	W
9	2010	Non-incapacitating injury	1	Collision with pedalcycle	Right angle	Bicycle	NW	Pickup	NE
10	2010	Non-incapacitating injury	2	Collision with motor vehicle	Rear end	Motorcycle	S	Car	S
11	2010	Possible injury	1	Overturn / rollover	Other	Motorcycle	S		



Source: Roadways and Lakes from ArcGIS Data Resource Center.
 Crash Data from MnDOT and Dept. of Public Safety.



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CRASH DATA ZAVORAL MINING AND RECLAMATION EIS SCANDIA, MINNESOTA

Drawn: KLM 10/20/2011

Approved: LK 10/20/2011

Scale: 1" = 1,500 feet

PROJECT NUMBER 09180095

FIGURE NUMBER 10

The roadway segments in the study area for crash data included:

- TH 97 from Manning Trail to Lofton Avenue
- TH 97 from Lofton Avenue to Olinda Trail
- TH 97 from Olinda Trail to TH 95
- Lofton from TH 97 to 228th Street

The intersections in the study area for crash data included:

- TH 97 & Manning Trail
- TH 97 & Lofton Avenue
- TH 97 & Meadowbrook Avenue
- TH 97 & Oakhill Road
- TH 97 & Olinda Trail
- TH 97 & TH 95

The segment crashes are relatively small in number and include run off road and deer collision crashes. These are typical for rural areas. There appear to be no major contributing factors in terms of roadway geometry and operations. Mn/DOT has reviewed the sight distance at the TH 97 and TH 95 intersection and found no deficiencies. TH 97 was rehabilitated in 2007 and the sight distances met Mn/DOT standard requirements at the 55 MPH speed limit. TH 95 was rehabilitated in 2009 and the sight distances met Mn/DOT standard requirements at the 55 MPH speed limit.

The intersection crash data is generally low at most intersections. The TH 97 and Lofton intersection has the highest number of crashes during the three year period (12 crashes). This includes five right angle crashes at the intersection. The TH 97 and Lofton intersection was part of Mn/DOT's resurfacing project. The cause of the crashes is likely due to driver error in turning out in front of vehicles on TH 97. If there are concerns about speeding on TH 97, this is an enforcement issue that requires the attention of the State Highway Patrol.

There was one fatal crash just north of the TH 97 and TH 95 intersection in 2006 that involved a pedestrian. This data was not provided in the initial crash reports and was found after additional research extended the intersection search area. Our team was notified of this crash by at the PAC meeting by a resident who was concerned because it was a pedestrian struck by a truck. The State Patrol investigated the crash and found that it was an error by the pedestrian in walking out in front of the truck and the driver was unable to stop in time.

A review of the data does not show involvement of semi-trucks in the area crashes. The data captures actual crashes and does not record near miss or other close call data.

6.3 Scandia Elementary School

Scandia Elementary School is located on the south side of TH 97 near Oakhill Road. School representatives were contacted and provided information on school bus operations, parent drop-off/pickup, and bike/walk patterns. The school does not cite any major concerns with traffic and safety on TH 97. They recognize it is a busy highway and do not have activities near the area. The following is a summary of the key findings:

- Buses drop off students at 9:05 a.m. (for a 9:15 start of school) and leave at 3:40 p.m. (school is dismissed at 3:30). There are 14 buses for about 390 students. All buses enter on TH 97 in the morning. Half the buses exit on TH 97 and the other half on Oakhill Road.
- During the year, 35 to 40 students are picked up and dropped off at various times. The north lot is used for pick-up/drop-off to personal vehicle traffic separate from the bus traffic.
- Six students ride bicycles to school (2 to 4 miles) and are required to have a bike/walk pass for safety. No students currently walk to school.

The traffic operation, capacity, and safety were evaluated for the school driveways (at TH 97 and Oakhill Road). No problems were found with capacity or safety based on traffic volumes and turning movements out of the driveway. TH 97 includes a right-turn lane into the school and a bypass lane westbound around turning vehicles.

