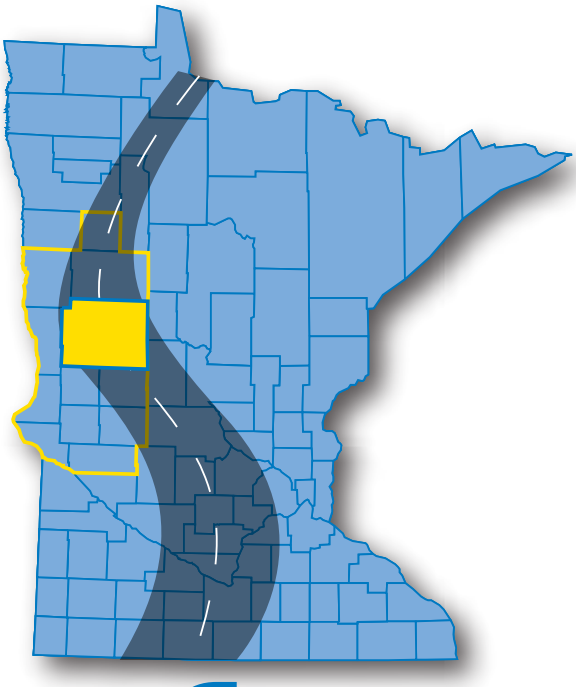
Otter Tail County

COUNTY ROADWAY



August 2011

Safety PLAN

Moving Toward **ZERO** Deaths

Prepared by:
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MINNESOTA DEPARTMENT OF TRANSPORTATION

Executive Summary

This Safety Plan for Otter Tail County was prepared as part of the Minnesota statewide highway safety planning process. The Plan was data driven, with a goal to reduce severe crashes (those involving fatalities and serious injuries) by documenting at-risk locations, identifying effective safety improvement strategies and better positioning the county to compete for available safety funds. The Plan includes a description of the connection to safety planning efforts at the national, State (through Minnesota's Strategic Highway Safety Plan and the Highway Safety Improvement Program) and regional (all of the counties in Area Transportation Partnership 4) levels.

Specifically, this Otter Tail County Safety Plan includes:

- A description of the Safety Emphasis Areas.
- Identification of a short list of high priority, low-cost Safety Strategies.
- Documentation of at-risk locations along the County's highway system that are considered candidates for safety investment. At-risk locations include roadway segments, horizontal curves and intersections with multiple severe crashes or with roadway geometry and traffic characteristics similar to other locations in Minnesota where severe crashes have occurred.
- Development of $7,191,803 of suggested safety projects at high priority locations. In addition, $33,400 of county nominated projects were identified.

The information in this Plan is consistent with best practices in safety planning as presented in guidance prepared by the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO) and the National Cooperative Highway Research Program (NCHRP). This information is provided to Otter Tail County in an effort to reduce the number of severe crashes on their highway system and it is understood that the final decision to implement any of the suggested projects resides with the Otter Tail County Engineer. It should also be noted that rankings are provided of County roadway facilities based on a comparison to documented risk factors. There is no expectation or requirement that Otter Tail County pursue safety projects in the exact rank order. The ranking suggests a general priority and it is understood that actual project development decisions will be made by County staff based on consideration of economic, social and political issues and coordination with other projects already in the County's Capital Improvement Program. It should be further noted that some of the at-risk locations and suggested safety projects involve the intersection of a County roadway and a State trunk highway. It is acknowledged that in these cases, the County does not have the authority to implement projects on the State's right-of-way. The County is encouraged to coordinate with Mn/DOT in order to pursue a partnership that identifies a path toward implementation. This Plan does NOT set requirements or mandates, is NOT a standard and is neither intended to be, nor does it establish a legal standard of care.

In an effort to help reduce the potential exposure to claims of negligence associated with motor vehicle crashes on Otter Tail County's highway system, three key points should be considered:

1. Federal law (23 U.S.C. Section 409) established that information generated as part of the statewide safety planning process is considered privileged and unavailable to the public. The privileged status includes crash data, where value/detail has been added by analysts during the safety planning process (for example; computation of crash rates,

disaggregation of crashes by type or severity, documentation of contributing factors, etc), the lists of at-risk locations, and information supporting the development and evaluation of potential safety projects. The federal law and the privileged status of the safety information was upheld by the U. S. Supreme Court in the case of Pierce County (Washington) v. Guillen. (See Appendix E)

2. Minnesota tort law provides for discretionary immunity for decisions made by agency officials when there is documentation of the decision and evidence of consideration of social, economic and political issues. In order to help establish immunity for decisions relative to moving forward with development of any of the suggested safety improvement projects, the County Engineer is encouraged to prepare a memo/plan of action for the County Board. This document would identify the projects selected for implementation and those they choose to dismiss and why. A sample is provided in Appendix E.

3. Minnesota tort law also provides for official immunity for decisions made by agency staff where there is written documentation of the thought process supporting project development and implementation.

A final point to note relates to the expected life of this Plan. As with any transportation plan, the expected shelf life of this document is not infinite – the distribution of crashes can change over time as well as roadway and traffic conditions that can contribute to the occurrence of crashes. This Plan contains $7.2 million of potential safety projects, which could provide Otter Tail County with a sufficient backlog of projects for up to five years. As a result, Otter Tail County is encouraged to consider periodically updating this Safety Plan when they have run out of safety projects to develop or after approximately five years.

TABLE OF CONTENTS

Executive Summary ..... **I**

1.0 Introduction **1-1**
1.1 Context of CRSP 1-2
1.1.1 National Context 1-2
1.1.2 State Context 1-4
1.1.3 Area Transportation Partnership (ATP) and County Context 1-7
1.1.4 Partnering Agencies and Organizations 1-8
1.2 CRSP Delivery Phases and Schedule 1-8
1.3 CRSP Project Approach 1-9

2.0 ATP 4 Overview **2-1**
2.1 Minnesota Crash Mapping Analysis Tool 2-1
2.2 Crash Data Sets 2-1
2.3 Facilities Analyzed 2-2
2.4 Information Provided by Counties 2-2
2.4.1 Segmentation of County Roads 2-2
2.4.2 Distance From Previous STOP Sign 2-3
2.5 ATP 4 Crash Disaggregation 2-3
2.6 Top Five Critical Emphasis Areas for ATP 4 2-5
2.6.1 ATP 4 Top 5 Critical Emphasis Areas 2-5
2.7 Safety Strategies for Counties in ATP 4 2-6
2.7.1 NCHRP Safety Strategies 2-6
2.7.2 Safety Strategies Brought to Safety Workshops 2-7
2.8 ATP 4 Safety Meetings 2-15
2.8.1 Project Kickoff Meeting 2-15
2.8.2 County Safety Review Meeting 1 2-15
2.8.3 Safety Strategies Workshops 2-16
2.8.4 County Safety Review Meeting 2 2-16
2.9 Use of Crash Surrogates to Identify Candidates for Safety Investment 2-17
2.9.1 Black Spot Method 2-17
2.9.2 Systemic Method 2-18
2.10 Identification and Prioritization of At Risk Locations 2-19
2.10.1 Rural Gravel Segments 2-19
2.10.2 Prioritizing Rural CSAH/CR Segments 2-20
2.10.3 Prioritizing Curves on Rural CSAH/CR System 2-21
2.10.4 Rural STOP Controlled Intersections 2-22
2.11 Application of Safety Strategies to At Risk Locations 2-23
2.11.1 Infrastructure Based Safety Projects 2-23

3.0 Otter Tail County Crash Analysis and Recommended Safety Projects.....3-1
3.1 County-wide Crash Overview.....3-1
3.1.1 Otter Tail Co. CSAH/CR System Crash Analysis Breakdown.....3-1
3.1.2 Township and Municipal Roadway Review.....3-1
3.1.3 Otter Tail County Critical Emphasis Areas.....3-1
3.2 County Road Safety Workshop.....3-6
3.2.1 Workshop Details.....3-6
3.2.2 Results of Stakeholder Prioritization Exercise.....3-7
3.3 Otter Tail County Detailed Crash Analysis.....3-8
3.3.1 Prioritizing Rural CSAH/CR Segments.....3-8
3.3.2 Prioritizing Curves on Rural CSAH/CR System.....3-14
3.3.3 Rural STOP Controlled Intersections.....3-20
3.4 County Safety Projects.....3-24
3.4.1 Infrastructure Based Safety Projects.....3-24

4.0 Driver Behavior Safety Strategies.....4-1
4.1 Why is Driver Behavior Important to Include in a County Plan?.....4-1
4.2 Teenage Drivers, Impaired Driving, Seat Belts, Speeding, Distraction.....4-1
4.2.1 Teenage Drivers.....4-1
4.2.2 Alcohol-Related Crashes.....4-1
4.2.3 Seat Belts.....4-2
4.2.4 Unsafe and Illegal Speeding and Aggressive Driving.....4-3
4.2.5 Distracted/Inattentive Driving.....4-3
4.3 Driver Behavior Change Strategies.....4-4
4.3.1 Traffic Safety Policy Work.....4-4
4.3.2 High Visibility Enforcement of Traffic Laws.....4-5
4.3.3 Community Training and Program Development.....4-6
4.4 Call for Innovative and New Ideas from the Community.....4-7
4.5 Barriers to Implementing Behavior Change Strategies.....4-8
4.6 Resources for Implementing Effective Behavior Change Strategies.....4-9
4.7 Actionable Interventions for a Community Concerned with Traffic Safety.....4-9
4.7.1 Driving Behavior Safety and Enforcement Messages.....4-9
4.8 Minnesota DPS Office of Traffic Safety Programs.....4-26

Appendices

Appendix A – Safety Workshop Information

Appendix B – Rural Segment Prioritization and Project Sheets

Appendix C – Rural Horizontal Curve Prioritization and Project Sheets

Appendix D – Rural Thru/Stop Intersection Prioritization and Project Sheets

Appendix E – Sample County Response

LIST OF ACRONYMS

"A-Injury" Crash – Serious Injury Crash
AASHTO - American Association of State Highway and Transportation Officials
ADT – Average Daily Traffic
ATP – Area Transportation Partnerships
CEA – Critical Emphasis Areas
CPS – Child Passenger Safety
CR – County Road
CRSP – County Road Safety Plan
CSAH – County State-Aid Highway
DPS – Department of Public Safety
DWI – Driving While Intoxicated
EMS – Emergency Medical Service
FHWA – Federal Highway Association
GDL – Graduated Drivers License
HEAT – Highway Enforcement of Aggressive Traffic
HMVMT – Hundred Million Vehicle Miles Travelled
HSIP – Highway Safety Improvement Program
"K" Severity Crash – Fatal crash
LED – Light-Emitting Diode
Mn/DOT – Minnesota Department of Transportation
MnCMAT – Minnesota Crash Mapping Analysis Tool
MnMUTCD – Minnesota Manual on Uniform Traffic Control Devices
MSAS –Municipal State Aid Highway
MUN – Municipal Roadway
MVM – Million vehicle miles
NCHRP - National Cooperative Highway Research Program
NETS – Network of Employers for Traffic Safety
NHSTA – National Highway Traffic Safety Administration
NightCAP – Nighttime Concentrated Alcohol Patrol
OTS – Office of Traffic Safety
SAFETEA-LU – Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users
SHSP – Strategic Highway Safety Plan
TH – Trunk Highway
TZD – Towards Zero Deaths
US – State Highway

Contents

1.0 Introduction 1-1
1.1 Context of CRSP 1-2
1.1.1 National Context 1-2
1.1.2 State Context 1-4
1.1.3 Area Transportation Partnership (ATP) and County Context 1-7
1.1.4 Partnering Agencies and Organizations 1-8
1.2 CRSP Delivery Phases and Schedule 1-8
1.3 CRSP Project Approach 1-9

1.0 Introduction

The Minnesota Department of Transportation (Mn/DOT) along with representatives from Area Transportation Partnerships (ATPs) and county representatives have prepared this County Roadway Safety Plan (CRSP or Plan) as part of a comprehensive effort to reduce the number of fatal and life changing injury crashes that occur on county highway systems. ATPs were created by Mn/DOT to emphasize greater public involvement and coordination in the preparation of transportation plans and programs—including development of system planning and capital investment documents such as the CRSPs. There are a total of eight ATPs in Minnesota, shown in Figure 1-1.

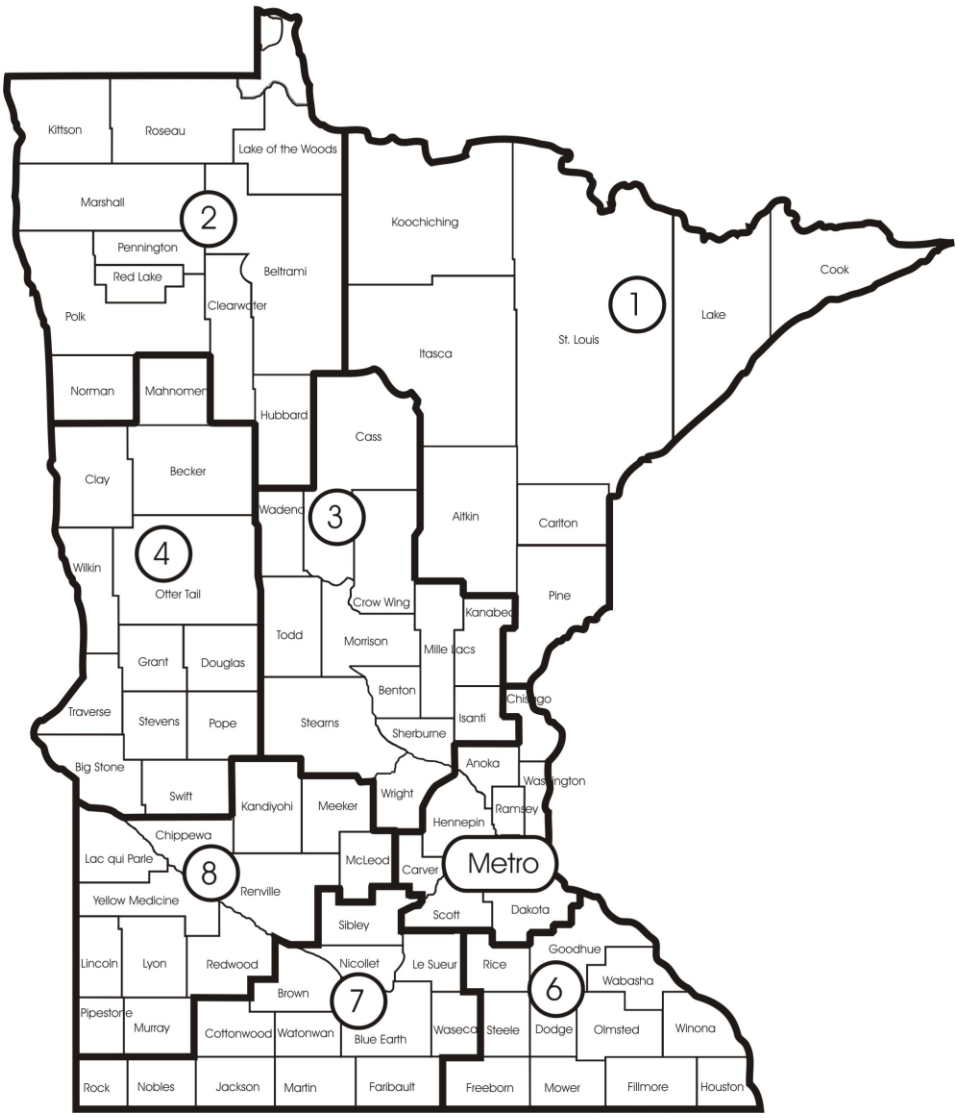


Figure 1-1
Minnesota's Eight Area Transportation Partnerships

The traffic safety priorities identified in this CRSP are the result of a data driven analysis of the over 16,000 crashes that occurred in ATP 4 over the five year period between 2005 and 2009. The primary objective of this CRSP is to identify a specific set of safety oriented projects (the implementation of specific strategies at specific locations) and to have these projects directly linked to the causation factors associated with the most severe crashes on the county highways within the ATP.

1.1 Context of CRSP

1.1.1 National Context

Fatal and life changing crashes are a major public health issue in the United States. In 2010, approximately 32,800 were killed in traffic crashes—an average of 90 killed every day; an additional 2.5 million people were injured.

As shown in Figures 1-2 and 1-3, traffic fatalities and the fatality rate decreased significantly and steadily in the 1970s and 1980s. The overall national traffic fatality rate has remained at approximately 1.45 fatalities per hundred million vehicle miles travelled (HMVMT) (see Figure 1-3).

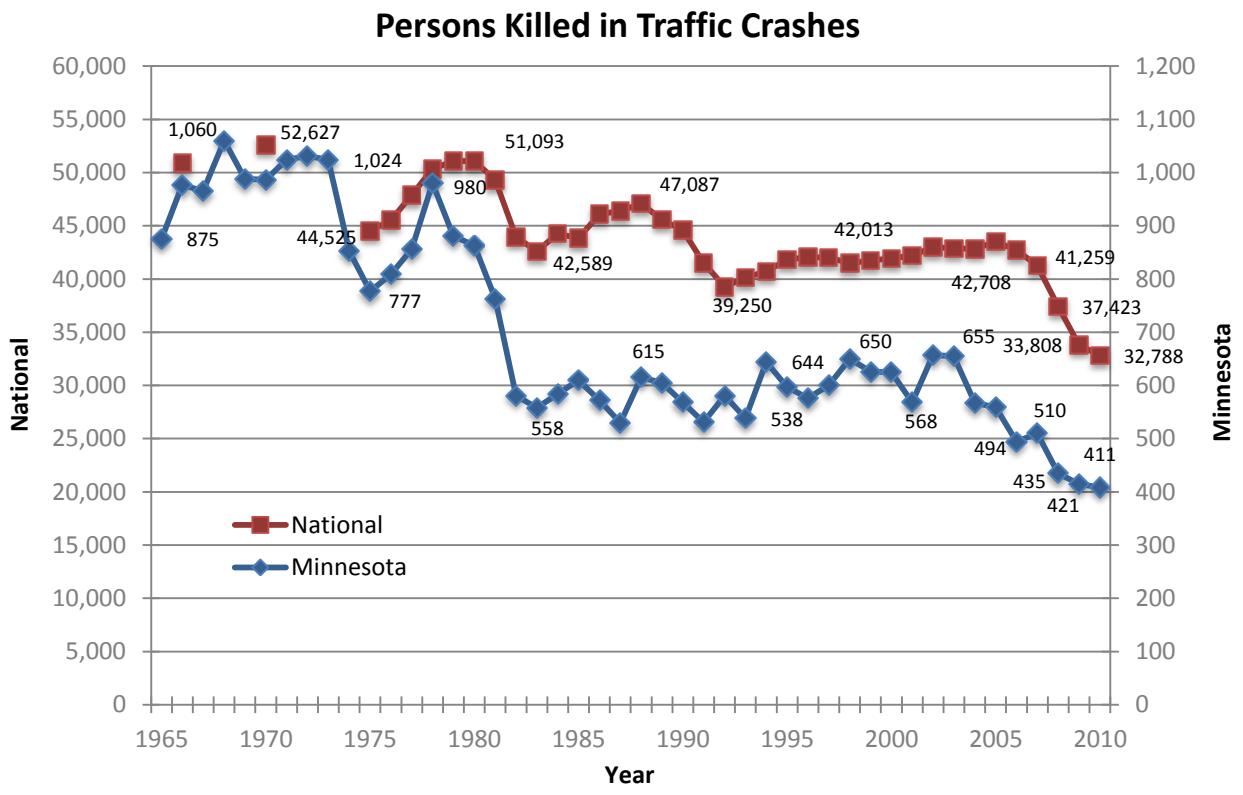


Figure 1-2
Trend in Traffic Fatalities in United States and Minnesota

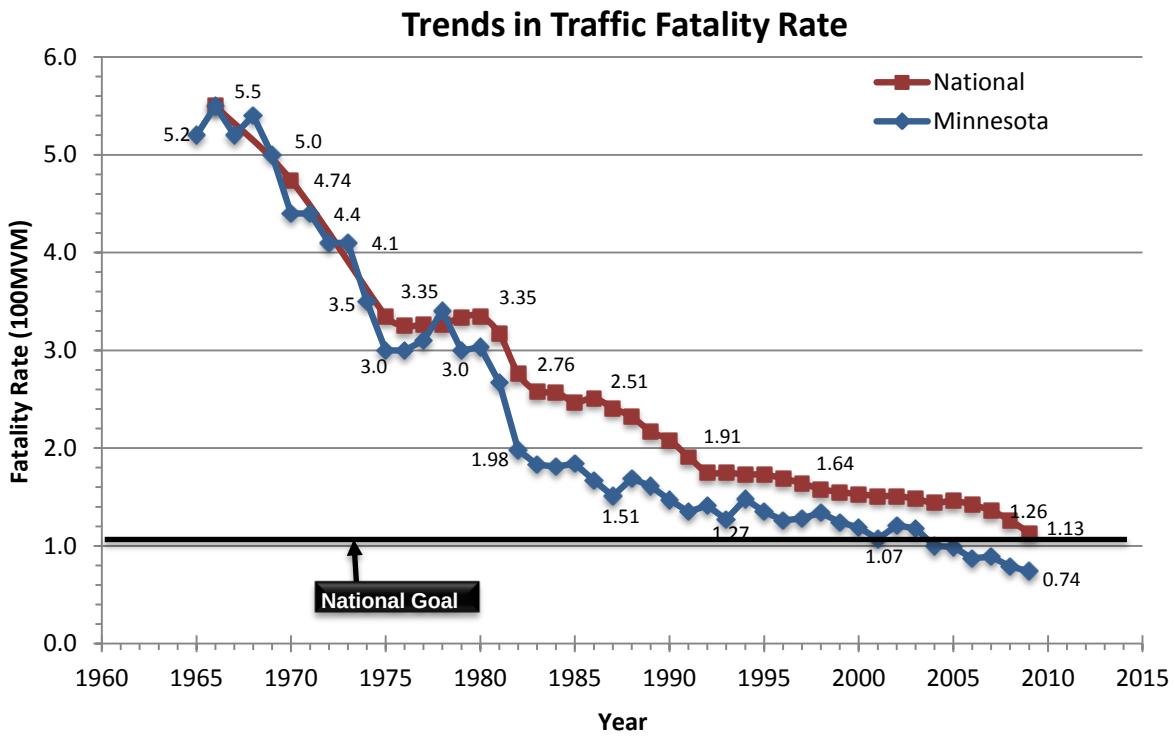


Figure 1-3
Trend in Traffic Fatality Rate in United States and Minnesota

The Federal Highway Administration (FHWA) and American Association of State Highway and Transportation Officials (AASHTO) have placed a renewed focus on the most severe crashes—including fatal and life changing—using a data driven process. The agencies have also placed a renewed emphasis on the Four Es—Education, Enforcement, Engineering, and Emergency Medical Services (EMS). Those involved with the Four Es are encouraged to set new goals, and determine new ways to measure progress.

FHWA and AASHTO have set a goal to reduce the number of traffic fatalities by 1,000 each year for the next 20 years. FHWA has determined that this goal will only be reached if they partner with individual states. Partnering will lead to more successful project implementation and result in programs that target the factors that contribute to the greatest number of fatal and severe crashes.

AASHTO's Strategic Highway Safety Plan and Critical Emphasis Areas
AASHTO published a nationally focused Strategic Highway Safety Plan (SHSP) in 1997; the plan was updated in 2004. The SHSP focused on 22 specific highway safety challenges, or Critical Emphasis Areas (CEAs), that are divided into the six parts or categories listed below (also see Table 1-1).

- Drivers,
- Special Users,
- Vehicles,
- Highways,
- Emergency Services, and
- Management.

TABLE 1-1
AASHTO State Highway Safety Plan (SHSP) Critical Emphasis Areas

Part 1: Drivers	**Part 4: Highways**
1. Instituting Graduated Licensing for Young Drivers	14. Reducing Vehicle-Train Crashes
2. Ensuring Drivers are Licensed and Fully Competent	15. Keeping Vehicles on the Roadway
3. Sustaining Proficiency in Older Drivers	16. Minimizing the Consequences of Leaving the Road
4. Curbing Aggressive Driving	17. Improving the Design and Operation of Highway Intersections
5. Reducing Impaired Driving	18. Reducing Head-On and Across Median Crashes
6. Keeping Drivers Alert	19. Designing Safer Work Zones
7. Increasing Driver Safety Awareness	**Part 5: Emergency Medical Services**
8. Increasing Seat Belt Usage	20. Enhancing Emergency Medical Capabilities to Increase Survivability
Part 2: Special Users	**Part 6: Management**
9. Making Walking and Street Crossing Safe	21. Improving Information and Decision Support Systems
10. Ensuring Safer Bicycle Travel	22. Creating More Effective Processes and Safety Management Systems
Part 3: Vehicles	
11. Improving Motorcycle Safety and Increasing Motorcycle Awareness	
12. Making Truck Travel Safer	
13. Increasing Safety Enhancements in Vehicles	

Source: American Association of State Highway and Transportation Officials (AASHTO) Strategic Highway Safety Plan (SHSP), 1997 and 2004.

The SHSP noted that individual state efforts had not effectively lowered the number of fatal crashes and that state efforts were not focused on primary factors that caused fatal crashes. Many state projects being implemented were not always based on the results of a data driven mapping process that linked crash causation to effective mitigation strategies. The SHSP recommended developing a safety programming process that included disaggregation of system wide crash data into the 22 CEAs.

Disaggregating crash data helps agencies identify their safety priorities based on crash analysis for their transportation system. This step also reduces the universe of safety strategies to those specifically associated to an agency's specific system (see Section 2.7 for more information about safety strategies). Finally, crash data disaggregation and identification of CEAs helps agencies select the most effective strategies for reducing crashes and determine where limited highway and safety improvement funds should be invested to have the most positive impact.

1.1.2 State Context

Minnesota's Comprehensive Safety Planning Efforts

Similar to the national trends, Minnesota experienced a significant reduction in traffic fatalities and the fatal crash rate from the mid-1970s through the 1980s (see Figures 1-2 and 1-3).

Between 1980 and 2000, the number of traffic fatalities increased slightly, while the fatal crash rate decreased as a result of increasing levels of vehicles traveled. Since the year 2000, the number of traffic fatalities and the fatal crash rate has dropped by approximately 35 percent.

AASHTO's SHSP was used as the basis for developing the Minnesota's SHSP. Mn/DOT in cooperation with the Minnesota Department of Public Safety developed the Minnesota Comprehensive Highway Safety Plan (CHSP) in December 2004. The CHSP identified the following:

- A unified approach for addressing traffic fatalities in Minnesota,
- Key crash types to target (also referred to as Critical Emphasis Areas), and
- High priority strategies intended to form the focus of future programs and projects (also referred to as Critical Strategies).

The CHSP was updated in 2007 to comply with federal legislative requirements set forth in the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU, the current federal law governing surface transportation programs). As the name suggests, SAFETEA-LU has several important safety requirements, including the development of state Strategic Highway Safety Plans. The CHSP was re-named the Minnesota Strategic Highway Safety Plan (SHSP). The Minnesota SHSP established a new traffic safety goal—to reduce the number of traffic fatalities to 400 or fewer by 2010. The original traffic safety goal set in the 2004 CHSP was to reduce traffic fatalities to 500 by 2008. This goal was achieved when 494 fatalities were recorded in 2008. Even though Minnesota has made steady progression reducing the number of traffic fatalities, the 2010 goal of fewer than 400 fatalities was not achieved – there were 411 fatalities in 2010.

Crashes on CSAH and CR Roads

Minnesota's CSAH and CR transportation system encompasses more than 50,000 miles of roadway out of a total of 134,000 miles statewide. Approximately one-half of statewide traffic fatalities occur on this system, making rural local roads perhaps the most at-risk part of the state's entire system. In response, the Minnesota SHSP identified the proactive and systemic deployment of low-cost strategies to cost-effectively address the high frequency, but very low density of severe crashes across many miles of rural roadways. The overrepresentation of severe and fatal crashes on the local roadways is reflected in ATP 4 and counties within the ATP. This reinforces the importance of efforts to implement a safety program that focuses on the local system, in addition to the state system of highways.

As noted earlier, both FHWA and Mn/DOT have adopted a focus of addressing traffic fatalities and life changing injuries, and this includes a heavy focus on rural areas. However, shifting from a focus on reducing the overall number of crashes to reducing the number of most severe crashes poses some challenges. The random, widely distributed nature of severe crashes makes it difficult to identify specific at-risk locations based only on crash statistics. For example, in Minnesota, approximately one-third of fatal crashes (190 per year) involve a single vehicle running off the road; 75 percent (145 per year) of these are in rural areas and 62 percent of these are on the local system. These severe road departure crashes occur on over 45,000 miles of county rural two-lane highways in Minnesota, which translates into the very low density of 0.002 fatal road departure crashes per mile. The majority of rural county locations have had few or no crashes during a typical five year study period. The random and widely distributed nature of severe crashes reinforces the need to incorporate a system based approach into the safety planning process.

Minnesota's State Highway Critical Emphasis Areas (CEAs)

Based on an updated state crash analysis conducted in 2010, Mn/DOT reviewed the number of fatalities related to each of the AASHTO Emphasis Areas summarized in Table 1-1. Detailed information about this effort is included in an update to the Technical Memorandum, Statewide Emphasis Area Analysis, 2004-2008 (December 4, 2009). This analysis identified the number of fatalities in each Emphasis Area along with the percentage represented of the total number of crashes (see Table 1-2).

TABLE 1-2
Summary of Minnesota's State Highway 2005-2009 Fatalities by AASHTO's Emphasis Area

	Emphasis Area	Minnesota Fatalities*	Percent
Part 1: Drivers	Instituting Graduated Licensing for Young Drivers	495 fatalities involved a driver under 21	20%
	Ensuring Drivers are Licensed and Fully Competent	201 fatalities involved a driver with an invalid license	8%
	Sustaining Proficiency in Older Drivers	461 fatalities involved a driver over 64	19%
	Curbing Aggressive Driving	638 fatalities involved a speeding driver	26%
	Reducing Impaired Driving	841 fatalities were alcohol related	35%
	Keeping Drivers Alert	386 fatalities involved an inattentive driver	16%
	Increasing Driver Safety Awareness	-- Not Quantifiable --	
	Increasing Seat Belt Usage and Improving Airbag Effectiveness	891 vehicle occupant fatalities were not using a restraint device**	49%
Part 2: Special Users	Making Walking and Street Crossing Safer	175 pedestrian fatalities	7%
	Ensuring Safer Bicycle Travel	42 bicyclists fatalities	2%
Part 3: Vehicles	Improving Motorcycle Safety and Increasing Motorcycle Awareness	304 motorcyclists fatalities	13%
	Making Truck Travel Safer	397 fatalities involving heavy vehicles	16%
	Increasing Safety Enhancements in Vehicles	-- Not Quantifiable --	
Part 4: Highways	Reducing Vehicle-Train Crashes	26 fatalities involving a collision with a train	1%
	Keeping Vehicles on the Roadway	751 single vehicle run-off the road fatalities	31%
	Minimizing the Consequences of Leaving the Road	Top 5 most harmful events for single vehicle run -off the road fatalities were: - Overturn/Rollover (50%) - Collision with a tree/shrubbery (17%) - Collision with an embankment/ditch/curb (10%) - Collision with a utility pole (3%) - Collision with guardrail (3%)	
	Improving the Design and Operation of Highway Intersections	873 fatalities at an intersection	36%
	Reducing Head-On and Across-Median Crashes	532 head-on and across-median fatalities	22%
	Designing Safer Work Zones	35 work zone fatalities	1%

TABLE 1-2
Summary of Minnesota's State Highway 2005-2009 Fatalities by AASHTO's Emphasis Area

	Emphasis Area	Minnesota Fatalities*	Percent
Part 5: EMS	Enhancing Emergency Medical Capabilities to Increase Survivability	In 2007, the average response time (time of crash to arrival hospital) was 47.4 minutes for 85 rural fatal crashes. For 42 urban fatal crashes, the average response time was 37.0 minutes.***	
Part 6: Manage-ment	Improving Information and Decision Support Systems	-- Not Quantifiable --	
	Creating More Effective Processes and Safety Management Systems	-- Not Quantifiable --	

* Source: Minnesota Crash Records (2005 – 2009); not including fatalities due to the I-35W Bridge collapse.
** Between 2005 and 2009, there were 1,824 vehicle occupant fatalities.
*** Information regarding EMS response times was from *Traffic Safety Facts 2007* (Source: NHTSA).
NOTE: Between 2005 and 2009, there were 2,209 fatal crashes that resulted in 2,427 fatalities.

Based on the results shown in Table 1-2, the top ten Emphasis Areas for the Mn/DOT state transportation system are documented in Table 1-3.

TABLE 1-3
Mn/DOT State Highway Top Ten Safety Emphasis Areas

Top 10 Emphasis Areas (Based on 2005-2009 MN Data)	Related Fatalities		Rank	CEAs included in 2007 MN SHSP
	Number	%		
Increasing Seat Belt Usage and Improving Airbag Effectiveness	891	49%	**1**	✓
Improving the Design and Operation of Highway Intersections	873	36%	**2**	✓
Reducing Impaired Driving	841	35%	**3**	✓
Keeping Vehicles on the Roadway (combined with Minimizing the Consequences of Leaving the Road)	751	31%	**4**	✓
Curbing Aggressive Driving	638	26%	**5**	✓
Instituting Graduated Licensing for Young Drivers	532	22%	**6**	✓
Reducing Head-On and Across-Median Crashes	495	20%	**7**	✓
Sustaining Proficiency in Older Drivers	461	19%	**8**	
Keeping Drivers Alert	397	16%	**9**	
Making Truck Travel Safer	386	16%	**10**	
Increasing Driver Safety Awareness				✓
Improving Information and Decision Support Systems				✓

Source: Minnesota Crash Records; not including fatalities due to the I-35W Bridge collapse.
2005-2009: 2,209 fatal crashes; 2,427 fatalities; 1,824 vehicle occupant fatalities

1.1.3 Area Transportation Partnership (ATP) and County Context

During development of the Minnesota SHSP, detailed county-level crash analysis was identified as a potential low cost countermeasure that could reduce the number of fatal and life changing crashes. Based on this observation, Mn/DOT has undertaken development of a Roadway Safety Plan for each Minnesota ATP and county.

The plans document ATP and county-specific crash trends, along with the range of available proactive safety measures to address these trends. The plans are intended to assist county engineers in identifying corridors that may benefit from systematic, low-cost safety improvements. Once corridors have been identified, county engineers can then more effectively prioritize the county's roadway safety needs and systematically implement safety measures across the entire county. These safety plans will provide counties an advantage towards securing future safety funding because systematic identification of crash problems and potential countermeasures is currently the focus of funding safety projects at the state and national level, and will be for the foreseeable future.

1.1.4 Partnering Agencies and Organizations

The national and Minnesota SHSPs were developed through coordination with a variety of stakeholders from public and private agencies. In Minnesota, the SHSP and this CRSP process includes working with stakeholders outside of the traditional safety planning process—including planning organizations, cities, or tribal units of government—when developing countermeasures to address county-specific safety issues. Individuals representing the 4 Es (Engineering, Education, Enforcement, and Emergency Medical Services) were invited to participate in the CRSP process. Those representing other modes of transportation—bicycle, pedestrian, commercial vehicles, motorcycles, etc.—were also encouraged to participate.

1.2 CRSP Delivery Phases and Schedule

The CRSP Project has been broken into four phases, as shown in Figure 1-4. Each phase covers at least two ATPs; Phases 2 through 4 also include individual planning efforts for counties located in the Twin Cities metropolitan area.

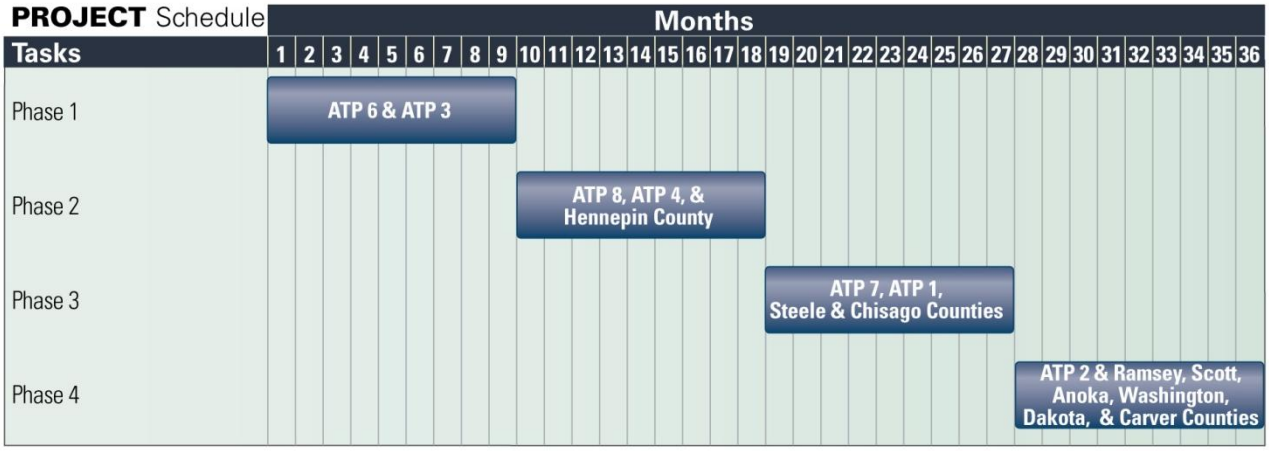


Figure 1-4
CRSP Schedule of Delivery, 4 Phases

The timing of these phases is as follows:

- Phase I—November 2009 through August 2010
- Phase II—August 2010 to May 2011
- Phase III—May 2011 to February 2012
- Phase IV—February 2012 to October 2012

1.3 CRSP Project Approach

Figure 1-5 shows the approach used to develop the CRSPs during Phase II for counties included in ATPs 4 and 8. Beginning with the crash analyses for each county and concluding with these CRSP reports, this process is the culmination of more than a year of working with Mn/DOT and involved counties.

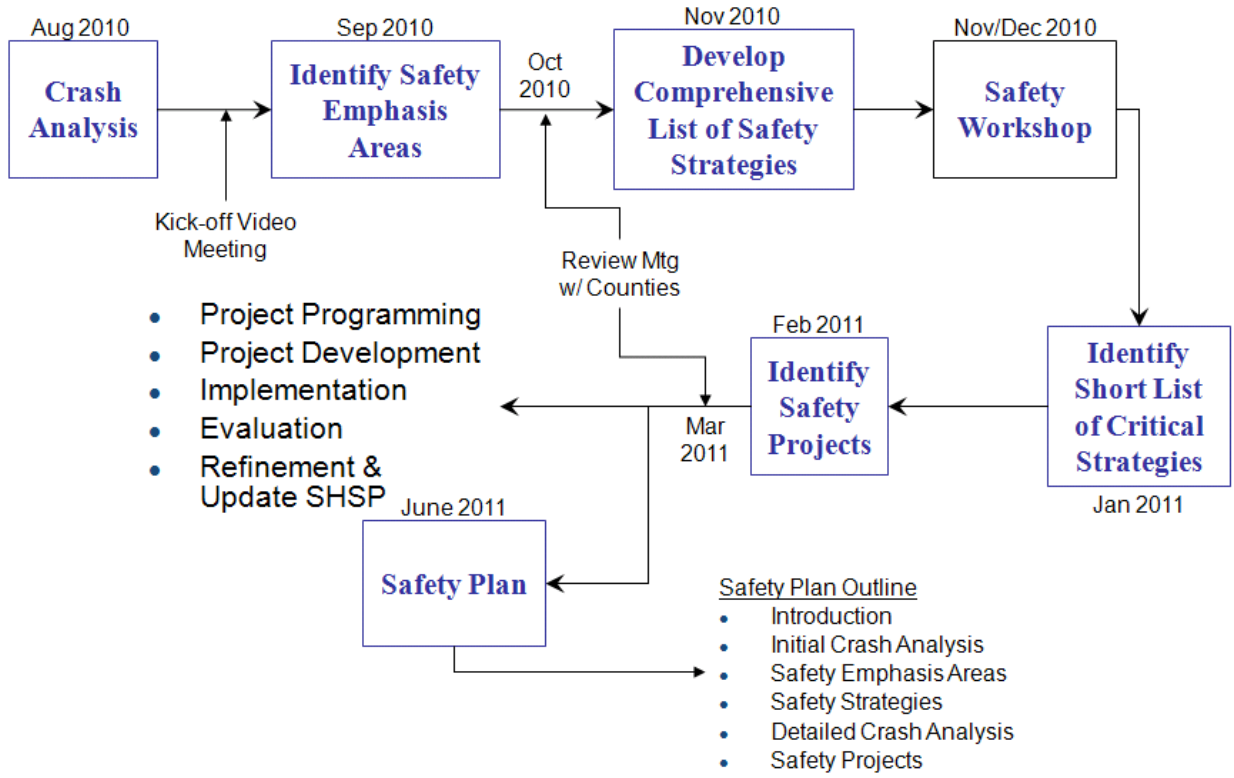


Figure 1-5
CRSP Project Approach

Table of Contents

2.0 ATP 4 Overview 2-1
2.1 Minnesota Crash Mapping Analysis Tool 2-1
2.2 Crash Data Sets 2-1
2.3 Facilities Analyzed 2-2
2.4 Information Provided by Counties 2-2
2.4.1 Segmentation of County Roads 2-2
2.4.2 Distance From Previous STOP Sign 2-3
2.5 ATP 4 Crash Disaggregation 2-3
2.6 Top Five Critical Emphasis Areas for ATP 4 2-5
2.6.1 ATP 4 Top 5 Critical Emphasis Areas 2-5
2.7 Safety Strategies for Counties in ATP 4 2-6
2.7.1 NCHRP Safety Strategies 2-6
2.7.2 Safety Strategies Brought to Safety Workshops 2-7
2.8 ATP 4 Safety Meetings 2-15
2.8.1 Project Kickoff Meeting 2-15
2.8.2 County Safety Review Meeting 1 2-15
2.8.3 Safety Strategies Workshops 2-16
2.8.4 County Safety Review Meeting 2 2-16
2.9 Use of Crash Surrogates to Identify Candidates for Safety Investment 2-17
2.9.1 Black Spot Method 2-17
2.9.2 Systemic Method 2-18
2.10 Identification and Prioritization of At Risk Locations 2-19
2.10.1 Rural Gravel Segments 2-19
2.10.2 Prioritizing Rural CSAH/CR Segments 2-20
2.10.3 Prioritizing Curves on Rural CSAH/CR System 2-21
2.10.4 Rural STOP Controlled Intersections 2-22
2.11 Application of Safety Strategies to At Risk Locations 2-23
2.11.1 Infrastructure Based Safety Projects 2-23

2.0 ATP 4 Overview

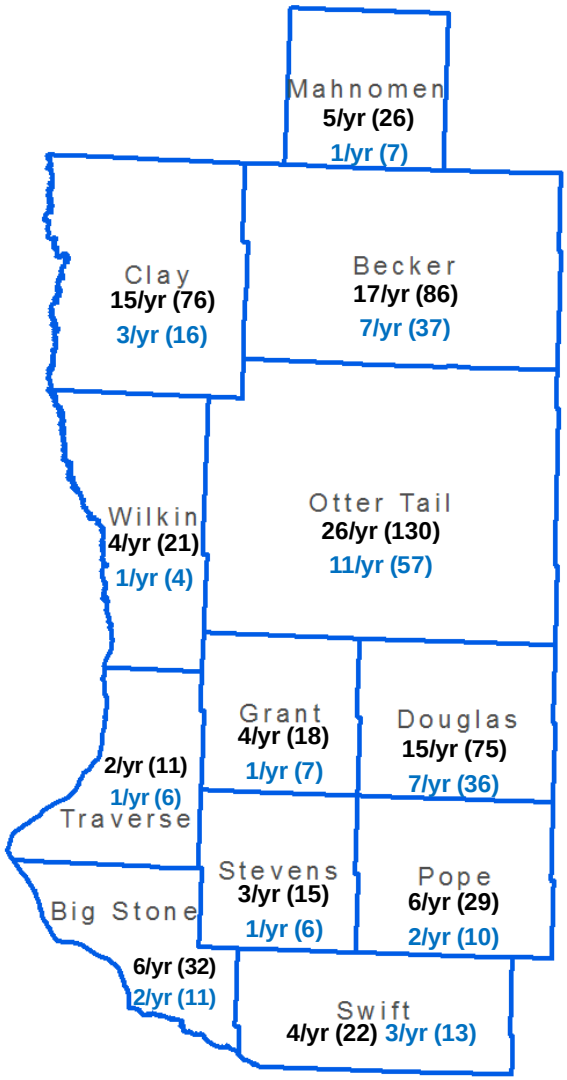
The first step in the process is conducting a crash analysis overview of each county and the ATP as a whole.

2.1 Minnesota Crash Mapping Analysis Tool

Crash analyses for counties were done using the Minnesota Crash Mapping Analysis Tool (MnCMAT). This map-based computer application provides a crash database for every Minnesota county and spatially locates individual crashes by reference point along all roadways in a county. Over 70 pieces of information are provided for each crash, including: route, reference point, day/date/time, severity, crash and road characteristics, and driver condition.