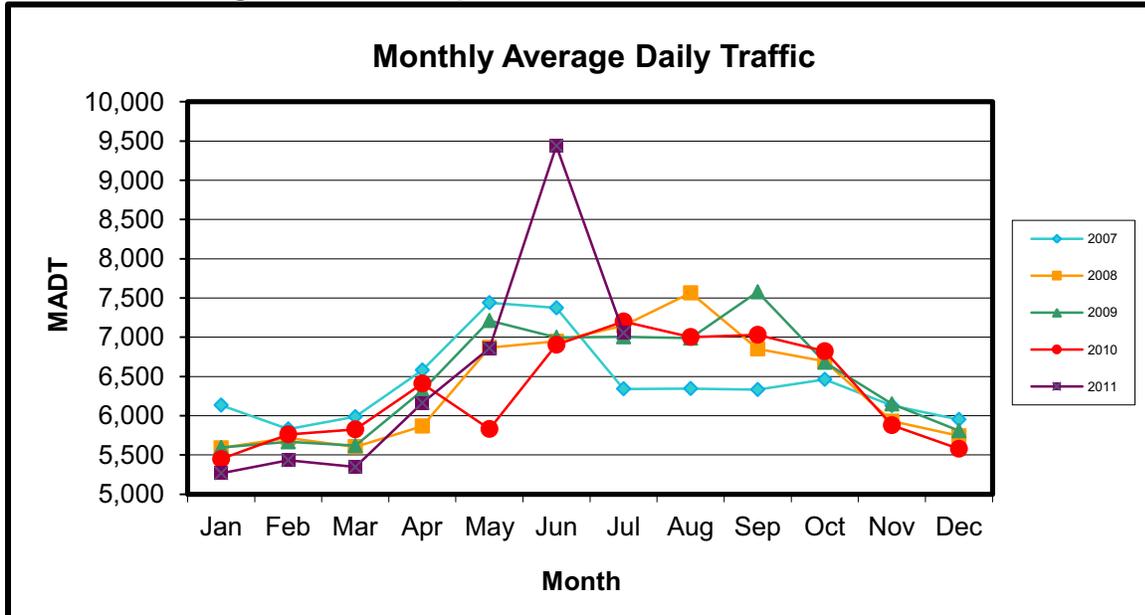
6.4 Impacts on Bicycle and Pedestrian Facilities

The proposed City of Scandia Trail Plan presents near and long-term improvement plans for trails in the area and connections to regional trails. The trails are planned for both pedestrian and bicycle users. Safety for pedestrian and bicycle users is an important component in the trail planning process. The following measures should be considered are described under Section 7-Potential Mitigation.

6.5 Impacts Related to Recreational Area Traffic

The area along the St. Croix River is scenic and provides a range of recreational and scenic driving opportunities. William O'Brien State Park is located approximately 2.5 miles south of the Zavoral Site on TH 95. Recreation traffic is a component in increasing average daily traffic on TH 97 and TH 95 during the spring to fall timeframe. Mn/DOT data recorded on TH 97 (at Automated Traffic Recorder station east of Lofton) is shown in Figure 11. The trunk highways have sufficient reserve capacity to handle the change in traffic volume for seasonal traffic. Periods of congestion may be experienced during peak weekend travel times, on a holiday weekend with or without the proposed Project. Removing the current hauling traffic from the river crossing at TH 243 and the portion of TH 95 north of the Zavoral Site should be beneficial to vehicles using these roadways to get to the state park or enjoy other recreational opportunities in the area.

Figure 11 – Monthly Traffic Volumes on TH 97 East of Lofton



7.0 Potential Mitigation

The following is a list of potential mitigation that may be included as part of the Zavoral Site EIS process.

The City of Scandia Trail Plan presents near- and long-term improvement plans for trails in the area and connections to regional trails.