2.2 Crash Data Sets

For both the ATP and individual counties, a data set consisting of five years of crash records was assembled. For all counties included in ATP 4, this data set included a total of 16,311 crashes for the years 2005-2009. Data for 2005-2009 was used as this was the most recent data available when the analysis of Phase II began.



Legend
15/yr (76 total) - Severe crashes on any jurisdiction
3/yr (16 total) - Severe crashes on CSAH/CR

MnCMAT Crash Data, 2005-2009
Severe = K (fatal) + A (life-changing injury)

Figure 2-1
ATP 4 Crash Overview

When performing safety analyses, it is generally recommended to use more than one year of data to reduce the possibility of basing recommendations on the events of a single, possibly a-typical year. Using five years of data provides statistically reliable results. However, using more than five years of data increases the possibility that results will reflect road conditions that no longer exist; this may occur if a roadway has been reconstructed, traffic control or speed limits have changed, etc.

Additionally, it is recommended to analyze datasets of 100 data points to produce statistically reliable analysis. For a majority of counties in ATP 4, the number of severe crashes in each county, as shown in Figure 2-1, does not support a statistically reliable dataset. The approach this project took was to use ATP totals and provide a comparison to the county data.

2.3 Facilities Analyzed

The crash analysis was broken into three main facility types: segments, curves and intersections.

1. Segments analyzed in this project included only paved CSAH or CR roads. Gravel roads were removed from the detailed analysis due to lack of infrastructure based strategies that can be applied to gravel roads and the fact that gravel roads only account for a low percentage of severe crashes (see Section 2.10.1).
2. Intersections included the analysis of CSAH and CR with state highways (US and TH), other county roads (CSAH and CR) or Municipal State-Aid roads. CSAH or CR intersecting with Township roads were removed from the analysis due to the very low number of crashes at these types of intersections.
3. Paved curves on CSAH and CR were included in the analysis if the radius was less than 3,000 feet. When a curve's radius exceeds 3,000 feet, the crash rate of the curve nears the expected crash rate of tangent sections.

2.4 Information Provided by Counties

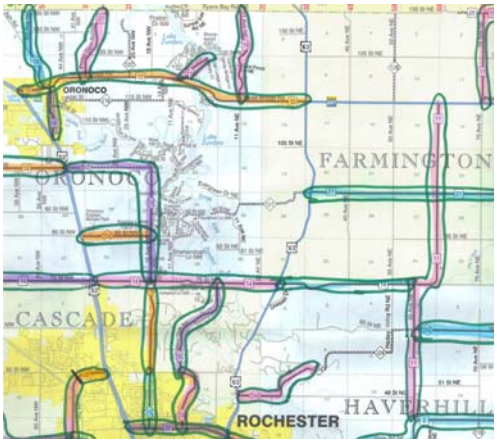
The initial list of intersections, segments and curve locations was assembled and then submitted to the counties for review and revising, where necessary. The counties then identified in-place traffic control devices, street lights and other information describing their facilities. This is the complete list of information provided by the counties for intersections and roadway segments:

Intersections

- Traffic control devices
- Street lights
- Distance from previous STOP sign (see section 2.4.2)

Segments

- Logical termini
- Facility type (2-lane, 4-lane, etc.)
- Installed rumble strips (center and/or edgeline)
- Installed chevrons



Route	#	Start	End
CSAH	3	South County Line	TH 30
CR	135	CSAH 3	East County Line

Figure 2-2
Sample County Road Segmentation

2.4.1 Segmentation of County Roads

Properly segmenting roadways into logical termini is important for identifying safety projects (see Figure 2-2). Segments should have similar speed limits, average daily traffic (ADT), and geometrics. In rural areas, roadway segments should range from three to ten miles; with a minimum segment length of one mile and maximum of 15 miles.

2.4.2 Distance From Previous STOP Sign

For thru-STOP and all-way STOP intersections, counties documented whether any STOP-leg approaches have a controlled approach with more than five miles from the previous stop sign (see Figure 2-3). This information is important because it has been identified as a risk factor associated with STOP-controlled intersections, including drivers being drowsy or not anticipating the stop sign. Research has indicated that STOP controlled intersections that are more than 5 miles from the previous STOP sign are more at-risk for intersection-related crashes. The reasons behind the increased risk are not completely understood –it may be related to drivers being less attentive to advance intersection warnings the longer they drive without seeing a STOP sign. This observed increased risk related to the distance to the previous STOP sign does NOT in any way translate to a suggestion to add STOP signs. It may suggest, depending on the presence of other risk factors (traffic volume, geometry, railroad crossing, etc) the need to consider improvements at the existing STOP controlled intersection.

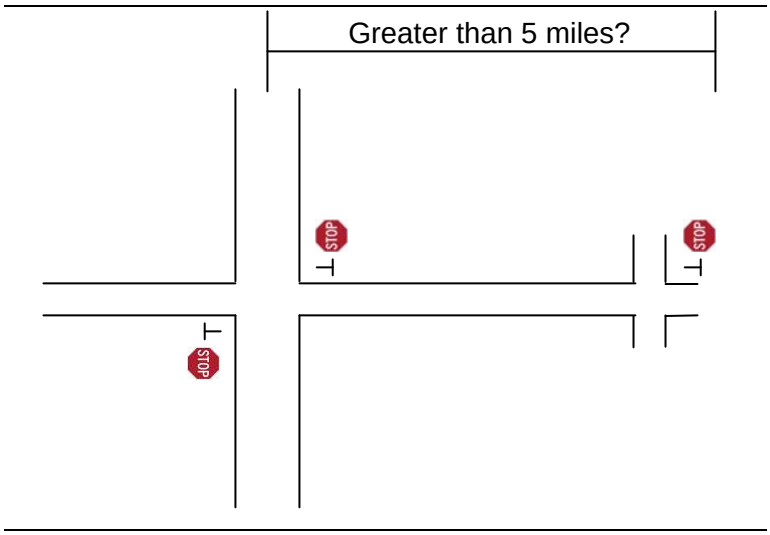
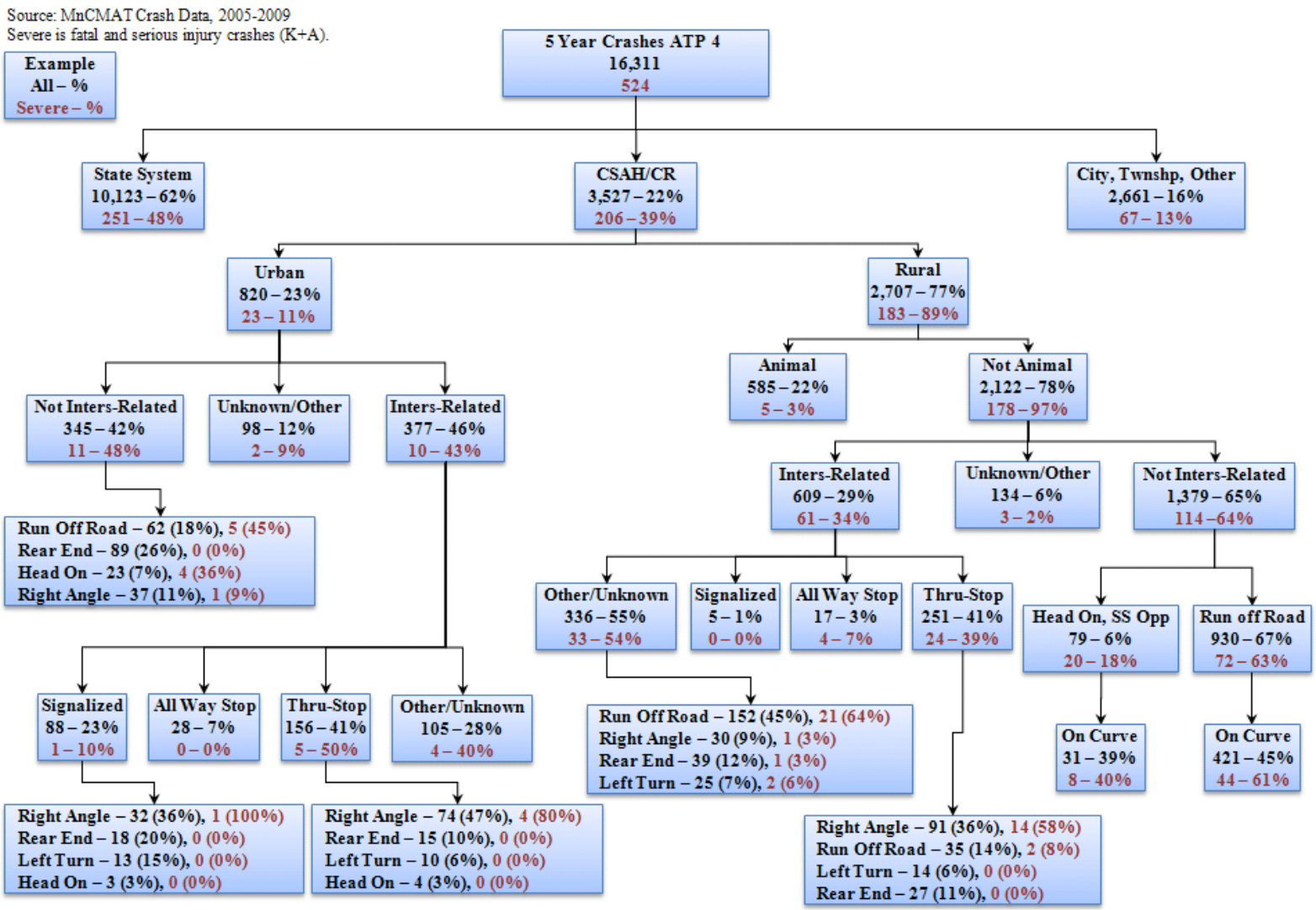


Figure 2-3
Distance from Previous STOP Sign

2.5 ATP 4 Crash Disaggregation

Figure 2-4 on the following page illustrates the disaggregated results for all crashes that occurred in ATP 4 from 2005-2009. Some highlights from this data set include:

- 39% of severe crashes occurred on the county system (CSAH and CR), whereas 48% occurred on the state system
- 89% of severe crashes on the county system occurred in rural areas
- 63% (72 of 183) of severe rural crashes are road departure crashes. Of these crashes, 61% occurred on curves
- 34% (61 of 183) of severe rural crashes on the county system are intersection related



NOTE: Categories shown are to highlight key crash data – since not all crash data is shown percentages may not add up to 100%.

Figure 2-4
ATP 4 County Crash Data Overview

2.6 Top Five Critical Emphasis Areas for ATP 4

The second step of the process involves identifying the Safety Emphasis Areas. These emphasis areas were originally identified by AASHTO and FHWA to provide a measure of consistency across the states in assigning severe crashes to specific categories. In addition, identifying safety emphasis areas represents the initial effort to help states and counties prioritize their safety planning efforts. The safety emphasis areas are pools of similar types of crashes that represent the greatest opportunities for reductions in severe crashes. The emphasis areas also assist in the identification of a short list of potential safety strategies. The notion being that most safety strategies are intended to mitigate a specific type of crash, instead of all severe crashes. As a result, the most comprehensive source of suggested safety strategies (the NCHRP 500 series) is broken down by safety emphasis areas:

2.6.1 ATP 4 Top 5 Critical Emphasis Areas

The results of the crash data analysis for ATP 4 in relation to AASHTO's 22 Safety Emphasis Areas are summarized in Table 2-2. Based on the crash analysis, the top five Safety Emphasis Areas for ATP 4 are:

- Aggressive driving and speeding
- Drug and alcohol-related
- Unbelted vehicle occupants
- Road departure crashes
- Intersection crashes

ATP 4's emphasis areas were generally consistent with the State's emphasis areas. However, unlike the State's emphasis areas, ATP 4 does not include the "young drivers (under 21)" emphasis area. Instead, ATP 4 has the emphasis area "Aggressive driving and speeding."

Strategies to reduce crashes depend on whether a CEA is infrastructure-based or driver-behavior-based. Infrastructure-based emphasis areas refer to characteristics of the area in which crashes occur. Driver-behavior-based emphasis areas refer to motorist characteristics or actions that contribute to crashes. ATP 4's top five CEAs can be categorized as shown in Table 2-1.

Because driver behavior is tied to laws made at the national or state level, agencies generally have less ability to address driver-behavior-based CEAs. The most effective approach to addressing driver-behavior-based CEAs is to focus on public education, law enforcement, and cooperation and collaboration with other county departments, agencies, and schools. There are generally more opportunities for counties to address infrastructure-based CEAs, as many of the associated strategies can be implemented as separate roadway improvement projects, or along with other planned improvements. The infrastructure-based and driver behavior-based strategies brought to the participants of the workshops are listed in Tables 2-3 through 2-10.

TABLE 2-1
Infrastructure-based and Driver Behavior-based Critical Emphasis Areas

Infrastructure-based CEAs
Road Departure Crashes
Intersection Crashes
Behavior-based CEAs
Aggressive driving and speeding
Drug and alcohol-related
Unbelted vehicle occupants

TABLE 2-2
ATP 4 Critical Emphasis Areas, Based on Crash Data Analysis

Emphasis Area		Statewide %	ATP 4 (CSAH/CR)	
Drivers	Young drivers (under 21)	26%	16%	(36)
	Unlicensed drivers	7%	7%	(16)
	Older drivers (over 64)	13%	15%	(34)
	Aggressive driving and speeding-related	21%	27%	(62)
	Drug and alcohol-related	26%	39%	(89)
	Inattentive, distracted, asleep drivers	20%	19%	(43)
	Safety awareness	- -	-	-
	Unbelted vehicle occupants	26%	38%	(87)
Special Users	Pedestrians crashes	8%	3%	(7)
	Bicycle crashes	4%	2%	(5)
Vehicles	Motorcycles crashes	15%	18%	(41)
	Heavy vehicle crashes	9%	7%	(16)
	Safety enhancements	- -	-	-
Highways	Train-vehicle collisions	0%	0%	(0)
	Road departure crashes	27%	49%	(113)
	Consequences of leaving road	- -	-	-
	Intersection crashes	42%	36%	(82)
	Head-On and Sideswipe (opposite) crashes	15%	23%	(54)
	Work zone crashes	1%	1%	(2)
EMS	Enhancing Emergency Capabilities	- -	-	-
Management	Information and decision support systems	- -	-	-
	More effective processes	- -	-	-
	Total Fatal and Serious Injury Crashes	9,122	230	

DPS Crash Data Records, 2005 to 2009

Critical Emphasis Areas (based on top 5 ATP 4 numbers)

Note: Numbers in this table do not add up to total crash numbers because one crash may be categorized into multiple emphasis areas. For example, one crash may involve a young driver at an intersection and therefore be included in both of these emphasis areas.

2.7 Safety Strategies for Counties in ATP 4

2.7.1 NCHRP Safety Strategies

A variety of strategies are available to address each Critical Emphasis Area by assisting state and local agencies reduce traffic-related fatalities and injuries. The National Cooperative Highway Research Program (NCHRP) has developed a series of guides that correspond to each of the 22 CEAs. This effort is part of NCHRP Project 17-18(3); Report 500 series. The guides correspond to the emphasis areas outlined in AASHTO's SHSP. Each guide includes a description of the problem, strategies for addressing the problem, and model implementation processes. The guides also categorize the safety strategies as proven, tried, and experimental, to provide practitioners with an idea of how wide-spread a particular strategy has been used. Proven strategies have been used in multiple locations with multiple studies showing them to be

effective. Tried strategies have been implemented in a number of locations but have not had rigorous evaluations completed to determine effectiveness. Experimental strategies represent ideas that have been considered sufficiently promising but have not been widely implemented or evaluated.

2.7.2 Safety Strategies Brought to Safety Workshops

NCHRP safety strategies were the basis for identifying safety strategies for ATP 4 and the counties. For the CRSP process, Mn/DOT and stakeholders sought to identify viable safety strategies for the top five Critical Emphasis Areas (see Section 2.6 and Figure 2-5), as well as young drivers and motorcyclists.

Even though the process sought safety strategies to address just five emphasis areas, there were still too many strategies for stakeholders to feasibly consider at workshops. Given this constraint, Mn/DOT and the CRSP team reviewed the full range of safety strategies, and did an initial screening based on cost and effectiveness. For example, the NCHRP report lists over 70 potential strategies to address intersection safety. The screening conducted by Mn/DOT's CRSP team narrowed this list down to twenty-six strategies considered to be the most applicable in ATP 4. These twenty-six strategies were then brought to the workshops and discussed with the workshop participants. The strategies considered to be the highest priority at the workshops were then brought to county staff.

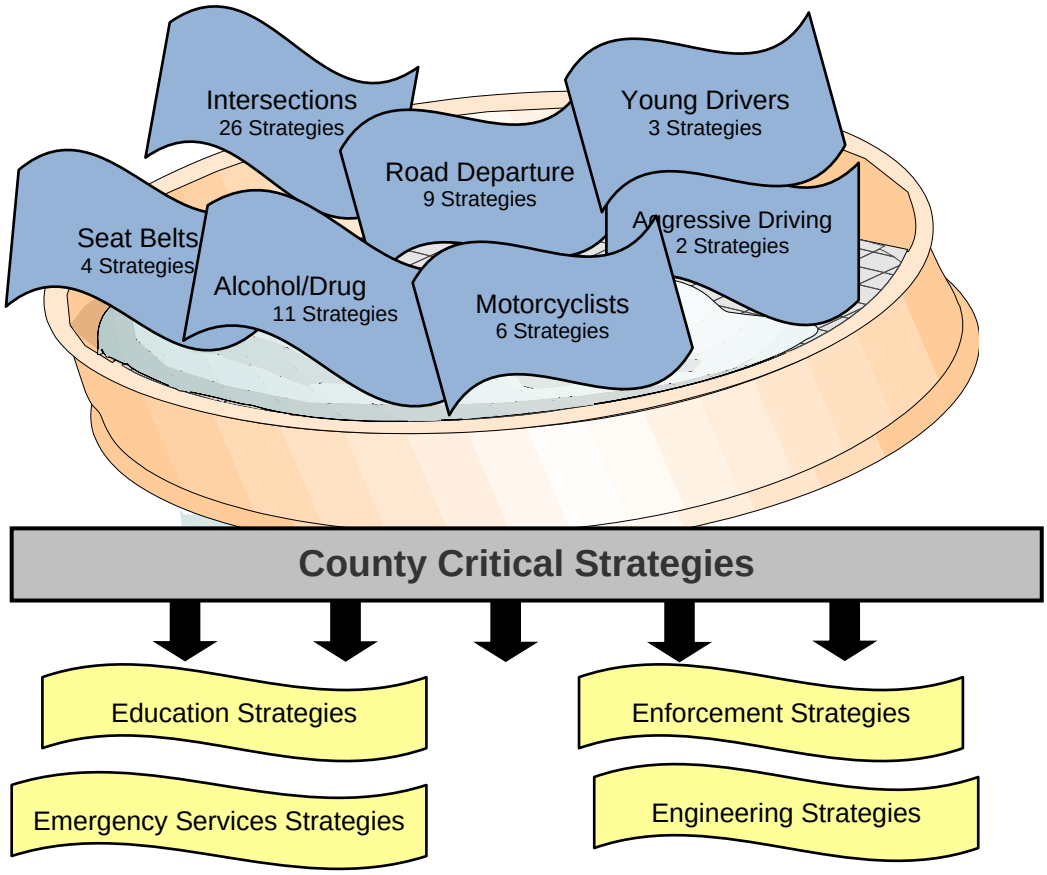


Figure 2-5
Screening of NCHRP Safety Strategies

TABLE 2-3
Infrastructure Safety Strategies Addressing Road Departure Crashes Considered at Safety Workshops

Objectives	Strategies	Relative Cost to Implement and Operate	Effectiveness	Typical Timeframe for Implementation
15.1 A—Keep vehicles from encroaching on the roadside	15.1 A1—Install shoulder rumble strips	Low	Proven*	Short
	15.1 A2—Install enhanced pavement markings, edgeline rumble strips or modified shoulder rumble strips on section with narrow or no paved shoulders	Low	Experimental/ Tried	Short
	15.1 A3—Install centerline rumble strips	Low	Proven*	Short
	15.1 A4—Provide enhanced shoulder or delineation and marking for sharp curves	Low	Tried/Proven	Short
	15.1 A5—Provide improved highway geometry for horizontal curves	High*	Proven	Long
	15.1 A8—Apply shoulder treatments: *Eliminate shoulder drop-offs; *Shoulder edge; *Widen and/or pave shoulders	Moderate*	Experimental/ Proven	Medium
	18.1 A-1-Install centerline rumble strips for two-lane roads	Low	Tried	Short
15.1 B—Minimize the likelihood of crashing into an object or overturning if the vehicle travels off the shoulder	15.1 B1—Design safer slopes and ditches to prevent rollovers	Moderate to High*	Proven	Medium
	15.1 B2—Remove/relocate objects in hazardous locations	Moderate to High	Proven	Medium

Relative Cost to Implement and Operate:
Low = <$10,000/mile; Moderate = $10,000-$100,000/mile; High = >$100,000/mile

Typical Timeframe for Implementation:
Short = < 1 year, Medium = 1-2 years, Long = > 2 years

Source: NCHRP 500 Series (2003); *Updated by CH2M HILL

TABLE 2-4
Infrastructure Strategies Addressing Intersection Crashes at Signalized Intersections Considered at Safety Workshops

Objectives	Strategies	Relative Cost to Implement and Operate	Effectiveness	Typical Timeframe for Implementation
17.2 A—Reduce frequency and severity of intersection conflicts through traffic control and operational improvements	17.2 A1—Optimize signal operation (phasing/timing, etc.)	Low	Tried/Proven	Short
	17.2 A2—Optimize clearance intervals	Low	Proven	Short
	17.2 A4—Employ signal coordination along a corridor or route	Low*	Proven	Medium
	17.2 A6—Improve operation of pedestrian and bicycle facilities at signalized intersections	Low	Tried/Proven	Short
	17.2 A7—Remove unwarranted/unnecessary signal	Low	Proven	Short
17.2 D -- Improve driver awareness of intersections and signal control	17.2 D2 -- Improve visibility of signals and signs at intersections	Low	Tried	Short
17.2 E -- Improve driver compliance with traffic control devices	17.2 E2 -- Supplement conventional enforcement of red-light running with confirmation lights	Low	Tried	Short
17.2 F—Improve access management near signalized intersections	17.2 F1—Restrict access to properties using driveway closures or turn restrictions	Low	Tried	Short
	17.2 F2—Restrict cross-median access near intersections	Low	Tried	Short
17.2 G -- Improve safety through other infrastructure treatments	17.2 G5 -- Restrict or eliminate parking on intersection approaches	Low	Proven	Short

Relative Cost to Implement and Operate:
Low = <$50,000/intersection; Moderate = $50,000-$500,000/intersection; High = >$500,000/intersection

Typical Timeframe for Implementation:
Short = < 1 year; Medium = 1-2 years; Long = > 2 years

Source: NCHRP 500 Series (2003); *Updated by CH2M HILL

TABLE 2-5
Infrastructure Strategies Addressing Intersection Crashes at Unsignalized Intersections Considered at Safety Workshops

Objectives	Strategies	Relative Cost to Implement and Operate	Effectiveness	Typical Timeframe for Implementation
17.1 A—Improve management of access near unsignalized intersections	17.1 A1 -- Implement driveway closure/relocations	Moderate	Tried	Medium
	17.1 A2—Implement driveway turn restrictions	Low	Tried	Short
17.1 B -- Reduce the frequency and severity of intersection conflicts through geometric design improvements	17.1 B12 -- Restrict or eliminate turning maneuvers by providing channelization or closing median openings	Low	Tried	Short
	17.1 B13 -- Close or relocate "high-risk" intersections	High	Tried	Long
	17.1 B16 -- Realign intersection approaches to reduce or eliminate intersection skew	High	Proven	Medium
	17.1 B17 -- Use indirect left-turn treatments to minimize conflicts at divided highway intersections	Moderate	Tried	Medium
17.1 C -- Improve sight distance at unsignalized intersections	17.1 C1 -- Clear sight triangle on stop- or yield-controlled approaches to intersections	Low	Tried	Short
17.1 D -- Improve availability of gaps in traffic and assist drivers in judging gap sizes at unsignalized intersections	17.1 D1 -- Provide an automated real-time system to inform drivers of suitability of available gaps for making turning and crossing maneuvers	Moderate	Experimental	Medium
17.1 E -- Improve driver awareness of intersections as viewed from the intersection approach	17.1 E1 -- Improve visibility of intersections by providing enhanced signing and delineation	Low	Tried	Short
	17.1 E2 -- Improve visibility of intersections by providing lighting	Moderate to High	Proven	Medium
	17.1 E3 -- Install splitter islands on the minor-road approach to an intersection	Moderate	Tried	Medium
	17.1 E4 -- Provide a stop bar (or provide a wider stop bar) on minor-road approaches	Low	Tried	Short
	17.1 E6 -- Call attention to the intersection by installing rumble strips on intersection approaches	Low	Tried	Short
17.1 F -- Choose appropriate intersection traffic control to minimize crash frequency and severity	17.1 F3 -- Provide roundabouts at appropriate locations	High	Proven	Long
17.1 H -- Reduce operating speeds on specific intersection approaches	17.1 H1 -- Provide targeted speed enforcement	Moderate	Proven	Short
	17.1 H2 -- Provide traffic calming on intersection approaches through a combination of geometrics and traffic control devices	Moderate	Proven	Medium

Relative Cost to Implement and Operate:
Low = <$50,000/intersection; Moderate = $50,000-$500,000/intersection; High = >$500,000/intersection

Typical Timeframe for Implementation:
Short = < 1 year; Medium = 1-2 years; Long = > 2 years

Source: NCHRP 500 Series (2003); *Updated by CH2M HILL

TABLE 2-6
Behavior-based Safety Strategies Addressing Young Driver (under 21) and Bicycle Crashes Considered at Safety Workshops

Objectives	Strategies	Effectiveness	Programs & Tactics*	Impact
1.1B—Publicize, enforce, and adjudicate laws pertaining to young drivers	1B—Publicize and conduct a high visibility enforcement Graduated Drivers License restrictions, underage drinking and driving and seatbelt laws	Proven	Publicizing is best done through community events for the local media and a public education campaign in the community about the enforcement. High visibility enforcement is when multiple jurisdictions and/or multiple squads are out at the same time patrolling in brightly colored vests and signage about the enforcement.	High
1.1C—Assist parents in managing their teens' driving	1C.1—Engage parents through outreach programs designed to educate parents about driving tips for their teens, facilitate parental supervision and management of young drivers, encourage selection of safety vehicles for young drivers.	Tried	N/A	Medium
Ensuring Safety Bicycle Travel	10D—Increase bicycle helmet usage, enhanced enforcement of bicycle laws and publicize issues		Advocate for policy change	Low

Source: NCHRP 500 Series (2003); *Revised by Mn/DOT Office of Traffic, Safety and Technology

TABLE 2-7
Behavior-based Safety Strategies Addressing Drug and Alcohol Related Crashes Considered at Safety Workshops

Objectives	Strategies	Effectiveness	Programs & Tactics*	Impact
5.1 A—Eliminate Drinking and Driving*	5.1 A2—Require Responsible Beverage Service Policies for Alcohol Servers and Retailers	Proven	Advocate for Server Training and strong management support	Medium
	5.1 A4—Employ Screening and Brief Interventions	Tried	These do not need to be in health care settings. A screening and brief intervention could be very effective after a DWI arrest (traumatic event)	Medium
	5.1 A5—Support Community Programs for Alternative Transportation*	Tried	Safe Cab is a partnership between beer distributors, bar owners and community program in Isanti County.	Medium
5.1 B—Enforce DWI Laws	5.1 B1—Conduct Regular Well-Publicized DWI Saturations*	Proven	A saturation is a multi-agency, multi-squad car enforcement effort. These agencies and cars enforce the same community or roadway with the number of squad cars proportionate to the community size.	HIgh
	5.1 B3—Conduct education and awareness campaign of the targeted enforcement of Zero Tolerance Laws for Drivers Under Age 21*	Proven	Publicizing is best done through community events for the local media and a public education campaign in the community about the enforcement. High visibility enforcement is when multiple jurisdictions and/or multiple squads are out at the same time patrolling in brightly colored vests and signage about the enforcement.	Low
5.1 C—Prosecute, Impose Sanctions on, and Treat DWI Offenders	5.1 C1—Suspend Driver's License Administratively Upon Arrest	Proven	Minnesota revokes driving privileges 7 days after alcohol test failure of 0.08 or above or test refusal	High
	5.1 C3—Eliminate Diversion Programs and Plea Bargains	Tried	N/A	High
5.1 D—Control High-BAC and Repeat Offenders	5.1 D2—Require Ignition Interlocks as a Condition for License Reinstatement	Proven	Governor proposed legislation in Jan 2010	High
	5.1 D3—Monitor Convicted DWI Offenders Closely	Proven	DWI courts or Intensive Supervision Programs	Low
	5.1 D4—Include stronger sentence guidelines that are enforced	Proven	DWI courts or Intensive Supervision Programs	Low

Source: NCHRP 500 Series (2003); *Revised by Mn/DOT Office of Traffic, Safety and Technology

TABLE 2-8
Behavior-based Safety Strategies Addressing Unbelted Vehicle Occupant Crashes Considered at Safety Workshops

Objectives	Strategies	Effectiveness	Programs & Tactics*	Impact
8.1 A—Maximize use of occupant restraints by all vehicle occupants	8.1 A1—Conduct highly publicized enforcement campaigns to maximize restraint use. Specifically, night time belt enforcement saturation*	Proven	Publicizing is best done through community events for the local media and a public education campaign in the community about the enforcement. High visibility enforcement is when multiple jurisdictions and/or multiple squads are out at the same time patrolling in brightly colored vests and signage about the enforcement. Methods for night time enforcement include having multi-agency and multiple squad cars in well lit areas where slow moving vehicles are passing and conducting for a limited time slot.	High
	6.1 D3—Encourage employers to 1)offer education programs to employees and to 2)enact traffic safety policies with clear consequences for failure to comply	Proven	Utilize materials and policy statements designed for employers by Network of Employers for Traffic Safety	Unknown
8.1 B—Ensure that restraints, especially child and infant restraints, are properly used	8.1 B2—Conduct high-profile "child restraint inspection" events at multiple community locations.	Proven	N/A	Low
	8.1 B3—Train advocates to check for proper child restraint use.	Tried	N/A	Low

Source: NCHRP 500 Series (2003); *Revised by Mn/DOT Office of Traffic Safety

TABLE 2-9
Behavior-based Safety Strategies Addressing Aggressive Driving at Safety Workshops

Objectives	Strategies	Effectiveness	Programs & Tactics*	Impact
4.1 – Deter aggressive driving in specific populations, including those with a history of such behavior, and at specific locations	4.1 A1- Publicize and conduct high visibility targeted enforcement of speeding and aggressive driving	Tried	Publicizing is best done through community events for the local media and a public education campaign in the community about the enforcement. High visibility enforcement is when multiple jurisdictions and/or multiple squads are out at the same time patrolling in brightly colored vests and signage about the enforcement.	High
	4.1 A3- Impose sanctions against repeat offenders	Experimental		unknown

Source: NCHRP 500 Series (2003); *Revised by Mn/DOT Office of Traffic, Safety and Technology

TABLE 2-10
Behavior-based Safety Strategies Addressing Motorcycle Crashes Considered at Safety Workshops

Objectives	Strategies	Effectiveness	Programs & Tactics*	Impact
11.1 B Reduce the number of motorcycle crashes due to rider impairment **11.1 C Reduce the number of motorcycle crashes due to unlicensed or untrained motorcycle riders**	*Publicize and conduct a high visibility enforcement of all laws pertaining to motorcycle riding.	Proven	Publicizing is best done through community events for the local media and a public education campaign in the community about the enforcement. High visibility enforcement is when multiple jurisdictions and/or multiple squads are out at the same time patrolling in brightly colored vests and signage about the enforcement. Methods for night time enforcement include having multi-agency and multiple squad cars in well lit areas where slow moving vehicles are passing and conducting for a limited time slot.	High
	*11.1 B3-Target law enforcement to specific motorcycle rider impairment behaviors that have been shown to contribute to crashes.	Proven	Motorcycle DWI Detection Guide or Detection of DWI Motorcyclists	Medium
	11.1 C2 Ensure that licensing and rider training programs adequately teach and measure skills and behaviors required for crash avoidance.	Tried	*Training courses provided around the state at Motorcycle Safety Center training sites.	Low
11.1 D Increase visibility of riders	11.1 C3 Identify and remove barriers to obtaining a motorcycle endorsement.	Tried	*Licensing laws: Motorcycle Skills Testing Program- From our own survey of participants, we found that approximately 1/3 would not have bothered to obtain their endorsement if it wasn't for this program.	Medium
	11.1 D1 Increase the awareness of the benefit of high-visibility clothing *Rider conspicuity: NHTSA's guidelines for motorcycle safety programs recommend that states educate riders on how to be more conspicuous to other drivers, and we have good resources via www.highviz.org .	Experimental	Publicizing is best done through the local media and a public education campaign in the community.	Low
11.1 E Reduce the severity of motorcycle crashes	11.1 E1 Increase the use of FMVSS 218 compliant helmets.	Proven	Pass statewide legislation requiring helmets for all riders.	High

Source: NCHRP 500 Series (2003); *Revised by Mn/DOT Office of Traffic, Safety and Technology

2.8 ATP 4 Safety Meetings

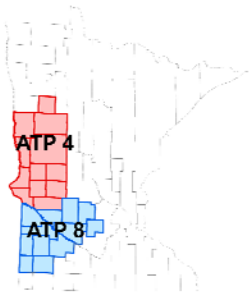
A series of meetings were conducted with each county during the project. The following is a summary of the various meetings.

2.8.1 Project Kickoff Meeting

On August 12, 2010, representatives from ATP 4 and ATP 8 met via video conference for a CRSP project kickoff meeting. Counties and engineers participating in Phase II of the CRSP are listed below (Figure 2-6).

ATP 4

- Becker – Brad Wentz
- Big Stone – Nicholas Anderson
- Clay - David Overbo
- Douglas - David Robley
- Grant – Tracey Von Bargen
- Mahnomen – Jon Large
- Otter Tail – Richard West
- Pope – Brian Noetzelman
- Stevens – Brian Giese
- Swift – Andy Sander
- Traverse – Larry Haukos
- Wilkin – Tom Richels



ATP 8

- Chippewa – Steve Kubista
- Kandiyohi – Gary Danielson
- Lac Qui Parle – Steve Kubista
- Lincoln – Lee Amundson
- Lyon – Sahail Kanwar
- McLeod – John Brunkhorst
- Meeker – Ronald Mortensen
- Murray – Randy Groves
- Pipestone – David Halbersma
- Redwood – William Rabenberg
- Renville – Marlin Larson
- Yellow Medicine – Andy Sander

Figure 2-6
CRSP Kickoff Meeting (August 12, 2010) Participants

2.8.2 County Safety Review Meeting 1

Two ATP 4 Statewide Roadway Safety Plan review meetings were held in October 2010. Prior to attending these meetings, Mn/DOT's CRSP team completed crash analyses for each county within the ATP 4. The results of these analyses were shared with the county engineers. The CRSP process was described, including a discussion of the safety strategies workshops that were held in December 2010. The first county safety review meeting was held on October 27, 2010, and was attended by representatives from the following counties:

- Becker
- Clay
- Douglas
- Otter Tail
- Mahnomen
- Wilkin

The second meeting was held on October 28, 2010, and was attended by representatives from the following counties:

- Grant
- Big Stone
- Traverse
- Pope
- Stevens
- Swift

2.8.3 Safety Strategies Workshops

Three Safety Planning Workshops were held for counties located within ATP 4 during December 2010/January 2011. The primary focus of the safety workshops was discussion and prioritization of safety strategies. Specifically, meeting participants prioritized safety strategies for the top five critical emphasis areas for ATP 4, as described above in Section 2.6. Table 2-11 lists which counties participated in each of the three workshops.

All of the safety strategies listed in Tables 2-3 through 2-10 were brought to the safety workshops for consideration and discussion by meeting participants. The following two tables show the results of the prioritization exercise that occurred at these workshops. Table 2-12 lists the top ranked infrastructure strategies while Table 2-13 lists the top ranked behavioral strategies.

TABLE 2-11
ATP 4 Safety Work Shop Schedule and Participating Counties

Date	Participating Counties
December 13, 2010 Fergus Falls	Becker Clay Douglas Otter Tail
December 15, 2010 Fergus Falls	Grant Mahnomen Traverse Wilkin
January 12, 2011 Morris	Big Stone Pope Stevens Swift

2.8.4 County Safety Review Meeting 2

ATP 4 Statewide Roadway Safety Plan review meetings were held in March 2011. The first meeting was a webinar held on March 8, 2011. During this meeting, the CRSP process; the facility prioritization process; and the project development process were reviewed. Prior to attending this meeting, the CRSP team completed the prioritization of at-risk location process and generated a list of projects for review by the county. During the second meeting, two counties were brought in to discuss and share feedback on their projects.

TABLE 2-12
Top-ranked Infrastructure Safety Strategies, Based on ATP 4 Workshop Voting Results

Objectives	Strategies	Votes
15.1 A—Keep vehicles from encroaching on the roadside	15.1 A1—Install shoulder rumble strips	47
	15.1 A2—Install enhanced pavement markings, edge line rumble strips or modified shoulder rumble strips on section with narrow or no paved shoulders	29
	15.1 A4—Provide enhanced shoulder or delineation and marking for sharp curves	48
	15.1 A8—Apply shoulder treatments *Eliminate shoulder drop offs, safety wedge, and widen and/or pave shoulders	29
17.1 C—Improve sight distance at unsignalized intersections	17.1 C1 -- Clear sight triangle on approaches and in medians by clearing grub, eliminating parking, etc	14
17.1 E—Improve driver awareness of intersections as viewed from the intersection approach	17.1 E2—Improve visibility of intersections by providing lighting	41

TABLE 2-13
Top-ranked Behavior-based Safety Strategies, Based on ATP 4 Workshop Voting Results

Objectives	Strategies	Votes
1.1B—Publicize, enforce, and adjudicate laws pertaining to young drivers	1B—Publicize and conduct a high visibility enforcement GDL restrictions, cell and texting laws, underage drinking and driving and seatbelt laws	36
6.1 C—Increase driver awareness of the risks of drowsy and distracted driving and promote driver focus	6.1 C2—Conduct high visibility enforcement for existing statutes to deter distracted and drowsy driving	40
8.1 A—Maximize use of occupant restraints by all vehicle occupants	8.1 A1—Conduct highly publicized enforcement campaigns to maximize restraint use. Specifically, night time belt enforcement saturation.	57
5.1 B—Enforce DWI Laws	5.1 B1—Conduct Regular Well-Publicized DWI Saturations	33
4.1 A—Deter aggressive driving in specific populations, including those with a history of such behavior, and at specific locations	4.1 A1—Publicize and conduct high visibility targeted enforcement of speeding and aggressive driving	28
11.1E—Reduce the severity of motorcycle crashes	11.1 E1 increase the use of FMVSS 218 compliant helmets	26

2.9 Use of Crash Surrogates to Identify Candidates for Safety Investment

The current best practices approach to safety planning is based on the Federal Highway Administrations (FHWA) advice to be data driven when developing the statewide strategic highway safety plan. In practice this advice translates to disaggregating a states severe crashes (fatal + A injury) in order to identify categories of crashes with large numbers that represent the greatest opportunities for reductions. In addition, this analytical effort also identifies key characteristics – locations, systems, crash data (type, frequency, rate, density, severity, etc.) and contributing factors that provide insight about the development and deployment of highway safety improvement projects at specific candidate locations along an agency's highway system.

There are currently two primary analytical methods to support the identification of candidate locations for the allocation of safety resources – the "black spot" method and the systemic method.

2.9.1 Black Spot Method

The black spot method has been the one most commonly used by transportation agencies, suggested guidelines have been in published literature for more than 30 years and there has been a great deal of research conducted that has refined the process in attempts to achieve results with higher levels of statistical reliability. The objective of black spot analysis is to find locations that exhibit unusually high frequencies or rates of crashes. The base crash data are analyzed and problem locations are identified, prioritized and ranked. Infrastructure based countermeasures, such as improved roadway geometry or traffic control devices are then applied to address documented safety deficiencies at specific locations.

The technical analysis of black spots has historically considered all crashes because severe crashes are too rare (fatal and A-injury crashes generally account for about 2% of all crashes), too random and widely distributed geographically to efficiently identify specific problem locations. However, the use of all crashes as the safety performance measure generally points analysts toward locations with high traffic volumes in urban areas. As a result, common black spot locations are intersections, particularly signalized intersections along multi-lane urban arterial roadways.

Black spot analysis is clearly a necessary component of a comprehensive program to address safety deficiencies along Minnesota's highways. In urban areas, where traffic volumes and crash frequencies are high, black spot analysis will likely continue to be the most commonly used analytical technique for allocating safety resources. Intuitively, it seems to make sense to target limited safety funds at locations that have documented safety deficiencies. However, black spots analysis has not proven to be effective in Minnesota at reducing the number of fatal and serious injury crashes that are widely distributed across the State's 135,000 miles of roads – crashes that are not concentrated enough to identify candidate sites for improvement through a process that is based solely on the total number of crashes.

As proof of the limited ability of the black spot methodology to identify candidates for statewide safety investment, see the following examples.

1. Minnesota has a long history of identifying black spots and annually publishes a Top 200 list of intersections along the 12,000 trunk highway system based on crash cost, frequency and severity. These Top 200 intersections are overwhelmingly signalized (70%) and urban (69%). However, this approach does not do a very good job of identifying intersections with fatal crashes (fewer than 10% of fatal crashes occurred at intersections in the Top 200 list) and it does not adequately identify at-risk intersections in rural areas where 66% of intersection related fatalities occur.

2. A comprehensive review of 1,862 intersections in 12 counties in ATP 4 found a total of 191 crashes per year (an average of less than 0.10 crashes per intersection per year) of which 71 were severe (occurring at approximately 4% of all intersections, and an average of 0.01 severe crashes per intersection per year). Out of the 1,862 intersections, only three (less than 0.2%) were found to have had two fatalities in a five year period. These three intersections averaged between less than one to two total crashes per year. As a result, even though these three intersections are the worst in a twelve county area (based on fatalities), they would not have ranked high enough to enter the Highway Safety Improvement Program (HSIP) as black spots.

2.9.2 Systemic Method

The systemic method has been added to the safety planning process in Minnesota to better address the over representation of severe crashes, the very low density of these crashes in rural areas and to complement the black spot component of the safety program. Approximately 70% of severe crashes occur in rural areas, but rural segments average approximately 0.01 severe crashes per mile per year, rural intersections average 0.02 severe crashes per intersection per year and there are virtually no black spots in these rural areas. The challenge associated with identifying candidates for safety investment in rural areas with low densities of severe crashes applies to both the state and local highway systems where severe crashes are almost equally divided.

The objective of the systemic method is the same as for the black spots, to identify candidates for the deployment of safety improvement projects. However, this method makes one fundamental change in the approach. The black spot method assumed that the presence of

(large numbers of) crashes equaled risk and that the absence of crashes indicated that there was no risk. The systemic method is based on the assumption that the absence of crashes does not equate to no risk.

The adoption of this premise about risk presented one very significant challenge – Mn/DOT previously had no method to assess risk using any measure other than crashes. In order to support the development of a new approach that defines risk based on crashes plus a variety of surrogate measures, research was conducted that identified rural segments and intersections with crashes and then documented the geometric and traffic features that were common among the various locations. This research identified a series of risk rating factors that could then be applied to the analysis of the key elements of rural systems – segments, horizontal curves and intersections in order to help distinguish those elements that are most at-risk.

This risk rating method can then be used to help answer the question – are all miles of rural segments, all horizontal curves and all intersections on my system equally at risk? The incorporation of this method into the process of preparing strategic highway safety plans for rural Mn/DOT Districts and counties suggests that the answer is NO; only about 15% to 20% of these facilities represent a high risk of severe crashes and therefore appear to be good candidates for safety investment through Minnesota's Highway Safety Improvement Program (HSIP).

A description of the risk rating factors that were applied to rural road segments, horizontal curves and intersections is provided in the following paragraphs.

2.10 Identification and Prioritization of At Risk Locations

The crash overview of each county in ATP 4 indicated that the elements of their system that contained the greatest number of severe crashes, and therefore represent the greatest opportunity for crash reduction include; rural segments, curves and intersections. The analytical process used to identify risk and prioritize specific locations is described in the following paragraphs.