- Tiller should provide funds to improve the existing pedestrian/bicycle trail along TH 95 in the mine area, and establish connecting to existing trails.
- A proposed trail on TH 97 is planned as an off-road trail to be constructed in the long-term plan. The proposed trail on State Scenic Byway TH 95 is also an off-road trail. The trail crossing at TH 97 and TH 95 is in the long-term plan. If a crossing is placed at this location while the Zavoral Site is operational, advanced signing for the trail crossing should be added.
- A trailhead is shown at TH 97 and State Scenic Byway TH 95. If the Zavoral Site is operational, the location of the trailhead should be relocated due to the proximity of the intersection to hauling vehicles.
- New crossings on TH 97 at Oakhill Road and Ozark Avenue are called out for design with traffic controls. This would most likely be some type of warning flashers, not traffic signals. The City may want to delay installing crossings at these locations until the mining is complete

The following is a list of potential mitigation measures.

- Construct the new driveway access directly across from TH 97 as required item by Mn/DOT for safe access. In a review conducted by Mn/DOT in 2009, the agency required that the Zavoral Site access onto State Scenic Byway TH 95 be moved south to line up with TH 97 and that a northbound right-turn lane be constructed (Mn/DOT letter to City of Scandia, January 22, 2009). The right-turn lane would be consistent with the design of the existing left-turn lane. This would also match the design on the southbound approach. The sight distance requirements were met based on Mn/DOT reviews of the existing TH 97 and State Scenic Byway TH 95 intersection, and the 2007 and 2009 rehabilitation projects (June 29, 2011, letter to Anne Hurlburt, City of Scandia). In a recent review of the development this year, Mn/DOT reaffirmed that the improvements outlined in the 2009 letter would be required.
- To ensure that additional truck traffic would not result from hauling from the Zavoral Site at peak demand concurrently with other sites (Wisconsin, Washington County, Chisago County, and other Eastern Minnesota locations), the number of trucks hauling Class C add-rock to the Scandia Mine should be recorded and reported by Tiller and limited to the projected maximum level of 280 trucks for Class C aggregate, or 560 trips per day or below, and documentation could be required. The maximum mining level supplied by Tiller for the air quality analysis worst case is higher than the information used for traffic and this monitoring would ensure that the projected traffic levels are not exceeded.

- Truck warning signs that are Minnesota Manual on Uniform Traffic Control Devices (MMUTCD) compliant are recommended on State Scenic Byway TH 95 to advise drivers of trucks crossing TH 97 in and out of the Zavoral Site. The installation of warning flashers is another option but should be discussed with Mn/DOT to evaluate the safety impacts.

Appendix A
Existing Signing & Striping at Intersections



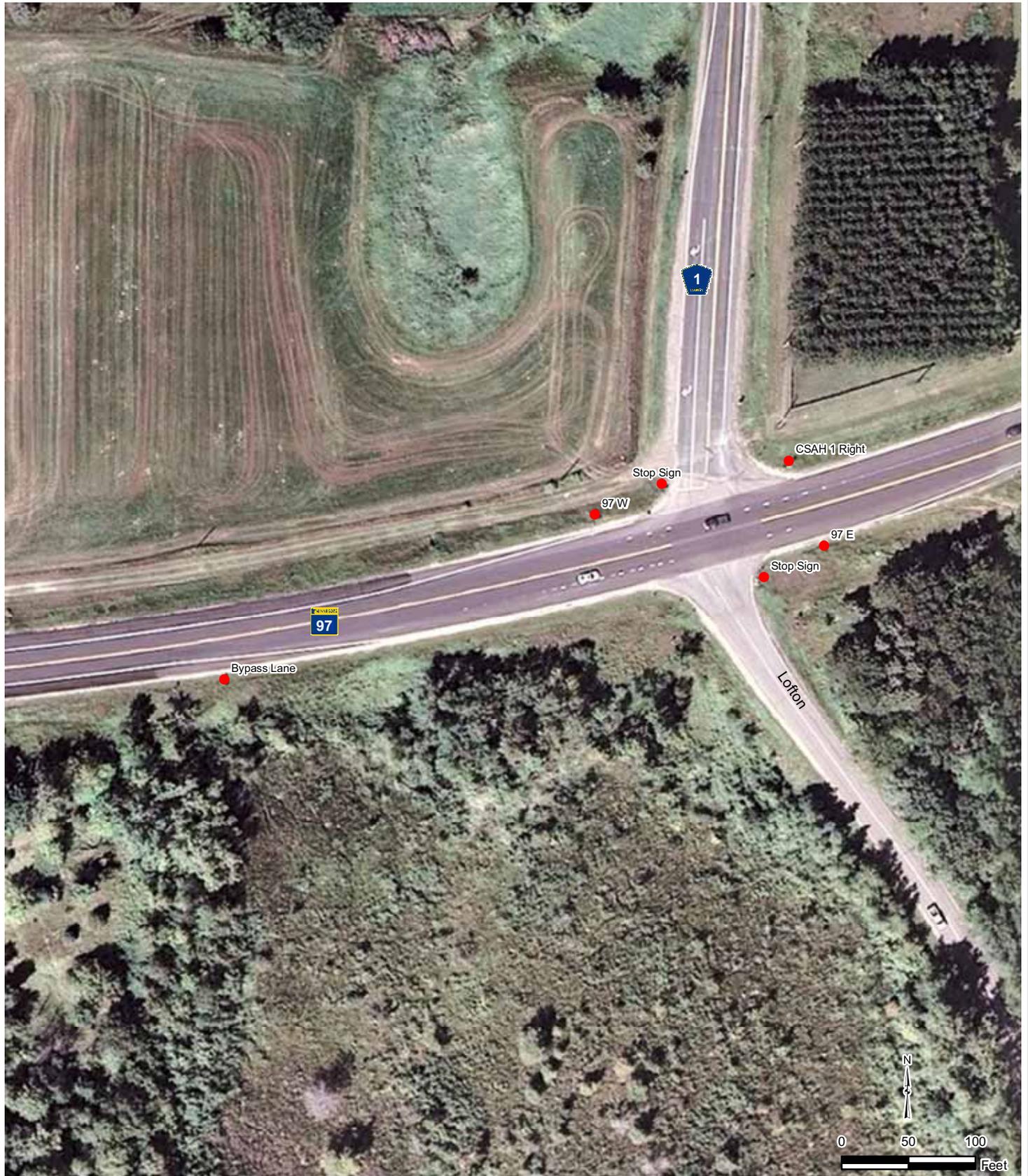
Source: Aerial photo from ArcGIS Data Resource Center. Signs from Google Street View.



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SIGNING AT INTERSECTION
 TH 97 & MANNING (CSAH 15)
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA

Drawn:	KLM	10/20/2011
Approved:	LK	10/20/2011
Scale:	1" = 100 feet	
PROJECT NUMBER	09180095	
FIGURE NUMBER	12	



Source: Aerial photo from ArcGIS Data Resource Center. Signs from Google Street View.



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 Suite 500
 Minneapolis, MN 55441
 T: 763-852-4200
 F: 763-473-0400
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SIGNING AT INTERSECTION
 TH 97 & LOFTON (CSAH 1)
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA

Drawn:	KLM	10/20/2011
Approved:	LK	10/20/2011
Scale:	1" = 100 feet	
PROJECT NUMBER	09180095	
FIGURE NUMBER	13	



Source: Aerial photo from ArcGIS Data Resource Center. Signs from Google Street View.



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SIGNING AT INTERSECTION
 TH 97 & OLINDA (CSAH 3)
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA

Drawn:	KLM	10/20/2011
Approved:	LK	10/20/2011
Scale:	1" = 100 feet	
PROJECT NUMBER	09180095	
FIGURE NUMBER	14	



Source: Aerial photo from ArcGIS Data Resource Center. Signs from Google Street View.