TABLE 2-14
ATP 4 Segment Summary

County	Gravel Mileage	Severe Crashes on Gravel	Paved Mileage	Severe Crashes on Paved
Becker	211	2	433	18
Big Stone	240	0	157	1
Clay	448	3	256	6
Douglas	140	3	352	16
Grant	289	1	149	2
Mahnomen	141	2	132	3
Otter Tail	0	0	1004	32
Pope	107	2	243	7
Stevens	N/A	0	163	0
Swift	226	1	218	14
Traverse	361	4	119	0
Wilkin	292	0	199	3
Total	**2,452**	**18**	**3,425**	**102**

Note: Some counties removed gravel roads from analysis, thus mileage could not be determined

2.10.1 Rural Gravel Segments

The twelve counties in ATP 4 are responsible for the operation of 5,877 miles of County State Aid Highway and County Roads, of which 3,425 miles are paved and 2,452 miles are gravel. In order to focus the analytical efforts on the roadways that represent the greatest opportunity for crash reduction, the first step in the process disaggregated severe crashes on the system by road surface – paved versus gravel. This analysis determined that gravel roads make up 42% of the system but fewer than 15% of all severe crashes occur on these roads. In addition, one-third of the counties have no severe crashes on their gravel roads and no county averages one severe crash per year on these roads. As a result, the analytical process focuses

on the paved roads where over 85% of the severe crashes occur and includes an overview of the gravel roads to confirm that there are no locations with multiple severe crashes.

2.10.2 Prioritizing Rural CSAH/CR Segments

A prioritization process was completed for the 3,425 miles of rural two-lane paved CSAH/CR segments in ATP 4 (Table 2-14). Levels of risk were assigned to a segment based on five risk factors. If a segment fit the criteria for a risk factor, it received a star. The highest priority segments have received the most stars (★). In cases where segments received the same number of stars, tie breaks of risk assessment and then road departure density were used to determine priority. The risk factors are:

- ADT Range
- Access Density
- Road Departure Density
- Critical Radius Curve Density
- Edge Risk Assessment

For additional information regarding the risk factors, see section 3.3.1.

Table 2-15 is a summary of the ATP 4 segment prioritization. Approximately 30 percent of the mileage (1,237 miles out of a total 3,425 miles) was considered high priority and received a proposed project.

TABLE 2-15
ATP 4 Segment Prioritization Summary

		Number of Segments							
ATP 4	Total Mileage	5★	4★	3★	2★	★	-	High Priority Mileage	
Becker	433	5	17	27	34	25	1	202	47%
Big Stone	157	0	1	19	33	41	7	97	24%
Clay	256	2	2	8	23	28	15	99	39%
Douglas	352	2	6	17	24	23	14	90	17%
Grant	149	0	2	5	13	11	3	90	60%
Mahnomen	132	0	1	13	3	6	3	69	25%
Otter Tail	1004	4	12	26	61	62	28	335	33%
Pope	243	0	4	9	14	15	7	91	37%
Stevens	163	1	0	8	10	11	1	101	62%
Swift	218	0	1	14	18	46	0	101	22%
Traverse	119	0	0	5	10	5	0	87	73%
Wilkin	199	0	1	5	19	12	3	77	39%
	3,425	**14**	**47**	**156**	**262**	**285**	**82**	**1,237**	**30%**
		0%	1%	3%	6%	6%	2%		

2.10.3 Prioritizing Curves on Rural CSAH/CR System

As was done for rural highway segments (see above), an analysis was completed to prioritize the 2,496 horizontal curves in ATP 4 based on the relative degree of risk. Table 2-16 provides a summary of crashes and curve counts in each county. The analysis of crashes related to curves in ATP 4 provided the following results:

- 2,118 of the 2,296 (92%) curves did not experience a crash during the study period
- 2 curves with multiple fatal crashes and 3 curves with multiple severe crashes
- Average curve severe crash density of 0.004 severe crashes/curve/year

TABLE 2-16
ATP 4 Curve Summary

County	Curve Count	Severe Crashes	Total Crashes	Chevrons Installed
Becker	462	12	72	31
Big Stone	180	0	4	37
Clay	47	2	16	17
Douglas	518	11	137	121
Grant	69	1	11	27
Mahnomen	90	3	8	2
Otter Tail	707	10	194	268
Pope	146	4	22	27
Stevens	42	0	7	26
Swift	177	5	20	113
Traverse	21	1	2	9
Wilkin	37	2	8	22
Total	**2,496**	**51**	**501**	**700**

The information provided above supports the notion that traditional methods of assigning safety risk based on the number of crashes would not effectively address the overrepresentation of severe and fatal crashes on horizontal curves. There are simply too few crashes on these curves to serve as a reliable indicator of the relative degree of risk. As a result, the CRSP team used a relatively new technique to assess the risk of curves, which used the following:

- Characteristics of curves for multiple counties where crashes had previously occurred
- Results from recently published Mn/DOT research (*Cost-Benefit Analysis of In-Vehicle Technologies and Infrastructure Changes to Avoid Crashes Along Curves and Shoulders;* completed by University of Minnesota and CH2M HILL, June 2009)

The above sources of material suggest that five features were found to increase the level of risk at individual curves and used in the prioritization process of rural curves. The five features are:

- Curve Radius
- Traffic Volumes
- Intersection in the Curve
- Visual Trap
- Crash Experience

For a more detailed description of these features, see section 3.3.2. A summary of the curve prioritization can be found in Table 2-17. Roughly 18 percent (448 out of 2,296) of the curves in ATP 4 were considered high priority (typically 3 or more stars).

TABLE 2-17
ATP 4 Curve Prioritization Summary

ATP 4	Total	5★	4★	3★	2★	★	-	High Priority	
Becker	462	1	13	35	144	182	87	49	11%
Big Stone	180	0	2	7	45	90	36	9	5%
Clay	47	0	2	4	12	17	12	6	13%
Douglas	518	0	13	39	79	137	250	52	10%
Grant	69	1	9	9	20	18	12	19	28%
Mahnomen	90	2	7	7	28	32	14	16	18%
Otter Tail	707	1	39	110	201	249	107	150	21%
Pope	146	2	25	21	48	35	15	48	33%
Stevens	42	0	3	8	18	12	1	11	26%
Swift	177	1	17	41	44	54	20	59	33%
Traverse	21	0	5	7	3	5	1	12	57%
Wilkin	37	1	8	8	6	12	2	17	46%
Total	**2,496**	**9**	**143**	**296**	**648**	**843**	**557**	**448**	**18%**
		0%	6%	12%	26%	34%	22%		

2.10.4 Rural STOP Controlled Intersections

There are 1,862 intersections within ATP 4, 1,833 of which are thru/stop intersections (Table 2-18). The average severe crash density is 0.10 severe crashes/intersection/year. This low density supports the notion of a prioritization process that assesses an intersection's risk. There are seven risk factors and a star is given to an intersection for each factor. The highest priority intersections received the most stars (★). In cases where intersections received the same number of stars, crash costs were used to break ties and determine priority. The risk factors include:

- Geometry of Intersection (skew)
- Geometry of Roadway (on/near curve)
- Commercial Development in Quadrants
- Distance to Previous STOP Sign
- ADT Ratio
- Railroad Crossing on Minor Approach
- Crash History

For more detailed information on the rural thru/stop intersection risk factors, see section 3.3.3. Table 2-19 summarizes the rural thru/stop prioritization process. Approximately 24 percent of these intersections were high priority (typically three or more stars) and received a proposed safety project.

TABLE 2-18
ATP 4 Rural Thru/Stop Intersection Summary

County	Intersections
Becker	174
Big Stone	27
Clay	240
Douglas	222
Grant	182
Mahnomen	86
Otter Tail	244
Pope	100
Stevens	70
Swift	149
Traverse	172
Wilkin	167
Total	**1,833**

TABLE 2-19
ATP 4 Rural Thru/Stop Intersection Prioritization Summary

ATP 4	Total	7★	6★	5★	4★	3★	2★	★	-	High Priority
Becker	174	0	0	4	8	37	50	53	22	49
Big Stone	27	0	0	0	4	8	30	56	43	12
Clay	240	0	0	1	7	17	36	107	72	45
Douglas	222	0	1	4	18	38	50	48	16	61
Gr□nt	182	0	0	0	2	15	30	71	64	47
Mahnomen	86	0	0	0	3	7	18	34	24	10
Otter Tail	244	0	0	11	19	46	75	65	28	76
Pope	100	0	0	1	7	16	27	32	17	33
Stevens	70	0	0	0	1	6	19	25	19	26
Swift	149	0	1	1	14	19	55	43	16	35
Traverse	172	0	0	0	2	6	22	80	62	30
Wilkin	167	0	0	1	2	11	36	64	53	14
	1,833	**0**	**2**	**23**	**87**	**226**	**448**	**678**	**436**	**438**
		0%	0%	1%	5%	12%	24%	36%	23%	

2.11 Application of Safety Strategies to At Risk Locations

One of the key objectives of this safety planning effort involved identifying low cost safety related projects that are focused on the County's documented safety emphasis areas. These safety emphasis areas contain the greatest number of severe crashes occurring along the County's system of highways. Deploying mitigations for the factors contributing to these crashes represent the best opportunity to move Minnesota Towards Zero Deaths. The need for low cost projects that can be widely deployed across the County's system of highways is based on the low density found among the county systems.

The list of potential projects is greater than what can reasonably be undertaken in a single year based on funding limitations. Also, the actual schedule for implementation of individual projects will be a function of securing funding from the State's Highway Safety Improvement Program (HSIP). Also, the high priority safety strategies are among those recommended for local systems in the State's Strategic Plan.

2.11.1 Infrastructure Based Safety Projects

The following is a summary of the infrastructure based safety projects for rural segments, curves and intersections. In order to support a consistent approach for developing the suggested safety projects, a series of decision trees were developed for highway segments, horizontal curves and intersections.

These tools identify the factors that were considered and the thought process that resulted in the suggested improvement at a particular location. It should be noted that all of the strategies included in the decision trees were selected because they were either determined to be proven effective at reducing crashes (by NCHRP and/or FHWA) or the majority of the safety studies found in the literature documented crash reductions. For example, edge line rumble strips, enhanced curve delineation, roundabouts and street lighting are all considered proven effective and are included in the decision trees. In addition, enhanced indirect turn median designs and dynamic warning signs are considered to have been tried at a sufficient number of locations and

the majority of evaluations have documented a decrease in crashes and these strategies are also included in the decision trees.

Several other possible strategies were not included because either there is no documentation of effectiveness (flashing LEDs at Stop Signs) or the majority of evaluations found an increase in the number of crashes (transverse rumble strips in FHWA's Clearinghouse on Crash Reduction). The decision tree for identifying roadway segment projects is shown in Figure 2-8 and indicates the roadway, traffic volume and adjacent land use factors considered in the project identification process.

The basic premise is that all high priority locations will have a project suggested, but not the same project. The actual project suggested for a specific location will depend on a variety of factors present at that location. For example, the basic roadway edge treatment is a rumble strip or stripe, depending on whether or not the segment has a paved shoulder. However, if the segment has a very low traffic volume (less than 200 vehicles per day), where the probability of a road departure crash is less, the suggested strategy is a less costly 6-inch edge line. Finally, where there is a high density of noise sensitive receivers adjacent to the road (residential, golf courses, hospitals, schools, etc.), the suggested strategy is an embedded wet reflective pavement marking which would not result in the same noise levels as an edge line rumble.

2.11.1.1 Rural Highway Segments

Seven types of projects were considered for implementation on each of the high priority rural highway segments. The project types are listed below. Several are also shown in Figure 2-7:

- ***2' Shoulder Paving + Safety Wedge + Rumble Strip***—Install two feet of shoulder paving, typically over an existing two foot gravel shoulder, along with a rumble strip and a safety wedge. No more than six miles of this strategy was suggested within a single year due to HSIP funding constraints. Estimated Cost: $40,000 per mile.
- ***Rumble Strip***—Install a rumble strip on paved shoulders. Estimated Cost: $3,000 per mile.
- ***Centerline Rumble Strip*** – Install a rumble strip on centerline. Estimated Cost: $1,500 per mile.
- ***Rumble StripE***—Install a rumble stripE on road edges. A rumble stripE differs from a rumble strip in that the white fog line is painted over the grooves. A rumble stripE allows for better retroreflectivity during wet conditions, as a vehicle's head lights will be reflected by the beads on the sides of the grooves. This strategy does not require paved shoulders but is limited only to segments with either a paved shoulder or 12 foot lane. Estimated Cost: $3,500 per mile.
- ***6" Wet Reflective Epoxy in Grooves***—Install a 6-inch wet reflective epoxy marking within a groove. A contractor must cut a 20 mil groove in the edge of the pavement, and then install a wet reflective marking within the groove. The wet reflective beads in the marking reflects light during wet conditions and better delineates road edges for driving in wet conditions. The groove protects the more expensive marking from damage by the snow plows. This strategies relatively higher costs and unproven (based on the NCHRP definition of widely deployed and subject to a rigorous statistical evaluation) safety benefits limits its use only to noise sensitive or Amish areas where edge line rumble strips are not feasible. Estimated Cost: $8,500 per mile.
- ***6" Latex Marking***—Install 6 inch latex marking, typically along ultra low volume (ADT less than 200 vehicles per day) roadways. Estimated Cost: $650 per mile.

- ***Chevrons + 2' Shoulder Paving in Critical Radius Curves***—Install chevrons and pave 2 feet of shoulder on both shoulders of critical radius curves in high priority segments. These projects are tallied within the curve projects. Estimated Cost: $40,000 per mile for the shoulder paving plus $3,300 per curve for the chevrons.
- ***Field Access Removal/Consolidation***—Remove or consolidate field access on rural segments with greater than the average access density. This project was applicable to three counties within ATP 4 based on the County's interest. Estimated Cost: $5,000 per access.

A decision tree shown in Figure 2-8 was developed to support a consistent approach for developing safety projects. This tool allows counties to choose between four different types of pavement edge treatments based on factors that include traffic volume and adjacent land use. Where traffic volumes are low or where the adjacent land use is considered noise sensitive (high density residential, parks, etc.), enhanced edge lines are the suggested treatment. On higher volume roadways, with few noise sensitive land uses, the suggested treatments are either rumble strips or stripEs.

A project form was prepared for each high priority segment (see Figure 3-17) that provides a description of the segment, brief crash history, list of deficiencies, a picture from the Video Log and the identified strategy.

Figure 2-7
Segment Safety Strategies Considered for Deployment

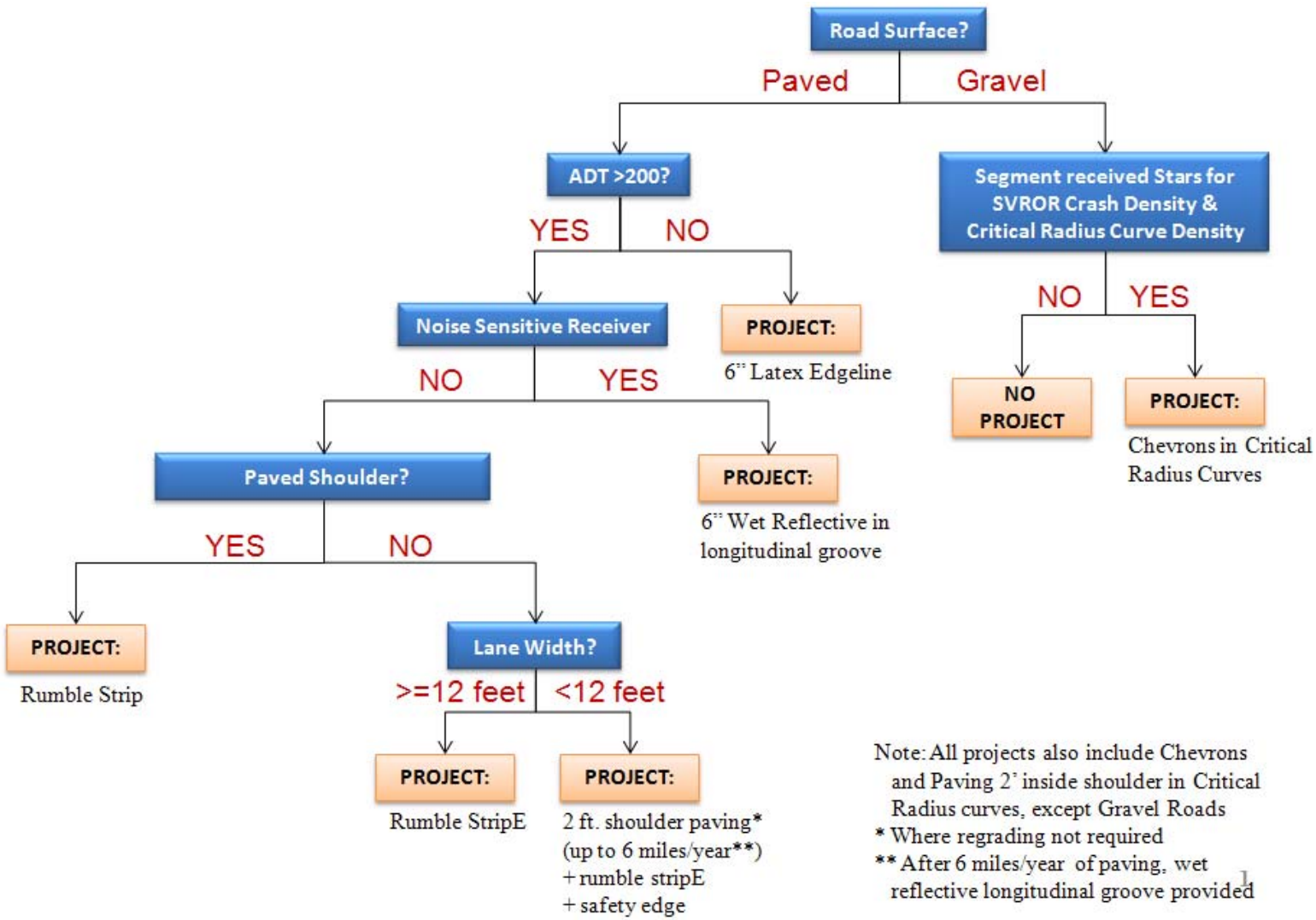


Figure 2-8
Segment Project Identification Process

Throughout ATP 4, a total of 1,125 miles received a suggested project, totaling $10,008,0155. Table 2-20 provides a summary of the project mileage and total cost for each county.

TABLE 2-20
ATP 4 Segment Project Summary (in miles)

ATP 4	2' Shoulder Pave+RS+Safety Wedge	Rumble Strip	Rumble StripE	6 inch edgelines	Ground In Wet-Reflective Markings	Total Project Value
Becker	11	9	60	3	21	$835,428
Big Stone	9	-	17	32	-	$305,545
Clay	8	59	3	9	1	$510,932
Douglas	26	10	20	4	27	$1,363,260
Grant	0	0	54	25	6	$255,673
Mahnomen	8	7	39	0	2	$499,730
Otter Tail	18	13	136	34	113	$2,218,875
Pope	29	20	0	32	3	$1,247,109
Stevens	29	0	16	8	29	$1,455,190
Swift	0	0	50	14	1	$191,880
Traverse	14	0	41	0	0	$715,492
Wilkin	6	3	47	-	-	$408,900
	157	121	483	161	203	$10,008,015

2.11.1.2 Horizontal Curves on Rural 2-Lane Roads

Curves were nominated for a project in three cases:

1. High priority curves and those in close proximity for uniformity and cost effectiveness (columns labeled ★Ranking and Proximity in Table 2-21)
2. Curves located on a high priority segments and with a radius between 500' and 1,200' (column labeled HP Seg + Crit Rad in Table 2-21),
3. Updating currently installed chevrons at curves where the signs are old and need to be updated.

Curves identified for a project received the following:

- ***2' Shoulder Paving + Safety Wedge + Rumble Strip***—Install two feet of shoulder paving, typically over an existing two foot gravel shoulder, along with rumble strip and a safety wedge. Estimated Cost: $40,000 per mile.
- ***Chevrons/Arrow Boards***—Install chevrons for guiding vehicles in both directions of travel. Figure 2-9 shows a typical example of installed chevrons. Estimated Cost: $3,300 per curve for Chevrons and $500 per curve for Arrow Boards.

Figure 2-9
Typical Chevron Installation

1. Throughout ATP 4, a total of 2,501 curves received a proposed project totaling $9,749,702. Table 2-21 summarizes the curve projects for each county.

TABLE 2-21
ATP 4 Curve Project Summary

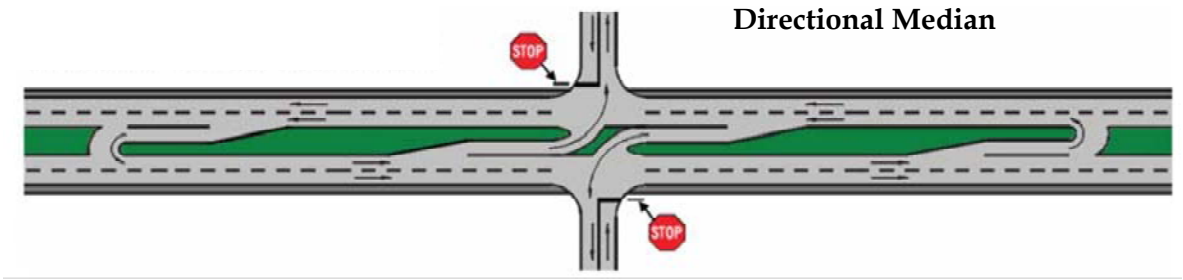
ATP 4	Currently Installed Chevrons	★Ranking	Proximity	HP Seg + Crit Rad	Total Project Value
Becker	31	49	123	191	$1,806,983
Big Stone	37	9	63	29	$298,184
Clay	17	6	5	19	$109,228
Douglas	121	49	141	49	$644,132
Grant	27	19	6	42	$414,120
Mahnomen	2	16	25	40	$440,043
Otter Tail	268	150	116	188	$3,951,728
Pope	27	48	13	72	$560,826
Stevens	26	11	10	27	$321,673
Swift	113	59	107	59	$941,750
Traverse	9	12	0	13	$131,604
Wilkin	22	17	4	14	$129,431
	700	**445**	**613**	**743**	**$9,749,702**

2.11.1.3 Rural Thru/Stop Intersections

Several project types were considered for implementation on each of the high priority rural thru/stop intersections. Intersection strategies are suggested for use based on two primary factors –1) the ability to mitigate the most common type of severe crash at rural, thru/stop intersections and 2) the results of the prioritization exercise with safety partners. The project types, illustrated in Figure 2-10, include:

- ***Roundabout***—Construct a roundabout in place of the thru/stop intersection. This strategy is proven effective, as evidenced with an 80 to 100 percent reduction in right angle crashes. A candidate intersection must have experienced multiple severe right angle crashes and meet volume thresholds for installing a traffic signal. Estimated Cost: $1,000,000 per intersection.

- ***Directional Median***—On mainline divided roadways, close the median for minor leg crossings and left turn maneuvers and build turnarounds downstream of the intersection. This is considered a tried strategy; initial studies in Minnesota and other states have found an 80 to 90 percent reduction in right angle crashes using this strategy. Estimated Cost: $150,000 per intersection.
- ***Mainline Dynamic Warning Sign***—Install loop detectors on the minor leg approaches and a dynamic flashing sign on the major leg approaches. When a vehicle approaches on a minor leg, the loop detectors send a signal to the mainline sign and flashers warn drivers of a vehicle at the stop sign. This is considered an experimental strategy but initial evaluations in other states indicate a 25 to 35 percent reduction in right angle crashes. Estimated Cost: $30,000 per intersection.
- ***Street Lights***—Install destination style street lights at the intersection. Counties were given the opportunity to choose between one or two street lights. Some chose two at all intersections; some chose one light at all intersections, while others chose a tiered approach with one light at T intersections and two lights at four leg intersections. This is considered a proven effective strategy with 25 to 35 percent reduction in crashes. Estimated Cost: $8,000 for one light per intersection and $13,000 for two lights per intersection.
- ***Upgraded Signs and Markings***—Install a standard set of signs and pavement markings on the minor intersection approaches. This is considered a tried strategy but initial evaluations in other states indicate a 25 percent reduction in right angle crashes. Estimated cost of the entire layout is $1,850 per minor leg approach. In the event that a county has already upgraded signs at an intersection, the pavement markings estimated cost is $700 per minor leg approach.
- ***Clearing and Grubbing –*** Improve sight distance at intersections by clearing and grubbing adjacent right-of-way. Estimated Cost: $4,500 for four-leg intersection and $2,450 for 3-leg intersection.



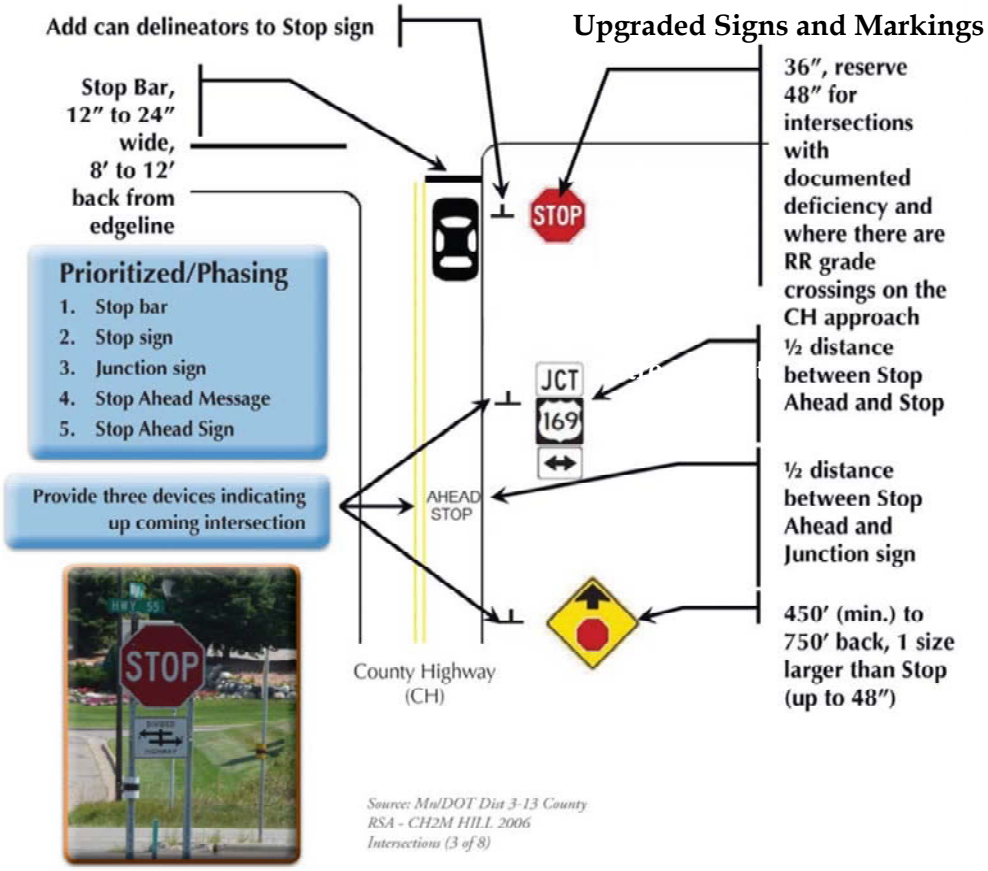


Figure 2-10
Intersection Safety Strategies Considered for Deployment

A decision tree was developed (see Figure 2-11) to ensure a consistent approach for proposed intersection project implementation. A project form was completed for each high priority intersection (see Figure 3-19 for an example). Each form includes an intersection description, a brief crash history, a list of deficiencies, an aerial photograph, and the identified strategy. Project forms for all high priority intersections are located in Appendix D.

The evaluation process used to develop a project for each of the high priority intersections considered the volume of traffic at the intersection, the geometry on the major approaches and whether or not there was a history of right angle crashes. The base project suggests the lowest level of investment (upgrade signs and markings on the minor approach) at intersections with very low volumes on the minor approaches (under 200 vehicles per day). The base project for intersections with slightly higher volumes on the minor approach (over 200 vehicles per day) also included installation of a destination style street light. Increase levels of investment are suggested at intersections with higher volumes and the presence of right angle crashes; this may include a dynamic mainline warning sign where the major road is divided with a median and a roundabout at intersections where the volumes would be high enough to meet the traffic volume warrants in the MNMUTCD for signalization.

Table 2-22 summarizes the 438 high priority and county nominated intersections in ATP 4 and suggested safety strategies, which include 4 directional median projects, 15 mainline dynamic warning signs, 220 street light installations, 467 sign and marking upgrades and 23 intersections to review signs and clear sight triangles. (Note: Intersections may receive more than one project type.)

TABLE 2-22
ATP 4 Intersection Project Summary

ATP 4	Roundabout	All-Way STOP	Directional Median	Dynamic Warning Sign	Street Lights	Signs & Markings	Review Signs & CST	Total Project Value
Becker	-	-	2	-	33	48	1	$745,550
Big Stone	-	-	-	-	3	11	-	$62,700
Clay	-	-	1	1	16	38	2	$507,750
Douglas	-	-	-	9	25	66	-	$742,400
Grant	-	-	-	-	7	41	6	$153,300
Mahnomen	-	-	-	-	12	24	4	$191,100
Otter Tail	-	-	1	2	64	76	-	$1,021,200
Pope	-	-	-	2	19	28	4	$355,200
Stevens	-	-	-	-	9	24	2	$136,100
Swift	-	-	-	-	9	35	1	$195,000
Traverse	-	-	-	-	5	26	3	$120,650
Wilkin	-	-	-	1	18	50	-	$322,150
	0	**0**	**4**	**15**	**220**	**467**	**23**	**$4,553,100**

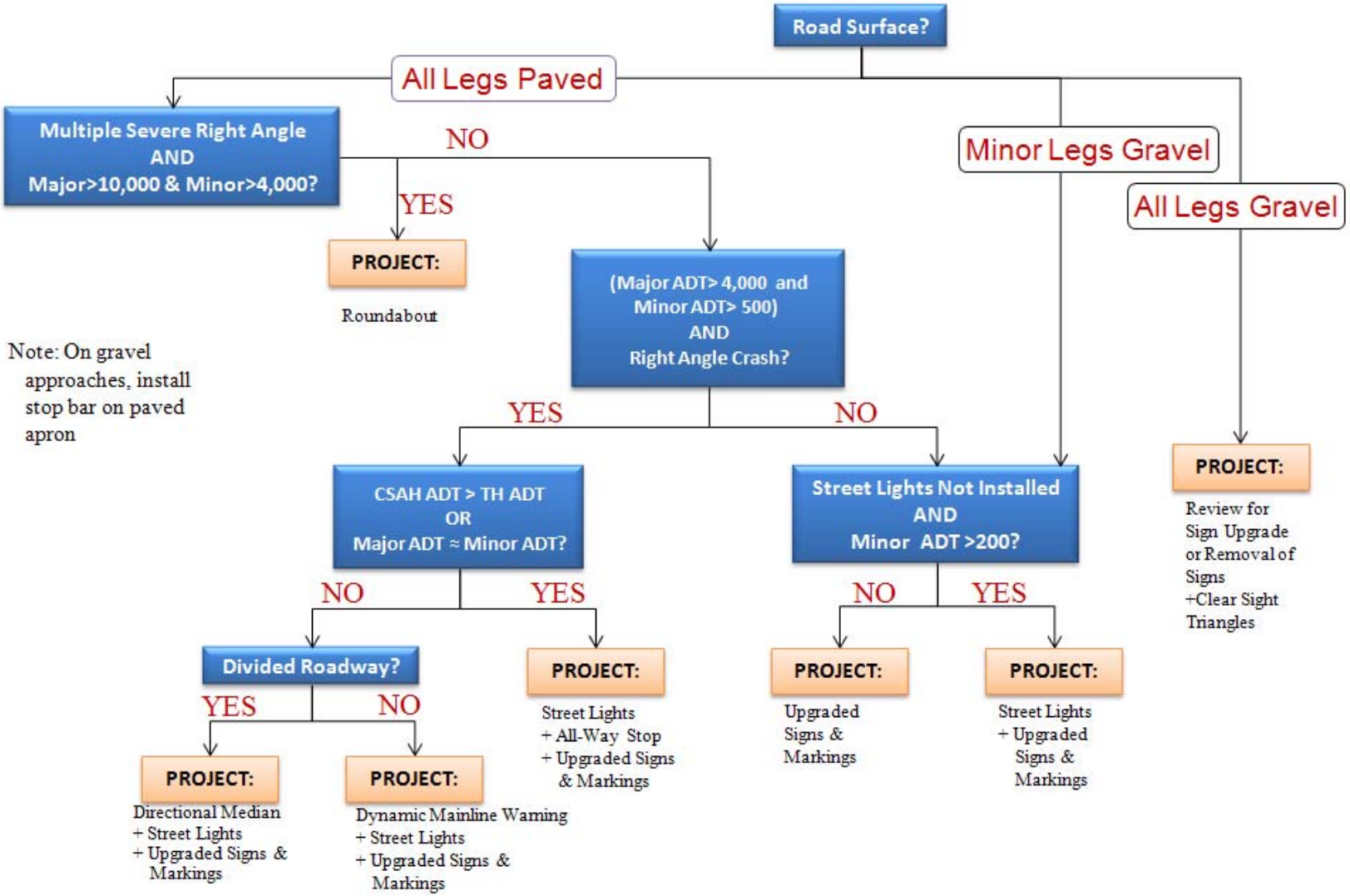


Figure 2-11
Intersection Project Identification Decision Tree

3.0 Otter Tail County Crash Analysis and Recommended Safety Projects 3-1
3.1 County-wide Crash Overview 3-1
3.1.1 Otter Tail County CSAH/CR System Crash Analysis Breakdown .. 3-1
3.1.2 Township and Municipal Roadway Review 3-1
3.1.3 Otter Tail County Critical Emphasis Areas 3-1
3.2 County Road Safety Workshop 3-6
3.2.1 Workshop Details..... 3-6
3.2.2 Results of Stakeholder Prioritization Exercise 3-7
3.3 Otter Tail County Detailed Crash Analysis 3-8
3.3.1 Prioritizing Rural CSAH/CR Segments 3-8
3.3.2 Prioritizing Curves on Rural CSAH/CR System..... 3-14
3.3.3 Rural STOP Controlled Intersections..... 3-20
3.4 County Safety Projects 3-24
3.4.1 Infrastructure Based Safety Projects 3-24

3.0 Otter Tail County Crash Analysis and Recommended Safety Projects

3.1 County-wide Crash Overview

Otter Tail County's crash analysis was conducted using the Minnesota Crash Mapping Analysis Tool (MnCMAT). The data set used covered five years, from 2005-2009 and included a total of 3,799 crashes. A map of the Otter Tail County highway system is shown in Figure 3-1.

3.1.1 Otter Tail County CSAH/CR System Crash Analysis Breakdown

Otter Tail County averages 11 severe crashes per year on their system. Details about the characteristics of these crashes are shown in Figure 3-2 and 3-3 and highlights include:

Rural Crashes on the CSAH/CR System

- 91 percent of the CSAH/CR severe crashes occurred in rural areas
- **Non-Intersection Related Crashes**
  - 62 percent of the CSAH/CR rural severe crashes are non-intersection related.
  - 81 percent of the CSAH/CR rural severe non-intersection related crashes are run off road crashes; 52 percent of these occurred on a curve.
- **Intersection Related Crashes**:
  - 38 percent of the CSAH/CR rural severe crashes are intersection related.
  - 37 percent of the CSAH/CR rural severe intersection related crashes occurred at a thru-STOP intersection; 71 percent of these were right angle crashes

Urban Crashes on the CSAH/CR System

- 9 percent of the CSAH/CR severe crashes occurred in urban areas

Highlights from the Otter Tail County crash data graphs shown on Figure 3-3 show that:

- CSAH roads have only 27 percent of the vehicle miles travelled (VMT) and 36 percent of severe crashes occur on these roads
- Otter Tail County CSAH and CRs have high crash severity rates [CSAHs = 4.3 severe crashes per 100 million vehicle miles (mvm) and CRs = 17.4 severe crashes per 100 mvm]

3.1.2 Township and Municipal Roadway Review

A review of the township and municipal crashes identified 25 severe crashes during the study period. No intersections were identified as experiencing multiple severe crashes, and no segments were identified as having multiple severe crashes.

3.1.3 Otter Tail County Critical Emphasis Areas

Figure 3-4 provides a summary of Otter Tail County's critical emphasis areas along with how these compare to ATP 4 and Statewide critical emphasis areas. Four of Otter Tail County's CEAs are the same as the Statewide CEAs (crashes involving: drug and alcohol-related; unbelted vehicle occupants; road departure and intersection). Aggressive driving and speed-related crashes are CEAs for ATP 4 and Otter Tail County, while young drivers is a statewide CEA.

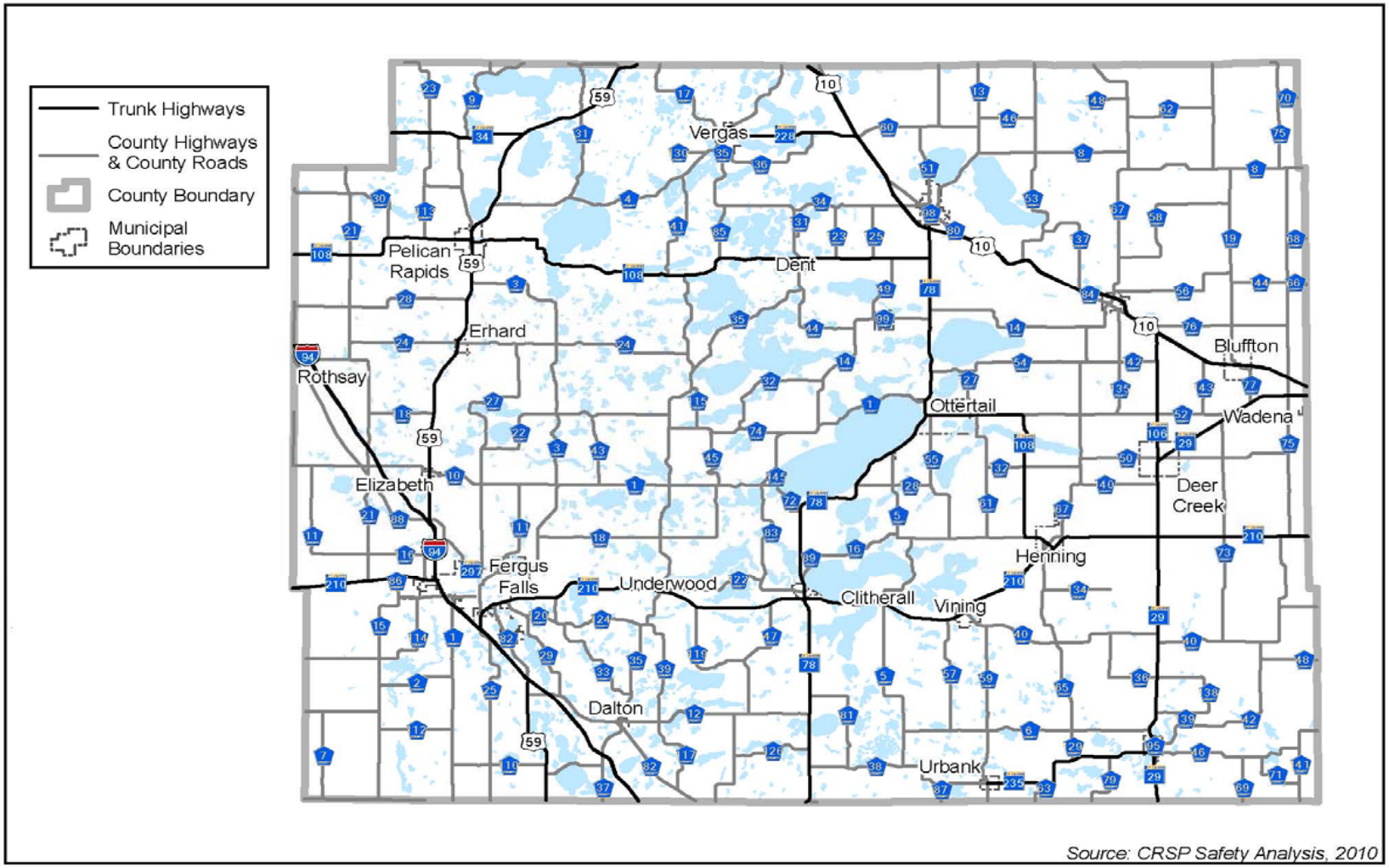


Figure 3-1
Otter Tail County Road Map

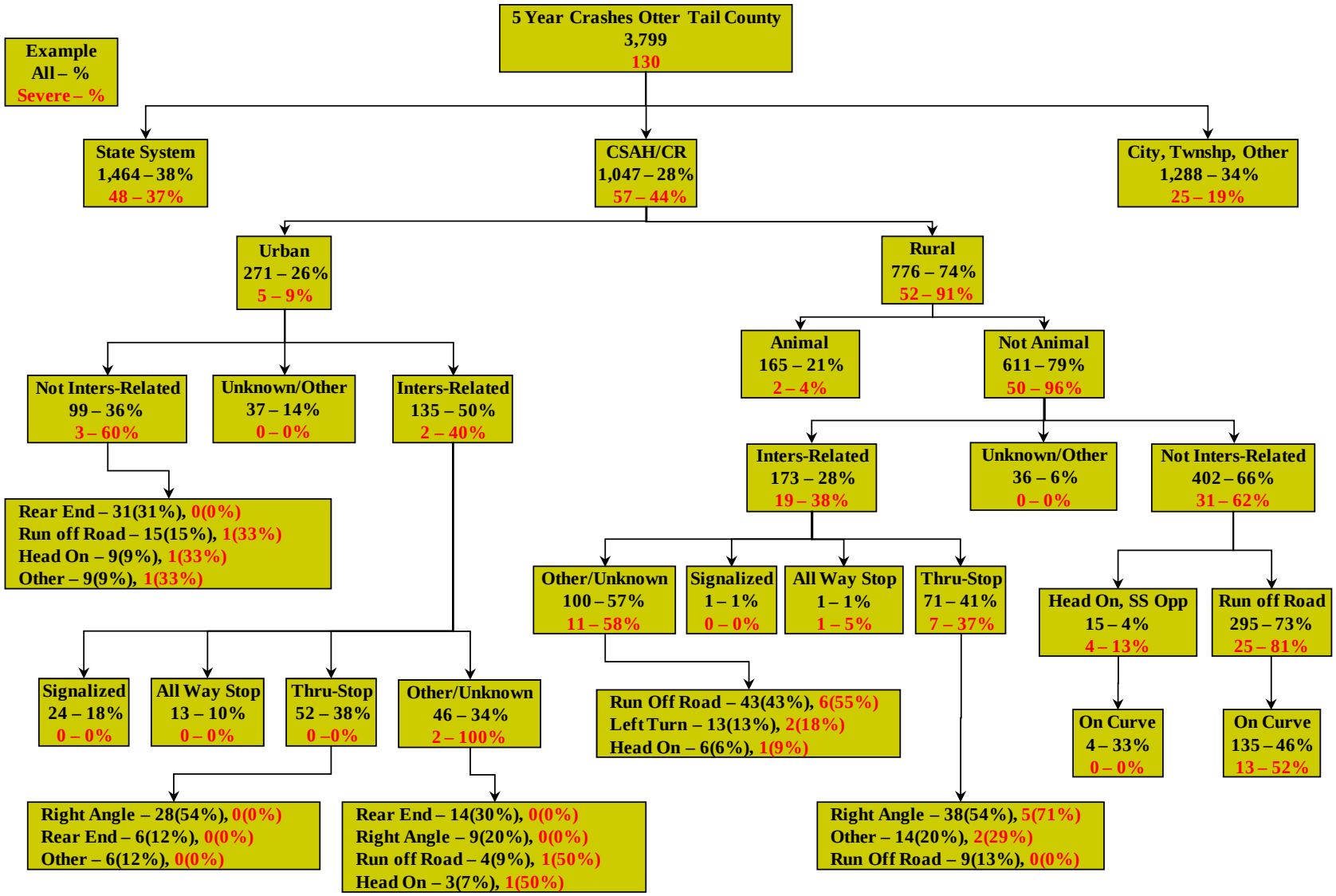
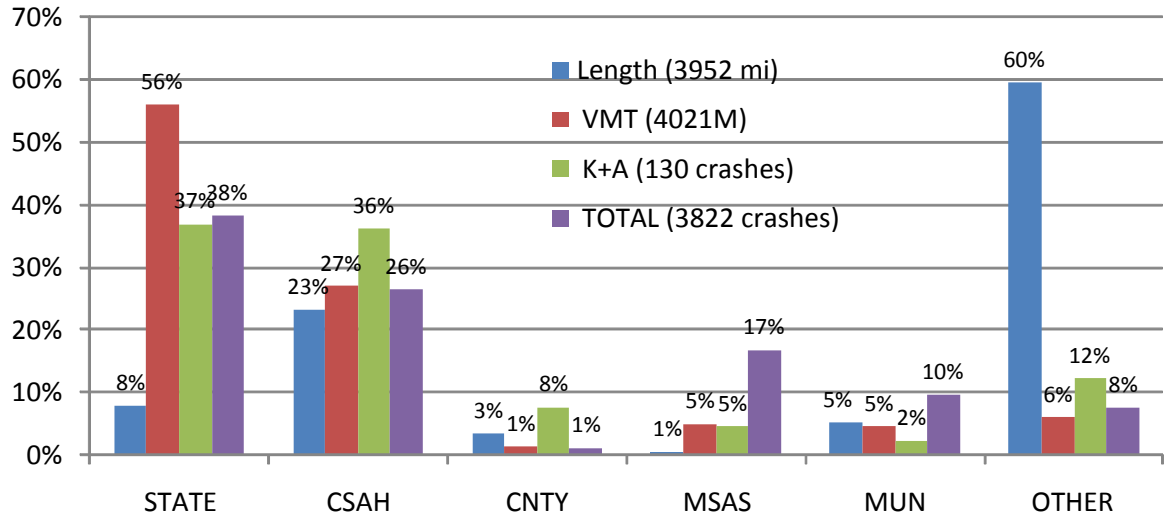
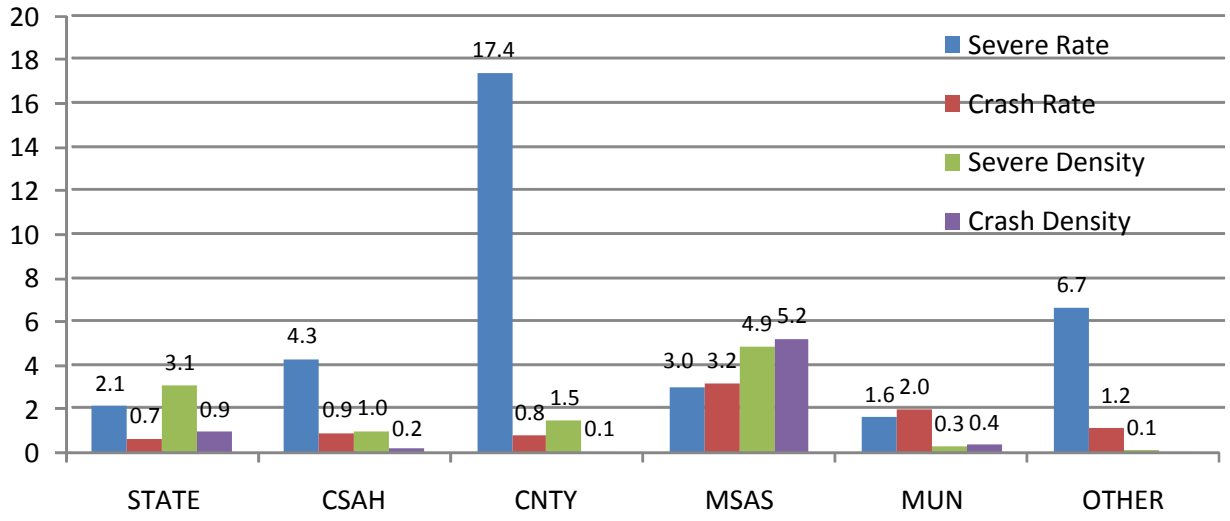


Figure 3-2
Otter Tail County Crash Data Overview



- The state system has the highest VMT at 56% but only 8% of the mileage
- CSAH/CR make up 44% of the severe crashes and only 28% of the VMT (26% of mileage)

- CSAH/CR have high severity rates.
  - CSAH severity rate = 4.3
  - CR severity rate = 17.4



Source: Mn/DOT TIS, 2005 -2009
Rate – Crashes/MVM, Density – Crashes per Mile per Year
Severe is fatal and serious injury crashes (K+A).

Figure 3-3
Otter Tail County Crash Data Graphs

Otter Tail County Emphasis Areas

Emphasis Area		Statewide Percentage	ATP 4 Interstate, US & TH	ATP 4 CSAH & CR	ATP 4 Twnshp & Other	Group 4A CSAH & CR	Otter Tail County Interstate, US & TH	Otter Tail County CSAH & CR	Otter Tail County City, Twnshp & Other
	Total Fatal and Serious Injury Crashes	9,122	249	230	94	369	49	56	26
Drivers	Young drivers (under 21)	26%	26% (65)	16% (36)	29% (27)	4% (16)	27% (13)	18% (10)	38% (10)
	Unlicensed drivers	8%	6% (16)	7% (16)	9% (8)	3% (11)	6% (3)	7% (4)	15% (4)
	Older drivers (over 64)	13%	24% (60)	15% (34)	10% (9)	6% (22)	14% (7)	13% (7)	8% (2)
	Aggressive driving and speeding-related	21%	20% (50)	27% (62)	22% (21)	12% (44)	22% (11)	29% (16)	23% (6)
	Drug and alcohol-related	26%	20% (51)	39% (89)	32% (30)	15% (57)	22% (11)	39% (22)	35% (9)
	Inattentive, distracted, asleep drivers	20%	23% (58)	19% (43)	17% (16)	6% (23)	12% (6)	16% (9)	15% (4)
	Safety awareness	- -	- -	- -	- -	- -	- -	- -	- -
	Unbelted vehicle occupants	26%	31% (78)	38% (87)	31% (29)	13% (49)	27% (13)	34% (19)	42% (11)
Special Users	Pedestrians crashes	8%	4% (10)	3% (7)	7% (7)	2% (6)	4% (2)	2% (1)	4% (1)
	Bicycle crashes	4%	0% (0)	2% (5)	6% (6)	1% (3)	0% ()	0% ()	0% ()
Vehicles	Motorcycles crashes	15%	9% (23)	18% (41)	18% (17)	7% (27)	8% (4)	18% (10)	19% (5)
	Heavy vehicle crashes	9%	19% (47)	7% (16)	2% (2)	3% (11)	20% (10)	7% (4)	4% (1)
	Safety enhancements	- -	- -	- -	- -	- -	- -	- -	- -
Highways	Train-vehicle collisions	0%	1% (2)	0% (0)	6% (6)	0% (0)	0% ()	0% ()	4% (1)
	Road departure crashes	27%	28% (69)	49% (113)	31% (29)	19% (70)	33% (16)	57% (32)	42% (11)
	Consequences of leaving road	- -	- -	- -	- -	- -	- -	- -	- -
	Intersection crashes	42%	34% (84)	36% (82)	37% (35)	12% (46)	22% (11)	38% (21)	31% (8)
	Head-On and Sideswipe (opposite) crashes	15%	22% (54)	23% (54)	13% (12)	7% (26)	22% (11)	14% (8)	15% (4)
	Work zone crashes	1%	1% (3)	1% (2)	0% (0)	0% (1)	0% ()	0% ()	0% ()
EMS	Enhancing Emergency Capabilities	- -	- -	- -	- -	- -	- -	- -	- -
Management	Information and decision support systems	- -	- -	- -	- -	- -	- -	- -	- -
	More effective processes	- -	- -	- -	- -	- -	- -	- -	- -

DPS Crash Data Records, 2005 to 2009

Top 5 Emphasis Areas by Jurisdiction

Note: Numbers are not additive, as one crash may involve a young driver at an intersection.

The numbers represent severe crashes (Fatal and A-type Injury crashes)

- Workshop Group 4A
  - Becker
  - Clay
  - Douglas
  - Otter Tail

Figure 3-4
Otter Tail County Critical Emphasis Areas

3.2 County Road Safety Workshop

3.2.1 Workshop Details

As described in Section 2.8, Otter Tail County participated in a safety planning workshop on December 13, 2010 at the Otter Tail Government Center in Fergus Falls, Minnesota. This was one of three workshops that focused on counties in ATP 4; two of these meetings were held in December 2010 and one was held in January 2011, which was postponed due to weather.

A total of 47 stakeholders participated in the workshop. In addition to ten participants from Otter Tail County, representatives from Becker, Clay, and Douglas Counties were also present, as well as Minnesota State Patrol representatives, DPS staff and Mn/DOT staff. A complete roster of those in attendance at this workshop is located in Appendix A. The agenda for all safety workshops included:

8:30 – 9:00	Registration and Coffee	
9:00 – 9:15	Introduction/Welcome	
9:15 - 10:30	Overview of Current Programs	
9:15	Overview of Crash Data	Brad Estochen, Mn/DOT
9:30	Dept of Public Safety, Office of Traffic Safety	Laura Turek, DPS
9:45	Local Speakers	Various
10:00	Dept of Public Safety, “Young Forever” video	MN State Patrol
10:30 – 10:45	Break	
10:45 - 11:30	Crash Data Overview & Breakout Objectives	Howard Preston, CH2M HILL
11:30 - 12:00	Breakout Group Discussion	
	Discuss shortlist and prioritize strategies	
12:00 – 12:30	Lunch	
12:30 – 2:00	Breakout Group Discussion	
2:15-2:30	Break	
2:30 - 2:45	Review Breakout Discussion	
2:45 – 3:00	Voting Exercise	
3:00	Adjourn	

Photos from the safety workshop that Otter Tail County representatives participated in are shown in Figure 3-5.

Figure 3-5
Photos from December 13, 2010 ATP 4 Safety Workshop

3.2.2 Results of Stakeholder Prioritization Exercise

At each of the safety workshops, participants prioritized safety strategies. The safety strategy prioritization began with an education session during the morning that provided information on the safety planning process and crash data to support the safety strategies, and presentations from DPS and Mn/DOT. Workshop participants were asked to help the County prioritize the safety strategies.

Participants were divided into two groups: an infrastructure group and a driver behavior group. Each group was tasked with prioritizing the strategies and identifying those with the highest priority. Typically, the list was narrowed down to ten strategies. Participants were given dots to vote on their preferred safety strategies. They had the option of placing all dots on one strategy or distributing the dots across multiple strategies. The voting results of the December 13, 2010, workshop and the cumulative totals of all workshops held within ATP 4 are displayed in Appendix A.

Table 3-1 summarizes Otter Tail County's top infrastructure safety strategies based on votes received at the December 13, 2010, workshop. Table 3-2 summarizes the top driver behavior safety strategies based on votes received at the workshop. Tables 3-1 and 3-2 also provide the combined voting results at all three ATP 4 workshops.

TABLE 3-1
Otter Tail County Infrastructure Safety Strategies Voting Results

Strategy	12/13/2010 Workshop Votes	ATP 4 Votes
1. Provide lighting to improve intersection visibility	22	41
2. Install shoulder rumble strips	21	47
3. Safety Edge/Pave Shoulders	18	29
4. Enhanced shoulder or delineation/marking for sharp curves	13	48
5. Edgeline Rumble Strips/StripEs	9	29
6. Clear sight triangle on approaches by clearing grub	1	14
7. Enhance signing and delineation to improve intersection visibility	1	4

TABLE 3-2
Otter Tail County Driver Behavior Safety Strategies Voting Results

Strategy	12/13/2010 Workshop Votes	ATP 4 Votes
1. Regular, Well-publicized DWI Saturations	19	33
2. Publicize and conduct high visibility targeted enforcement of speeding and aggressive driving	19	28
3. Restraint use enforcement, including night time enforcement.	18	57
4. Enforcement of GDL restrictions, cell and texting laws, underage drinking & driving, seatbelt laws	15	36
5. Distracted/Drowsy Enforcement	13	40
6. Increase use of FMVSS 218 compliant helmets	13	26

3.3 Otter Tail County Detailed Crash Analysis

The initial county-wide analysis of crashes found that of the 209 crashes that occur on Otter Tail County highways annually, 74 percent of these occur in rural areas. Of the severe crashes (fatal and A-injury), 91 percent occur in rural areas. Following is a more detailed analysis focused on prioritizing Otter Tail County's rural segments, rural intersections and rural curves.

3.3.1 Prioritizing Rural CSAH/CR Segments

There are 1,004 miles of rural highway in Otter Tail County's system. Reviewing the Otter Tail crash data, the predominant type of crash on these roads is vehicles running off the road, which accounts for 73 percent of rural non-intersection crashes and 81 percent of severe rural non-intersection crashes.

Given that the goal of the CRSP is to provide a list of county-specific safety projects that will mitigate conditions at specific locations, it is important to identify rural highway segments that are at higher risk for severe crashes. For this purpose, rural highways in Otter Tail County were broken down into 193 segments. A prioritization process was then completed where levels of risk were assigned to a segment based on five risk factors. If a segment fit the criteria for a risk factor, it received a star. The highest priority segments have received the most stars (★). In cases where segments received the same number of stars, tie breaks of edge risk assessment and then road departure crash density were used to determine priority. The risk factors are:

ADT Range - Figure 3-6 illustrates that 16 percent of the rural system in ATP 4 has between 600 and 1,200 ADT. These segments also experience a high amount of road departure crashes (35 percent). Roadways in Otter Tail County with an ADT between 600 and 1,200 ADT received a star.

Access Density – Otter Tail County's rural roadways average approximately 10.8 access points per mile (which includes field entrances, commercial entrances, etc). Roadways experiencing higher access density received a star.

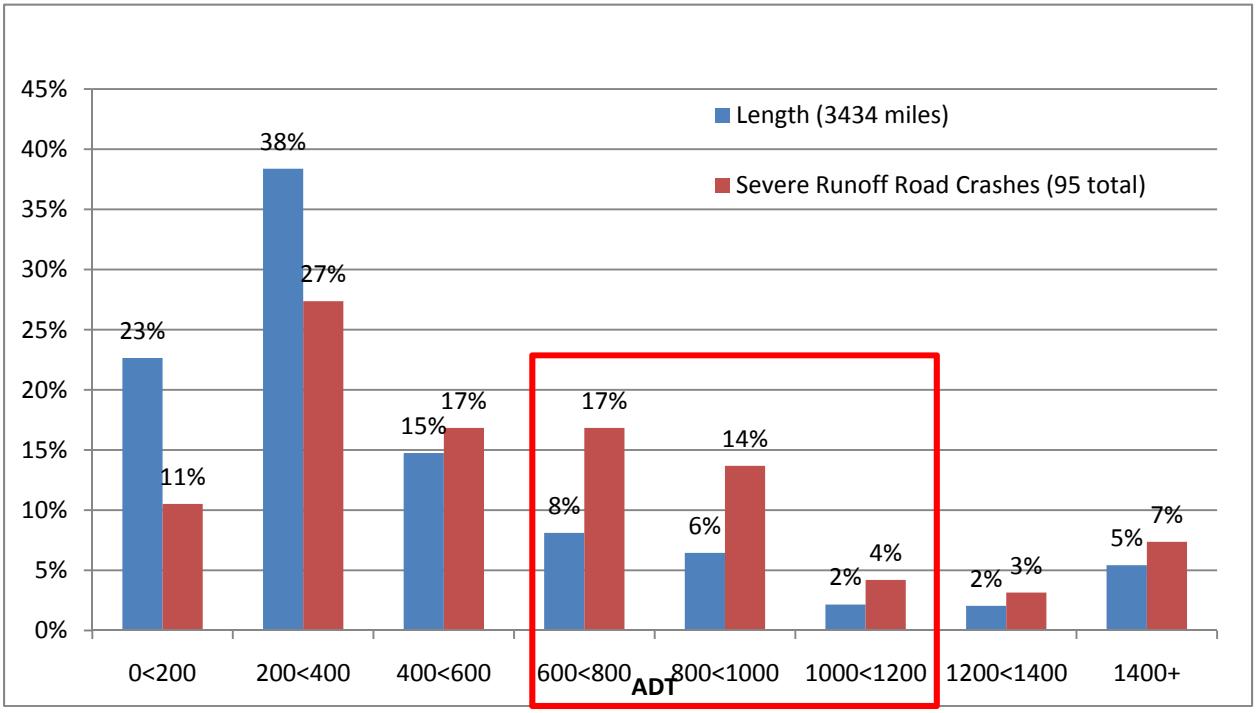


Figure 3-6
ATP 4 CSAH/CR Mileage and Road Departure Crashes by ADT

Road Departure Density - Otter Tail County rural segments had an average road departure density of 0.08 road departure crashes per mile per year. Any segment experiencing a road departure density higher than the average received a star.

Critical Radius Curve Density - With curve-related road departure accounting for 52 percent of the severe road departure crashes, curves are an important factor in identifying risk. In ATP 4, curves with a radius between 500 and 1,200 feet experienced 68 percent of the severe road departure crashes. Otter Tail County curves within this critical radius experienced 50 percent of the severe road departure crashes. An average density of these types of curves was computed for the segments (0.35 curves per mile) and any segments with a higher than average density received a star.

Edge Risk Assessment – A rating system was developed to categorize the risk level of vehicles leaving the travel lane. Roads with a usable shoulder and reasonable clear zone received a rating of one. Roads with little or no usable shoulder, but a reasonable clear zone received a rating of two, as did roads with a usable shoulder but fixed objects in the clear zone. Roads with no usable shoulder and fixed objects in the clear zone received a rating of three. Examples of these edge risks are shown in Figure 3-7. Roads were evaluated by analysts via Mn/DOT's video log to determine the rating. Roads with a rating of two or three received a star.

1 – Usable Shoulder, Reasonable Clear Zone

2 – No Usable Shoulder, Reasonable Clear Zone

2 – Usable Shoulder, Roadside with Fixed Obstacles

3 – No Usable Shoulder, Roadside with Fixed Obstacles

Figure 3-7
Sample Edge Risk Assessment Photos

Figure 3-8 illustrates a portion of the raw data that was used to prioritize segments on the Otter Tail County highway system. The information includes a list of highway segments as well as present risk factors. The complete data set used for the rural highway segment analysis is provided in the Appendix B.

Corridor	Route	#	Start	End	Length	Runoff Road Crashes	Intersection Crashes	ADT	RD Density	Access Density	Curves w/ Critical Radius / Mile	Edge Risk Assesment
1.01	CSAH	1	GRANT COUNTY LINE C	FERGUS FALLS CORP	11.6	10	6	903	0.17	10.6	0.00	1
1.03	CSAH	1	FERGUS FALLS CORP	CSAH 10	5.5	6	7	3031	0.22	16.7	0.00	1
1.04	CSAH	1	CSAH 10	CSAH 35	5.9	4	9	2383	0.14	11.4	0.00	1
1.05	CSAH	1	CSAH 35	Oak Ridge Beach Rd	11.4	9	5	1556	0.16	10.4	0.26	1
1.06	CSAH	1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	4.6	1	2	1586	0.04	41.5	0.65	1
2.01	CSAH	2	WILKIN CNTY LINE	CSAH 1	8.3	2		133	0.05	7.6	0.00	2
3.01	CSAH	3	CSAH 10	CSAH 24	8.4	6	1	596	0.14	14.2	0.36	2
3.02	CSAH	3	CSAH 24	USTH 59	7.5	3		664	0.08	10.1	0.40	2
4.01	CSAH	4	USTH 59	CSAH 31	4.1	6	5	1300	0.29	14.6	0.24	1

Figure 3-8
Sample of Otter Tail County Rural Highway Segment Data

Table 3-3 summarizes the results of the prioritized segments from Figure 3-9.

TABLE 3-3
Summary of Otter Tail County Prioritized Segments

Segment Ranking	# of Segments	% of Segments	Miles	% of Miles
★★★★★	4	2%	26.0	3%
★★★★	12	6%	67.9	7%
★★★	26	13%	138.2	14%
★★	61	32%	303.7	30%
★	62	32%	325.4	32%
-	28	15%	142.9	14%
	193	**100%**	**1004.1**	**100%**

Analysis completed on the data resulted in the priority ranking of these corridors for future improvements. Table 3-4 provides the high priority segments identified through the segment analysis process. High priority segments were those with three or more stars or segments with two stars and an edge risk assessment of two or three. Figure 3-9 includes a map showing the location of the high priority segments. Complete results of the segment analysis are included in the Appendix B.

TABLE 3-4
Otter Tail County High Priority Rural Highway Segments

Rank	Corridor	Route	#	Start	End	Length	ADT	ADT Range	RD Density	Access Density	Curve Critical Radius Density	Edge Risk	Totals	Tiebreakers	
														Edge Risk	RD Density
1	34.01	CSAH	34	CSAH 35	PERHAM CORP LMTS	6.8	1,148	★	★	★	★	★	★★★★★	3	0.32
2	4.04	CSAH	4	VERGAS CORP LMTS	BECKER COUNTY LINE	4.7	1,170	★	★	★	★	★	★★★★★	3	0.13
3	35.07	CSAH	35	CSAH 41	DENT CORP LMTS	9.3	684	★	★	★	★	★	★★★★★	2	0.17
4	9.03	CSAH	9	MNTH 34	BECKER COUNTY LINE	5.2	863	★	★	★	★	★	★★★★★	2	0.15
5	31.02	CSAH	31	USTH 59	CSAH 20	2.9	558		★	★	★	★	★★★★	3	0.21
6	64.01	CSAH	64	MNTH 78	DOUGLAS COUNTY LIN	0.6	350		★	★	★	★	★★★★	2	0.67
7	35.05	CSAH	35	UNDERWOOD CORP LI	CSAH 1	6	1,115	★	★		★	★	★★★★	2	0.43
8	5.03	CSAH	5	CLITHERALL CORP LMT	CSAH 16	4.7	650	★	★		★	★	★★★★	2	0.21
9	35.01	CSAH	35	USTH 59	DALTON CORP LMTS	5.8	602	★	★		★	★	★★★★	2	0.21
10	3.01	CSAH	3	CSAH 10	CSAH 24	8.4	596		★	★	★	★	★★★★	2	0.14
11	33.01	CSAH	33	CSAH 35	MNTH 210	8.5	251		★	★	★	★	★★★★	2	0.12
12	83.02	CSAH	83	BATTLE LAKE CORP LI	CSAH 1	8.5	388		★	★	★	★	★★★★	2	0.12
13	122.02	CNTY	122	UNDERWOOD CORP LI	CSAH 83	5.4	611	★	★		★	★	★★★★	2	0.11
14	3.02	CSAH	3	CSAH 24	USTH 59	7.5	664	★	★		★	★	★★★★	2	0.08
15	20.01	CSAH	20	CSAH 9	USTH 59	5.1	994	★	★	★	★		★★★★	1	0.20
16	111.02	CNTY	111	FERGUS FALLS CORP	CSAH 10	4.5	870	★	★	★	★		★★★★	1	0.18
17	4.02	CSAH	4	CSAH 31	VERGAS CORP LMTS	8.9	1,222		★	★		★	★★★	3	0.29
18	31.01	CSAH	31	CSAH 4	USTH 59	5.1	573			★	★	★	★★★	3	0.08
19	67.03	CSAH	67	CSAH 52	NEW YORK MILLS COR	6.9	676	★			★	★	★★★	3	0.06
20	35.03	CSAH	35	DALTON CORP LMTS	UNDERWOOD CORP LI	8.3	559		★		★	★	★★★	2	0.14
21	24.05	CSAH	24	ERHARD CORP LMTS	CSAH 3	4.8	589		★	★		★	★★★	2	0.13
22	56.02	CSAH	56	NEW YORK MILLS COR	CSAH 19	6.6	344		★	★		★	★★★	2	0.09
23	55.01	CSAH	55	CSAH 16	OTTERTAIL CORP LMTS	6.8	290		★		★	★	★★★	2	0.09
24	29.01	CSAH	29	CSAH 82	MNTH 210	7.4	471		★		★	★	★★★	2	0.08
25	72.01	CSAH	72	MNTH 78	CSAH 83	3	1,358			★	★	★	★★★	2	0.07
26	75.01	CSAH	75	CSAH 40	MNTH 210	4.5	140			★	★	★	★★★	2	0.04
27	23.01	CSAH	23	CSAH 9	MNTH 34	5.2	165			★	★	★	★★★	2	0.04
28	16.01	CSAH	16	MNTH 78	CSAH 5	5.7	607	★			★	★	★★★	2	0.04
29	41.01	CNTY	41	CSAH 35	MNTH 108	6	547			★	★	★	★★★	2	0.03
30	36.01	CSAH	36	CSAH 35	MNTH 228	6.6	290			★	★	★	★★★	2	0.03
31	45.02	CSAH	45	CSAH 1	CSAH 74	3.9	219			★	★	★	★★★	2	0.00
32	61.01	CSAH	61	CSAH 16	MNTH 108	7.5	224			★	★	★	★★★	2	0.00
33	119.01	CNTY	119	CSAH 47	MNTH 210	6.1	191			★	★	★	★★★	2	0.00
34	115.01	CNTY	115	CSAH 74	CSAH 35	2.5	235			★	★	★	★★★	2	0.00
35	145.01	CNTY	145	CSAH 72	CSAH 1	1	630	★		★		★	★★★	2	0.00
36	84.03	CSAH	84	NEW YORK MILLS COR	USTH 10 EAST	0.5	1,350		★	★	★		★★★	1	0.80
37	80.03	CSAH	80	PERHAM CORP LMTS	USTH 10 EAST	1.7	2,599		★	★	★		★★★	1	0.47
38	75.03	CSAH	75	MNTH 29	USTH 10	1	1,050	★	★	★			★★★	1	0.40
39	10.03	CSAH	10	ELIZABETH CORP LMTS	CSAH 1	6.5	1,187	★	★	★			★★★	1	0.25
40	17.02	CSAH	17	VERGAS CORP LMTS	BECKER COUNTY LINE	6.3	1,400		★	★	★		★★★	1	0.22
41	53.01	CSAH	53	USTH 10	CSAH 8	7.9	294		★	★	★		★★★	1	0.18
42	35.10	CSAH	35	CSAH 34	CSAH 36	7.5	986	★		★	★		★★★	1	0.03
43	10.01	CSAH	10	WILKIN COUNTY LINE C	ELIZABETH CORP LMTS	6.7	357		★			★	★★	3	0.09
44	30.02	CSAH	30	CSAH 21	MNTH 108	4.4	255			★		★	★★	3	0.00
45	131.01	CNTY	131	CSAH 35	CSAH 35	1.5	54		★			★	★★	2	0.27
46	19.02	CSAH	19	BLUFFTON CORP LMTS	CSAH 56	4.9	460		★			★	★★	2	0.16
47	113.01	CNTY	113	MNTH 108	CSAH 23	3	140		★			★	★★	2	0.13
48	50.03	CSAH	50	DEER CREEK CORP LI	CSAH 75	6.1	330		★			★	★★	2	0.10
49	15.01	CSAH	15	GRANT COUNTY LINE C	CSAH 2 North	6.7	153		★			★	★★	2	0.09
50	24.02	CSAH	24	ROTHSAY CORP LMTS	CSAH 21 South	2.6	315				★	★	★★	2	0.08
51	52.01	CSAH	52	MNTH 108	MNTH 106	7.2	860	★				★	★★	2	0.06
52	142.01	CNTY	142	CSAH 67	MNTH 106	3.9	230			★		★	★★	2	0.05
53	137.01	CNTY	137	USTH 10	CSAH 53	6	290				★	★	★★	2	0.03
54	42.02	CSAH	42	PARKERS PRAIRIE COI	CSAH 40	10.2	161				★	★	★★	2	0.02
55	73.02	CSAH	73	MNTH 210	MNTH 29	6.7	218			★		★	★★	2	0.00
56	126.01	CNTY	126	CSAH 47	MNTH 78	4.2	100				★	★	★★	2	0.00
57	132.01	CNTY	132	CSAH 61	MNTH 108	2	150			★		★	★★	2	0.00
58	146.01	CNTY	146	CSAH 13	CSAH 53	3	80			★		★	★★	2	0.00
59	5.04	CSAH	5	CSAH 16	MNTH 78	4.8	404				★	★	★★	2	0.00
60	32.01	CSAH	32	CSAH 74	CSAH 14	6.6	225				★	★	★★	2	0.00
61	71.01	CSAH	71	DOUGLAS COUNTY LIN	CSAH 46	4.3	175				★	★	★★	2	0.00
62	128.01	CNTY	128	MNTH 78	CSAH 55	4	223				★	★	★★	2	0.00
63	138.01	CNTY	138	MNTH 29	CH 136	4.3	115				★	★	★★	2	0.00

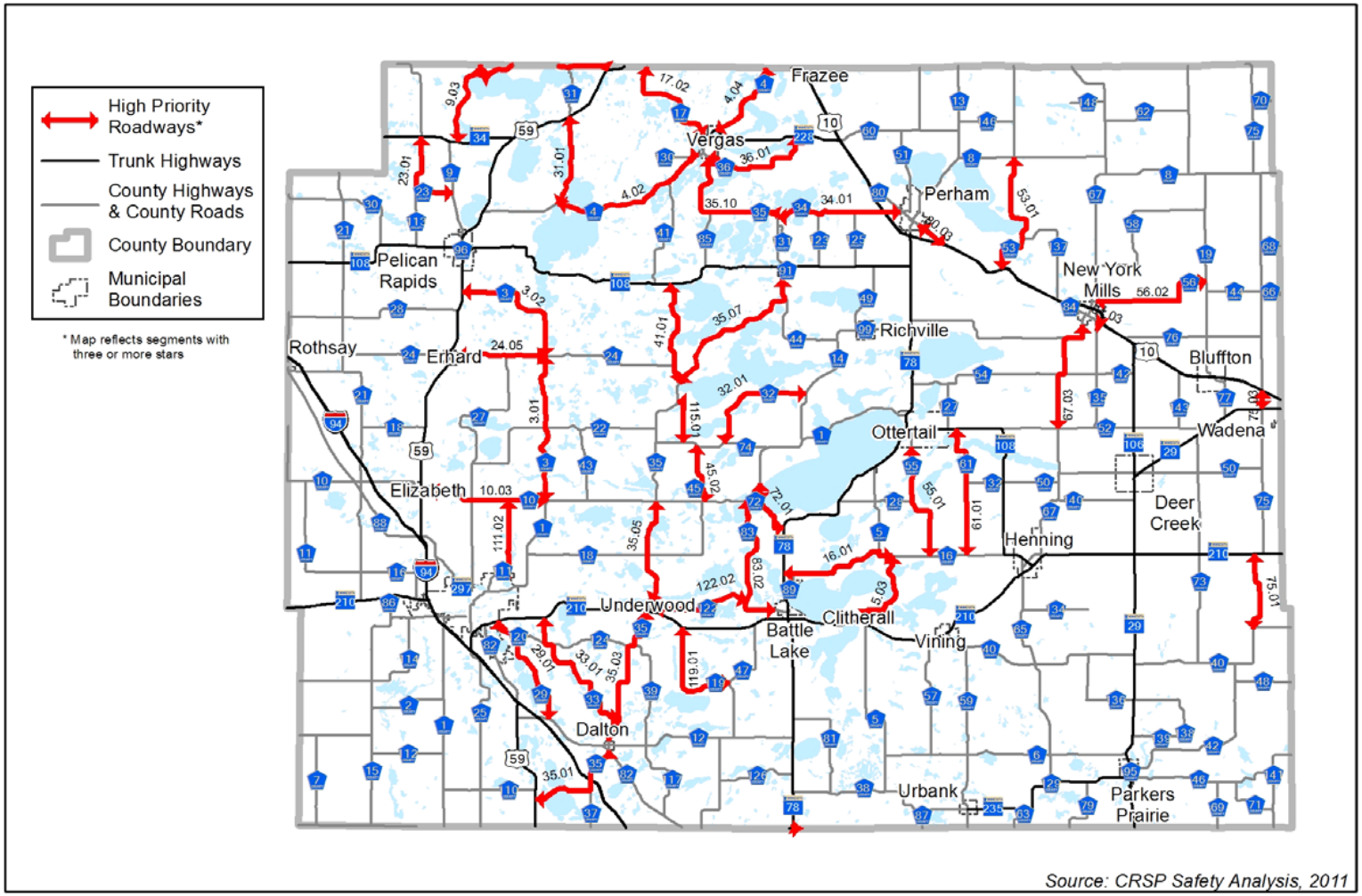


Figure 3-9
Otter Tail County High Priority Segment Map

It is notable that nine of the segments in Otter Tail County's rural highway system experienced multiple severe crashes. These nine segments are listed in Table 3-5.

TABLE 3-5
Otter Tail County Highway Segments Experiencing Multiple Severe Crashes

Corridor	Route #	Start	End	Area	Length (mi.)	Fatal Crash	Serious Injury Crash	Severe Road Departure
9.02	CSAH 9	PELICAN RAPIDS CORP LMTS	MNTH 34	Rural	4.9	2	1	3
17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	Rural	6.3	0	2	2
24.03	CSAH 24	CSAH 21 South	ERHARD CORP LMTS	Rural	6.0	0	2	2
35.01	CSAH 35	USTH 59	DALTON CORP LMTS	Rural	5.8	0	2	2
40.02	CNTY 40	VINING CORP LMTS	MNTH 29	Rural	10.6	3	1	3
52.01	CSAH 52	MNTH 108	MNTH 106	Rural	7.2	0	2	0
82.03	CSAH 82	DALTON CORP LMTS	USTH 59	Rural	5.2	0	2	2
111.02	CNTY 111	FERGUS FALLS CORP LMTS	CSAH 10	Rural	4.5	1	1	2
142.01	CNTY 142	CSAH 67	MNTH 106	Rural	3.9	1	1	0
TOTALS						**7**	**14**	**16**

There were a total of 21 severe crashes on the nine segments listed in the table. The majority of these crashes involved road departure crashes (16 of the 21 crashes). The following list highlights other points related to the 21 severe crashes:

- 16 road departure crashes
- 2 right angle crashes
- 1 head-on crash
- 1 left-turn crash

3.3.2 Prioritizing Curves on Rural CSAH/CR System

The detailed crash analysis also studied horizontal curves. This subset of the rural highway system received additional attention because emerging research indicates that horizontal curves with certain characteristics contribute to the overall frequency of road departure crashes. The 1,004 miles of rural Otter Tail County highways contain 707 horizontal curves; the total length of these curves is 140 miles, which is 14 percent of the county highway system mileage. However, approximately 52 percent of severe road departure crashes occur on horizontal curves (see Table 3-6). As a result, horizontal curves were identified as an at-risk element of Otter Tail County's rural highway system.

TABLE 3-6
Crashes on Otter Tail County CSAH/CR System, Including Horizontal Curves

	Rural Road Departure Crashes	Rural Road Departure Crashes On Horizontal Curves	% of Crashes on Horizontal Curves
All Crashes	295	135	46%
Severe Crashes (K+A)	25	13	52%

As was done for rural highway segments an analysis was completed to prioritize horizontal curves based on the relative degree of risk. The analysis of crashes related to curves in Otter Tail County provided the following results:

- Crashes occurred on 140 of the 707 (roughly 20 percent) horizontal curves on Otter Tail County's CSAH/CR system.
- Severe injury or fatal crashes occurred on only 10 curves during the 5 year study period, meaning that these types of crashes occurred on only 1.4 percent of the curves.
- Four total fatal crashes occurred on four different curves.
- No curves experienced multiple severe crashes over the 5 year study period; supporting that these crashes occur randomly across the system and that the presence of a severe crash is not sufficient to identify the risk associated with horizontal curves.

This information supports the idea that traditional methods of assigning safety risk based on the number of crashes would not effectively address the overrepresentation of severe and fatal crashes on horizontal curves. There are simply too few crashes on these curves to serve as a reliable indicator of the relative degree of risk. As a result, the CRSP team used a relatively new technique to assess the risk of curves, which used the following:

- Characteristics of curves in Otter Tail County where crashes had previously occurred, as well as available information from similar analysis for neighboring Minnesota counties
- Results from Mn/DOT research (*Cost-Benefit Analysis of In-Vehicle Technologies and Infrastructure Changes to Avoid Crashes Along Curves and Shoulders;* completed by University of Minnesota and CH2M HILL, June 2009)

These sources of material suggest that five roadway features were found to increase the level of risk at individual curves and were used in the prioritization process of rural curves.

Curve Radius - Shorter curve radii results in higher overall crash density, however 68 percent of the severe crashes occurred on curves with 500 to 1,200 foot radius within ATP 4 (see Figure 3-10). This relationship is similar to that found in Mn/DOT and other national research. Another factor in support of establishing a 1,200 foot radius as the upper limit for the range of at-risk curves is the fact that this radii approximates a 55 mph design speed based on Table 3-3.02A in Mn/DOT's Road Design Manual. As a result curves with a radius between 500 and 1,200 feet received a star or were considered to be at risk.

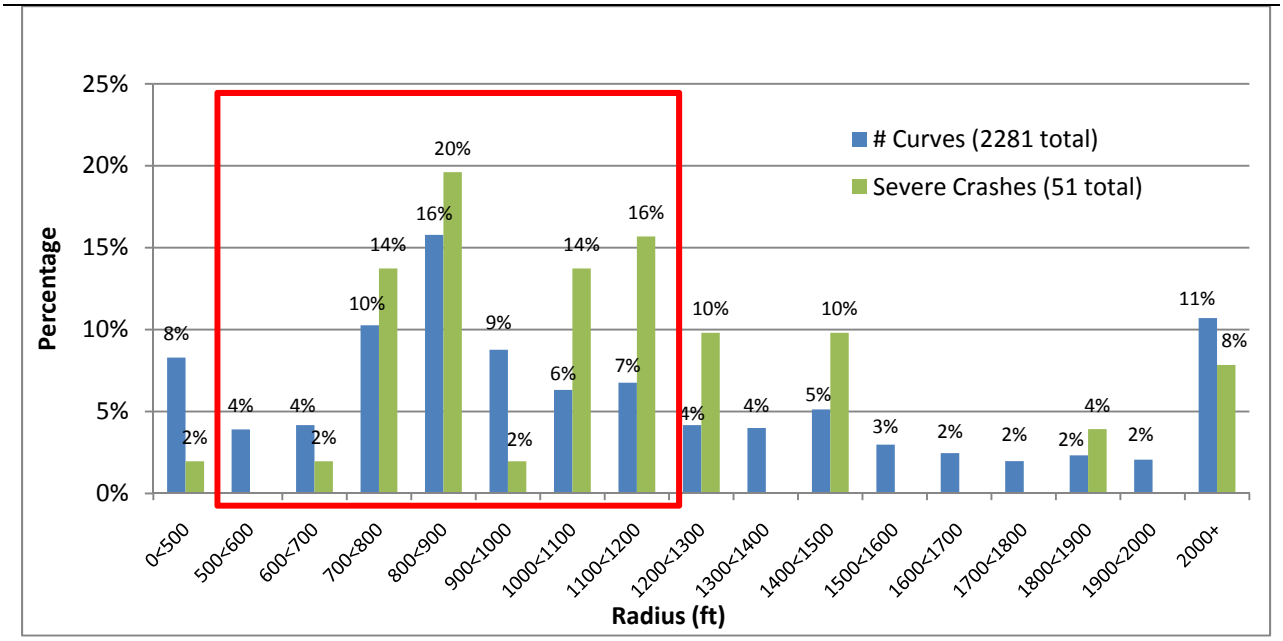


Figure 3-10
ATP 4 Severe Crashes on Curves and Curve Radius

Traffic Volumes - There is a range of volumes in each system that is overrepresented relative to the frequency of curve-related crashes. In ATP 4, curves in the volume range between 200 and 600 vehicles per day accounted for 51 percent of severe crashes on curves (see Figure 3-11). Curves with an ADT between 200 and 600 vehicles per day received a star.

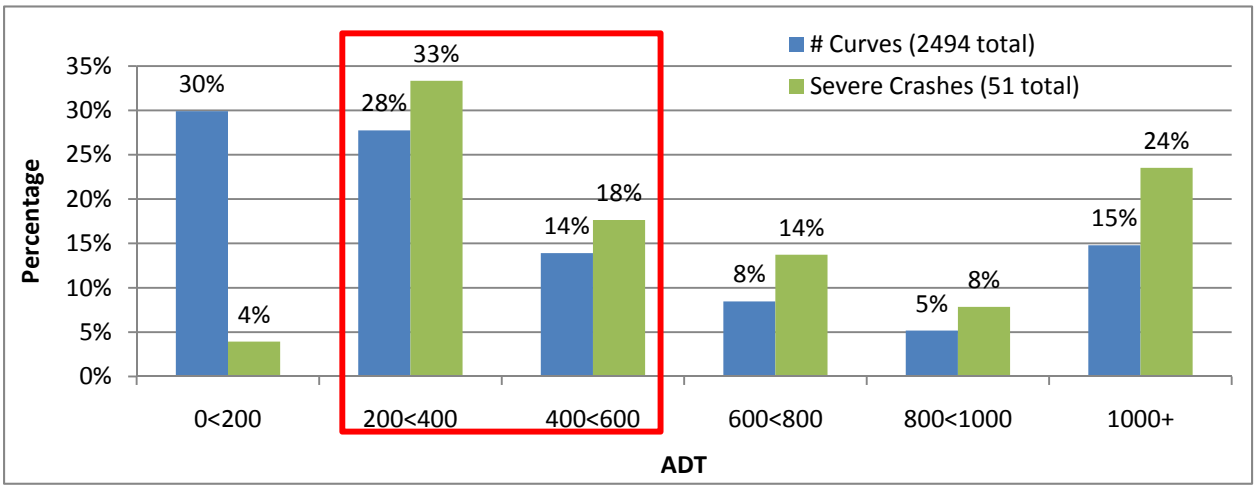


Figure 3-11
ATP 4 Severe Crashes on Curves and Curve ADT

Intersection in the Curve - The presence of an intersection in the curve increased the level of crash risk; therefore these curves received a star.

Visual Trap - The presence of a visual trap increases the level of crash risk. A visual trap exists when a crest vertical curve occurs prior to the beginning of the horizontal curve or when a minor road, tree line, or line of utility pole continues on a tangent (see Figure 3-12). These curves received a star.

Figure 3-12
Example of a Visual Trap

Crash Experience - If a curve had experienced a severe crash over the five-year study period, it received a star.

A sample of the data analysis results for curve prioritization is shown in Figure 3-13. Complete results of the data analysis and prioritization ranking can be found in Appendix C.

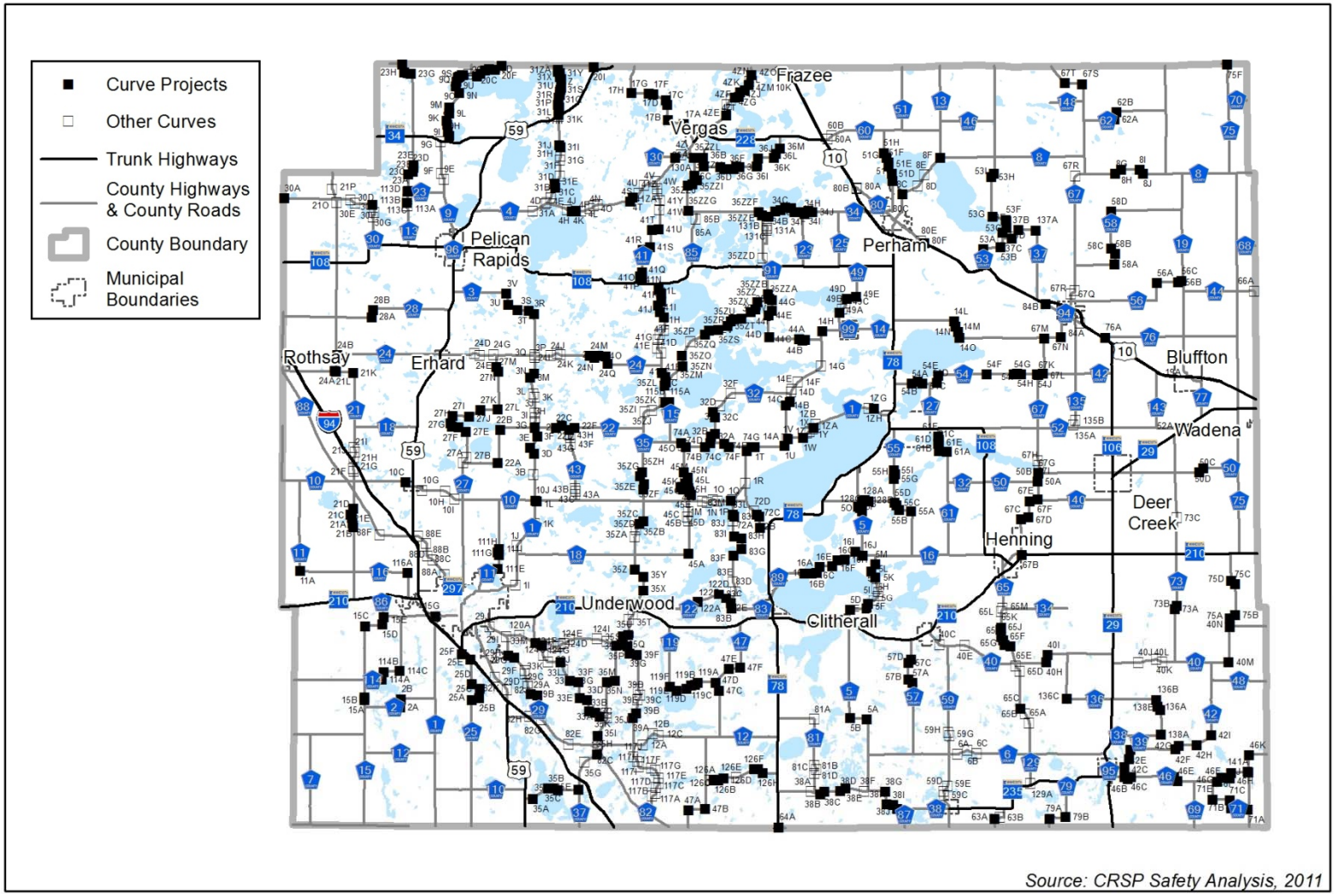
Curve Count	ID	Corridor	Segment	Start	End	K	A	K	A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Rank	Proximity
1	10C	10.01	CSAH 10	WILKIN COUNTY LINE C	ELIZABETH CORP LMTS	-	-	-	-	722	1,275	420	Yes	Yes	Yes	★★★★	-
2	10G	10.02	CSAH 10	ELIZABETH CORP LMTS	ELIZABETH CORP LMTS	-	-	-	-	1,232	1,006	1,250	Yes	No	No	★	-
3	10H	10.03	CSAH 10	ELIZABETH CORP LMTS	CSAH 1	-	-	-	-	2,774	2,296	1,250	Yes	No	No	★	-
4	10I	10.03	CSAH 10	ELIZABETH CORP LMTS	CSAH 1	-	-	-	-	1,259	920	1,250	No	No	Yes	★	-
5	10J	10.03	CSAH 10	ELIZABETH CORP LMTS	CSAH 1	-	-	-	-	770	701	1,150	Yes	Yes	No	★★	-
6	10K	10.04	CSAH 10	USTH 10	BECKER COUNTY LINE	-	-	-	-	747	700	1,050	Yes	No	Yes	★★★	-
7	111E	111.02	CNTY 111	FERGUS FALLS CORP	CSAH 10	-	1	-	-	1,155	1,521	960	No	No	No	★★	-
8	111G	111.02	CNTY 111	FERGUS FALLS CORP	CSAH 10	1	-	-	-	1,057	775	550	Yes	Yes	No	★★★★	-
9	111H	111.02	CNTY 111	FERGUS FALLS CORP	CSAH 10	-	-	-	-	869	976	550	No	Yes	No	★★	-
10	111I	111.02	CNTY 111	FERGUS FALLS CORP	CSAH 10	-	-	-	-	1,109	614	550	No	Yes	Yes	★★★	-
11	113A	113.01	CNTY 113	MNTH 108	CSAH 23	-	-	-	-	2,051	561	140	No	No	No		-
12	113B	113.01	CNTY 113	MNTH 108	CSAH 23	-	-	-	-	1,011	534	140	No	No	No	★	-
13	113C	113.01	CNTY 113	MNTH 108	CSAH 23	-	-	-	-	2,308	532	140	No	No	No		-
14	113D	113.01	CNTY 113	MNTH 108	CSAH 23	-	-	-	-	371	434	140	No	Yes	Yes	★	-
15	114A	114.02	CNTY 114	CSAH 15	CSAH 15	-	-	-	-	812	1,249	70	No	Yes	No	★	-
16	114B	114.02	CNTY 114	CSAH 15	CSAH 15	-	-	-	-	821	1,473	70	Yes	Yes	No	★★	-
17	114C	114.02	CNTY 114	CSAH 15	CSAH 15	-	-	-	-	848	1,306	165	Yes	Yes	Yes	★★★	-

Figure 3-13
Sample of Otter Tail County Curves Data and Prioritization

In summary, one curve in Otter Tail County received 5 stars. 150 curves received a high priority ranking of 3 stars or more (22 percent). Figure 3-14 includes a map showing all high priority curves that are assigned a proposed safety project. Appendix C also includes information—both a map and table—of curves which were analyzed but were not recommended for a project. Table 3-7 summarizes the results of the prioritization.