Legend

— Proposed Driveway and Turn Lane



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SIGNING AT INTERSECTION
 TH 97 & TH 95
 ZAVORAL MINING AND RECLAMATION EIS
 SCANDIA, MINNESOTA

Drawn:	KLM	10/20/2011
Approved:	LK	10/20/2011
Scale:	1" = 100 feet	
PROJECT NUMBER	09180095	
FIGURE NUMBER	15	

Appendix B
Minnesota DOT Driveway Review Comments



Minnesota Department of Transportation

Metropolitan District

Waters Edge
1500 West County Road B-2
Roseville, MN 55113-3174

June 29, 2011

Anne Hurlburt
City Administrator
City of Scandia
14727 209th St North
Scandia, MN 55073

SUBJECT: Zavoral Mining, Mn/DOT Review #EAW09-001A – **Follow Up Letter**
East of TH 95 at TH 97 Intersection
Scandia, Washington County
Control Section: 8210

Dear Ms Hurlburt:

Thank you for meeting with Mn/DOT on Tuesday, June 7th concerning the Zavoral Mining plans. This letter is intended to respond to the questions brought up at this meeting. The questions and answers are as follows:

Mn/DOT though is currently reviewing options concerning the need for the trail as well as the proper ownership of the trail.

1. *Since truck traffic will be traveling between the Zavoral site to the site off of Lofton, trucks are not expected to turn right into the site. Is a right turn lane (Per Mn/DOT's letter dated January 22, 2009) still needed? Would a truck acceleration lane on TH 97 be more useful?*

Based on the trips generated by the proposed mining operation, a right turn lane is warranted. To allow for current and future turning movements into the site, the right turn lane is still required. Since it would not be feasible to construct an acceleration lane long enough for trucks to reach highway speed, an acceleration lane is not needed. For questions concerning these comments, please contact Chad Erickson, Mn/DOT Metro Traffic Section, at 651-234-7806.

2. *Since sight distance is better to the north, than the south, will Mn/DOT still require the Zavoral driveway on TH 95 to be moved further south to line up with TH 97?*

Yes, the change in sight distance would be minimal. The driveway must be aligned with TH 97 to improve the operation of traffic at the TH 97/TH 95/Zavoral Mining intersection.

3. *Who owns and maintains the stub trail located along the east side of TH 95, south of TH 97? Will the trail need to be rebuilt?*

Mn/DOT currently owns this trail. In order to accommodate the right turn lane, the trail will need to be relocated. However, Mn/DOT is currently reviewing options concerning the need for the trail as well as the proper ownership of the trail.

If you have any additional questions regarding this follow up letter, please call me at (651) 234-7794.

Sincerely,



Tod Sherman,
Planning Supervisor

Copy send via Groupwise:

Marc Briese, Area Engineer

Chad Erickson, Traffic

Adam Josephson, Area Manager

Michael Caron, Tiller Corporation (Mikec@tillercorp.com)

Christina Morrison, Tiller Corporation (Christinam@tillercorp.com)

Kirsten Pauly, Sunde Engineering (kapuly@sundecivil.com)