TABLE 3-7
Summary of Otter Tail County Prioritized Curves

Curve Ranking	# of Curves	% of Curves	Chevroned	% of Chevroned
★★★★★	1	0%	1	0%
★★★★	39	6%	32	12%
★★★	110	16%	84	31%
★★	201	28%	89	33%
★	249	35%	62	23%
-	107	15%	0	0%
	707	100%	268	100%



Source: CRSP Safety Analysis, 2011

Figure 3-14
Otter Tail County Curve Project Map

3.3.3 Rural STOP Controlled Intersections

There were only seven severe crashes on Otter Tail County's rural CSAH/CR system at STOP controlled intersections. Looking at the ATP 4 level however, there are 24 rural CSAH/CR system crashes at thru-STOP controlled intersections. The most severe type of crash occurring at these intersections is a right-angle crash. Given that there are 244 of these intersections across the County, a prioritization process is needed to focus the County's efforts in implementing safety projects. The prioritization process assesses an intersection's risk exposure for seven factors and a star is given to an intersection for each risk factor. The highest priority intersections received the most stars (★). In cases where intersections received the same number of stars, crash costs were used to break ties and determine priority. The risk factors include:

Geometry of Intersection - Previous research has shown that skewed intersections have a higher risk of crashes. If an intersection has a skewed approach of greater than 15 degrees, it received a star.

Geometry of Roadway - Previous research has shown that intersections located on or near a horizontal curve are subject to a higher level of risk. Intersections located on or near horizontal curves received a star.

Commercial Development in Quadrants - Previous research has shown that intersections with commercial development located in one or more of the intersection quadrants have a higher level of risk. Private residences or farms were not included in this category. Intersections with commercial development in a quadrant received a star.

Distance to Previous STOP Sign - Previous research has shown that drivers lose attention when traveling for longer distances without a STOP sign. Therefore, intersections with minor leg approaches without a STOP sign within 5 miles received a star.

ADT Ratio - There is a range of ADT ratio (minor/major) on the County system that is more susceptible to severe crashes than others. Intersections with an ADT ratio between 0.4 and 0.8 received a star.

Railroad Crossing on Minor Approach - Intersections on or near a railroad line are subject to an increased level of risk. Drivers must navigate the railroad tracks while approaching the intersection. Therefore, if an intersection has a railroad crossing on one of the minor leg approaches to the intersection it received a star.

Crash History - If an intersection had experienced a crash during the five-year study period, it received a star.

Figure 3-15 provides a sample of the raw data that was used in the prioritization of rural thru-STOP intersections, as well as their risk criteria. The complete data set used for the rural intersection analysis is provided in Appendix D.

Int #	Sys	Num	Intersection Description	Skew	On/Near Curve	Development	RR Xing	ADT	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Crash Cost
1.01	CSAH	1	CSAH 1 and CSAH 26	No	No	No	No	995	Yes	3	0.38	$ 115,000
1.02	CSAH	1	CSAH 1 and T 1196 CNTY 110 RT (120TH	No	No	No	No	774.5	Yes	1	0.11	$ 12,000
1.03	CSAH	1	CSAH 1 and CNTY 112 140TH ST	No	No	No	No	767.5	No	1	0.19	$ 12,000
1.04	CSAH	1	CSAH 1 and CSAH 2 (170TH ST)	No	No	No	No	974.5	No	1	0.11	$ 91,000
1.06	CSAH	1	CSAH 1 and CSAH 15	No	Yes	No	No	3487	Yes	1	0.38	$ 91,000
1.22	CSAH	1	CSAH 1 and CSAH 18	No	No	No	No	3225	Yes	1	0.26	$ 12,000
1.23	CSAH	1	CSAH 1 and CSAH 10	No	Yes	No	No	2925	No	1	0.49	$ 91,000
1.24	CSAH	1	CSAH 1 and CSAH 43	No	No	No	No	2540	No	0	0.16	$ -
1.25	CSAH	1	CSAH 1 and CSAH 35	No	No	No	No	3150	Yes	5	0.48	$ 342,000
1.26	CSAH	1	CSAH 1 and CSAH 45 WEST	No	No	No	No	1893	Yes	0	0.10	$ -
1.27	CSAH	1	CSAH 1 and CSAH 45 EAST	No	No	No	No	1965	No	0	0.18	$ -
1.28	CSAH	1	CSAH 1 and CSAH 83	Yes	Yes	No	No	1905	Yes	0	0.12	$ -
1.29	CSAH	1	CSAH 1 and CNTY 145	No	Yes	Yes	No	1540	No	1	0.51	$ 91,000
1.30	CSAH	1	CSAH 1 and CSAH 74	No	Yes	No	No	1573	Yes	0	0.25	$ -
1.31	CSAH	1	CSAH 1 and CSAH 14	No	Yes	No	No	1645	Yes	0	0.35	$ -
2.01	CSAH	2	CSAH 2 and T 1152 CSAH 7	No	No	No	No	184.5	Yes	0	0.54	$ -
2.02	CSAH	2	CSAH 2 and CSAH 15 , T 1153 SOUTH	No	No	No	No	262	Yes	0	0.50	$ -
2.03	CSAH	2	CSAH 2 and CSAH 15 NORTH	No	No	No	No	412	Yes	0	0.32	$ -
3.01	CSAH	3	CSAH 3 and CSAH 10	No	Yes	No	No	1560	Yes	2	0.71	$ 24,000

Figure 3-15
Sample of Otter Tail County Rural Intersection Data

Table 3-8 summarizes the results of the prioritized intersections from Figure 3-16.

TABLE 3-8
Summary of Otter Tail County Prioritized Intersections

Intersection Ranking	# of Intersections	% of Intersections
★★★★★★★	0	0%
★★★★★★	0	0%
★★★★★	11	5%
★★★★	19	8%
★★★	46	19%
★★	75	31%
★	65	27%
-	28	11%
	244	**100%**

Analysis completed on the data referenced in Figure 3-15 resulted in the prioritization of rural thru-STOP intersections for future improvements. Table 3-9 lists the high priority intersections. Complete results of the rural thru-STOP intersection analysis are included in Appendix D. All intersections with 3 or more stars were considered high priority (32 percent) and were assigned a proposed safety project. Locations of the high priority intersections are shown on a map in Figure 3-16.

TABLE 3-9
Otter Tail County High Priority Rural Intersections

Rank	Int #	Sys	#	Intersection Description	Skew	On/Near Curve	Development	RR Xing	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Priority	Crash Cost
1	60.01	CSAH	60	CSAH 60 and USTH 10	★	★		★	★	★		★★★★★	$ 275,000
2	9.03	CSAH	9	CSAH 9 and MNTH 34 WEST	★	★			★	★	★	★★★★★	$ 251,000
3	21.02	CSAH	21	CSAH 21 and CSAH 88	★			★	★	★	★	★★★★★	$ 136,000
4	35.07	CSAH	35	CSAH 35 and MNTH 210		★	★		★	★	★	★★★★★	$ 103,000
5	35.11	CSAH	35	CSAH 35 and CSAH 41	★	★			★	★	★	★★★★★	$ 103,000
6	35.12	CSAH	35	CSAH 35 and CSAH 44	★	★			★	★	★	★★★★★	$ 103,000
7	52.01	CSAH	52	CSAH 52 and MNTH 108	★	★			★	★	★	★★★★★	$ 103,000
8	8.03	CSAH	8	CSAH 8 and CSAH 13	★	★			★	★	★	★★★★★	$ 12,000
9	10.03	CSAH	10	CSAH 10 and CSAH 88	★			★	★	★	★	★★★★★	$ 12,000
10	14.06	CSAH	14	CSAH 14 and CSAH 67	★	★			★	★	★	★★★★★	$ 12,000
11	9.05	CSAH	9	CSAH 9 and CSAH 20	★	★	★		★		★	★★★★★	$ -
12	53.01	CSAH	53	CSAH 53 and USTH 10	★	★			★	★		★★★★	$ 740,000
13	4.07	CSAH	4	CSAH 4 and MNTH 228 NORTH	★	★			★	★		★★★★	$ 424,000
14	40.03	CSAH	40	CSAH 40 and CSAH 65		★			★	★	★	★★★★	$ 412,000
15	5.03	CSAH	5	CSAH 5 and MNTH 210 , T 1461	★		★		★	★		★★★★	$ 272,000
16	16.05	CSAH	16	CSAH 16 and MNTH 108		★			★	★	★	★★★★	$ 251,000
17	75.04	CSAH	75	CSAH 75 and USTH 10	★			★	★	★		★★★★	$ 218,000
18	64.01	CSAH	64	CSAH 64 and MNTH 78	★	★				★	★	★★★★	$ 148,000
19	22.01	CSAH	22	CSAH 22 and CSAH 27	★	★			★	★		★★★★	$ 148,000
20	28.01	CSAH	28	CSAH 28 and USTH 59	★	★			★	★		★★★★	$ 103,000
21	1.29	CSAH	1	CSAH 1 and CNTY 145		★	★			★	★	★★★★	$ 91,000
22	35.05	CSAH	35	CSAH 35 and CNTY 124	★	★				★	★	★★★★	$ 91,000
23	40.09	CSAH	40	CSAH 40 and CSAH 75	★	★				★	★	★★★★	$ 91,000
24	35.04	CSAH	35	CSAH 35 and CSAH 82	★	★			★	★		★★★★	$ 24,000
25	3.01	CSAH	3	CSAH 3 and CSAH 10		★			★	★	★	★★★★	$ 24,000
26	80.01	CSAH	80	CSAH 80 and USTH 10 EAST	★	★				★	★	★★★★	$ 12,000
27	4.02	CSAH	4	CSAH 4 and CSAH 31		★			★	★	★	★★★★	$ 12,000
28	4.03	CSAH	4	CSAH 4 and CSAH 41	★				★	★	★	★★★★	$ 12,000
29	19.05	CSAH	19	CSAH 19 and CSAH 56		★			★	★	★	★★★★	$ 12,000
30	47.02	CSAH	47	CSAH 47 and CNTY 119	★	★			★		★	★★★★	$ -
31	52.04	CSAH	52	CSAH 52 and MNTH 106					★	★	★	★★★	$ 594,000
32	82.01	CSAH	82	CSAH 82 and USTH 59					★	★	★	★★★	$ 436,000
33	52.02	CSAH	52	CSAH 52 and CSAH 67					★	★	★	★★★	$ 412,000
34	1.25	CSAH	1	CSAH 1 and CSAH 35					★	★	★	★★★	$ 342,000
35	4.01	CSAH	4	CSAH 4 and USTH 59		★			★	★		★★★	$ 273,000
36	6.04	CSAH	6	CSAH 6 and MNTH 29		★			★	★		★★★	$ 273,000
37	84.03	CSAH	84	CSAH 84 and USTH 10 EAST		★	★			★		★★★	$ 239,000
38	8.10	CSAH	8	CSAH 8 and CSAH 75 EAST					★	★	★	★★★	$ 227,000
39	15.04	CSAH	15	CSAH 15 and CSAH 86		★				★	★	★★★	$ 182,000
40	50.03	CSAH	50	CSAH 50 and CSAH 67 NORTH		★				★	★	★★★	$ 136,000
41	5.01	CSAH	5	CSAH 5 and CSAH 38					★	★	★	★★★	$ 136,000
42	20.01	CSAH	20	CSAH 20 and CSAH 31		★				★	★	★★★	$ 136,000
43	33.03	CSAH	33	CSAH 33 and CNTY 120		★				★	★	★★★	$ 136,000
44	57.01	CSAH	57	CSAH 57 and MNTH 210		★			★	★		★★★	$ 136,000
45	21.06	CSAH	21	CSAH 21 and CSAH 28					★	★	★	★★★	$ 136,000
46	24.03	CSAH	24	CSAH 24 and CSAH 27		★			★	★		★★★	$ 103,000
47	33.04	CSAH	33	CSAH 33 and MNTH 210		★			★	★		★★★	$ 103,000
48	1.06	CSAH	1	CSAH 1 and CSAH 15		★			★	★		★★★	$ 91,000
49	1.23	CSAH	1	CSAH 1 and CSAH 10		★				★	★	★★★	$ 91,000
50	8.04	CSAH	8	CSAH 8 and CSAH 53					★	★	★	★★★	$ 91,000
51	16.01	CSAH	16	CSAH 16 and MNTH 78					★	★	★	★★★	$ 91,000
52	34.02	CSAH	34	CSAH 34 and CNTY 123	★	★				★		★★★	$ 91,000
53	35.06	CSAH	35	CSAH 35 and CSAH 39		★			★	★		★★★	$ 91,000
54	38.02	CSAH	38	CSAH 38 and CSAH 81	★				★	★		★★★	$ 91,000
55	41.01	CSAH	41	CSAH 41 and MNTH 108 EAST		★			★	★		★★★	$ 91,000
56	54.03	CSAH	54	CSAH 54 and CSAH 67		★			★	★		★★★	$ 91,000
57	85.01	CSAH	85	CSAH 85 and MNTH 108	★	★				★		★★★	$ 12,000
58	143.01	CNTY	143	CNTY 143 and USTH 10	★			★		★		★★★	$ 12,000
59	12.04	CSAH	12	CSAH 12 and CSAH 47 WEST					★	★	★	★★★	$ 12,000
60	63.01	CSAH	63	CSAH 63 and MNTH 235					★	★	★	★★★	$ 12,000
61	18.01	CSAH	18	CSAH 18 and CSAH 35					★	★	★	★★★	$ 12,000
62	1.28	CSAH	1	CSAH 1 and CSAH 83	★	★			★			★★★	$ -
63	3.02	CSAH	3	CSAH 3 and CSAH 22		★			★		★	★★★	$ -
64	3.03	CSAH	3	CSAH 3 and CSAH 24		★			★		★	★★★	$ -
65	21.05	CSAH	21	CSAH 21 and CSAH 24 NORTH		★			★		★	★★★	$ -
66	29.02	CSAH	29	CSAH 29 and CNTY 120	★	★					★	★★★	$ -
67	31.01	CSAH	31	CSAH 31 and USTH 59	★	★			★			★★★	$ -
68	35.14	CSAH	35	CSAH 35 and MNTH 108 EAST	★			★	★			★★★	$ -
69	50.02	CSAH	50	CSAH 50 and CSAH 67 SOUTH	★	★			★			★★★	$ -
70	67.02	CSAH	67	CSAH 67 and CSAH 67		★			★		★	★★★	$ -
71	119.01	CNTY	119	CNTY 119 and MNTH 210	★	★			★			★★★	$ -
72	137.01	CNTY	137	CNTY 137 and USTH 10	★			★	★			★★★	$ -
73	21.04	CSAH	21	CSAH 21 and CSAH 24 SOUTH		★			★		★	★★★	$ -
74	29.01	CSAH	29	CSAH 29 and CSAH 82	★	★			★			★★★	$ -
75	29.03	CSAH	29	CSAH 29 and MNTH 210	★		★		★			★★★	$ -
76	32.01	CSAH	32	CSAH 32 and CSAH 74	★	★			★			★★★	$ -

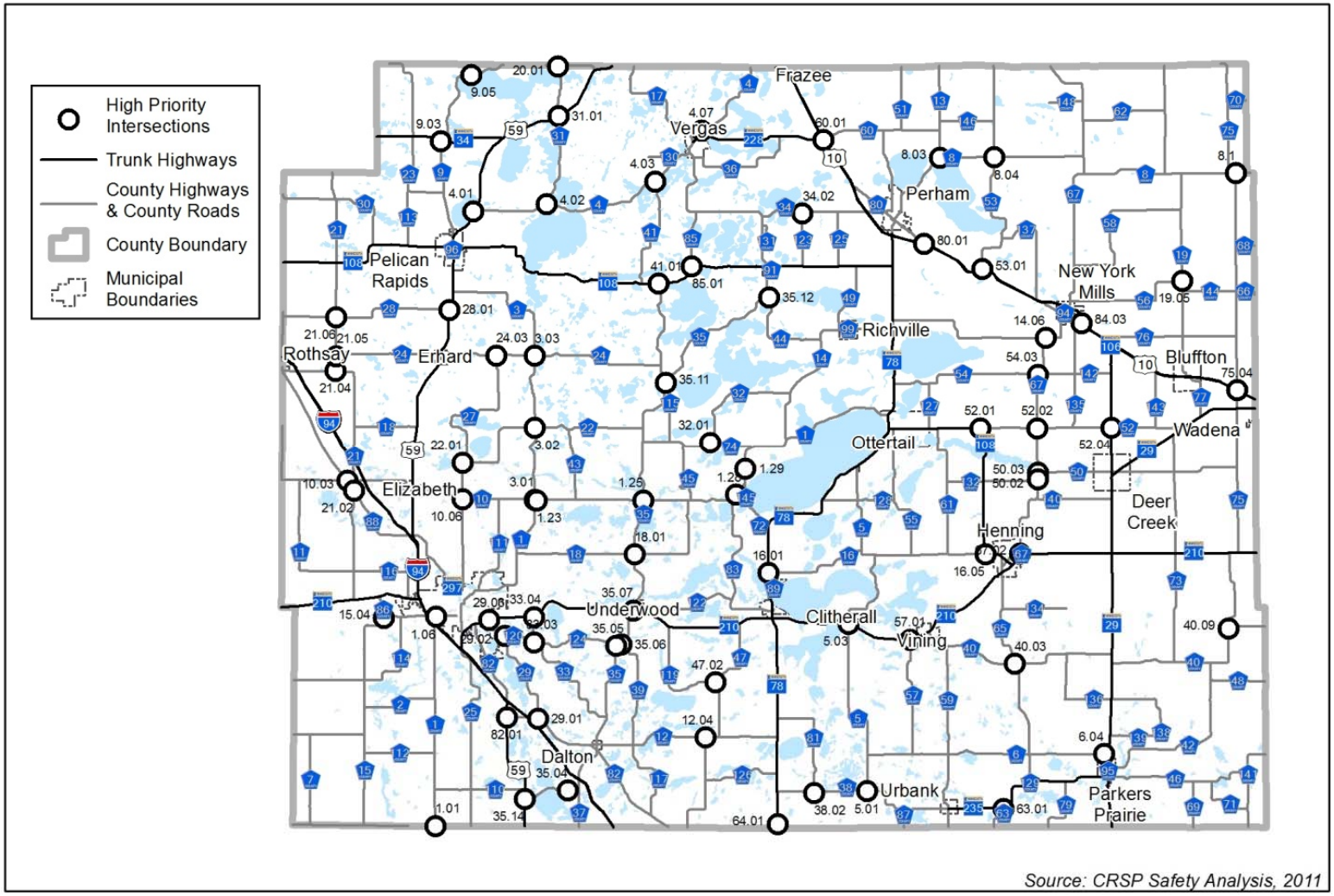


Figure 3-16
Otter Tail County High Priority Intersection Map

3.4 County Safety Projects

One of the key objectives of Otter Tail County's safety planning effort involved identifying low cost safety related projects that are focused on the County's documented safety emphasis areas. These safety emphasis areas contain the greatest number of severe crashes occurring along the County's system of highways. Deploying mitigations for the factors contributing to these crashes represent the best opportunity to move Otter Tail County Towards Zero Deaths.

The need for low cost projects that can be widely deployed across the County's system of highways is based on the fact that Otter Tail County averages eleven severe crashes (Fatal and A-Injury) per year and these are spread across 1004 miles of rural County highways and hundreds of intersections. As a result, the density of these severe crashes is very low and Minnesota's Strategic Highway Safety Plan has demonstrated that the most effective programmatic approach involves a wide application of relatively low cost safety projects.

The effort to develop low-cost safety projects is based on the application of high priority strategies at the most at-risk locations that were identified as part of the detailed analysis of the County's system of highways. High priority safety strategies identified in Section 3.2 (and which were the direct outcomes of the December 13, 2010, County Roadway Safety Workshop) basically consist of the following types of improvements:

- Improvements to the edges of rural highways and enhanced delineation of horizontal curves in rural areas.
- Upgrading the signs and pavement markings, installing street lights at rural STOP controlled intersections.
- Improve sight distance at unsignalized intersections.
- Behavioral campaigns to increase seat belt compliance, reduce impaired driving, increase motorcycle helmet usage, decrease speeding (aggressive driving) and support the graduated driver license law.

The at-risk locations are documented in Section 3.3, and include rural County highway segments, rural STOP controlled intersections and horizontal curves along rural two-lane facilities. The low cost safety projects that are suggested for implementation are described in the following sections.

The list of potential projects is greater than what can reasonably be undertaken in a single year based on funding limitations. The actual schedule for implementation of individual projects will be a function of securing funding from the State's Highway Safety Improvement Program (HSIP). This safety plan, prepared for Otter Tail County, is consistent with the Minnesota's Strategic Highway Safety Plan. Also, the high priority safety strategies are among those recommended for local systems in the State's Strategic Plan. Both of these items put Otter Tail County in a better position to be successful at securing HSIP funding.

3.4.1 Infrastructure Based Safety Projects

This section summarizes the infrastructure based safety projects considered and ultimately identified for rural segments, curves and intersections.

3.4.1.1 Rural Highway Segments

Five types of projects were considered for implementation on each of the high priority rural highway segments. Project types are also discussed in Section 2.11 and shown in Figure 2-7. The project types and costs are:

- ***2' Shoulder Paving + Safety Wedge + Rumble Strip -*** Estimated Cost: $40,000 per mile.
- ***Rumble Strip -*** Estimated Cost: $3,000 per mile.
- ***Rumble StripE -*** Estimated Cost: $3,500 per mile.
- ***6" Wet Reflective Epoxy in Grooves –*** Estimated Cost: $8,500 per mile. This strategy's relatively higher costs and unproven safety benefits limits its use only to noise sensitive or Amish areas.
- ***6" Latex Marking -*** Estimated Cost: $650 per mile.

A decision tree shown in Figure 2-8 was developed to support a consistent approach for developing safety projects. This tool allows counties to choose between five different types of pavement edge treatments based on factors that include traffic volume and adjacent land use. Where traffic volumes are low, 6" Latex Marking is the suggested treatment. Where the adjacent land use is considered noise sensitive (high density residential, parks, etc.), 6" Wet Reflective Epoxy in Grooves is the suggested treatment. On higher volume roadways, with few noise sensitive land uses, the suggested treatments are either rumble strips or stripEs, depending on these segment's lane and shoulder widths.

Table 3-10 summarizes the high priority segments and suggested strategies, which includes 18 miles of 2 foot shoulder paving+safety wedge+rumble strip, 13.4 miles of rumble strips, 135.8 miles of rumble stripEs, 112.9 miles of 6" wet reflective epoxy in grooves, and 33.6 miles of 6" latex marking.

A project form was completed for each high priority segment. Figure 3-17 shows an example project form, including a description of the segment, brief crash history, ranking factors, a picture from the Video Log and the identified strategy. Project forms for all high priority segments are included in Appendix B.

TABLE 3-10
Otter Tail County Segment Project Summary

Rank	Corridor #	Route #	Start	End	Length	Ranking	2' Shoulder Pave+RS +Safety Wedge	Rumble Strip	Rumble StripE	6" Latex Marking	6" Wet Reflective Epoxy in Grooves	Project Cost
1	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	6.8	★★★★★	4.8	0.0	0.0	0.0	2.0	$209,882
2	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	4.7	★★★★★	0.0	0.0	3.9	0.0	0.8	$20,445
3	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	9.3	★★★★★	0.0	0.0	6.0	0.0	3.3	$48,825
4	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	5.2	★★★★★	3.0	0.0	0.0	0.0	2.2	$139,204
5	31.02	CSAH 31	USTH 59	CSAH 20	2.9	★★★★	0.0	0.0	0.0	0.0	2.9	$24,650
6	64.01	CSAH 64	MNTH 78	DOUGLAS COUNTY LINE	0.6	★★★★	0.6	0.0	0.0	0.0	0.0	$24,000
7	35.05	CSAH 35	UNDERWOOD CORP LMTS	CSAH 1	6.0	★★★★	6.0	0.0	0.0	0.0	0.0	$240,000
8	5.03	CSAH 5	CLITHERALL CORP LMTS	CSAH 16	4.7	★★★★	0.0	0.0	0.0	0.0	4.7	$39,950
9	35.01	CSAH 35	USTH 59	DALTON CORP LMTS	5.8	★★★★	3.6	0.0	0.0	0.0	2.2	$162,574
10	3.01	CSAH 3	CSAH 10	CSAH 24	8.4	★★★★	0.0	4.6	3.8	0.0	0.0	$27,090
11	33.01	CSAH 33	CSAH 35	MNTH 210	8.5	★★★★	0.0	0.0	8.5	0.0	0.0	$29,750
12	83.02	CSAH 83	BATTLE LAKE CORP LMTS	CSAH 1	8.5	★★★★	0.0	0.0	5.8	0.0	2.7	$43,350
13	122.02	CNTY 122	UNDERWOOD CORP LMTS	CSAH 83	5.4	★★★★	0.0	0.0	2.7	0.0	2.7	$32,400
14	3.02	CSAH 3	CSAH 24	USTH 59	7.5	★★★★	0.0	6.6	0.0	0.0	0.9	$27,450
15	20.01	CSAH 20	CSAH 9	USTH 59	5.1	★★★★	0.0	0.0	3.8	0.0	1.3	$24,225
16	111.02	CNTY 111	FERGUS FALLS CORP LMTS	CSAH 10	4.5	★★★★	0.0	0.0	4.5	0.0	0.0	$15,750
17	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	8.9	★★★	0.0	0.0	3.0	0.0	5.9	$60,520
18	31.01	CSAH 31	CSAH 4	USTH 59	5.1	★★★	0.0	0.0	1.6	0.0	3.5	$35,445
19	67.03	CSAH 67	CSAH 52	NEW YORK MILLS CORP LMTS	6.9	★★★	0.0	0.0	6.9	0.0	0.0	$24,150
20	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LMTS MNTH 210	8.3	★★★	0.0	0.0	0.0	0.0	8.3	$70,550
21	24.05	CSAH 24	ERHARD CORP LMTS	CSAH 3	4.8	★★★	0.0	0.0	4.8	0.0	0.0	$16,800
22	56.02	CSAH 56	NEW YORK MILLS CORP LMTS	CSAH 19	6.6	★★★	0.0	0.0	6.6	0.0	0.0	$23,100
23	55.01	CSAH 55	CSAH 16	OTTERTAIL CORP LMTS	6.8	★★★	0.0	0.0	6.8	0.0	0.0	$23,800
24	29.01	CSAH 29	CSAH 82	MNTH 210	7.4	★★★	0.0	0.0	4.6	0.0	2.8	$39,960
25	72.01	CSAH 72	MNTH 78	CSAH 83	3.0	★★★	0.0	0.0	0.0	0.0	3.0	$25,500
26	75.01	CSAH 75	CSAH 40	MNTH 210	4.5	★★★	0.0	0.0	0.0	0.0	0.0	$0
27	23.01	CSAH 23	CSAH 9	MNTH 34	5.2	★★★	0.0	0.0	0.0	5.2	0.0	$3,380
28	16.01	CSAH 16	MNTH 78	CSAH 5	5.7	★★★	0.0	0.0	3.2	0.0	2.5	$32,490
29	41.01	CNTY 41	CSAH 35	MNTH 108	6.0	★★★	0.0	0.0	3.7	0.0	2.3	$32,400
30	36.01	CSAH 36	CSAH 35	MNTH 228	6.6	★★★	0.0	0.0	3.1	0.0	3.5	$40,590
31	45.02	CSAH 45	CSAH 1	CSAH 74	3.9	★★★	0.0	0.0	2.8	0.0	1.1	$19,110

TABLE 3-10 (Continued)
Otter Tail County Segment Project Summary

Rank	Corridor #	Route #	Start	End	Length	Ranking	2' Shoulder Pave+RS +Safety Wedge	Rumble Strip	Rumble StripE	6" Latex Marking	6" Wet Reflective Epoxy in Grooves	Project Cost
32	61.01	CSAH 61	CSAH 16	MNTH 108	7.5	★★★	0.0	0.0	5.9	0.0	1.6	$34,125
33	119.01	CNTY 119	CSAH 47	MNTH 210	6.1	★★★	0.0	0.0	0.0	6.1	0.0	$3,965
34	115.01	CNTY 115	CSAH 74	CSAH 35	2.5	★★★	0.0	0.0	1.6	0.0	0.9	$13,250
35	145.01	CNTY 145	CSAH 72	CSAH 1	1.0	★★★	0.0	0.0	0.0	0.0	1.0	$8,500
36	84.03	CSAH 84	NEW YORK MILLS CORP LMTS	USTH 10 EAST	0.5	★★★	0.0	0.5	0.0	0.0	0.0	$1,500
37	80.03	CSAH 80	PERHAM CORP LMTS	USTH 10 EAST	1.7	★★★	0.0	1.7	0.0	0.0	0.0	$5,100
38	75.03	CSAH 75	MNTH 29	USTH 10	1.0	★★★	0.0	0.0	0.0	0.0	1.0	$8,500
39	10.03	CSAH 10	ELIZABETH CORP LMTS	CSAH 1	6.5	★★★	0.0	0.0	0.0	0.0	6.5	$55,250
40	17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	6.3	★★★	0.0	0.0	0.0	0.0	6.3	$53,550
41	53.01	CSAH 53	USTH 10	CSAH 8	7.9	★★★	0.0	0.0	5.7	0.0	2.2	$38,710
42	35.1	CSAH 35	CSAH 34	CSAH 36	7.5	★★★	0.0	0.0	4.6	0.0	2.9	$40,875
43	10.01	CSAH 10	WILKIN COUNTY LINE CSAH 11	ELIZABETH CORP LMTS	6.7	★★	0.0	0.0	6.7	0.0	0.0	$23,450
44	30.02	CSAH 30	CSAH 21	MNTH 108	4.4	★★	0.0	0.0	2.2	0.0	2.2	$26,400
45	131.01	CNTY 131	CSAH 35	CSAH 35	1.5	★★	0.0	0.0	0.0	1.5	0.0	$975
46	19.02	CSAH 19	BLUFFTON CORP LMTS	CSAH 56	4.9	★★	0.0	0.0	1.8	0.0	3.1	$32,585
47	113.01	CNTY 113	MNTH 108	CSAH 23	3.0	★★	0.0	0.0	0.0	3.0	0.0	$1,950
48	50.03	CSAH 50	DEER CREEK CORP LMTS	CSAH 75	6.1	★★	0.0	0.0	0.0	0.0	6.1	$51,850
49	15.01	CSAH 15	GRANT COUNTY LINE CSAH 26	CSAH 2 North	6.7	★★	0.0	0.0	0.0	0.0	0.0	$0
50	24.02	CSAH 24	ROTHSAY CORP LMTS	CSAH 21 South	2.6	★★	0.0	0.0	2.6	0.0	0.0	$9,100
51	52.01	CSAH 52	MNTH 108	MNTH 106	7.2	★★	0.0	0.0	3.1	0.0	4.1	$45,720
52	142.01	CNTY 142	CSAH 67	MNTH 106	3.9	★★	0.0	0.0	0.0	0.0	3.9	$33,150
53	137.01	CNTY 137	USTH 10	CSAH 53	6.0	★★	0.0	0.0	6.0	0.0	0.0	$21,000
54	42.02	CSAH 42	PARKERS PRAIRIE CORP LMTS	CSAH 40	10.2	★★	0.0	0.0	0.0	0.0	0.0	$0
55	73.02	CSAH 73	MNTH 210	MNTH 29	6.7	★★	0.0	0.0	0.0	0.0	6.7	$56,950
56	126.01	CNTY 126	CSAH 47	MNTH 78	4.2	★★	0.0	0.0	0.0	4.2	0.0	$2,730
57	132.01	CNTY 132	CSAH 61	MNTH 108	2.0	★★	0.0	0.0	0.0	2.0	0.0	$1,300
58	146.01	CNTY 146	CSAH 13	CSAH 53	3.0	★★	0.0	0.0	0.0	3.0	0.0	$1,950
59	5.04	CSAH 5	CSAH 16	MNTH 78	4.8	★★	0.0	0.0	0.0	0.0	4.8	$40,800
60	32.01	CSAH 32	CSAH 74	CSAH 14	6.6	★★	0.0	0.0	5.5	0.0	1.1	$28,710
61	71.01	CSAH 71	DOUGLAS COUNTY LINE	CSAH 46	4.3	★★	0.0	0.0	0.0	4.3	0.0	$2,795
62	128.01	CNTY 128	MNTH 78	CSAH 55	4.0	★★	0.0	0.0	4.0	0.0	0.0	$14,000
63	138.01	CNTY 138	MNTH 29	CH 136	4.3	★★	0.0	0.0	0.0	4.3	0.0	$2,795
						TOTAL (miles)	**18.0**	**13.4**	**135.8**	**33.6**	**112.9**	**$2,218,875**

Note: The final decision to submit any project to compete for HSIP funding, and if successful, to pursue project development, is the responsibility of the County Engineer.

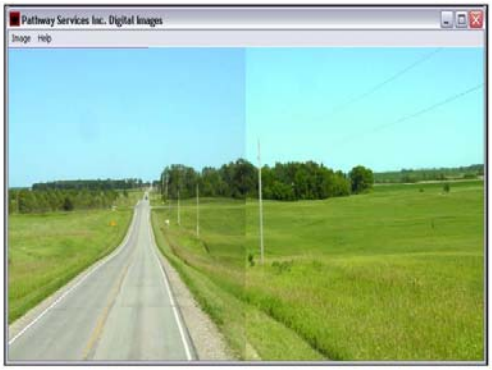
CSAH 34 from CSAH 35 to PERHAM CORP LMTS Project

Agency: Otter Tail County

Roadway Data

Type: CSAH
Number: 34

	Verbal
Start:	CSAH 35
End:	PERHAM CORP LMTS
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1148
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	6.8
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	15	11	1
Density (per mile per year)	0.44	0.32	0.03
Rate (per MVM)	1.05	0.77	0.07

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1148	600 to 1199	★
RD Density	0.32	0.08	★
Access Density	11.32	10.80	★
Curve Critical Radius Density	0.59	0.35	★
Edge Risk	3	2 or 3	★
			★★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	4.8	$193,120
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.0	$16,762

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Little McDonald Lake, Paul Lake and Rusch Lake shoreline properties.

Implementation Cost

Federal Funds	$188,894
Local Match (10% of Total project cost)	$20,988
Total Project Cost	**$209,882**

Rank: 1
Segment ID: 34.01
Date: 4/27/2011

Figure 3-17
Sample Segment Project Form

3.4.1.2 Horizontal Curves on Rural 2-Lane Roads

Curves were nominated for a project in three cases:

1. High priority curves and those in close proximity (for uniformity and cost effectiveness)
2. Curves located on a high priority segments and with a radius between 500' and 1,200'
3. Updating currently installed chevrons where the signs need to be updated

Curves identified for a project received the following:

- ***2' Shoulder Paving + Safety Wedge + Rumble Strip -*** Cost: $40,000 per mile.
- ***Chevrons -*** Install chevrons for guiding vehicles in both directions of travel. Estimated Cost: $3,300 per curve. (See Figure 2-9 for an example of a typical chevron installation).

In all, 488 curves were identified for projects at a total of over $3,950,000 (see Table 3-11). A project form has been completed for each high priority curve on a segment by segment basis (see Figure 3-18). The project form describes the segment, lists curves on the segment, ranking criteria, and provides estimated project costs. Project forms for all high priority curves can be found in Appendix C.

TABLE 3-11
OTTER TAIL COUNTY CURVE PROJECT SUMMARY

Corridor #	Curves	Project Cost ($)
1.03	1	$1,388
1.05	6	$8,283
1.06	2	$4,034
2.01	2	$18,221
3.01	6	$24,106
3.02	5	$57,291
4.02	4	$29,962
4.04	7	$58,285
5.01	2	$15,554
5.03	6	$71,026
5.04	3	$21,555
8.02	2	$13,934
8.04	4	$50,790
9.03	14	$91,795
10.01	1	$8,492
10.03	1	$3,698
10.04	1	$3,698
11.01	1	$14,118
14.01	3	$23,517
14.04	4	$24,468
15.02	5	$39,686
15.03	1	$3,506
16.01	9	$89,359
16.02	1	$7,936
17.02	7	$71,632
20.01	7	$10,871
21.01	5	$35,373
21.02	2	$19,877
22.01	2	$20,520
22.02	4	$33,414

TABLE 3-11
OTTER TAIL COUNTY CURVE PROJECT SUMMARY

Corridor #	Curves	Project Cost ($)
23.01	5	$27,577
23.02	3	$26,762
24.02	1	$11,615
24.03	1	$19,095
24.06	5	$42,603
25.01	6	$51,826
27.03	10	$101,211
28.02	2	$17,456
29.01	4	$32,736
30.01	1	$14,702
30.02	1	$9,836
31.01	4	$23,866
31.02	15	$103,029
32.01	4	$43,105
33.01	10	$85,312
34.01	10	$90,279
35.01	6	$54,865
35.03	7	$81,044
35.05	5	$54,424
35.06	5	$6,723
35.07	14	$38,222
35.09	1	$8,121
35.1	7	$74,858
36.01	13	$122,285
38.01	4	$33,669
38.02	4	$43,700
39.01	6	$71,262
40.02	2	$29,994
40.03	2	$20,203
41.01	9	$18,038
41.02	7	$58,021
42.02	7	$69,205
44.01	7	$44,304
45.01	1	$12,982
45.02	10	$94,026
46.02	11	$89,030
47.01	2	$28,873
47.02	4	$52,876
49.02	3	$26,949
50.01	2	$23,055
50.03	2	$23,252
51.02	6	$34,990
52.02	1	$11,391
53.01	8	$61,434
54.01	10	$95,230
55.01	7	$40,997
56.02	3	$20,262
57.01	4	$25,970
58.01	4	$45,658

TABLE 3-11
OTTER TAIL COUNTY CURVE PROJECT SUMMARY

Corridor #	Curves	Project Cost ($)
61.01	6	$39,121
62.01	2	$18,914
63.01	1	$5,967
64.01	1	$15,391
65.01	1	$8,823
65.02	6	$24,301
67.02	6	$45,871
67.03	4	$48,367
67.07	2	$16,750
71.01	4	$34,488
72.01	3	$25,582
73.01	2	$17,486
74.01	1	$7,869
74.02	6	$24,661
75.01	4	$38,056
75.05	1	$9,713
76.01	1	$6,065
79.01	2	$27,130
80.03	1	$3,701
83.02	8	$83,774
84.03	1	$3,790
111.02	4	$37,310
113.01	2	$13,933
114.02	3	$12,189
115.01	2	$22,630
116.01	1	$9,115
119.01	6	$53,302
122.02	4	$25,804
126.01	6	$54,037
128.01	3	$23,718
130.01	1	$11,255
136.01	2	$22,403
136.02	1	$14,270
137.01	3	$23,834
138.01	2	$22,835
141.01	1	$5,967
TOTAL	488	$3,951,728

Note: The final decision to submit any project to compete for HSIP funding, and if successful to pursue project development, is the responsibility of the County Engineer.

Curves on CSAH 1 from FERGUS FALLS CORP LMTS to CSAH 10

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
1I	0	0	1249	4625	Yes	Yes	★★	-	-	-	-	-
1J	0	0	1588	2350	Yes	Yes	★★	-	-	-	-	-
1K	0	0	1503	2350	Yes	No	★	-	-	-	-	-
1L	0	0	1606	2350	Yes	No	★	-	-	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost	Units	Total cost
Chevrons	Proactive	$3,300 per curve	1 curves	$0
Arrow Board Only	Proactive	$500 per curve	0 curves	$0
Rumble Strip	Proactive	$3,000 per mile	.5 miles	$1,388
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000 per mile	.0 miles	$0
				$1,388

Implementation Cost

Federal Funds	$1,249
Local Match (10% of Total project cost)	$139
Total Project Cost	$1,388

Page: 1
Segment ID: 1.03
Date: 4/28/2011

2005-2009 MnCMAT Crash Data

Figure 3-18
Sample Curve Project Form

3.4.1.3 Rural Thru-STOP Intersections

Several project types were considered for implementation on each of the high priority rural thru-STOP intersections. Intersection strategies are suggested for use based on two primary factors –1) the ability to mitigate the most common type of severe crash at rural, thru-STOP intersections and 2) the results of the prioritization exercise with safety partners. The project types and estimated costs are listed, and are described in Section 2.11.3 and illustrated in Figure 2-10.

- ***Roundabout -*** Estimated cost: $1,000,000 per intersection.
- ***Directional Median -*** Estimated cost: $150,000 per intersection.
- ***Mainline Dynamic Warning Sign -*** Estimated Cost: $30,000 per intersection.
- ***Street Lights -*** Install destination style street lighting at the intersection. Estimated Cost: $8,000 for one street light per intersection, $13,000 for two street lights.
- ***Upgraded Signs and Markings -*** Estimated Cost: (entire layout) $1,850 per minor leg approach.
- ***Review Signs and Clear Sight Triangle -*** Estimated Cost: $2,450 per approach

A decision tree was developed (see Figure 2-11) to ensure a consistent approach for proposed rural intersection project implementation. A project form was completed for each high priority intersection (see Figure 3-19 for an example). Each form includes an intersection description, a brief crash history, ranking criteria, an aerial photograph, and the identified strategy. Project forms for all high priority intersections are located in Appendix D.

The evaluation process used to develop a project for each of the high priority intersections considered the volume of traffic at the intersection, the geometry on the major approaches and whether or not there was a history of right angle crashes. The base project suggests the lowest level of investment (upgrade signs and markings on the minor approach) at intersections with very low volumes on the minor approaches (under 200 vehicles per day). The base project for intersections with slightly higher volumes on the minor approach (over 200 vehicles per day) also included installation of a destination style street light. Increased levels of investment are suggested at intersections with higher volumes and the presence of right angle crashes; this may include a dynamic mainline warning sign, a directional median where the major road is divided, or a roundabout at intersections where the volumes would be high enough to meet the traffic volume warrants in the MNMUTCD for signalization.

Table 3-12 summarizes the 76 high priority intersections and suggested safety strategies, which includes one directional median, two mainline dynamic warning signs, 64 street light installations, and 76 sign and marking upgrades.

It should be further noted that some of the at-risk locations and suggested safety projects involve the intersection of a County roadway and a State trunk highway. It is acknowledged that in these cases, the County does not have the authority to implement projects on the State's right-of-way. The County is encouraged to coordinate with Mn/DOT in order to pursue a partnership that identifies a path toward implementation.

CSAH 9 and MNTH 34 WEST

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 5.4
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 3075
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 2400
Minor ADT: 1350

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	4	0	0
Rate (per MVM)	0.7	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.56	0.4 - 0.8	★
Total Crashes	4	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 2
Intersection ID: 9.03
Date: 5/9/2011

Figure 3-19
Sample Intersection Project Form

TABLE 3-12
Otter Tail County Intersection Project Summary

Rank	Int. ID	System	#	Description	Risk Ranking	Round-about	Directional Median	Mainline Dynamic Warning Sign	Install Street Lights	Signs & Marking	Review Signs & Clearing/ Grubbing	Project Cost ($)
1	60.01	CSAH	60	CSAH 60 and USTH 10	★★★★★	-	X	-	X	X	-	$166,700
2	9.03	CSAH	9	CSAH 9 and MNTH 34 WEST	★★★★★	-	-	-	X	X	-	$9,850
3	21.02	CSAH	21	CSAH 21 and CSAH 88	★★★★★	-	-	-	X	X	-	$16,700
4	35.07	CSAH	35	CSAH 35 and MNTH 210	★★★★★	-	-	X	-	X	-	$33,700
5	35.11	CSAH	35	CSAH 35 and CSAH 41	★★★★★	-	-	-	X	X	-	$9,850
6	35.12	CSAH	35	CSAH 35 and CSAH 44	★★★★★	-	-	-	X	X	-	$9,850
7	52.01	CSAH	52	CSAH 52 and MNTH 108	★★★★★	-	-	-	X	X	-	$9,850
8	8.03	CSAH	8	CSAH 8 and CSAH 13	★★★★★	-	-	-	X	X	-	$9,850
9	10.03	CSAH	10	CSAH 10 and CSAH 88	★★★★★	-	-	-	X	X	-	$16,700
10	14.06	CSAH	14	CSAH 14 and CSAH 67	★★★★★	-	-	-	X	X	-	$9,850
11	9.05	CSAH	9	CSAH 9 and CSAH 20	★★★★★	-	-	-	X	X	-	$9,850
12	53.01	CSAH	53	CSAH 53 and USTH 10	★★★★	-	-	-	X	X	-	$16,700
13	4.07	CSAH	4	CSAH 4 and MNTH 228 NORTH	★★★★	-	-	-	X	X	-	$9,850
14	40.03	CSAH	40	CSAH 40 and CSAH 65	★★★★	-	-	-	X	X	-	$16,700
15	5.03	CSAH	5	CSAH 5 and MNTH 210 , T 1461 EAST	★★★★	-	-	-	X	X	-	$16,700
16	16.05	CSAH	16	CSAH 16 and MNTH 108	★★★★	-	-	-	X	X	-	$9,850
17	75.04	CSAH	75	CSAH 75 and USTH 10	★★★★	-	-	X	X	X	-	$46,700
18	64.01	CSAH	64	CSAH 64 and MNTH 78	★★★★	-	-	-	X	X	-	$9,850
19	22.01	CSAH	22	CSAH 22 and CSAH 27	★★★★	-	-	-	X	X	-	$16,700
20	28.01	CSAH	28	CSAH 28 and USTH 59	★★★★	-	-	-	X	X	-	$16,700
21	1.29	CSAH	1	CSAH 1 and CNTY 145	★★★★	-	-	-	X	X	-	$9,850
22	35.05	CSAH	35	CSAH 35 and CNTY 124	★★★★	-	-	-	-	X	-	$1,850
23	40.09	CSAH	40	CSAH 40 and CSAH 75	★★★★	-	-	-	X	X	-	$1,850
24	35.04	CSAH	35	CSAH 35 and CSAH 82	★★★★	-	-	-	X	X	-	$16,700
25	3.01	CSAH	3	CSAH 3 and CSAH 10	★★★★	-	-	-	X	X	-	$9,850
26	80.01	CSAH	80	CSAH 80 and USTH 10 EAST	★★★★	-	-	-	X	X	-	$9,850
27	4.02	CSAH	4	CSAH 4 and CSAH 31	★★★★	-	-	-	X	X	-	$9,850
28	4.03	CSAH	4	CSAH 4 and CSAH 41	★★★★	-	-	-	X	X	-	$9,850

TABLE 3-12
Otter Tail County Intersection Project Summary

Rank	Int. ID	System	#	Description	Risk Ranking	Round-about	Directional Median	Mainline Dynamic Warning Sign	Install Street Lights	Signs & Marking	Review Signs & Clearing/ Grubbing	Project Cost ($)
29	19.05	CSAH	19	CSAH 19 and CSAH 56	★★★★	-	-	-	X	X	-	$9,850
30	47.02	CSAH	47	CSAH 47 and CNTY 119	★★★	-	-	-	X	X	-	$9,850
31	52.04	CSAH	52	CSAH 52 and MNTH 106	★★★	-	-	-	X	X	-	$16,700
32	82.01	CSAH	82	CSAH 82 and USTH 59	★★★	-	-	-	X	X	-	$9,850
33	52.02	CSAH	52	CSAH 52 and CSAH 67	★★★	-	-	-	X	X	-	$16,700
34	1.25	CSAH	1	CSAH 1 and CSAH 35	★★★	-	-	-	X	X	-	$16,700
35	4.01	CSAH	4	CSAH 4 and USTH 59	★★★	-	-	-	X	X	-	$9,850
36	6.04	CSAH	6	CSAH 6 and MNTH 29	★★★	-	-	-	X	X	-	$9,850
37	84.03	CSAH	84	CSAH 84 and USTH 10 EAST	★★★	-	-	-	X	X	-	$9,850
38	8.1	CSAH	8	CSAH 8 and CSAH 75 EAST	★★★	-	-	-	X	X	-	$9,850
39	15.04	CSAH	15	CSAH 15 and CSAH 86	★★★	-	-	-	X	X	-	$9,850
40	50.03	CSAH	50	CSAH 50 and CSAH 67 NORTH	★★★	-	-	-	X	X	-	$9,850
41	5.01	CSAH	5	CSAH 5 and CSAH 38	★★★	-	-	-	X	X	-	$9,850
42	20.01	CSAH	20	CSAH 20 and CSAH 31	★★★	-	-	-	X	X	-	$ 9,850
43	33.03	CSAH	33	CSAH 33 and CNTY 120	★★★	-	-	-	-	X	-	$9,850
44	57.01	CSAH	57	CSAH 57 and MNTH 210	★★★	-	-	-	-	X	-	$1,850
45	21.06	CSAH	21	CSAH 21 and CSAH 28	★★★	-	-	-	-	X	-	$3,700
46	24.03	CSAH	24	CSAH 24 and CSAH 27	★★★	-	-	-	X	X	-	$1,850
47	33.04	CSAH	33	CSAH 33 and MNTH 210	★★★	-	-	-	-	X	-	$9,850
48	1.06	CSAH	1	CSAH 1 and CSAH 15	★★★	-	-	-	X	X	-	$3,700
49	1.23	CSAH	1	CSAH 1 and CSAH 10	★★★	-	-	-	X	X	-	$9,850
50	8.04	CSAH	8	CSAH 8 and CSAH 53	★★★	-	-	-	X	X	-	$16,700
51	16.01	CSAH	16	CSAH 16 and MNTH 78	★★★	-	-	-	X	X	-	$9,850
52	34.02	CSAH	34	CSAH 34 and CNTY 123	★★★	-	-	-	-	X	-	$9,850
53	35.06	CSAH	35	CSAH 35 and CSAH 39	★★★	-	-	-	-	X	-	$1,850
54	38.02	CSAH	38	CSAH 38 and CSAH 81	★★★	-	-	-	-	X	-	$3,250
55	41.01	CSAH	41	CSAH 41 and MNTH 108 EAST	★★★	-	-	-	X	X	-	$9,850
56	54.03	CSAH	54	CSAH 54 and CSAH 67	★★★	-	-	-	X	X	-	$9,850
57	85.01	CSAH	85	CSAH 85 and MNTH 108	★★★	-	-	-	X	X	-	$16,700

TABLE 3-12
Otter Tail County Intersection Project Summary

Rank	Int. ID	System	#	Description	Risk Ranking	Round-about	Directional Median	Mainline Dynamic Warning Sign	Install Street Lights	Signs & Marking	Review Signs & Clearing/ Grubbing	Project Cost ($)
58	143.01	CNTY	143	CNTY 143 and USTH 10	★★★	-	-	-	-	X	-	$3,250
59	12.04	CSAH	12	CSAH 12 and CSAH 47 WEST	★★★	-	-	-	X	X	-	$9,850
60	63.01	CSAH	63	CSAH 63 and MNTH 235	★★★	-	-	-	X	X	-	$9,850
61	18.01	CSAH	18	CSAH 18 and CSAH 35	★★★	-	-	-	X	X	-	$16,700
62	1.28	CSAH	1	CSAH 1 and CSAH 83	★★★	-	-	-	X	X	-	$9,850
63	3.02	CSAH	3	CSAH 3 and CSAH 22	★★★	-	-	-	X	X	-	$16,700
64	3.03	CSAH	3	CSAH 3 and CSAH 24	★★★	-	-	-	X	X	-	$16,700
65	21.05	CSAH	21	CSAH 21 and CSAH 24 NORTH	★★★	-	-	-	X	X	-	$9,850
66	29.02	CSAH	29	CSAH 29 and CNTY 120	★★★	-	-	-	X	X	-	$9,850
67	31.01	CSAH	31	CSAH 31 and USTH 59	★★★	-	-	-	X	X	-	$16,700
68	35.14	CSAH	35	CSAH 35 and MNTH 108 EAST	★★★	-	-	-	X	X	-	$9,850
69	50.02	CSAH	50	CSAH 50 and CSAH 67 SOUTH	★★★	-	-	-	X	X	-	$9,850
70	67.02	CSAH	67	CSAH 67 and CSAH 67	★★★	-	-	-	X	X	-	$9,850
71	119.01	CNTY	119	CNTY 119 and MNTH 210	★★★	-	-	-	X	X	-	$16,700
72	137.01	CNTY	137	CNTY 137 and USTH 10	★★★	-	-	-	X	X	-	$16,250
73	21.04	CSAH	21	CSAH 21 and CSAH 24 SOUTH	★★★	-	-	-	-	X	-	$1,850
74	29.01	CSAH	29	CSAH 29 and CSAH 82	★★★	-	-	-	-	X	-	$1,850
75	29.03	CSAH	29	CSAH 29 and MNTH 210	★★★	-	-	-	X	X	-	$16,700
76	32.01	CSAH	32	CSAH 32 and CSAH 74	★★★	-	-	-	X	X	-	$9,850
					TOTAL	**0**	**1**	**2**	**64**	**76**	**0**	**$1,021,200**

Note: The final decision to submit any project to compete for HSIP funding and if successful to pursue project development, are the responsibility of the County Engineer.

3.4.1.4 County Nominated Projects

Otter Tail County had additional projects that were nominated outside of the data driven process. These projects include the installation of street lights and upgraded signs and markings. The County nominated projects include the following intersections, as shown in Table 3-13.

TABLE 3-13
Otter Tail County Nominated Intersection Projects

Int ID	System	Route #	Description	Risk Ranking	Install Street Lights	Signs & Markings	Project Cost ($)
1.01	CSAH	1	CSAH 1 and CSAH 26	★★	x	x	$16,700
10.06	CSAH	10	CSAH 10 and CSAH 27	★★	x	x	$16,700

Contents

4.0 Driver Behavior Safety Strategies 4-1
4.1 Why is Driver Behavior Important to Include in a County Plan? 4-1
4.2 Teenage Drivers, Impaired Driving, Seat Belts, Speeding, Distraction 4-1
4.2.1 Teenage Drivers 4-1
4.2.2 Alcohol-Related Crashes 4-1
4.2.3 Seat Belts 4-2
4.2.4 Unsafe and Illegal Speeding and Aggressive Driving 4-3
4.2.5 Distracted/Inattentive Driving 4-3
4.3 Driver Behavior Change Strategies: Proven, Experimental, Tried 4-4
4.3.1 Traffic Safety Policy Work: State Law and Worksite Policy 4-4
4.3.2 High Visibility Enforcement of Traffic Laws 4-5
4.3.3 Community Training and Program Development 4-6
4.4 Call for Innovative and New Ideas from the Community 4-7
4.5 Barriers to Implementing Behavior Change Strategies 4-8
4.6 Resources for Implementing Effective Behavior Change Strategies 4-9
4.7 Actionable Interventions for a Community Concerned with Traffic Safety 4-9
4.7.1 Driving Behavior Safety and Enforcement Messages 4-9
4.8 Minnesota Department of Public Safety Office of Traffic Safety Programs 4-26

4.0 Driver Behavior Safety Strategies

4.1 Why is Driver Behavior Important to Include in a County Plan?

Traffic crashes are the leading killer of Minnesotans, ages 1-34 — each year more than 400 people are killed on our roads and 31,000 are injured.
These deaths and injuries are all preventable and predictable. In most cases, unsafe driver behavior is the primary contributing factor for crashes. Traffic crashes can be prevented and reduced if motorists buckle up, drive at safe speeds, pay attention and plan ahead to avoid impaired driving.

The most effective method to encourage these safe driving behaviors is to apply enforcement efforts coupled with educational outreach. Research indicates education alone is not effective, and enforcement alone will not sustain a change in driver behavior.

At the foundation of Minnesota and the nation's driving issues is a complacency toward driving — there is little outrage about the deaths or serious action to prevent them. The public seems to accept that these crashes will always occur. The challenge is to sculpt and foster a new driving culture, where Minnesotans practice and promote safe driving — and join in the vision that these tragedies are preventable.

4.2 Teenage Drivers, Impaired Driving, Seat Belts, Speeding, Distraction

The data presented in this chapter is specifically for Area Transportation Partnership (ATP) 4. This is the same data that was presented at each of the County Safety Plan Workshops in ATP 4. You will remember that the data suggests that contributing factors for this region most often are inexperienced drivers, impaired driving, failure to use seat belts, speeding and distracted driving.

4.2.1 Teenage Drivers

Traffic crashes are the leading killer of Minnesota teens. Teenage drivers' inexperience behind the wheel puts them at significantly higher risk for fatal and serious injury crashes. Also contributing to these crashes are low seat belt compliance rates, risk-taking behind the wheel, and distractions, such as other passengers in the vehicle (see charts on the following pages). A main issue regarding teen drivers is that they are still developing their decision-making and judgment skills up until their early 20s.

There have been legislative efforts to support safe teen driving. The Graduated Driver's License law helps newly licensed teen drivers hone their driving skills during the first year of licensure by minimizing exposure to two high-risk situations: carrying multiple teen passengers and driving late at night. New teen drivers are also banned from all cell phone use.

Parents are critical factors in developing safe teen drivers. Parents need to continue to monitor and train teen drivers, even after licensure, reinforce state laws, set reasonable rules and limits specific to their teen driver — and be safe role models behind the wheel.

4.2.2 Alcohol-Related Crashes

Each year, alcohol-related deaths account for one-third of the state's total death count, while more than 30,000 motorists are arrested for DWI annually. Young adult males are the primary offenders and those most often killed in alcohol-related crashes. In ATP 4, motorists ages 21–29 have the highest level of involvement in alcohol-related fatal and serious injury crashes (see Figure 4-1).

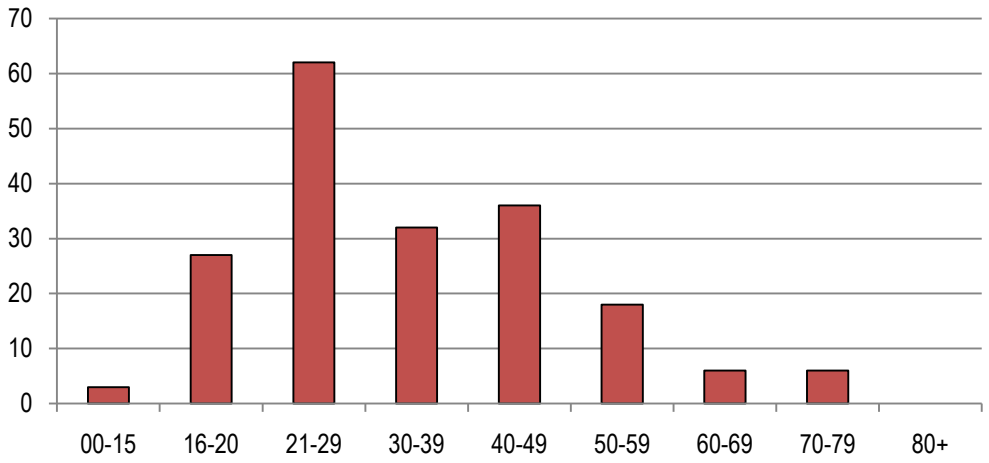


Figure 4-1
2005 – 2009 Alcohol-Related Fatalities and Severe Injuries by Age in ATP 4

Alcohol-related fatalities and severe injuries typically occur on the weekends, at night and early morning hours, most often in the summer months. The majority of the alcohol-related crashes in ATP 4 are on CSAHs and trunk highways.

4.2.3 Seat Belts

Each year, more than half of the state's vehicle occupant fatalities are unbelted. Minnesota's seat belt compliance rate hit a daytime record-high of 92 percent in 2010 following the passing of the primary seat belt law in 2009. Data reveal, however, that belt use is lower at night — for example, 75 percent of drinking drivers killed in crashes are also not buckled up. Belt use is generally lower on county roads or CSAH's. The groups with the lowest seat belt use rates are rural males — mostly teens and young adults (see age groups in Figure 4-2) and pickup truck drivers.

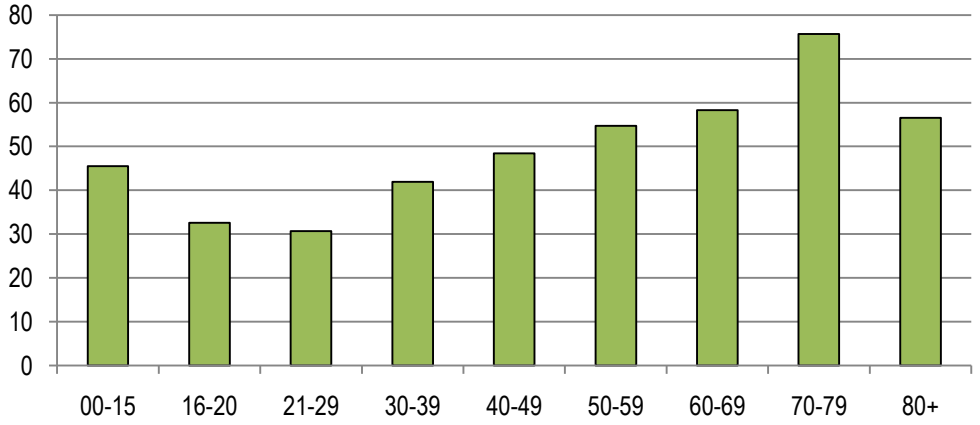


Figure 4-2
2005 – 2009 Percentage of Fatalities and Severe Injuries – Belted during Crash by Age in ATP 4

4.2.4 Unsafe and Illegal Speeding and Aggressive Driving

Illegal or unsafe speed is a leading factor in fatal crashes. Each year, almost 70 percent of speed-related fatal crashes occur on rural roads. Aggressive driving behavior (speeding, tailgating, running lights, unsafely changing lanes, etc.) is primarily a young driver issue. Speed-related fatalities and serious injuries typically occur on weekend evenings and early mornings. The drivers are most often males, ages 16-20 and 21-29 (see Figure 4-3).

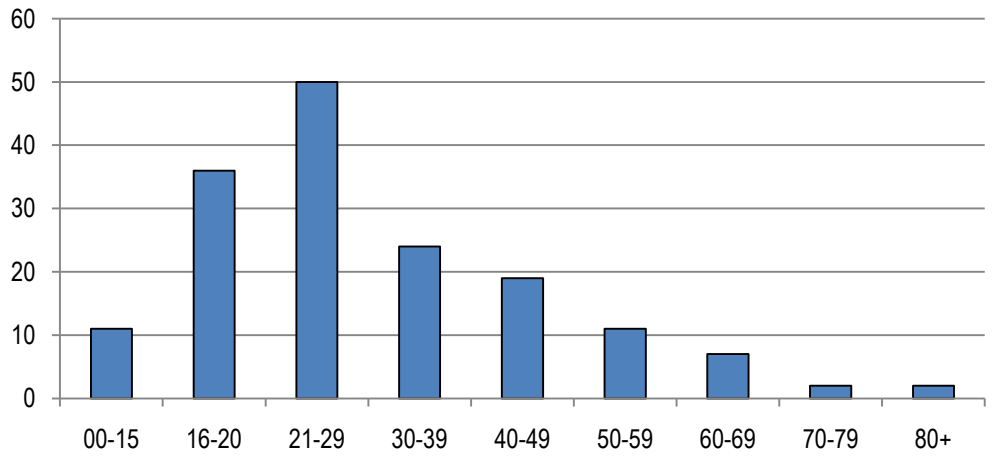


Figure 4-3
2005 – 2009 Speed-Related Fatalities and Severe Injuries by Age in ATP 4

4.2.5 Distracted/Inattentive Driving

There are a range of distractions in a vehicle — including daydreaming, conversations, cell phone use/texting, reaching for items, eating, grooming and more. Each year, distracted driving accounts for at least one-quarter of all crashes, resulting in 70 deaths and 350 serious injuries — these numbers are low as it is a challenge for law enforcement to determine "distraction" as a crash factor.

While much focus of distraction is on teens/young adults, new studies show that adults are just as active on cell phones and texting behind the wheel. In Minnesota, it is illegal for drivers to read/compose/send texts or emails, or access the Web on a wireless device while the vehicle is in motion or part of traffic — including while stopped in traffic

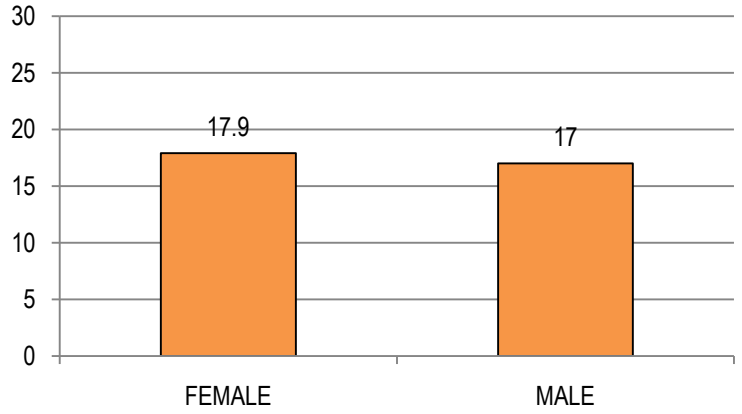


Figure 4-4
2005 – 2009 Percentage of Fatalities and Severe Injuries that were Inattention-Related by Gender in ATP 4

or at a stop light. Women are disproportionately represented in inattention-related fatal and serious injury crashes (see the gender breakdown in Figure 4-4).

4.3 Driver Behavior Change Strategies: Proven, Experimental, Tried

The Minnesota Department of Public Safety Office of Traffic Safety created a list of driver behavior change strategies that could be implemented by all communities. The strategies included were based on the research provided by the National Cooperative Highway Research Program (NCHRP) 500 Series and the National Highway Traffic Safety Association (NHTSA)-produced Countermeasures that Work, 5th edition. The strategies were chosen to address each of the most prevalent contributing factors to fatal and severe injuries on Minnesota roads, outlined below. Based on the research of the strategy, each was rated for effectiveness in addressing an issue and impact on the problem when implemented.

4.3.1 Behavior Change Strategies — Traffic Safety Policy Work: State Law and Worksite Policy

State Law Policy

State-level legislative efforts to improve traffic safety have been researched and proven effective in many states. Local community groups can advocate for laws by contacting local legislators or educating community members about the benefits of proposed legislation/current laws.

If the laws currently exist, it is important to maintain those laws and enforce them. To stay involved in traffic safety policy efforts, advocates should support law enforcement efforts to enforce laws, and voice support for enforcement initiatives to the local government (city council or county commissioners).

TABLE 4-1
Strategies for State Legislation

Strategies	Contributing Factor	Effectiveness	Impact
Require ignition interlocks as a condition for license reinstatement	Impaired	Proven	High
Suspend driver's license administratively upon arrest	Impaired	Proven	High
Eliminate diversion programs and plea bargains	Impaired	Tried	High
Pass statewide legislation requiring helmets for all motorcycle riders	Motorcycle	Proven	High
Pass statewide legislation identifying licensing requirements for all motorcycle riders	Motorcycle	Tried	Low
Pass statewide legislation requiring helmets for all bicyclists	Bicyclists	Tried	Low
Impose sanctions against repeat offenders for speed	Speed	Experimental	Unknown

Worksite Policy

Many Minnesota employers have implemented policies for employees that support traffic safety such as seat belt use, speed, alcohol and cell phone use. Policies can offer protection to employees, employee's families and the employer. Employee productivity and employer liability are the main reasons employers focus on traffic safety policies. In the liquor establishment setting, a policy requiring responsible beverage service training is helpful in protecting the establishment from liability.

TABLE 4-2
Strategies for Worksites

Strategies	Contributing Factor	Effectiveness	Impact
Encourage employers to offer fatigue management programs to employees working nighttime or rotating shifts	Distraction	Proven	Medium
Encourage employers to enact traffic safety policies with clear consequences for failure to comply	Distraction/Seat Belts/Alcohol	Proven	Medium

4.3.2 Behavior Change Strategies — High Visibility Enforcement of Traffic Laws: A Priority for All Counties

What is High-Visibility Enforcement?

High-visibility enforcement employs a multiple jurisdictional and/or multiple squad approach to saturate specific corridors. The efforts use electronic or static signage on officer-saturated traffic corridors (for example, to alert motorists they've entered a "DWI Arrest Zone"). Participating officers also wear "DWI Enforcement" reflective gear to increase enforcement visibility. This enforcement strategy can be used to enforce laws pertaining to DWI, seat belt use and speeding and aggressive driving.

Which laws are enforced?

- Publicize and conduct high-visibility targeted enforcement of laws pertaining to speeding and aggressive driving.
- Conduct highly publicized enforcement campaigns to maximize restraint use. Specifically, nighttime belt enforcement saturation.
- Conduct on-going, well-publicized DWI saturations.

Who are potential partners?

- Local law enforcement (State Patrol, county sheriff, city police).
- Community partners (coalitions or county public health educators, school officials, parents).
- Local media (newspaper, radio, cable/TV).

How is it done?

- Public education outreach and enforcement activity are coordinated. A wide range of media will be used for public education. Signs in the community will advertise that an enforcement campaign is taking place.
- For the media — craft and issue a news release; officers or community members can conduct interviews and offer ride-a-longs; conduct live, call-in radio talk shows; kick-off news conference with many officers and squads present, as well as ambulances/fire trucks and families of crash victims.
- Community efforts include writing letters to the editor during the same time period, as well as distributing posters, coasters, window clings and other promotional items with the enforcement message to local businesses and schools. Communities should be creative in how they promote traffic safety.
- The enforcement could include officers wearing highly visible vests, big orange signs on the roadside that announce the enforcement, and use of changeable message signs (banks or other businesses often will place a message on their sign advertising the enforcement). Use three or more squad cars on a small corridor or area looking for the same thing — such as seat belt non-use or impaired driving.

TABLE 4-3
Strategies for High Visibility Enforcement

Strategies	Contributing Factor	Effectiveness	Impact
Conduct highly publicized enforcement campaigns to maximize restraint use—specifically, night time belt enforcement saturation	Seat Belts	Proven	High
Conduct on-going well-publicized DWI saturations	Impaired	Proven	High
Publicize and conduct high visibility targeted enforcement of speeding and aggressive driving	Speed	Tried	High
Publicize enhanced enforcement of bicycle laws, and publicize bicycle helmet usage	Young Drivers/ Riders	Tried	High
Conduct high visibility enforcement of existing statutes to deter distracted and drowsy driving	Distraction	Experimental	High
Motorcyclist rider conspicuity campaigns — publicizing is best done through the local media and a public education campaign in the community	Motorcycle	Tried	Low
Conduct education and awareness campaign of the targeted enforcement of Zero Tolerance Laws for Drivers Under Age 21	Young Drivers	Proven	Low

4.3.3 Behavior Change Strategies — Community Training and Program Development

Community Training

To effectively address driver behavior, communities should provide training opportunities for motorcycle riders, child passenger safety advocates, bicyclists and parents. The training provides updated safety information or practices to different groups of stakeholders. Community trainings bring the traffic topic to the foreground and provide an opportunity for questions and answers by those receiving the information or skills.

TABLE 4-4
Strategies for Community Training

Strategies	Contributing Factor	Effectiveness	Impact
Training courses provided for motorcycle riders around the state at Motorcycle Safety Center training sites	Motorcycle	Tried	Medium
Publicize use of bicycle helmets with bicyclists	Young Bicyclists	Tried	Low
Engage parents through outreach programs designed to educate parents about: • teen driving risks • driving tips for their teens • parental supervision • managing young drivers • selecting safer vehicles for young drivers	Young Drivers	Tried	Medium
Conduct high-profile “child restraint inspection” events at multiple community locations	Seat Belts	Proven	Low
Train child passenger safety advocates to check for proper child restraint use	Seat Belts	Tried	Low

Community Program Development

Developing community programs to address impaired driving can be useful in multiple settings. In liquor establishments, promotion of enforcement efforts and alternative transportation options (buses, cabs, light rail) can be effective in deterring impaired driving. Intensive supervision of DWI offenders can help with accountability and reducing recidivism. Finally, interventions in the emergency department or jail, during a teachable moment, may be effective in directing individuals to chemical health services.

TABLE 4-5
Strategies for Program Development

Strategies	Contributing Factor	Effectiveness	Impact
Support community programs for alternative transportation-partnership between beer distributors, bar owners and community program	Impaired	Tried	Medium
Monitor convicted DWI offenders closely — DWI courts or intensive supervision programs	Impaired	Proven	Low
Employ screening and brief interventions	Impaired	Tried	Medium

4.4 Call for Innovative and New Ideas from the Community

These innovative ideas proposed from County Highway Safety Plan workshops have not been evaluated or studied, but may have the potential to be effective strategies in changing driver behavior. Each of these ideas has strengths and limitations. The Department of Public Safety Office of Traffic Safety (OTS) has included comments to consider below for each idea.

Law Enforcement and Traffic Citations

"Administrative citations could be an option to giving out state citations. Law enforcement may be more likely to issue an administrative citation, as it costs the offender less money. This part of the state has historically had a lower median income and this may have an effect on the number of citations and warnings issued."

OTS encourages thoughtful consideration before communities adopt administrative citations. The benefit of the administrative citation is that it is less expensive and may lead to officers giving a citation for lower speed violations, rather than a warning. But there are concerns. Administrative citations would not allow for identifying high-risk drivers having multiple citations, as the administrative citation does not go on the driving record.

Seat Belt Citation Cost

"Lower the cost of seat belt citations. Law enforcement may be deterred from writing seat belt citations, because of the high cost and low median income in this area of the state."

Research has demonstrated that it often takes several citations to change the behavior of a driver.

Car Technology Legislation

"Pass legislation to require vehicle companies to build their vehicles with new technologies incorporated. Examples of these technologies are: phones automatically turning off when the vehicle is started, ignition interlocks, locking out max speeds, smart keys, GPS navigating the vehicle, and exterior vehicle sensors."

OTS supports the use of car technology to improve safety, but does not have a comment on specific legislation.

Distraction Legislation

"Pass legislation to pass a hands-free law. This means no dialing, texting, or e-mailing would be legal. The current law allows drivers 18 years and over dial cell phones when driving. Therefore it is difficult for law enforcement to know whether the driver is making a call or texting. The use of new technology to curb texting and cell phone use while driving could be helpful. One example shared was applications that disable cell phones when going over five miles per hour (www.eyesuup.com)."

OTS is concerned with endorsing hands-free cell phone use while driving, as the cognitive distraction is still very much there. While hands-free is step in the right direction, it is still not a safe way to drive a vehicle.

Technology and Law Enforcement

"Information sharing between state, county, and local law enforcement agencies could be improved with technology. This means updating the technology so that all citations are computerized in a central database which is accessible by all law enforcement across the state."

OTS believes this would an expensive and time consuming undertaking. It would require a significant amount of cooperation from all law enforcement agencies in Minnesota to build and transition to using a new system.

Teens – High Visibility Enforcement Waves Around High Schools

"Law enforcement issuing citations to teens around the school they attend may have a ripple effect and get the message out that there is a strong possibility that they may get cited if they break traffic laws. It is important to note that education along with targeted enforcement is a proven strategy."

OTS greatly supports high-visibility efforts around locations where young drivers are present. OTS encourages law enforcement to partner with local schools to combine awareness efforts with the enforcement.

Peer Education in Schools

"Implement peer driven programs in schools that promote safe driving."

OTS encourages traffic safety awareness and education efforts, as long as they are conducted in conjunction with law enforcement efforts.

Parents and Driver's Ed

"Parent involvement in driver's education should be mandatory. Parents should be required to attend an initial meeting before their teen begins driver's education, similar to the mandatory sports meetings that they have to attend to participate in high school sports."

OTS encourages communities to commit to providing parent education opportunities to learn about how to work with and manage their teen drivers.

4.5 Barriers to Implementing Behavior Change Strategies

During the planning process, it is important to consider the barriers to implementing driver-behavior based strategies. These barriers will vary according to the proposed strategy to be implemented.

One of the most cited barriers to implementing many strategies is the political environment. This barrier is most evident when implementing new law enforcement efforts. County and local law enforcement agencies are governed by elected boards. Sometimes targeted law enforcement is considered infringing on people's rights or viewed as a revenue stream for the city or county. Alcohol compliance checks and liquor server training can also be quite controversial, especially in small, rural communities.

Another significant barrier is funding sources for overtime traffic enforcement as well as other traffic safety programs. The state does issue a limited amount of grant funds for traffic safety coalitions and for overtime enforcement. Not all areas utilize these funds and in some cases departments are not able to find enough staff willing to take the overtime hours. This is particularly evident in smaller

communities with limited staff. Furthermore, some communities do not feel traffic safety is a top priority, even though the data points to traffic crashes as a primary cause of death.

One way to get beyond these barriers is to educate those with authority or political positions. It is important to use data to back up the request for the community to focus on changing driver behavior. Rarely are crashes actual "accidents." Most crashes could have been prevented if drivers in each community had followed safe driving practices.

4.6 Resources for Implementing Effective Behavior Change Strategies

The focus of all traffic safety efforts needs to be data driven. All strategies used to change driver behavior begin with identifying the local problem areas. Find county-specific fact sheets on various topics and comprehensive Minnesota Motor Vehicle Crash Facts reports at the OTS website: www.dps.state.mn.us/ots, click on "Crash Data and Reports". Use this information to choose strategies to implement in your community and to better localize your news items for media/outreach.

Actionable intervention strategies are described below for a community concerned with traffic safety, specifically with the issues of young drivers, impaired driving, seat belt use, speed and distraction.

For each intervention strategy, there is:

- Description of the activity
- Time and funding needed to implement
- Barriers to implementing the strategy in the community
- Potential partners in the community
- Specific actions a county could take to support the strategy
- Contact information for finding out what is currently being implemented in your county

Almost all of these interventions are currently being implemented throughout the state. The programs and contacts at OTS are a great place to start if there is interest in pursuing any of these methods to change driver behavior in your county.

4.7 Actionable Interventions for a Community Concerned with Traffic Safety (young drivers, impairment, belts, speed, distraction)

- Driving Behavior Safety and Enforcement Messages
- High Visibility Enforcement (young drivers, impairment, belts, speed and distraction)
- Community Support for Law Enforcement Efforts (young drivers, alcohol, belts, speed and distraction)
- Community Traffic Safety Coalitions
- Regional Partnerships
- Worksite Education and Policy (young drivers, alcohol, belts, speed and distraction)
- Child Passenger Safety – Technician Training and Community Clinics (belts)
- Working with Parents of Young Drivers (young drivers)
- Mock Crash at Local School (young drivers)
- Crash Video Targeted to Minnesota Youth (young drivers)
- Alternative Rides Home (impairment)
- Intensive Supervision of DWI Offenders (impairment)
- Reducing Impaired Driving- Ignition Interlock (impairment)
- Motorcycle Initiatives (motorcyclist, impairment, speed, distraction)

Enforcement Focus: Speed, Seatbelts, Impaired Driving, Distracted Driving, Young Drivers

Driver behavior change strategies will use public outreach or messaging as part of the implementation process. These are messages developed by the National Highway Traffic Safety Administration that Minnesota adopts. Taglines indicated below should be repeated at the community level for a strong and coherent message.

- Buckle Up. Click it or Ticket.
- Drive at Safe Speeds — Obey the Sign or Pay the Fine.
- Drunk Driving. Over the Limit, Under Arrest.
- Always have a plan for a safe and sober ride.

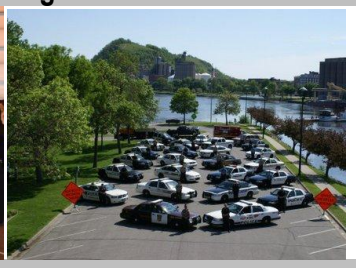
Educational Materials Available

Promote Safe Driving Behavior and Ongoing Enforcement Efforts in the Community

Description: Partners are encouraged to post and distribute these materials at business/locations that deliver a teen/young adult target (fast food, bars, convenience stores, etc.). Items include bar coasters, brochures, flyers, posters, window clings, and other materials to promote enforcement in the community. Use these items in combination with added enforcement. Public service announcements (TV, radio, print) also available to download at www.dps.state.mn.us/ots , click on "Public Service Announcements."

Funding: Free resources for promoting law enforcement and traffic safety efforts are available at no charge through the Office of Traffic Safety website: www.dps.state.mn.us/ots, click on "Resource Catalog".

Enforcement Focus: Speed, Seatbelts, Impaired Driving, Distracted Driving, Young Drivers



High Visibility Enforcement and Publicity about Enforcement

Description: High visibility enforcement is when multiple jurisdictions and/or multiple squads are out in relatively close proximity on a single roadway, often using brightly colored vests and enforcement signs. Enforcement effort lengths can vary. Publicizing is done through community events for the local media and a public education campaign (posters, letter to the editor) in the community about the enforcement. OTS funded programs include: Heightened Enforcement of Aggressive Traffic (HEAT), Night Concentrated Alcohol Patrol (Night CAP) and Safe and Sober overtime enforcement grants.

Time: example for an agency grant - total hours working Safe and Sober Waves: 460 hours
October Belt Wave: 96 hours
December DWI Wave: 79 hours
Memorial Day Belt Wave: 96
June Motorcycle Wave: 10
July Speed Wave: 44
Ted Foss Move Over Law Enforcement: 9
Labor Day DWI Wave: 106
Outside of Wave hours: 20

Funding: For information on funding and opportunities for getting involved in enforcement projects, go to the OTS website www.dps.state.mn.us/ots.

Who is currently working on this in your county? To find out more about this effort or what is currently occurring in your county, please go to www.dps.state.mn.us/ots or Shannon Swanson at shannon.swanson@state.mn.us or Jean Ryan at jean.m.ryan@state.mn.us.

Barriers to Success

- Low public awareness and low public support for enforcement
- Low support for enforcement from community leadership
  (Mayors, business owners, city council or county commissions, school boards)

Potential Agency Partners

- Minnesota State Patrol, county sheriff's offices, city police departments
- Regional partners and neighboring counties

Specific Actions a County Could Take to Support Strategy

- Write letters to the editor during pre-media effort in support of law enforcement efforts to give citations.
- Assist with identifying locations with high crash involvement for targeted enforcement.
- Discuss the enforcement with local government officials and/or attend and speak at a kick-off press conference.
- Order materials with enforcement messages from the Office of Traffic Safety website and post in community.

Community Support for Law Enforcement Efforts

Speeding concerns in Chatfield

By Karen Reisner

Superintendent of City Services Tony Lammers received approval at Chatfield's October 26 council meeting to purchase four 30-mile per hour speed limit signs to be installed along Hillside Drive. Mayor Les Knutson acknowledged the public's concerns about both speeding and jake breaking on the road from Hwy 52 to the new elementary school.

Knutson said the city needs to keep school children safe. He expects it might be necessary to install speed bumps. Knutson suggested some people will have difficulty keeping their speed at 30 miles per hour coming down the hill. Speed limit signs will be a start.

City Attorney Fred Suhler questioned whether the city could install the signs without a study by MnDot. He suggested someone in district 6 for MnDot be called so a study could be done if they require it. Suhler added that just because the road is within the city limits doesn't necessarily mean it is a 30-mile per hour zone. He pointed to the lack of residences along the road.

The councilors voted to go ahead and buy the signs while Suhler's concerns are explored.

Auditor Proposal Accepted

The councilors accepted a proposal submitted by Smith Schafer and Associates to do the city's audits for three years

See SPEEDING Page 15 ►

Comment on this article at www.fillmorecountyjournal.com

Letters to the Editor in the Local Paper

Description: Community members can submit letters to the editor of local news publications from multiple perspectives — first responder, family of victim, chief/sheriff, community stakeholders. The letters can be original or from a template. The purpose of these letters is to address a traffic safety issue in the community due to a crash or during an enforcement effort. Letters give the public the perception that the community, not simply law enforcement and traffic safety advocates, value the efforts of traffic enforcement in the area.

Elected officials have influence on enforcement and implementation of sanctions related to driving offenses (sheriffs, judges, township/county boards). A community group could ask those running for public office what their position is on traffic safety related items. This could be tied to a letter to the editor piece or part of a larger traffic safety effort by local public health or community coalition advocates.

A newspaper commentary from a county judge discusses his views on the primary seat belt law and its importance. This commentary could be customized and shared with local county officials, judges and city councils as a way to start discussion regarding seat belt citations and the court system.

Time: The time involved in this effort would include the time to write the piece and submit it to your local publication.

Funding: Free template letters, talking points and data for your county are on the OTS website www.dps.state.mn.us/ots.

Who is currently working on this in your county? To find out more about this effort or what is currently occurring in your county, please go to www.dps.mn.us/ots or contact Laura Turek at laura.turek@state.mn.us.

Barriers to Success

- Low public support for enforcement
- Lack of support from local business owners for traffic safety
- Low support for enforcement from community leadership (Mayors, business owners, city council or county commissions, school boards)

Potential Agency Partners

- Minnesota State Patrol, county sheriff's offices, city police departments
- School administrators
- Judges and attorneys
- Community members impacted by traffic crashes
- County public health educators
- County engineers

Specific Actions a County Could Take to Support Strategy

- Write a letter to the editor in support of law enforcement efforts.
- Order materials with enforcement messages from the OTS website and post in your community.

Community Traffic Safety Coalitions

TZD Safe Roads Grant Program

Description: TZD Safe Roads incorporates three elements: the development of local coalitions made up of diverse community partnerships that focus on traffic safety, the fatal review committees which analyze community traffic deaths and the identification of practices and strategies that might have prevented them.
TZD Safe Roads grants focus on connecting crash data and statewide efforts with local collaborations and activities. It also makes use of research and evaluation studies that point to the activities and best practices that have the greatest impact in reducing traffic deaths and serious crashes.

Time: The time involved in this effort would include the time to apply for the grant, the coordinators time to set up and hold meetings and follow up on activities in the community. Time of coalition members is typically donated by their employers if it is during the normal business day.

Funding: Funding ranges from $5,000 to $28,000. A community may apply to the TZD Safe Roads Program each year for funding to support a coalition coordinator position and basic materials for activities. The request for proposals will be on the OTS website www.dps.state.mn.us/ots.

Who is currently working on this in your county? To find out more about this effort or what is currently occurring in your county, please go to www.dps.mn.us/ots or contact Laura Turek at laura.turek@state.mn.us.

Barriers to Success

- Low public support for traffic safety
- Lack of awareness of the target groups over represented in the data
- Funding and time for coordination
- Lack of continuity of effort due to staff turnover

Potential Agency Partners

- Minnesota State Patrol, county sheriff's offices, city police departments
- School administrators or community members impacted by traffic crashes
- Judges and attorneys
- County public health or county engineers
- Regional partners and neighboring counties

Specific Actions a County Could Take to Support Strategy

- Call a meeting with several community members who also have an interest in traffic safety. Typical options are law enforcement, ambulance or hospital staff, school administrators or driver's education instructors and public health educators.
- Allow time for you or your staff to attend and support coalition meetings and events.

Regional Partnerships for Traffic Safety

Towards Zero Deaths (TZD) Regional Steering Committees and Workshops

Description: The role of the regional steering committees in the TZD effort is to work with local partners to reduce deaths and serious injuries on local roadways. This can be accomplished by reaching out to the counties and communities within the region to create awareness of current traffic crash trends and presenting evidence-based solutions to prevent crashes (for engineering, enforcement, education and emergency medical services). The steering committee can gather key stakeholders to create an action plan to implement traffic safety projects in the region.

Time: The time involved in this effort would include the time to attend steering committee meetings once per month, assist in community level activities in the region and contribute to the planning and attend the spring workshop in your region.

Funding: The primary funding for each region comes from three state sources: the Minnesota Department of Transportation, Office of Traffic, Safety and Technology and the Operations budget in each district and the Department of Public Safety, Office of Traffic Safety.

Who is currently working on this in your county? To find out more about this effort or what is currently occurring in your county, please go to www.minnesotatzd.org or contact Laura Turek at laura.turek@state.mn.us.