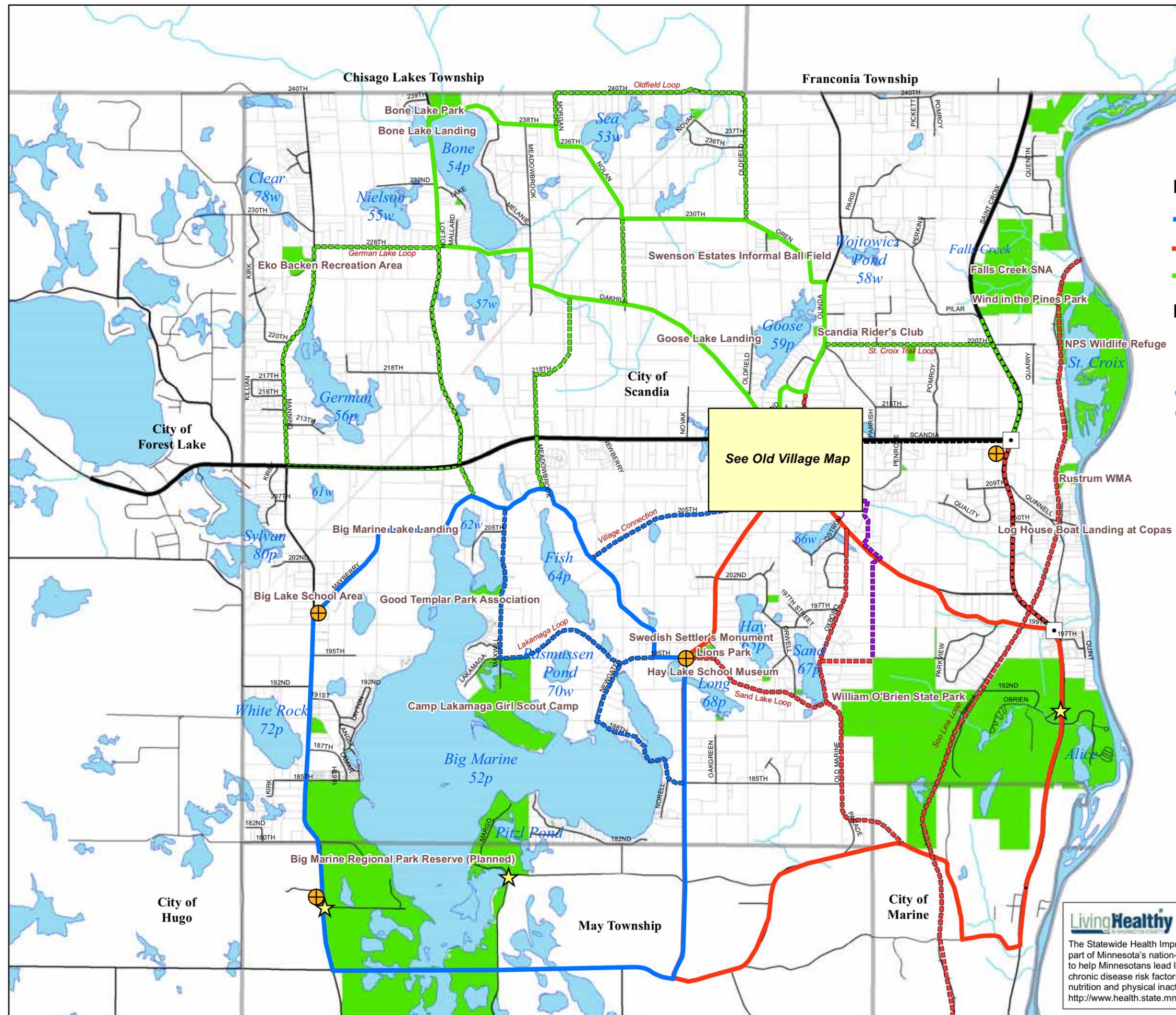
Mark Rothfork, AECOM (mark.rothfork@aecom.com)

Angie Christo, AECOM (angela.christo@aecom.com)

Ann Braden / Metropolitan Council

Appendix C
City of Scandia Trail Plan

Figure 1: Trails Planning Map

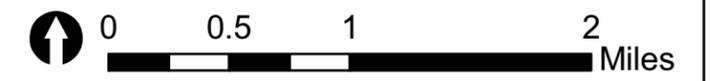


Bike Routes (Friends of Scandia Parks)

- Big Marine Trail (13 miles)
- Scandia/Marine Trail (13 miles)
- Scandia North or Bone Lake Trail (10 miles)

Neighborhood Loops

- - - Scandia North Trails Loop
- - - Scandia/Marine Loop
- - - Big Marine Loop Trails
- County Road Trail
- - - Off-Road Trail
- - - Gateway Trail (Proposed)
- Existing Sidewalks
- Proposed Sidewalks
- ✱ Destinations
- ⊕ Trailheads
- Existing Trail Crossings
- Proposed Trail Crossings
- ★ Park Entrance