Barriers to Success

- Low public support for enforcement
- Lack of support from local business owners for traffic safety
- Low support for enforcement from community leadership (Mayors, business owners, city council or county commissions, school boards)

Potential Agency Partners

- Minnesota State Patrol, county sheriff's offices, city police departments
- School administrators
- Judges and attorneys
- Community members impacted by traffic crashes
- County public health
- County engineers

Specific Actions a County Could Take to Support Strategy

- Attend your regional workshop as a traffic safety stakeholder and encourage your colleagues to attend.
- Contact your regional coordinator to be added to the mailing list for email and event updates.
- Contact your regional coordinator to be added to the steering committee.
- Offer your skills to a project that the region is undertaking. Examples include workshop planning, seatbelt use observation studies or speaking at a media event.

Worksite Policy on Traffic Safety Laws

Network of Employers for Traffic Safety

Description: Minnesota Network of Employers for Traffic Safety (NETS) is a non-profit, public-private partnership, dedicated to reducing traffic deaths and injuries within our nation's work force. Resources for employers in the community are available through NETS. Businesses in the community can be encouraged to establish traffic safety policies for their employees. They can also proactively educate their staff about key traffic safety messages. The NETS Program offers tools, such as brochures, sample policies/procedures, interactive website (www.minnesotasafetycouncil.org/nets/) and lectures to help initiate/enforce traffic safety programs in businesses.

Time: The amount of time to implement worksite strategies can vary from the five minutes to five hours. Examples of strategies include forwarding emails about an upcoming enforcement effort to all employees or placing a poster in the break room, organizing a lunch presentation for staff on traffic safety or placing banners in employee parking lots.

Funding: There are free promotional materials, newsletters and staff available to give presentations through the Network of Employers for Traffic Safety and the Office of Traffic Safety.

Who is currently working on this in your county? For more information on worksites involved in NETS in your county, traffic safety programs or model policies with education materials, contact Lisa Kons at 800-444-9150 or kons@minnesotasafetycouncil.org or www.dps.state.mn.us/ots.

Barriers to Success

- Lack of support for traffic safety from human resources or leadership at worksite
- Low public support for worksite policies
- Lack of enforcement of worksite policies
- Low public support for enforcement
- Low support for enforcement from community leadership
  (e.g. mayor, business owners, city council, county commissions, school boards)

Potential Agency Partners

- Chambers of commerce
- Service clubs in the community (e.g. Rotary, Lions)
- County sheriff ‘s offices
- County public health

Specific Actions a County Could Take to Support Strategy

- Forward OTS media release emails about the upcoming enforcement effort to all employees.
- Order posters or banners from the OTS website and place in the break room or employee parking lots.
- Contact NETS to organize a lunch presentation for staff or a booth at an employee health fair.
- Bring a sample distracted driving policy to your human resource department.

Child Passenger Safety

Car Seat Clinics and Technician Training

Description: Communities use car seat clinics to educate new or expecting parents. In order to hold a clinic, a community would need at least one, but ideally six CPS technicians to be available for appointments with families. A CPS technician has to receive training to be able to provide:

- One-on-one CPS awareness education to families
- Presentations on traffic safety for parent classes, community groups, etc.
- Safety seat inspections at a clinic or by appointment
- Instruction for daycare / foster care child passenger safety classes.

Time: To become a CPS Technician you need to take a 32 hour course, which is typically done in three or four days. A clinic can be run as often as is needed and is usually run by appointment. Each appointment takes 30-45 minutes.

Funding: Upcoming classes and clinics are listed on our website, www.buckleupkids.state.mn.us.

Who is currently working on this in your county? To find out more about this effort or what is currently occurring in your county, please go to http://www.buckleupkids.state.mn.us/ or contact Heather Darby at heather.darby@state.mn.us.

Barriers to Success

- Low employer support for technicians to keep up their certifications by working at clinics
- Shift in job duties may make clinic attendance difficult
- Technicians may find it difficult to stay certified due to time commitments
- Lack of funds set aside for the program
- Low support for enforcement of child passenger safety laws from community leadership (mayor, business owners, city council or county commissions, school boards)

Potential Agency Partners

- Minnesota State Patrol, county sheriff's offices, city police departments
- County public health
- Hospitals
- EMS child passenger safety advisory board

Specific Actions a County Could Take to Support Child Passenger Safety

- Encourage CPS training, especially with law enforcement, and support CPS as part of employee duties.
- Allow training time for instructors and technicians.
- Encourage community members to become instructors in order to keep technicians in the area current.

Working with Parents of Young Drivers

Information and Tools for Parents

Description: There are many ways the traffic safety community can reach out to and involve parents in their teen's driving. The first step is to offer basic information on the risks and the laws that impact new drivers. The second step is to empower parents to work with their teen consistently, create driving contracts, monitor and, if needed, withdraw the teen's license.

Information for Parents from Local School

A simple method to get information to parents is posting information on teen driving laws on the school website. Some communities have mailed out letters from the school resource officer to parents highlighting risks to teens and laws for new drivers. For teen driving laws, see the "Teen Drivers" page on the Office of Traffic Safety website (www.dps.mn.us/ots).

Parent Class through Driver Education Programs

Experts agree that more effective parental involvement holds significant promise for further reducing teen crashes. Implementing a parental education module in driver education programs across the state can enhance parental awareness of teen driver safety issues. For parent education curriculum content ideas, see the "Teen Drivers" page on the Office of Traffic Safety website (www.dps.mn.us/ots).

Teen-Parent Contract and Teen Driving Skills Checklist

Provide tools to high schools and driver schools in your areas to encourage parents to set limits with their teen driver, and to closely monitor their teen's driving skills. For teen driving tools, see the "Teen Drivers" page on the Office of Traffic Safety website (www.dps.mn.us/ots).

Teenage Monitoring Systems

There is technology being used to assist parents in monitoring youth driving behavior. Intense monitoring of teenage driving with electronic devices is becoming a popular approach to young driver safety issues. It could be used as a tool to support Graduated Drivers Licensing laws (GDL) and collaboration between teens and parents about the importance of safe driving. There are several technologies in development (e.g. University of Minnesota, www.humanfirst.umn.edu , Iowa) and those already commercially available through insurance companies (American Family, www.drivecam.com). There are various options available for implementation as part of an insurance program, a field trial or a parent buying an application for a teen's Smartphone. For studies on this technology, go to http://www.drivecam.com/our-markets/family/testimonials-and-research-proof.

Withdrawal of Parental Consent/Voluntary Surrender form (PS33061). This is the form parents can use to legally remove a child's license until they are 18 years old. Many parents do not know about this option. Educate your community about this item, and encourage parents to have a discussion with their teen about the privilege of driving and to make a teen/parent contract. The parent needs to set the expectations about wearing a seat belt, putting the cell phone out of reach, obeying the laws about speed and driving focused. In the case that the expectations are not met, the form can be used as the consequence. To get a copy of the form go to http://www.dps.state.mn.us/dvs/PDFForms/FormFrame.htm

Time: The time for these activities can range from one hour to create a letter to the editor or to parents all the way to eight to ten hours monthly to staff and support a parent program for driver education.

Funding: Free resources for parent driver education class and parent tools are available from the OTS. Costs may be needed for instructor time and facility costs to hold a parent class. If letters are mailed, the mailing costs could be shared with the school if letter goes out with another mailing or a local insurance company. The cost of the Drive Cam program may be higher (see website).

Who is currently working on this in your county? To find out more about this effort or what is occurring in your county, please go to www.dps.mn.us/ots or contact Gordy Pehrson at gordy.pehrson@state.mn.us.

Barriers to Success

- Lack of parent awareness for risks, laws and tools to use with teen
- Competing interests from parents (e.g. work commitments, other children's activities)
- Lack of support from school administration or teachers
- High expense and time intensive program (specific to Drive Cam)

Potential Agency Partners

- School administration and staff
- Local insurance companies
- Driver's education instructors
- Parents
- County public health
- Minnesota State Patrol, county sheriff's offices, city police departments

Specific Actions a County Could Take to Support Strategy

- Coordinate a mailing of parent letters to parents with teen driving information. It is common to share costs with the school to include the letter with another mailing.
- Facilitate parent education classes with the driver education programs in your county.
- Make parents aware of the Withdrawal of Parental Consent/Voluntary Surrender form by explaining its purpose at parent/student events (sports meetings, school conferences).
- Write a letter to the editor to make parents aware of teen driving risks, laws, the important role they play in developing a safe driver.
- Encourage high visibility enforcement near popular teen hang-outs, schools, during periods of greater risk (prom, graduation, 4th of July, late summer before school starts).

Mock Traffic Crash at Local Schools

Mock Crash Guide

Description: A mock crash is a simulated emergency response to a crash scene. Mock crashes are usually conducted for groups of students at high schools or colleges. The goal of a mock crash is to educate teenagers and young adults about the dangers of impaired driving and the importance of seat belts. Community groups can organize this presentation with law enforcement, emergency services and schools. A comprehensive guide is available to help guide and organize this event. It is a good idea to focus any mock crash events in October or May, as it will support seat belt enforcement efforts going on statewide.

Time: Time investment can vary depending on the role, however the planning process takes three to five months. Preparation the day of the event can be four to five hours and the event itself is at least one hour.

Funding: Funding for a mock crash generally includes food and beverage for volunteers, staff time from the school involved and the community volunteers and minimal supply costs. Mock Crash Guide is available on www.dps.state.mn.us/ots , click on "Safe Communities."

Who is currently working on this in your county? Many local high schools may be hosting a mock crash each year, or every other year. Contact local principals in your county or the local driver's education instructors. To find out more about this effort or what is occurring in your county, please go to www.dps.mn.us/ots or contact Laura Turek at laura.turek@state.mn.us. For up to date contact lists for high school student groups or drivers educators, contact Gordy Pehrson at gordy.pehrson@state.mn.us.

Barriers to Success

- Lack of community support for event
- Difficulty in school scheduling or with the weather

Potential Agency Partners

- EMS in the community or county public health educators
- Minnesota State Patrol, county sheriff's offices, city police departments
- School administration and staff, coaches, parents or drivers education instructors

Specific Actions a County Could Take to Support Strategy

- Coordinate an event with teachers, coaches or driver educators by connecting with other traffic safety stakeholders and the high school, technical school or college.
- Write a letter to the editor after the event to give it more publicity.
- Encourage high visibility enforcement near popular teen hang-outs, schools, during periods of greater risk (prom, graduation, 4th of July, late summer before school starts, etc).

Crash Video Targeted to Minnesota Youth

How to Save a Life Video or Young Forever

Description: How to Save a Life and Young Forever videos were created by the Minnesota State Patrol and feature tragic stories from teens and young adults involved in fatal or serious injury crashes in Minnesota. The video features hard-hitting, graphic images of crash scenes married with relevant music tracks. The video must be presented by a state trooper and is a great piece to show at high schools and community groups. To bring this video to your community, contact your local State Patrol District.

Time: The program and video together run for 60 minutes in a class room or auditorium setting.

Funding: The program is offered for free through the Minnesota State Patrol.

Who is currently working on this in your county? If you would like a Trooper to come and present Young Forever to your group contact the Minnesota State Patrol District in which you reside. For a list of Minnesota State Patrol Districts click on District Index. http://www.dps.state.mn.us/patrol/distindex/index.htm. For more specific questions, please contact Lt. Eric Roeske, eric.roeske@state.mn.us.

Barriers to Success

- Lack of awareness of film availability
- Availability of state patrol troopers to give presentation with the video
- Availability of time in school schedule for presentation

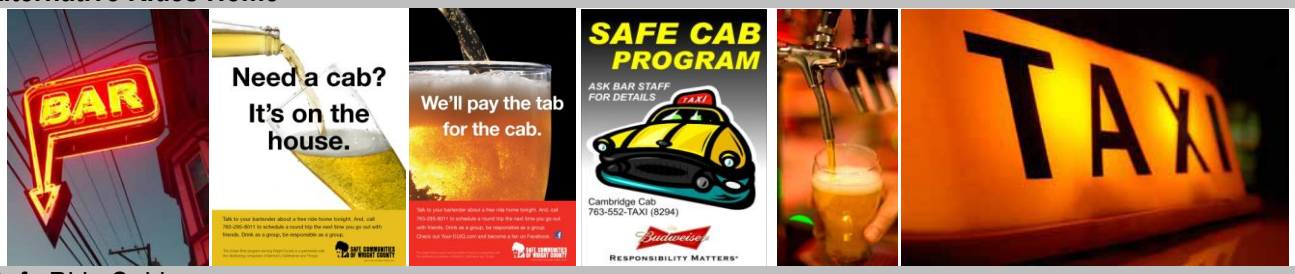
Potential Agency Partners

- Minnesota State Patrol
- Drivers education instructors
- School administration and staff
- Coaches and parents
- County public health educators
- Regional partners and neighboring counties

Specific Actions a County Could Take to Support Strategy

- Coordinate a video and presentation with teachers, coaches or driver educators by contacting the State Patrol district for your county at www.dps.mn.us/patrol.
- Write a letter to the editor after the presentation to give it more publicity in the community.
- Encourage high visibility enforcement near popular teen hang-outs, schools, during periods of greater risk (prom, graduation, 4th of July, late summer before school starts, etc).

Alternative Rides Home



Safe Ride Guide

Description: A strategy embraced by many communities to prevent impaired driving is to provide alternative transportation services. The goal of this effort is to provide critical information about alternative transportation or safe ride programs to individuals or communities interested in providing similar services. With a solid understanding of the elements necessary to build strong safe ride programs, interested stakeholders can create an effective local program that provides a valuable service while reducing impaired driving in their communities. The Safe Ride Guide is available on www.minnesotatzd.org.

Time: Program development can take between three months and one year to get the system created and the users adjusted to the model. It helps to have a coalition coordinator or community member who has several hours a week to work on logistics and call meetings to communicate with stakeholders.

Funding: The amount of funding needed can vary from $300-$800 per month to print, advertise and pay the time for coordination. In some programs the local beer distributor pays a portion, the bar owners pay a portion and the rider pays a portion of each ride.

Who is currently working on this in your county? In 2011, there are several counties working to develop Safe Ride programs: Isanti, Kanabec, Pine, Wright, Sherburne, Otter Tail. To find out more about this effort or what is occurring in your county, please go to www.dps.mn.us/ots or contact Jean Ryan at jean.m.ryan@state.mn.us.

Barriers to Success

- Low public awareness of program
- Lack of alternative transport
- Lack of support for program from enforcement
- Lack of early involvement from liquor establishment owners
- Lack of funding

Potential Agency Partners

- Local liquor establishment owners and workers and local beer distributors
- Local judges and attorneys
- Minnesota State Patrol, county sheriff's offices, city police departments

Specific Actions a County Could Take to Support Strategy

- Write letters to the editor during pre-media efforts in support of law enforcement efforts for DWI.
- Assist with identifying liquor establishments or beer distributors interested in participating in the program.
- Discuss the program with local government officials.
- Advertise the program to your colleagues and friends.
- Encourage law enforcement to partner with bars involved in the program to handle issues as they arise.

Intensive Supervision Programs for DWI Offenders

DWI Courts

Description: A DWI Court is a team-based approach that seeks to enhance public safety through the reduction of DWI recidivism by providing effective chemical dependency evaluation and treatment, intensive supervision and offender accountability. A DWI Court team requires judicial leadership, prosecutors, defense attorneys, probation and law enforcement officers, a case management worker, and a network of relevant and supportive community resources to work with repeat DWI offenders who have substance abuse issues. The DWI Courts follow ten guiding principles: 1) target the population by identifying a subset of the DWI offender population for inclusion in the DWI court program, 2) perform a clinical assessment of the impaired-driving offender, 3) develop a treatment plan, 4) supervise the offender, 5) forge agency, organization, and community partnerships, 6) take a judicial leadership role, 7) develop case management strategies, 8) address transportation issues, 9) evaluate the program, and 10) create a sustainable program.
Time: Court time is two to four hours per week for all team members. Probation and DWI Court Program Coordinators require additional time for their responsibilities.

Funding: OTS provides grants to assist new DWI courts that average $92,000 annually. For more information on DWI Courts, go to http://www.mncourts.gov/?page=626.

Who is currently working on this in your county? In 2011, there are ten DWI Courts in Minnesota. They are located in Beltrami, Cass, Crow Wing, Hennepin, Itasca, Lake of the Woods, Ottertail, Ramsey, Roseau and So. St. Louis County.
To find out more about this effort or what is occurring in your county, please go to www.dps.mn.us/ots or contact Jody Oscarson at jody.oscarson@state.mn.us.

Barriers to Success

- Lack of funding
- Difficulty in finding replacement for team members

Potential Partners

- State Court Administration Office
- Bureau of Indian Affairs
- City councils or county boards
- County attorneys

Specific Actions a County Could Take to Support Strategy

- Write a letter to editor in support of DWI courts.
- Secure funding to support the program.
- Write a letter to city council members/county boards in support of DWI courts.
- Write a letter to your senator or representative in support of DWI courts.

Reducing Impaired Driving in the Community

Community Promotion of Ignition Interlock

Description: Ignition interlock is a breath testing system installed on a motor vehicle that is designed to prevent an individual from driving impaired. To start the vehicle, a driver is required to blow into a tube that measures their alcohol concentration (AC) level. In Minnesota, if the device detects alcohol at a 0.02 AC level or above the vehicle will not start. The device also requires the driver to provide additional breath samples randomly while they are driving to assure that the person driving the car is not impaired. Research has demonstrated that recidivism (re-offense) rates are reduced 64% while a person has ignition interlock installed. However, once it is removed, recidivism rates return to the level equivalent to those that did not install ignition interlock. Therefore, it is important to require DWI offenders to also participate in programs that will change long-term drinking and driving behavior.

Time: Time on ignition interlock can range from 90 days to six years.

Funding: Participants pay for the ignition interlock device. Currently the cost is approximately $100 per month, which averages three to four dollars per day. Starting July 1, 2011, service providers will be required to provide an ignition interlock at a reduced rate for those that the Department of Public Safety has determined to be indigent.

Who is currently working on this in your county? To find out more about this effort or what is occurring in your county, please go to www.dps.mn.us/ots or contact Jean Ryan at jean.m.ryan@state.mn.us .

Barriers to Success

- Low participation by DWI offenders
- Minimal consequences for driving illegally compared to the cost to reinstate driving privileges
- Misperception about ignition interlock – example: drivers can use a balloon to start their vehicle or ignition interlock is being “soft” on impaired drivers.
- Not understanding the public safety benefits of ignition interlock

Potential Agency Partners

- Minnesota State Patrol, county sheriff’s offices, city police departments
- County public health educators
- Prosecuting attorneys
- Defense attorneys
- District court judges

Specific Actions a County Could Take to Support Strategy

- Educate judicial partners on the benefits of ignition interlock and encourage their use.
- Educate the community on the benefits of ignition interlock and how it can be used to enhance public safety.

Motorcycle Training

Minnesota Motorcycle Safety Center

Description: The Minnesota Motorcycle Safety Center offers a complete motorcycle safety package to accomplish this mission by providing high-quality motorcycle safety education and training through on-cycle and classroom rider training courses; media relations, events, campaigns, and informational materials; and third party skills testing for motorcycle license endorsement through the Basic Rider Course and evening motorcycle testing project at select DVS Exam Stations.

The Minnesota Motorcycle Safety Center relies on the support of the motorcycling community, dealers, clubs, and motorcycle rights organizations. These groups serve as partners for events such as the annual Washout, rider training course promotion, education and outreach, and through a motorcyclist advisory committee. All of this information is available at www.motorcyclesafety.state.mn.us

Time: Courses take between half and full weekend days.

Funding: Costs of seminars and courses can range from $20-$160 dollars.

Who is currently working on this in your county? To find out more about this effort or what is occurring in your county, please go to www.dps.mn.us/ots or contact Bill Shaffer at William.shaffer@state.mn.us See what courses are offered in Minnesota by going to http://cfapp.southcentral.edu/motorcycle/

Barriers to Success

- Low social support for training, helmets and high visibility gear
- People don't realize the benefits of receiving training
- Motorcyclists don't realize the great availability of training options

Potential Agency Partners

- Motorcycling community
- Dealers
- Clubs
- Motorcycle rights organizations
- Minnesota State Patrol, county sheriff's offices, city police departments
- Regional partners and neighboring counties

Specific Actions a County Could Take to Support Strategy

- Educate and encourage riders to get trained and licensed.
- Educate the community on awareness of motorcycles on the roads.

Rider Training Locations in Minnesota
800-407-6677
International Falls
Thief River Falls
East Grand Forks
Bemidji
Eveleth
Grand Rapids
Moorhead
Detroit Lakes
Duluth
Fergus Falls
Brainerd
Staples
Alexandria
St. Cloud
Anoka
Willmar
White Bear Lake
Brooklyn Park
St. Paul
Hutchinson
Rosemount
Eden Prairie
Marshall
Red Wing
North Mankato
Pipestone
Rochester
Winona
Luverne
Worthington
Albert Lea

4.8 Minnesota Department of Public Safety Office of Traffic Safety Programs

- *Toward Zero Deaths (TZD)* Safe Roads Community Coalitions — Public health groups and other advocates partner with law enforcement to promote enforcement and traffic safety messages locally.
- Communications/Educational Outreach/Paid Media — Deliver messages to media outlets via news releases/advisories/interviews, etc.; provide tools/materials for communities to promote messages locally; and conduct year-long $2.5 million advertising buys targeting key demographics.
- *HEAT (Highway Enforcement of Aggressive Traffic)* — Partnership between MnDOT and State Patrol to enforce speed limits and educate motoring public on dangers of unsafe speeds.
- *Safe & Sober* — Statewide, aggressive overtime traffic safety enforcement and education efforts, federally funded.
- *Night CAP (Nighttime Concentrated Alcohol Patrol)* — Enhanced DWI enforcement and education efforts in the counties with the highest number of alcohol-related fatalities and serious injuries.
- DWI Courts and Court Monitoring — Intensive supervision methods used with DWI offenders.
- Alternative Rides Home Programs — Programs that create safe transportation options in rural areas to prevent impaired driving.
- Worksite Policies and Training — Tools for employers to educate and enforce traffic safety policies with employees.
- Motorcycle Safety Training Centers— Get information on rider training, licensing and public information and education.

Minnesota Department of Public Safety Office of Traffic Safety
www.dps.state.mn.us/ots

Appendix A

Safety Workshop Information

County Road Safety Plans - Phase II
Safety Strategies Workshop Attendees

ATP: 4 **December 13, 2010**
Workshop Group: 4A (Becker, Clay, Douglas and Otter Tail Counties)
Location: Otter Tail Government Center, Fergus Falls **Attendees: 47**

	Name	County	Representing
1	Mark Gagnon	Becker	Becker County S.O.
2	Rick Hoivm	Becker	Becker County Hwy
3	Tim Erickson	Becker	Cormorant Township
4	Claudia Hanson	Becker	Cormorant Township
5	Gerry Schram	Becker	Becker County Commissioner
6	Brad Wentz	Becker	Becker County
7	Brian Shepard	Becker	Becker County Construction Manager
8	T.S. (not legible)	Becker	Detroit Lakes
9	Patrick Hollister	Clay	Clay County Public Health
10	Dan Schoonhoven	Clay	Moorhead Fire/Rescue
11	Darin Bredman	Clay	Clay County Sheriff Office
12	Matt Siiro	Clay	Clay County Sheriff Office
13	Keely Ihry	Clay	Clay County. Public Health
14	Joel Shart	Clay	City of Moorhead Police
15	Wayne Lepper	Clay	Highland Grove Township
16	George Peterson	Clay	Cromwell Township
17	Carol Schoff	Clay	Cromwell Township
18	Dave Overbo	Clay	Clay County Hwy
19	Brian Berg	Clay	Clay County Admin
20	Justin Kristan	Clay	FM Metro COG
21	Scott Green	Douglas	Douglas County Public Works
22	Terry Gillespie	Douglas	Douglas County Public Works
23	Jessica Peterson	Douglas	Douglas County Public Health
24	Crystal Hoepner	Douglas	Douglas County Public Health
25	Bev Bales	Douglas	Douglas County Commissioner
26	Paul Anderson	Douglas	Douglas County Commissioner
27	Dan Olsen	Douglas	Douglas County Commissioner
28	Dave Robley	Douglas	Douglas County Public Works
29	Dwayne Waldorf	Douglas	Carlos Township
30	Rod Meyer	Douglas	Carlos Township
31	Rick West	Otter Tail	Otter Tail County Hwy
32	Jane Patrick	Otter Tail	Otter Safe Communities
33	Jeff Stabnow	Otter Tail	Township Engineer
34	Charles Grotte	Otter Tail	OTC Hwy Dept
35	Wayne Johnson	Otter Tail	OTC Commissioner
36	Tria Mann	Otter Tail	DWI Court
37	David Hauser	Otter Tail	County Attorney
38	Jon Karger	Otter Tail	OTC Sheriff
39	Roger Froemming	Otter Tail	OTC Commissioner
40	Vicki Severson	Otter Tail	West Otter Tail Township Officers Assn.

County Road Safety Plans - Phase II
Safety Strategies Workshop Attendees

	Name	County	Representing
41	Tom Kummrow	Mn/DOT & Others	OTS
42	Merle Earley	Mn/DOT & Others	Mn/DOT
43	Chuck Brekes	Mn/DOT & Others	MN State Patrol
44	Tom Swehson	Mn/DOT & Others	Mn/DOT
45	Jesse Grabow	Mn/DOT & Others	MN State Patrol
46	Cheri Marti	Mn/DOT & Others	OTS/DPS
47	Jean Ryan	Mn/DOT & Others	OTS/DPS

ATP 4 - Workshop Voting Results

Road Departure Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
15.1 A -- Keep vehicles from encroaching on the roadside	**15.1 A1 -- Install shoulder rumble strips**	**21**	**9**	**17**	**47**
	15.1 A2 -- Install enhanced pavement markings, edgeline rumble strips or modified shoulder rumble strips on section with narrow or no paved shoulders	9	**20**		**29**
	15.1 A3 -- Install centerline rumble strips	0	0	0	0
	15.1 A4 -- Provide enhanced shoulder or delineation and marking for sharp curves	**13**	**16**	**19**	**48**
	15.1 A8 -- Apply shoulder treatments *Eliminate shoulder drop-offs *Safety edge *Widen and/or pave shoulders	**18**	0	**11**	**29**

Signalized Intersection Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
17.2 E -- Improve driver compliance with traffic control devices	17.2 E2 -- Supplement conventional enforcement of red-light running with Enforcement lights	0	0	0	0
17.2 F -- Improve access management near signalized intersections	17.2 F1 -- Restrict access to properties using driveway closures or turn restrictions	0	0	0	0
	17.2 F2 -- Restrict cross-median access near intersections	0	0	0	0

Unsignalized Intersection Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
17.1 B -- Reduce the frequency and severity of intersection conflicts through geometric design improvements	17.1 B16 -- Realign intersection approaches to reduce or eliminate intersection skew	0	0	1	1
	17.1 B17 -- Use indirect left-turn treatments to minimize conflicts at divided highway intersections	1	0	0	1
17.1 C -- Improve sight distance at unsignalized intersections	**17.1 C1 -- Clear sight triangle on approaches and in medians by clearing grub, eliminating parking, etc**	**1**	0	**13**	**14**
17.1 E -- Improve driver awareness of intersections as viewed from the intersection approach	**17.1 E1 -- Improve visibility of intersections by providing enhanced signing and delineation (stop bar, larger regulatory signs, LED stop signs, etc)**	**1**	**2**	1	**4**
	17.1 E2 -- Improve visibility of intersections by providing lighting	**22**	**7**	**12**	**41**
17.1 H -- Reduce operating speeds on specific intersection approaches	17.1 H1 -- Install dynamic speed feedback signs*	0	0	2	2

ATP 4 - Workshop Voting Results

Impaired Driving Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
*5.1 A-Eliminate Drinking and Driving	*5.1 A5- Support Community Programs for Alternative Transportation	0	0	**5**	5
5.1 B-Enforce DWI Laws	*5.1 B1-Conduct Regular Well-Publicized DWI Saturations	**19**	**13**	1	**33**

Seat Belt Usage Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
8.1 A- Maximize use of occupant restraints by all vehicle occupants	***8.1 A1- Conduct highly publicized enforcement campaigns to maximize restraint use. Specifically, night time belt enforcement saturation.**	**18**	**12**	**27**	**57**
8.1 B- Insure that restraints, especially child and infant restraints, are properly used	8.1 B2- Conduct high-profile "child restraint inspection" events at multiple community locations.	0	0	2	2
	8.1 B3- Train advocates to check for proper child restraint use.	0	0		0

Aggressive Driving Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
4.1 A- Deter aggressive driving in specific populations, including those with a history of such behavior, and at specific locations	**4.1 A1- Publicize and conduct high visibility targeted enforcement of speeding and aggressive driving**	**19**	**5**	4	**28**
	4.1 A3- Impose sanctions against repeat offenders	8	0	**10**	18

Distracted Driving Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
Objective 6.1 C—Increase driver awareness of the risks of drowsy and distracted driving and promote driver focus	***6.1 C2—Conduct high visibility enforcement for existing statutes to deter distracted and drowsy driving**	**13**	**17**	**10**	**40**

Young Driver and Bicycle Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
1.1B Publicize, enforce, and adjudicate laws pertaining to young drivers	**1B -- Publicize and conduct a high visibility enforcement GDL restrictions, cell and texting laws, underage drinking and driving and seatbelt laws**	**15**	**7**	**14**	**36**
Ensuring Safer Bicycle Travel	10D -- Increase bicycle helmet usage, enhanced enforcement of bicycle laws, and publicize issues.	0	0	1	1

Motorcycle Safety Strategies

Objectives	Strategies	Workshop 4A - December 13, 2010 (Becker, Clay, Douglas, Otter Tail)	Workshop 4B, December 15, 2010 (Grant, Mahnomen, Traverse, Wilkin)	Workshop 4C, January 12, 2011 (Big Stone, Pope, Stevens, Swift)	Total ATP 4
11.1 E Reduce the severity of motorcycle crashes	**11.1 E1 Increase the use of FMVSS 218 compliant helmets.**	**13**	**13**	**0**	**26**

Appendix B

Rural Segment Prioritization and Project Sheets

Otter Tail County
Rural Segment Listing

Corridor	Route	#	Start	End	Length	Runoff Road Crashes	Intersection Crashes	ADT	RD Density	Access Density	Curves w/ Critical Radius / Mile	Edge Risk Assesment
1.01	CSAH	1	GRANT COUNTY LINE C	FERGUS FALLS CORP L	11.6	10	6	903	0.17	10.6	0.00	1
1.03	CSAH	1	FERGUS FALLS CORP L	CSAH 10	5.5	6	7	3031	0.22	16.7	0.00	1
1.04	CSAH	1	CSAH 10	CSAH 35	5.9	4	9	2383	0.14	11.4	0.00	1
1.05	CSAH	1	CSAH 35	Oak Ridge Beach Rd	11.4	9	5	1556	0.16	10.4	0.26	1
1.06	CSAH	1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	4.6	1	2	1586	0.04	41.5	0.65	1
2.01	CSAH	2	WILKIN CNTY LINE	CSAH 1	8.3	2		133	0.05	7.6	0.00	2
3.01	CSAH	3	CSAH 10	CSAH 24	8.4	6	1	596	0.14	14.2	0.36	2
3.02	CSAH	3	CSAH 24	USTH 59	7.5	3		664	0.08	10.1	0.40	2
4.01	CSAH	4	USTH 59	CSAH 31	4.1	6	5	1300	0.29	14.6	0.24	1
4.02	CSAH	4	CSAH 31	VERGAS CORP LMTS	8.9	13	4	1222	0.29	14.3	0.22	3
4.04	CSAH	4	VERGAS CORP LMTS	BECKER COUNTY LINE	4.7	3		1170	0.13	14.7	1.28	3
5.01	CSAH	5	CSAH 38	MNTH 210	10.2	7	5	409	0.14	8.1	0.20	1
5.03	CSAH	5	CLITHERALL CORP LMT	CSAH 16	4.7	5	2	650	0.21	10.0	0.85	2
5.04	CSAH	5	CSAH 16	MNTH 78	4.8			404	0.00	8.3	0.42	2
6.01	CSAH	6	CSAH 5	CSAH 65 and CH 129	9		1	224	0.00	10.7	0.11	1
6.02	CSAH	6	CSAH 65 and CH 129	MNTH 29	4.1	8	1	570	0.39	10.0	0.00	1
7.01	CSAH	7	GRANT COUNTY LINE C	CSAH 2	5			55	0.00	6.4	0.00	1
8.02	CSAH	8	PERHAM CORP LMTS	CSAH 53	6.9	5	3	1809	0.14	14.6	0.00	1
8.03	CSAH	8	CSAH 53	CSAH 67	4.9	1	1	550	0.04	10.6	0.00	1
8.04	CSAH	8	CSAH 67	WADENA COUNTY LINE	9.4	4	3	733	0.09	7.2	0.21	1
9.02	CSAH	9	PELICAN RAPIDS CORP	MNTH 34	4.9	9	8	1350	0.37	11.0	0.00	1
9.03	CSAH	9	MNTH 34	BECKER COUNTY LINE	5.2	4	2	863	0.15	29.2	1.15	2
10.01	CSAH	10	WILKIN COUNTY LINE C	ELIZABETH CORP LMTS	6.7	3	1	357	0.09	9.9	0.15	3
10.03	CSAH	10	ELIZABETH CORP LMTS	CSAH 1	6.5	8	7	1187	0.25	11.1	0.15	1
10.04	CSAH	10	USTH 10	BECKER COUNTY LINE	0.7			1050	0.00	10.0	1.43	1
11.01	CSAH	11	CSAH 21	CSAH 10	8			101	0.00	8.8	0.13	2
11.02	CSAH	11	CSAH 10	NORTH 3 MILES ALONG	3	1		85	0.07	11.7	0.00	0
12.02	CSAH	12	DALTON CORP LMTS	MNTH 78	9.9	2	2	573	0.04	8.9	0.00	1
13.01	CSAH	13	CSAH 8	BECKER COUNTY LINE	5.1	2	3	594	0.08	9.2	0.00	2
14.01	CSAH	14	CSAH 1	RICHVILLE CORP LMTS	7.9	3		635	0.08	9.9	0.51	1
14.03	CSAH	14	RICHVILLE CORP LMTS	MNTH 78	2.1		2	922	0.00	16.7	0.00	1
14.04	CSAH	14	MNTH 78	CSAH 67	9.1	2	1	534	0.04	10.0	0.22	2
15.01	CSAH	15	GRANT COUNTY LINE C	CSAH 2 North	6.7	3	1	153	0.09	6.7	0.00	2
15.02	CSAH	15	CSAH 2 North	FERGUS FALLS CORP L	6			458	0.00	8.8	0.83	1
16.01	CSAH	16	MNTH 78	CSAH 5	5.7	1	2	607	0.04	8.1	0.70	2
16.02	CSAH	16	CSAH 5	MNTH 108	7	6	4	734	0.17	10.1	0.00	1
17.02	CSAH	17	VERGAS CORP LMTS	BECKER COUNTY LINE	6.3	7	2	1400	0.22	11.1	0.48	1
18.01	CSAH	18	BEGIN CSAH 18	CSAH 45	9.5	4	2	680	0.08	9.4	0.00	1
19.02	CSAH	19	BLUFFTON CORP LMTS	CSAH 56	4.9	4	3	460	0.16	10.0	0.00	2
19.03	CSAH	19	CSAH 56	CSAH 8	5.9	4	1	265	0.14	8.5	0.00	1
19.04	CSAH	19	CSAH 8	BECKER COUNTY LINE	6			280	0.00	9.3	0.00	1
20.01	CSAH	20	CSAH 9	USTH 59	5.1	5	1	994	0.20	27.1	0.39	1
21.01	CSAH	21	MNTH 210	CSAH 10	6.6		1	220	0.00	8.3	0.30	2
21.02	CSAH	21	CSAH 10	CSAH 24	7.1	3		184	0.08	9.9	0.42	1
21.03	CSAH	21	CSAH 24	MNTH 108	5	2	1	260	0.08	10.4	0.00	1
21.04	CSAH	21	MNTH 108	CLAY COUNTY LINE	5	2		245	0.08	9.8	0.00	1
22.01	CSAH	22	CSAH 27	CSAH 3	5.8	1	2	589	0.03	13.1	0.17	1
22.02	CSAH	22	CSAH 3	CSAH 35	6.1	1	1	365	0.03	13.1	0.16	1
23.01	CSAH	23	CSAH 9	MNTH 34	5.2	1	1	165	0.04	11.2	0.58	2
23.02	CSAH	23	MNTH 34	CLAY COUNTY LINE	5.2	1	1	329	0.04	8.5	0.58	1
24.02	CSAH	24	ROTHSAY CORP LMTS	CSAH 21 South	2.6	1		315	0.08	7.7	0.38	2
24.03	CSAH	24	CSAH 21 South	ERHARD CORP LMTS	6	2		380	0.07	11.2	0.17	1
24.05	CSAH	24	ERHARD CORP LMTS	CSAH 3	4.8	3	1	589	0.13	11.7	0.00	2

Otter Tail County
Rural Segment Listing

Corridor	Route	#	Start	End	Length	Runoff Road Crashes	Intersection Crashes	ADT	RD Density	Access Density	Curves w/ Critical Radius / Mile	Edge Risk Assesment
24.06	CSAH	24	CSAH 3	CSAH 41	7.4	1		355	0.03	7.2	0.41	1
25.01	CSAH	25	GRANT COUNTY LINE C	MNTH 210	10.6	4	1	271	0.08	8.6	0.57	1
26.01	CSAH	26	WILKIN COUNTY LINE	6.5 MILES EAST ON GR/	6.4	1		140	0.03	8.0	0.00	2
27.02	CSAH	27	FERGUS FALLS CORP L	CSAH 10	4.6	3	5	2250	0.13	14.3	0.00	1
27.03	CSAH	27	CSAH 10	CSAH 24	11.1	2	2	744	0.04	7.8	0.27	1
28.01	CSAH	28	WILKIN COUNTY LINE C	CSAH 21	2.9			145	0.00	9.0	0.00	1
28.02	CSAH	28	CSAH 21	USTH 59	6.6	1	1	187	0.03	9.5	0.30	1
29.01	CSAH	29	CSAH 82	MNTH 210	7.4	3		471	0.08	9.7	0.41	2
30.01	CSAH	30	WILKIN COUNTY LINE	CSAH 21	3.2	1		125	0.06	9.4	0.31	1
30.02	CSAH	30	CSAH 21	MNTH 108	4.4		1	255	0.00	11.6	0.23	3
31.01	CSAH	31	CSAH 4	USTH 59	5.1	2	1	573	0.08	18.4	0.78	3
31.02	CSAH	31	USTH 59	CSAH 20	2.9	3	2	558	0.21	22.8	2.76	3
32.01	CSAH	32	CSAH 74	CSAH 14	6.6		1	225	0.00	7.7	0.45	2
33.01	CSAH	33	CSAH 35	MNTH 210	8.5	5		251	0.12	11.2	1.06	2
34.01	CSAH	34	CSAH 35	PERHAM CORP LMTS	6.8	11	4	1148	0.32	11.3	0.59	3
35.01	CSAH	35	USTH 59	DALTON CORP LMTS	5.8	6	4	602	0.21	10.3	0.52	2
35.03	CSAH	35	DALTON CORP LMTS	UNDERWOOD CORP LM	8.3	6		559	0.14	8.6	0.72	2
35.05	CSAH	35	UNDERWOOD CORP LM	CSAH 1	6	13	3	1115	0.43	8.3	0.83	2
35.06	CSAH	35	CSAH 1	CSAH 41	7.4	1	3	988	0.03	11.2	0.14	1
35.07	CSAH	35	CSAH 41	DENT CORP LMTS	9.3	8	1	684	0.17	14.5	0.86	2
35.09	CSAH	35	MNTH 108	CSAH 34	2.9	2		395	0.14	12.1	0.34	1
35.10	CSAH	35	CSAH 34	CSAH 36	7.5	1		986	0.03	13.2	0.93	1
36.01	CSAH	36	CSAH 35	MNTH 228	6.6	1	1	290	0.03	16.7	1.36	2
37.01	CSAH	37	CSAH 26	CSAH 35	2.1		1	390	0.00	9.5	0.00	1
38.01	CSAH	38	MNTH 78	CSAH 5	5.2	1	3	330	0.04	10.2	0.38	1
38.02	CNTY	38	CSAH 5	URBANK CORP LMTS	4.8	3	1	454	0.13	6.5	0.83	1
39.01	CNTY	39	CSAH 12	CSAH 35	6.4			135	0.00	9.4	1.09	1
40.02	CNTY	40	VINING CORP LMTS	MNTH 29	10.6	4	3	274	0.08	9.7	0.19	2
40.03	CNTY	40	MNTH 29	TODD COUNTY LINE	10.4	1		300	0.02	9.9	0.19	2
41.01	CNTY	41	CSAH 35	MNTH 108	6	1		547	0.03	11.8	0.50	2
41.02	CSAH	41	MNTH 108	CSAH 4	6.7	1	1	401	0.03	14.8	1.04	1
42.02	CSAH	42	PARKERS PRAIRIE COR	CSAH 40	10.2	1		161	0.02	6.7	0.49	2
43.01	CSAH	43	CSAH 1	CSAH 22	4.3	2		380	0.09	9.1	0.47	1
44.01	CSAH	44	CSAH 14	CSAH 35	5.3	2		311	0.08	11.7	0.57	1
45.01	CSAH	45	3 MILES SOUTH OF CSA	CSAH 1	3			185	0.00	9.7	0.33	1
45.02	CSAH	45	CSAH 1	CSAH 74	3.9			219	0.00	16.7	1.79	2
46.02	CSAH	46	PARKERS PRAIRIE COR	TODD COUNTY LINE	9.9	5	2	420	0.10	8.7	1.11	1
47.01	CSAH	47	GRANT COUNTY LINE	CSAH 12	5.9	3		333	0.10	7.6	0.34	1
47.02	CSAH	47	CSAH 12	MNTH 210	7.4		1	225	0.00	5.7	0.14	2
48.01	CSAH	48	CSAH 42	TODD COUNTY LINE	3			85	0.00	8.7	0.00	1
49.02	CSAH	49	RICHVILLE CORP LMTS	MNTH 108	3.6	1	2	567	0.06	13.1	0.83	1
50.01	CSAH	50	MNTH 108	DEER CREEK CORP LM	6.6	1		354	0.03	8.0	0.30	2
50.03	CSAH	50	DEER CREEK CORP LM	CSAH 75	6.1	3	3	330	0.10	10.3	0.33	2
51.02	CSAH	51	PERHAM CORP LMTS	BECKER COUNTY LINE	7.6	5	2	728	0.13	9.9	0.13	1
52.01	CSAH	52	MNTH 108	MNTH 106	7.2	2	5	860	0.06	7.9	0.00	2
52.02	CSAH	52	MNTH 106	MNTH 29	3.9	1	1	560	0.05	11.0	0.26	1
53.01	CSAH	53	USTH 10	CSAH 8	7.9	7	4	294	0.18	12.9	0.89	1
53.02	CSAH	53	CSAH 8	BECKER COUNTY LINE	5	2	1	440	0.08	9.2	0.00	1
54.01	CSAH	54	MNTH 78	CSAH 67	8.6	1	3	600	0.02	10.6	0.47	1
55.01	CSAH	55	CSAH 16	OTTERTAIL CORP LMTS	6.8	3		290	0.09	10.3	0.74	2
56.02	CSAH	56	NEW YORK MILLS CORP	CSAH 19	6.6	3	1	344	0.09	11.4	0.15	2
57.01	CSAH	57	CSAH 6	MNTH 210	6.6	2	1	130	0.06	10.2	0.61	1
58.01	CSAH	58	CSAH 67	CSAH 19	9.2	2	1	135	0.04	9.3	0.33	1
59.01	CSAH	59	DOUGLAS COUNTY LINI	URBANK CORP LMTS	0.8			425	0.00	10.0	0.00	2
59.03	CSAH	59	URBANK CORP LMTS	CSAH 40	8.7	1		324	0.02	8.5	0.23	2
60.01	CSAH	60	USTH 10 and MNTH 228	CSAH 51	3.5	2		475	0.11	10.0	0.00	1
60.02	CSAH	60	CSAH 51	CSAH 13	2.2		1	380	0.00	13.6	0.00	1