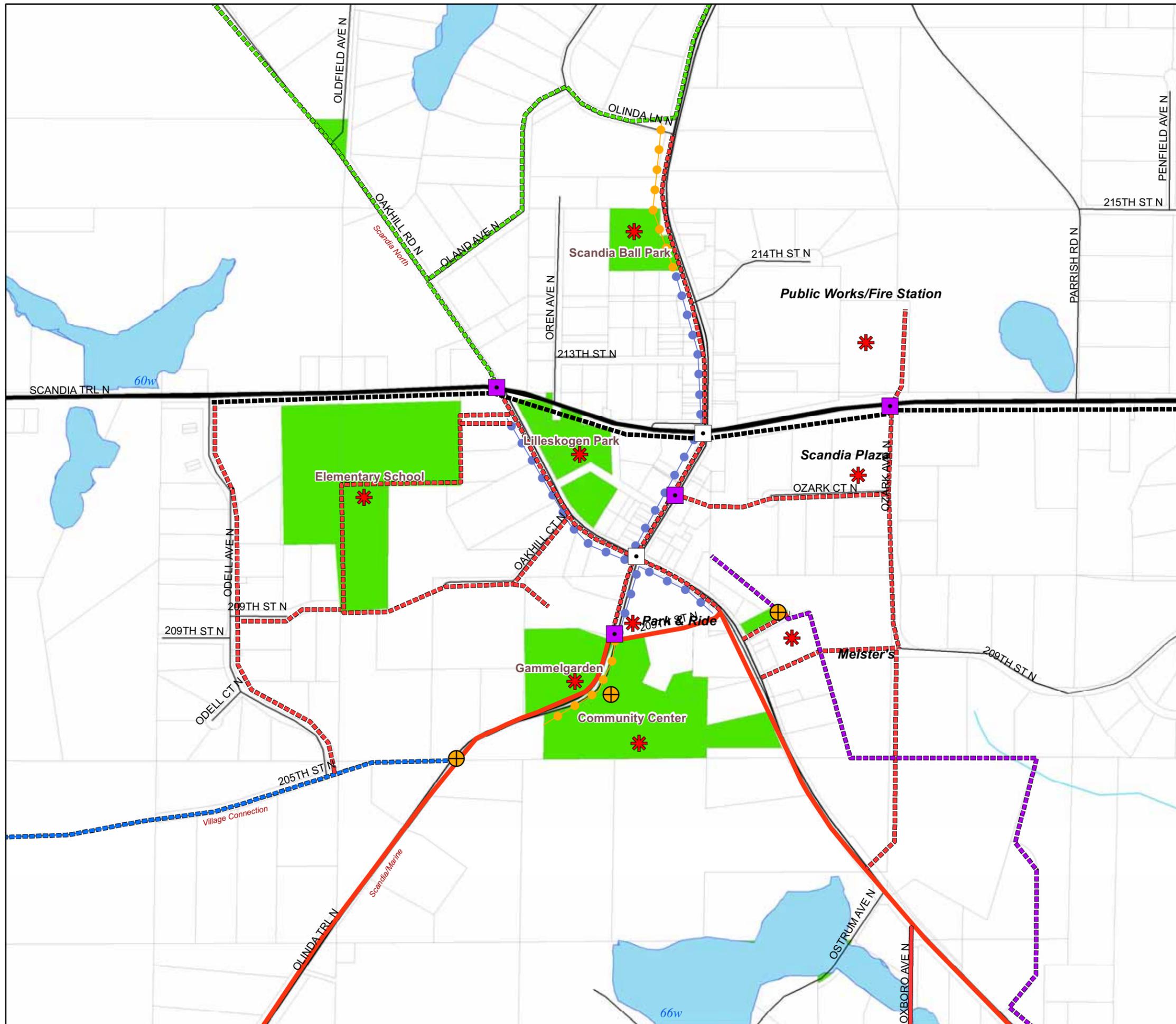
Data Sources: Scandia Comprehensive Plan, Washington County, Metropolitan Council, Minnesota Department of Natural Resources.

LivingHealthy
Washington County

The Statewide Health Improvement Program (SHIP), an integral part of Minnesota's nation-leading 2008 health reform law, strives to help Minnesotans lead longer, healthier lives by preventing the chronic disease risk factors of tobacco use and exposure, poor nutrition and physical inactivity. For more information, visit <http://www.health.state.mn.us/healthreform/ship>.



**Figure 2:
Trails Planning Map - Old Village**

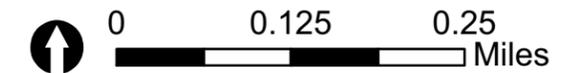


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