Otter Tail County
Rural Segment Listing

Corridor	Route	#	Start	End	Length	Runoff Road Crashes	Intersection Crashes	ADT	RD Density	Access Density	Curves w/ Critical Radius / Mile	Edge Risk Assesment
61.01	CSAH	61	CSAH 16	MNTH 108	7.5			224	0.00	10.9	0.40	2
62.01	CSAH	62	CSAH 67	CSAH 19	4.9			165	0.00	8.4	0.41	1
63.01	CSAH	63	DOUGLAS COUNTY LINI	MNTH 235	1.4		1	235	0.00	10.0	0.00	2
64.01	CSAH	64	MNTH 78	DOUGLAS COUNTY LIN	0.6	2	1	350	0.67	16.7	1.67	2
65.01	CSAH	65	CSAH 6	CSAH 40	5.2	1		380	0.04	8.7	0.38	1
65.02	CSAH	65	CSAH 40	HENNING CORP LMTS	5.2	1	1	460	0.04	11.9	0.38	1
66.01	CSAH	66	CSAH 75	WADENA COUNTY LINE	1.2			160	0.00	12.5	0.83	1
67.02	CSAH	67	HENNING CORP LMTS	CSAH 52	7.5	2	1	346	0.05	10.3	0.67	1
67.03	CSAH	67	CSAH 52	NEW YORK MILLS CORI	6.9	2	4	676	0.06	9.3	0.58	3
67.05	CSAH	67	NEW YORK MILLS CORI	CSAH 8 EAST	7.7	3	2	844	0.08	12.9	0.13	1
67.06	CSAH	67	CSAH 8 EAST	CSAH 8 WEST	1			560	0.00	12.0	0.00	1
67.07	CSAH	67	CSAH 8 WEST	BECKER COUNTY LINE	6.3	1		393	0.03	10.3	0.16	1
68.01	CSAH	68	CSAH 75	WADENA COUNTY LINE	1			105	0.00	12.0	0.00	1
69.01	CSAH	69	DOUGLAS COUNTY LINI	CSAH 46	2.5		1	200	0.00	10.0	0.00	1
70.01	CSAH	70	CSAH 75	WADENA COUNTY LINE	1			140	0.00	13.0	0.00	1
71.01	CSAH	71	DOUGLAS COUNTY LINI	CSAH 46	4.3			175	0.00	8.6	0.93	2
72.01	CSAH	72	MNTH 78	CSAH 83	3	1	2	1358	0.07	25.0	0.67	2
73.01	CSAH	73	CSAH 40	MNTH 210	6.1	1	1	155	0.03	10.5	0.33	1
73.02	CSAH	73	MNTH 210	MNTH 29	6.7		3	218	0.00	11.9	0.00	2
74.01	CSAH	74	CSAH 35	CSAH 45	2.4			420	0.00	15.4	0.42	1
74.02	CSAH	74	CSAH 45	CSAH 1	4			375	0.00	15.5	0.50	1
75.01	CSAH	75	CSAH 40	MNTH 210	4.5	1	1	140	0.04	12.4	0.67	2
75.02	CSAH	75	MNTH 210	MNTH 29	8	3	2	502	0.08	11.8	0.00	1
75.03	CSAH	75	MNTH 29	USTH 10	1	2	7	1050	0.40	19.0	0.00	1
75.04	CSAH	75	USTH 10	CSAH 8	12.1	1	1	557	0.02	10.6	0.00	1
75.05	CSAH	75	CSAH 8	BECKER COUNTY LINE	6.4	1		305	0.03	11.1	0.16	1
76.01	CSAH	76	USTH 10	CSAH 19	4.4			220	0.00	8.2	0.23	1
76.02	CSAH	76	CSAH 19	CSAH 75	3.1		1	220	0.00	12.3	0.00	1
77.01	CSAH	77	MNTH 29	BLUFFTON CORP LMTS	1.4	2	1	280	0.29	14.3	0.00	1
79.01	CSAH	79	DOUGLAS CNTY LINE	MNTH 235	3.4		1	175	0.00	9.4	0.59	1
80.01	CSAH	80	USTH 10 WEST	PERHAM CORP LMTS	2.5		1	3220	0.00	6.8	0.00	1
80.03	CSAH	80	PERHAM CORP LMTS	USTH 10 EAST	1.7	4	3	2599	0.47	18.2	0.59	1
81.01	CSAH	81	MNTH 78	CSAH 38	6.1	1	1	128	0.03	9.7	0.66	1
82.01	CSAH	82	GRANT COUNTY LINE	DALTON CORP LMTS	6.2	2	1	700	0.06	7.6	0.00	1
82.03	CSAH	82	DALTON CORP LMTS	USTH 59	5.2	7	4	1300	0.27	11.7	0.00	1
82.04	CSAH	82	USTH I 94	FERGUS FALLS CORP L	2.8	6	6	3408	0.43	11.1	0.00	1
83.02	CSAH	83	BATTLE LAKE CORP LM	CSAH 1	8.5	5	2	388	0.12	12.9	0.59	2
84.01	CSAH	84	USTH 10 WEST	NEW YORK MILLS CORI	0.8	1	2	1050	0.25	8.8	0.00	1
84.03	CSAH	84	NEW YORK MILLS CORI	USTH 10 EAST	0.5	2	2	1350	0.80	28.0	2.00	1
85.01	CSAH	85	MNTH 108	CSAH 35	3.2		1	465	0.00	11.6	0.00	1
87.01	CSAH	87	DOUGLAS COUNTY LINI	CSAH 38	1		1	460	0.00	14.0	0.00	1
88.01	CSAH	88	FERGUS FALLS CORP L	USTH 59	3.2	7	6	3012	0.44	16.9	0.00	1
88.02	CSAH	88	USTH 59	CSAH 10	5.3	1	1	495	0.04	8.7	0.00	1
88.03	CSAH	88	CSAH 10	WILKIN CO CSAH 24	7.1			375	0.00	6.6	0.00	1
89.02	CSAH	89	BATTLE LAKE CORP	CSAH 16	0.7			235	0.00	11.4	0.00	1
110.01	CNTY	110	CSAH 1	USTH 59	5	1		95	0.04	8.8	0.00	2
111.02	CNTY	111	FERGUS FALLS CORP L	CSAH 10	4.5	4	2	870	0.18	11.1	0.89	1
112.01	CNTY	112	CSAH 15	CSAH 1	3.9			103	0.00	10.5	0.00	1
113.01	CNTY	113	MNTH 108	CSAH 23	3	2		140	0.13	10.7	0.33	2
114.01	CNTY	114	WILKIN COUNTY LINE	CSAH 15	3.8			70	0.00	6.8	0.00	1
114.02	CNTY	114	CSAH 15	CSAH 15	5.4	1		170	0.04	7.6	0.56	1
115.01	CNTY	115	CSAH 74	CSAH 35	2.5			235	0.00	13.2	0.80	2
116.01	CNTY	116	CSAH 21	MNTH 210	4.3		2	462	0.00	11.9	0.23	1
117.01	CNTY	117	CSAH 82	CSAH 12	5			180	0.00	10.6	1.20	1
118.01	CNTY	118	CSAH 21	USTH 59	3.5	1		130	0.06	8.3	0.00	1
119.01	CNTY	119	CSAH 47	MNTH 210	6.1			191	0.00	11.0	0.49	2
120.01	CNTY	120	CSAH 29	CSAH 33	1.6	1	1	540	0.13	15.6	0.00	1

Otter Tail County
Rural Segment Listing

Corridor	Route	#	Start	End	Length	Runoff Road Crashes	Intersection Crashes	ADT	RD Density	Access Density	Curves w/ Critical Radius / Mile	Edge Risk Assesment
122.02	CNTY	122	UNDERWOOD CORP LI	CSAH 83	5.4	3	1	611	0.11	9.1	0.37	2
123.01	CNTY	123	MNTH 108	CSAH 34	2.9	1		163	0.07	11.0	0.00	1
124.01	CNTY	124	CSAH 33	CSAH 35	4.6	1	1	190	0.04	12.4	1.09	1
125.01	CNTY	125	MNTH 108	CSAH 34	3	1	3	680	0.07	12.7	0.00	1
126.01	CNTY	126	CSAH 47	MNTH 78	4.2		1	100	0.00	10.7	0.71	2
127.01	CNTY	127	MNTH 108	CSAH 54	2.5		2	365	0.00	8.4	0.00	1
128.01	CNTY	128	MNTH 78	CSAH 55	4			223	0.00	9.3	0.75	2
129.01	CNTY	129	MNTH 235	CSAH 6	1.7		1	165	0.00	8.2	0.59	1
130.01	CNTY	130	1.5 MILES WEST OF CS	CSAH 4	1.5			260	0.00	18.0	0.67	1
131.01	CNTY	131	CSAH 35	CSAH 35	1.5	2	1	54	0.27	10.0	0.00	2
132.01	CNTY	132	CSAH 61	MNTH 108	2			150	0.00	12.0	0.00	2
134.01	CNTY	134	CSAH 65	3.5 MILES EAST OF CSA	3.5			130	0.00	13.4	0.00	1
135.01	CNTY	135	CSAH 52	CSAH 84	6			215	0.00	10.7	0.00	1
136.01	CNTY	136	CH 138	MNTH 29	3.1			105	0.00	12.6	0.65	1
136.02	CNTY	136	MNTH 29	CSAH 40	5		1	65	0.00	7.8	0.20	1
137.01	CNTY	137	USTH 10	CSAH 53	6	1		290	0.03	8.7	0.50	2
138.01	CNTY	138	MNTH 29	CH 136	4.3			115	0.00	10.0	0.47	2
139.01	CNTY	139	CSAH 42	CH 138	0.8			40	0.00	17.5	0.00	1
140.01	CNTY	140	CSAH 67	MNTH 29	4.1			113	0.00	8.3	0.00	1
141.01	CNTY	141	CSAH 71	CSAH 46	2.2			80	0.00	9.5	0.00	2
142.01	CNTY	142	CSAH 67	MNTH 106	3.9	1	3	230	0.05	12.8	0.00	2
143.01	CNTY	143	CSAH 52	USTH 10	3.1		1	74	0.00	9.0	0.00	2
144.01	CNTY	144	CSAH 19	CSAH 75	3			130	0.00	7.7	0.00	1
145.01	CNTY	145	CSAH 72	CSAH 1	1			630	0.00	56.0	0.00	2
146.01	CNTY	146	CSAH 13	CSAH 53	3			80	0.00	11.0	0.00	2
148.01	CNTY	148	2 MILES WEST OF CSAH	CSAH 67	1.9			90	0.00	12.6	0.00	1
					1004.1	393	254		0.08		0.35	70

Edge Risk Legend	
3 --	Risky' - NEITHER shoulder or good clear zone
2 --	Either a shoulder OR good clear zone
1 --	BOTH shoulder and a good clear zone

Critical ADT Range	
Min	600
Max	1,199

	Access	Critical Radius Curves
Total	10881	352
Total Mileage	1004.1	1004.1
Average Density (Total/Mile)	10.8	0.35

Otter Tail County
Rural Segment Prioritization

Rank	Corridor	Route	#	Start	End	Length	ADT	ADT Range	RD Density	Access Density	Curve Critical Radius Density	Edge Risk	Totals	Tiebreakers Edge Risk	Tiebreakers RD Density
1	34.01	CSAH	34	CSAH 35	PERHAM CORP LMTS	6.8	1,148	★	★	★	★	★	★★★★★	3	0.32
2	4.04	CSAH	4	VERGAS CORP LMTS	BECKER COUNTY LINE	4.7	1,170	★	★	★	★	★	★★★★★	3	0.13
3	35.07	CSAH	35	CSAH 41	DENT CORP LMTS	9.3	684	★	★	★	★	★	★★★★★	2	0.17
4	9.03	CSAH	9	MNTH 34	BECKER COUNTY LINE	5.2	863	★	★	★	★	★	★★★★★	2	0.15
5	31.02	CSAH	31	USTH 59	CSAH 20	2.9	558		★	★	★	★	★★★★	3	0.21
6	64.01	CSAH	64	MNTH 78	DOUGLAS COUNTY LIN	0.6	350		★	★	★	★	★★★★	2	0.67
7	35.05	CSAH	35	UNDERWOOD CORP LM	CSAH 1	6	1,115	★	★		★	★	★★★★	2	0.43
8	5.03	CSAH	5	CLITHERALL CORP LMT	CSAH 16	4.7	650	★	★		★	★	★★★★	2	0.21
9	35.01	CSAH	35	USTH 59	DALTON CORP LMTS	5.8	602	★	★		★	★	★★★★	2	0.21
10	3.01	CSAH	3	CSAH 10	CSAH 24	8.4	596		★	★	★	★	★★★★	2	0.14
11	33.01	CSAH	33	CSAH 35	MNTH 210	8.5	251		★	★	★	★	★★★★	2	0.12
12	83.02	CSAH	83	BATTLE LAKE CORP LM	CSAH 1	8.5	388		★	★	★	★	★★★★	2	0.12
13	122.02	CNTY	122	UNDERWOOD CORP LM	CSAH 83	5.4	611	★	★		★	★	★★★★	2	0.11
14	3.02	CSAH	3	CSAH 24	USTH 59	7.5	664	★	★		★	★	★★★★	2	0.08
15	20.01	CSAH	20	CSAH 9	USTH 59	5.1	994	★	★	★	★		★★★★	1	0.20
16	111.02	CNTY	111	FERGUS FALLS CORP L	CSAH 10	4.5	870	★	★	★	★		★★★★	1	0.18
17	4.02	CSAH	4	CSAH 31	VERGAS CORP LMTS	8.9	1,222		★	★		★	★★★	3	0.29
18	31.01	CSAH	31	CSAH 4	USTH 59	5.1	573			★	★	★	★★★	3	0.08
19	67.03	CSAH	67	CSAH 52	NEW YORK MILLS CORI	6.9	676	★			★	★	★★★	3	0.06
20	35.03	CSAH	35	DALTON CORP LMTS	UNDERWOOD CORP LM	8.3	559		★		★	★	★★★	2	0.14
21	24.05	CSAH	24	ERHARD CORP LMTS	CSAH 3	4.8	589		★	★		★	★★★	2	0.13
22	56.02	CSAH	56	NEW YORK MILLS CORI	CSAH 19	6.6	344		★	★		★	★★★	2	0.09
23	55.01	CSAH	55	CSAH 16	OTTERTAIL CORP LMTS	6.8	290		★		★	★	★★★	2	0.09
24	29.01	CSAH	29	CSAH 82	MNTH 210	7.4	471		★		★	★	★★★	2	0.08
25	72.01	CSAH	72	MNTH 78	CSAH 83	3	1,358			★	★	★	★★★	2	0.07
26	75.01	CSAH	75	CSAH 40	MNTH 210	4.5	140			★	★	★	★★★	2	0.04
27	23.01	CSAH	23	CSAH 9	MNTH 34	5.2	165			★	★	★	★★★	2	0.04
28	16.01	CSAH	16	MNTH 78	CSAH 5	5.7	607	★			★	★	★★★	2	0.04
29	41.01	CNTY	41	CSAH 35	MNTH 108	6	547			★	★	★	★★★	2	0.03
30	36.01	CSAH	36	CSAH 35	MNTH 228	6.6	290			★	★	★	★★★	2	0.03
31	45.02	CSAH	45	CSAH 1	CSAH 74	3.9	219			★	★	★	★★★	2	0.00
32	61.01	CSAH	61	CSAH 16	MNTH 108	7.5	224			★	★	★	★★★	2	0.00
33	119.01	CNTY	119	CSAH 47	MNTH 210	6.1	191			★	★	★	★★★	2	0.00
34	115.01	CNTY	115	CSAH 74	CSAH 35	2.5	235			★	★	★	★★★	2	0.00
35	145.01	CNTY	145	CSAH 72	CSAH 1	1	630	★		★		★	★★★	2	0.00
36	84.03	CSAH	84	NEW YORK MILLS CORI	USTH 10 EAST	0.5	1,350		★	★	★		★★★	1	0.80
37	80.03	CSAH	80	PERHAM CORP LMTS	USTH 10 EAST	1.7	2,599		★	★	★		★★★	1	0.47
38	75.03	CSAH	75	MNTH 29	USTH 10	1	1,050	★	★	★			★★★	1	0.40
39	10.03	CSAH	10	ELIZABETH CORP LMTS	CSAH 1	6.5	1,187	★	★	★			★★★	1	0.25
40	17.02	CSAH	17	VERGAS CORP LMTS	BECKER COUNTY LINE	6.3	1,400		★	★	★		★★★	1	0.22
41	53.01	CSAH	53	USTH 10	CSAH 8	7.9	294		★	★	★		★★★	1	0.18
42	35.10	CSAH	35	CSAH 34	CSAH 36	7.5	986	★		★	★		★★★	1	0.03
43	10.01	CSAH	10	WILKIN COUNTY LINE C	ELIZABETH CORP LMTS	6.7	357		★			★	★★	3	0.09
44	30.02	CSAH	30	CSAH 21	MNTH 108	4.4	255			★		★	★★	3	0.00
45	131.01	CNTY	131	CSAH 35	CSAH 35	1.5	54		★			★	★★	2	0.27
46	19.02	CSAH	19	BLUFFTON CORP LMTS	CSAH 56	4.9	460		★			★	★★	2	0.16
47	113.01	CNTY	113	MNTH 108	CSAH 23	3	140		★			★	★★	2	0.13
48	50.03	CSAH	50	DEER CREEK CORP LM	CSAH 75	6.1	330		★			★	★★	2	0.10
49	15.01	CSAH	15	GRANT COUNTY LINE C	CSAH 2 North	6.7	153		★			★	★★	2	0.09
50	24.02	CSAH	24	ROTHSAY CORP LMTS	CSAH 21 South	2.6	315				★	★	★★	2	0.08
51	52.01	CSAH	52	MNTH 108	MNTH 106	7.2	860	★				★	★★	2	0.06
52	142.01	CNTY	142	CSAH 67	MNTH 106	3.9	230			★		★	★★	2	0.05
53	137.01	CNTY	137	USTH 10	CSAH 53	6	290				★	★	★★	2	0.03

Otter Tail County
Rural Segment Prioritization

Rank	Corridor	Route	#	Start	End	Length	ADT	ADT Range	RD Density	Access Density	Curve Critical Radius Density	Edge Risk	Totals	Tiebreakers Edge Risk	Tiebreakers RD Density
54	42.02	CSAH	42	PARKERS PRAIRIE COF	CSAH 40	10.2	161				★	★	★★	2	0.02
55	73.02	CSAH	73	MNTH 210	MNTH 29	6.7	218			★		★	★★	2	0.00
56	126.01	CNTY	126	CSAH 47	MNTH 78	4.2	100				★	★	★★	2	0.00
57	132.01	CNTY	132	CSAH 61	MNTH 108	2	150			★		★	★★	2	0.00
58	146.01	CNTY	146	CSAH 13	CSAH 53	3	80			★		★	★★	2	0.00
59	5.04	CSAH	5	CSAH 16	MNTH 78	4.8	404				★	★	★★	2	0.00
60	32.01	CSAH	32	CSAH 74	CSAH 14	6.6	225				★	★	★★	2	0.00
61	71.01	CSAH	71	DOUGLAS COUNTY LIN	CSAH 46	4.3	175				★	★	★★	2	0.00
62	128.01	CNTY	128	MNTH 78	CSAH 55	4	223				★	★	★★	2	0.00
63	138.01	CNTY	138	MNTH 29	CH 136	4.3	115				★	★	★★	2	0.00
64	88.01	CSAH	88	FERGUS FALLS CORP L	USTH 59	3.2	3,012		★	★			★★	1	0.44
65	82.04	CSAH	82	USTH I 94	FERGUS FALLS CORP L	2.8	3,408		★	★			★★	1	0.43
66	9.02	CSAH	9	PELICAN RAPIDS CORP	MNTH 34	4.9	1,350		★	★			★★	1	0.37
67	4.01	CSAH	4	USTH 59	CSAH 31	4.1	1,300		★	★			★★	1	0.29
68	77.01	CSAH	77	MNTH 29	BLUFFTON CORP LMTS	1.4	280		★	★			★★	1	0.29
69	82.03	CSAH	82	DALTON CORP LMTS	USTH 59	5.2	1,300		★	★			★★	1	0.27
70	84.01	CSAH	84	USTH 10 WEST	NEW YORK MILLS CORI	0.8	1,050	★	★				★★	1	0.25
71	1.03	CSAH	1	FERGUS FALLS CORP L	CSAH 10	5.5	3,031		★	★			★★	1	0.22
72	1.01	CSAH	1	GRANT COUNTY LINE C	FERGUS FALLS CORP L	11.6	903	★	★				★★	1	0.17
73	16.02	CSAH	16	CSAH 5	MNTH 108	7	734	★	★				★★	1	0.17
74	8.02	CSAH	8	PERHAM CORP LMTS	CSAH 53	6.9	1,809		★	★			★★	1	0.14
75	35.09	CSAH	35	MNTH 108	CSAH 34	2.9	395		★	★			★★	1	0.14
76	1.04	CSAH	1	CSAH 10	CSAH 35	5.9	2,383		★	★			★★	1	0.14
77	51.02	CSAH	51	PERHAM CORP LMTS	BECKER COUNTY LINE	7.6	728	★	★				★★	1	0.13
78	27.02	CSAH	27	FERGUS FALLS CORP L	CSAH 10	4.6	2,250		★	★			★★	1	0.13
79	120.01	CNTY	120	CSAH 29	CSAH 33	1.6	540		★	★			★★	1	0.13
80	38.02	CNTY	38	CSAH 5	URBANK CORP LMTS	4.8	454		★		★		★★	1	0.13
81	46.02	CSAH	46	PARKERS PRAIRIE COF	TODD COUNTY LINE	9.9	420		★		★		★★	1	0.10
82	43.01	CSAH	43	CSAH 1	CSAH 22	4.3	380		★		★		★★	1	0.09
83	8.04	CSAH	8	CSAH 67	WADENA COUNTY LINE	9.4	733	★	★				★★	1	0.09
84	21.02	CSAH	21	CSAH 10	CSAH 24	7.1	184		★		★		★★	1	0.08
85	18.01	CSAH	18	BEGIN CSAH 18	CSAH 45	9.5	680	★	★				★★	1	0.08
86	67.05	CSAH	67	NEW YORK MILLS CORI	CSAH 8 EAST	7.7	844	★		★			★★	1	0.08
87	14.01	CSAH	14	CSAH 1	RICHVILLE CORP LMTS	7.9	635	★			★		★★	1	0.08
88	44.01	CSAH	44	CSAH 14	CSAH 35	5.3	311			★	★		★★	1	0.08
89	125.01	CNTY	125	MNTH 108	CSAH 34	3	680	★		★			★★	1	0.07
90	49.02	CSAH	49	RICHVILLE CORP LMTS	MNTH 108	3.6	567			★	★		★★	1	0.06
91	1.06	CSAH	1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	4.6	1,586			★	★		★★	1	0.04
92	124.01	CNTY	124	CSAH 33	CSAH 35	4.6	190			★	★		★★	1	0.04
93	65.02	CSAH	65	CSAH 40	HENNING CORP LMTS	5.2	460			★	★		★★	1	0.04
94	41.02	CSAH	41	MNTH 108	CSAH 4	6.7	401			★	★		★★	1	0.03
95	35.06	CSAH	35	CSAH 1	CSAH 41	7.4	988	★		★			★★	1	0.03
96	54.01	CSAH	54	MNTH 78	CSAH 67	8.6	600	★			★		★★	1	0.02
97	74.01	CSAH	74	CSAH 35	CSAH 45	2.4	420			★	★		★★	1	0.00
98	74.02	CSAH	74	CSAH 45	CSAH 1	4	375			★	★		★★	1	0.00
99	10.04	CSAH	10	USTH 10	BECKER COUNTY LINE	0.7	1,050	★			★		★★	1	0.00
100	14.03	CSAH	14	RICHVILLE CORP LMTS	MNTH 78	2.1	922	★		★			★★	1	0.00
101	66.01	CSAH	66	CSAH 75	WADENA COUNTY LINE	1.2	160			★	★		★★	1	0.00
102	130.01	CNTY	130	1.5 MILES WEST OF CS	CSAH 4	1.5	260			★	★		★★	1	0.00
103	136.01	CNTY	136	CH 138	MNTH 29	3.1	105			★	★		★★	1	0.00
104	13.01	CSAH	13	CSAH 8	BECKER COUNTY LINE	5.1	594					★	★	2	0.08
105	40.02	CNTY	40	VINING CORP LMTS	MNTH 29	10.6	274					★	★	2	0.08
106	2.01	CSAH	2	WILKIN CNTY LINE	CSAH 1	8.3	133					★	★	2	0.05
107	14.04	CSAH	14	MNTH 78	CSAH 67	9.1	534					★	★	2	0.04
108	110.01	CNTY	110	CSAH 1	USTH 59	5	95					★	★	2	0.04
109	26.01	CSAH	26	WILKIN COUNTY LINE	6.5 MILES EAST ON GR/	6.4	140					★	★	2	0.03
110	50.01	CSAH	50	MNTH 108	DEER CREEK CORP LM	6.6	354					★	★	2	0.03

Otter Tail County
Rural Segment Prioritization

Rank	Corridor	Route	#	Start	End	Length	ADT	ADT Range	RD Density	Access Density	Curve Critical Radius Density	Edge Risk	Totals	Tiebreakers Edge Risk	Tiebreakers RD Density
111	59.03	CSAH	59	URBANK CORP LMTS	CSAH 40	8.7	324					★	★	2	0.02
112	40.03	CNTY	40	MNTH 29	TODD COUNTY LINE	10.4	300					★	★	2	0.02
113	47.02	CSAH	47	CSAH 12	MNTH 210	7.4	225					★	★	2	0.00
114	63.01	CSAH	63	DOUGLAS COUNTY LIN	MNTH 235	1.4	235					★	★	2	0.00
115	11.01	CSAH	11	CSAH 21	CSAH 10	8	101					★	★	2	0.00
116	21.01	CSAH	21	MNTH 210	CSAH 10	6.6	220					★	★	2	0.00
117	59.01	CSAH	59	DOUGLAS COUNTY LIN	URBANK CORP LMTS	0.8	425					★	★	2	0.00
118	141.01	CNTY	141	CSAH 71	CSAH 46	2.2	80					★	★	2	0.00
119	143.01	CNTY	143	CSAH 52	USTH 10	3.1	74					★	★	2	0.00
120	6.02	CSAH	6	CSAH 65 and CH 129	MNTH 29	4.1	570		★				★	1	0.39
121	1.05	CSAH	1	CSAH 35	Oak Ridge Beach Rd	11.4	1,556		★				★	1	0.16
122	5.01	CSAH	5	CSAH 38	MNTH 210	10.2	409		★				★	1	0.14
123	19.03	CSAH	19	CSAH 56	CSAH 8	5.9	265		★				★	1	0.14
124	60.01	CSAH	60	USTH 10 and MNTH 228	CSAH 51	3.5	475		★				★	1	0.11
125	47.01	CSAH	47	GRANT COUNTY LINE	CSAH 12	5.9	333		★				★	1	0.10
126	21.03	CSAH	21	CSAH 24	MNTH 108	5	260		★				★	1	0.08
127	21.04	CSAH	21	MNTH 108	CLAY COUNTY LINE	5	245		★				★	1	0.08
128	53.02	CSAH	53	CSAH 8	BECKER COUNTY LINE	5	440		★				★	1	0.08
129	25.01	CSAH	25	GRANT COUNTY LINE C	MNTH 210	10.6	271				★		★	1	0.08
130	75.02	CSAH	75	MNTH 210	MNTH 29	8	502			★			★	1	0.08
131	123.01	CNTY	123	MNTH 108	CSAH 34	2.9	163			★			★	1	0.07
132	24.03	CSAH	24	CSAH 21 South	ERHARD CORP LMTS	6	380			★			★	1	0.07
133	82.01	CSAH	82	GRANT COUNTY LINE	DALTON CORP LMTS	6.2	700	★					★	1	0.06
134	57.01	CSAH	57	CSAH 6	MNTH 210	6.6	130				★		★	1	0.06
135	67.02	CSAH	67	HENNING CORP LMTS	CSAH 52	7.5	346				★		★	1	0.05
136	52.02	CSAH	52	MNTH 106	MNTH 29	3.9	560			★			★	1	0.05
137	65.01	CSAH	65	CSAH 6	CSAH 40	5.2	380				★		★	1	0.04
138	23.02	CSAH	23	MNTH 34	CLAY COUNTY LINE	5.2	329				★		★	1	0.04
139	38.01	CSAH	38	MNTH 78	CSAH 5	5.2	330				★		★	1	0.04
140	114.02	CNTY	114	CSAH 15	CSAH 15	5.4	170				★		★	1	0.04
141	27.03	CSAH	27	CSAH 10	CSAH 24	11.1	744	★					★	1	0.04
142	22.01	CSAH	22	CSAH 27	CSAH 3	5.8	589			★			★	1	0.03
143	22.02	CSAH	22	CSAH 3	CSAH 35	6.1	365			★			★	1	0.03
144	81.01	CSAH	81	MNTH 78	CSAH 38	6.1	128				★		★	1	0.03
145	75.05	CSAH	75	CSAH 8	BECKER COUNTY LINE	6.4	305			★			★	1	0.03
146	24.06	CSAH	24	CSAH 3	CSAH 41	7.4	355				★		★	1	0.03
147	39.01	CNTY	39	CSAH 12	CSAH 35	6.4	135				★		★	1	0.00
148	60.02	CSAH	60	CSAH 51	CSAH 13	2.2	380			★			★	1	0.00
149	67.06	CSAH	67	CSAH 8 EAST	CSAH 8 WEST	1	560			★			★	1	0.00
150	68.01	CSAH	68	CSAH 75	WADENA COUNTY LINE	1	105			★			★	1	0.00
151	70.01	CSAH	70	CSAH 75	WADENA COUNTY LINE	1	140			★			★	1	0.00
152	76.02	CSAH	76	CSAH 19	CSAH 75	3.1	220			★			★	1	0.00
153	85.01	CSAH	85	MNTH 108	CSAH 35	3.2	465			★			★	1	0.00
154	87.01	CSAH	87	DOUGLAS COUNTY LIN	CSAH 38	1	460			★			★	1	0.00
155	89.02	CSAH	89	BATTLE LAKE CORP	CSAH 16	0.7	235			★			★	1	0.00
156	116.01	CNTY	116	CSAH 21	MNTH 210	4.3	462			★			★	1	0.00
157	117.01	CNTY	117	CSAH 82	CSAH 12	5	180				★		★	1	0.00
158	129.01	CNTY	129	MNTH 235	CSAH 6	1.7	165				★		★	1	0.00
159	134.01	CNTY	134	CSAH 65	3.5 MILES EAST OF CSA	3.5	130			★			★	1	0.00
160	139.01	CNTY	139	CSAH 42	CH 138	0.8	40			★			★	1	0.00
161	148.01	CNTY	148	2 MILES WEST OF CSAI	CSAH 67	1.9	90			★			★	1	0.00
162	15.02	CSAH	15	CSAH 2 North	FERGUS FALLS CORP L	6	458				★		★	1	0.00
163	62.01	CSAH	62	CSAH 67	CSAH 19	4.9	165				★		★	1	0.00
164	79.01	CSAH	79	DOUGLAS CNTY LINE	MNTH 235	3.4	175				★		★	1	0.00
165	11.02	CSAH	11	CSAH 10	NORTH 3 MILES ALONG	3	85			★			★	0	0.07
166	30.01	CSAH	30	WILKIN COUNTY LINE	CSAH 21	3.2	125							1	0.06
167	118.01	CNTY	118	CSAH 21	USTH 59	3.5	130							1	0.06

Otter Tail County
Rural Segment Prioritization

Rank	Corridor	Route	#	Start	End	Length	ADT	ADT Range	RD Density	Access Density	Curve Critical Radius Density	Edge Risk	Totals	Tiebreakers Edge Risk	Tiebreakers RD Density
168	58.01	CSAH	58	CSAH 67	CSAH 19	9.2	135							1	0.04
169	8.03	CSAH	8	CSAH 53	CSAH 67	4.9	550							1	0.04
170	12.02	CSAH	12	DALTON CORP LMTS	MNTH 78	9.9	573							1	0.04
171	88.02	CSAH	88	USTH 59	CSAH 10	5.3	495							1	0.04
172	73.01	CSAH	73	CSAH 40	MNTH 210	6.1	155							1	0.03
173	67.07	CSAH	67	CSAH 8 WEST	BECKER COUNTY LINE	6.3	393							1	0.03
174	28.02	CSAH	28	CSAH 21	USTH 59	6.6	187							1	0.03
175	75.04	CSAH	75	USTH 10	CSAH 8	12.1	557							1	0.02
176	45.01	CSAH	45	3 MILES SOUTH OF CSA	CSAH 1	3	185							1	0.00
177	6.01	CSAH	6	CSAH 5	CSAH 65 and CH 129	9	224							1	0.00
178	7.01	CSAH	7	GRANT COUNTY LINE C	CSAH 2	5	55							1	0.00
179	19.04	CSAH	19	CSAH 8	BECKER COUNTY LINE	6	280							1	0.00
180	28.01	CSAH	28	WILKIN COUNTY LINE C	CSAH 21	2.9	145							1	0.00
181	37.01	CSAH	37	CSAH 26	CSAH 35	2.1	390							1	0.00
182	48.01	CSAH	48	CSAH 42	TODD COUNTY LINE	3	85							1	0.00
183	69.01	CSAH	69	DOUGLAS COUNTY LIN	CSAH 46	2.5	200							1	0.00
184	76.01	CSAH	76	USTH 10	CSAH 19	4.4	220							1	0.00
185	80.01	CSAH	80	USTH 10 WEST	PERHAM CORP LMTS	2.5	3,220							1	0.00
186	88.03	CSAH	88	CSAH 10	WILKIN CO CSAH 24	7.1	375							1	0.00
187	112.01	CNTY	112	CSAH 15	CSAH 1	3.9	103							1	0.00
188	114.01	CNTY	114	WILKIN COUNTY LINE	CSAH 15	3.8	70							1	0.00
189	127.01	CNTY	127	MNTH 108	CSAH 54	2.5	365							1	0.00
190	135.01	CNTY	135	CSAH 52	CSAH 84	6	215							1	0.00
191	136.02	CNTY	136	MNTH 29	CSAH 40	5	65							1	0.00
192	140.01	CNTY	140	CSAH 67	MNTH 29	4.1	113							1	0.00
193	144.01	CNTY	144	CSAH 19	CSAH 75	3	130							1	0.00
						Total Stars --		33	65	84	78	70			
						% That Gets Star --		17%	34%	44%	40%	36%			

	#	%	Totals Mileage	%
★★★★★	4	2%	26.0	3%
★★★★	12	6%	67.9	7%
★★★	26	13%	138.2	14%
★★	61	32%	303.7	30%
★	62	32%	325.4	32%
	28	15%	142.9	14%
	193	100%	1004.1	100%

	Stars
ADT Range -	If segment has an ADT in the range of most at risk ADT based on ATP totals. (600 to 1199)
RD Density -	If segment has higher road departure density than the county average (0.08).
Access Density	If segment has access density than the county average (10.8).
Curve Critical Radius Density -	If segment has higher density of curves with critical radius than the county average (0.35).
Edge Risk Assessment -	Edge risk of 2 or 3, based on assessment of roadway edge and clear zone

CSAH 34 from CSAH 35 to PERHAM CORP LMTS Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	34
	Verbal
Start:	CSAH 35
End:	PERHAM CORP LMTS
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1148
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	6.8
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	15	11	1
Density (per mile per year)	0.44	0.32	0.03
Rate (per MVM)	1.05	0.77	0.07

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1148	600 to 1199	★
RD Density	0.32	0.08	★
Access Density	11.32	10.80	★
Curve Critical Radius Density	0.59	0.35	★
Edge Risk	3	2 or 3	★
			★★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	4.8	$193,120
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.0	$16,762

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Little McDonald Lake, Paul Lake and Rusch Lake shoreline properties.

Implementation Cost

Federal Funds	$188,894
Local Match (10% of Total project cost)	$20,988
Total Project Cost	**$209,882**

Rank: 1
Segment ID: 34.01
Date: 5/17/2011

CSAH 4 from VERGAS CORP LMTS to BECKER COUNTY LINE Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	4
	Verbal
Start:	VERGAS CORP LMTS
End:	BECKER COUNTY LINE
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1170
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	1'
Shoulder Type:	gravel
Length (miles):	4.7
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	7	3	0
Density (per mile per year)	0.30	0.13	0.00
Rate (per MVM)	0.70	0.30	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1170	600 to 1199	★
RD Density	0.13	0.08	★
Access Density	14.68	10.80	★
Curve Critical Radius Density	1.28	0.35	★
Edge Risk	3	2 or 3	★
			★★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	3.9	$13,654
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	0.8	$6,792

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Rose Lake shoreline properties.

Implementation Cost

Federal Funds	$18,401
Local Match (10% of Total project cost)	$2,045
Total Project Cost	**$20,445**

Rank: 2
Segment ID: 4.04
Date: 5/17/2011

CSAH 35 from CSAH 41 to DENT CORP LMTS Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	35
	Verbal
Start:	CSAH 41
End:	DENT CORP LMTS
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	684
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	2-6'
Shoulder Type:	gravel
Length (miles):	9.3
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	13	8	1
Density (per mile per year)	0.28	0.17	0.02
Rate (per MVM)	1.12	0.69	0.09

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	684	600 to 1199	★
RD Density	0.17	0.08	★
Access Density	14.52	10.80	★
Curve Critical Radius Density	0.86	0.35	★
Edge Risk	2	2 or 3	★
			★★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	6.0	$21,158
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	3.3	$27,668

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Dead Lake and Star Lake shoreline properties.

Implementation Cost

Federal Funds	$43,943
Local Match (10% of Total project cost)	$4,883
Total Project Cost	**$48,825**

Rank: 3
Segment ID: 35.07
Date: 5/17/2011

CSAH 9 from MNTH 34 to BECKER COUNTY LINE Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	9
	Verbal
Start:	MNTH 34
End:	BECKER COUNTY LINE
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	863
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	1'
Shoulder Type:	gravel
Length (miles):	5.2
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	6	4	0
Density (per mile per year)	0.23	0.15	0.00
Rate (per MVM)	0.73	0.49	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	863	600 to 1199	★
RD Density	0.15	0.08	★
Access Density	29.23	10.80	★
Curve Critical Radius Density	1.15	0.35	★
Edge Risk	2	2 or 3	★
			★★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	3.0	$120,640
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.2	$18,564

Notes - Southern 3 miles will be regraded in 2011/2012 and will receive 2' pave+RS+SW. Project selection for northern portion adjusted for Pelican Lake and Tamarac Lake shoreline properties. 6" edgeline 2010

Implementation Cost

Federal Funds	$125,284
Local Match (10% of Total project cost)	$13,920
Total Project Cost	**$139,204**

Rank: 4
Segment ID: 9.03
Date: 5/17/2011

CSAH 31 from USTH 59 to CSAH 20 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	31
	Verbal
Start:	USTH 59
End:	CSAH 20
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	558
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	2.9
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	4	3	1
Density (per mile per year)	0.28	0.21	0.07
Rate (per MVM)	1.36	1.02	0.34

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	558	600 to 1199	
RD Density	0.21	0.08	★
Access Density	22.76	10.80	★
Curve Critical Radius Density	2.76	0.35	★
Edge Risk	3	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.9	$24,650

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Pelican Lake and Little Pelican Lake shoreline properties.

Implementation Cost

Federal Funds	$22,185
Local Match (10% of Total project cost)	$2,465
Total Project Cost	**$24,650**

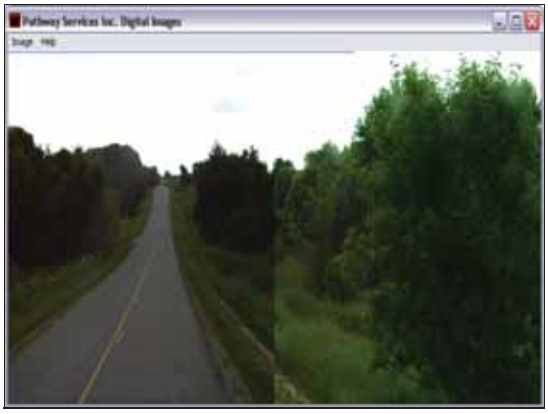
Rank: 5
Segment ID: 31.02
Date: 5/17/2011

CSAH 64 from MNTH 78 to DOUGLAS COUNTY LINE Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	64
	Verbal
Start:	MNTH 78
End:	DOUGLAS COUNTY LINE
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	350
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	0.6
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	3	2	0
Density (per mile per year)	1.00	0.67	0.00
Rate (per MVM)	7.83	5.22	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	350	600 to 1199	
RD Density	0.67	0.08	★
Access Density	16.67	10.80	★
Curve Critical Radius Density	1.67	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.6	$24,000	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$21,600
Local Match (10% of Total project cost)	$2,400
Total Project Cost	**$24,000**

Rank: 6
Segment ID: 64.01
Date: 5/17/2011

CSAH 35 from UNDERWOOD CORP LMTS to CSAH 1 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	35
	Verbal
Start:	UNDERWOOD CORP LMTS
End:	CSAH 1
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1115
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	6.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	17	13	1
Density (per mile per year)	0.57	0.43	0.03
Rate (per MVM)	1.39	1.07	0.08

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1115	600 to 1199	★
RD Density	0.43	0.08	★
Access Density	8.33	10.80	
Curve Critical Radius Density	0.83	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010 HSIP.
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	6.0	$240,000	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$216,000
Local Match (10% of Total project cost)	$24,000
Total Project Cost	**$240,000**

Rank: 7
Segment ID: 35.05
Date: 5/17/2011

CSAH 5 from CLITHERALL CORP LMTS to CSAH 16 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	5
	Verbal
Start:	CLITHERALL CORP LMTS
End:	CSAH 16
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	650
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	1'
Shoulder Type:	gravel
Length (miles):	4.7
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	5	5	0
Density (per mile per year)	0.21	0.21	0.00
Rate (per MVM)	0.90	0.90	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	650	600 to 1199	★
RD Density	0.21	0.08	★
Access Density	10.00	10.80	
Curve Critical Radius Density	0.85	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	4.7	$39,950

Notes - 6" edgeline 2010 HSIP.

Implementation Cost

Federal Funds	$35,955
Local Match (10% of Total project cost)	$3,995
Total Project Cost	**$39,950**

Rank: 8
Segment ID: 5.03
Date: 5/17/2011

CSAH 35 from USTH 59 to DALTON CORP LMTS Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	35
	Verbal
Start:	USTH 59
End:	DALTON CORP LMTS
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	602
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	5.8
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	10	6	2
Density (per mile per year)	0.34	0.21	0.07
Rate (per MVM)	1.57	0.94	0.31

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	602	600 to 1199	★
RD Density	0.21	0.08	★
Access Density	10.34	10.80	
Curve Critical Radius Density	0.52	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	3.6	$143,840
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.2	$18,734

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Ten Mile Lake shoreline properties.

Implementation Cost

Federal Funds	$146,317
Local Match (10% of Total project cost)	$16,257
Total Project Cost	**$162,574**

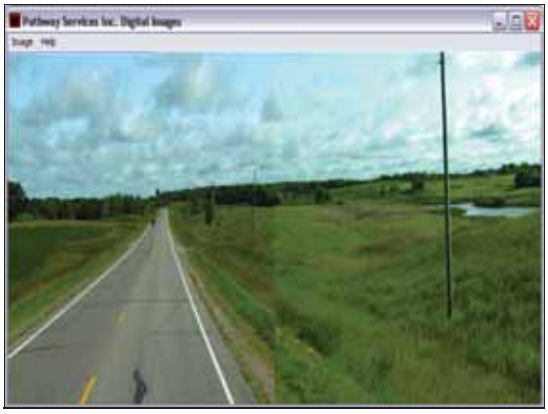
Rank: 9
Segment ID: 35.01
Date: 5/17/2011

CSAH 3 from CSAH 10 to CSAH 24 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	3
	Verbal
Start:	CSAH 10
End:	CSAH 24
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	596
Facility Type:	2-Lane
Lane Width:	12'-14'
Shoulder Width:	2-6'
Shoulder Type:	paved/gravel
Length (miles):	8.4
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	10	6	0
Density (per mile per year)	0.24	0.14	0.00
Rate (per MVM)	1.09	0.66	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	596	600 to 1199	
RD Density	0.14	0.08	★
Access Density	14.17	10.80	★
Curve Critical Radius Density	0.36	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	4.6	$13,860	
Rumble StripE	Proactive	$3,500	3.8	$13,230	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$24,381
Local Match (10% of Total project cost)	$2,709
Total Project Cost	**$27,090**

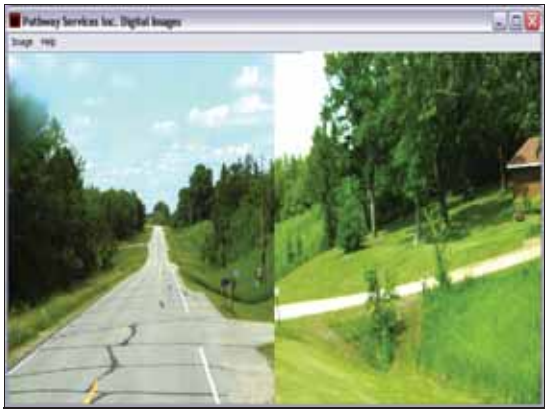
Rank: 10
Segment ID: 3.01
Date: 5/17/2011

CSAH 33 from CSAH 35 to MNTH 210 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	33
	Verbal
Start:	CSAH 35
End:	MNTH 210
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	251
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	5.5'
Shoulder Type:	gravel
Length (miles):	8.5
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	7	5	0
Density (per mile per year)	0.16	0.12	0.00
Rate (per MVM)	1.80	1.29	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	251	600 to 1199	
RD Density	0.12	0.08	★
Access Density	11.18	10.80	★
Curve Critical Radius Density	1.06	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	8.5	$29,750	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$26,775
Local Match (10% of Total project cost)	$2,975
Total Project Cost	**$29,750**

Rank: 11
Segment ID: 33.01
Date: 5/17/2011

CSAH 83 from BATTLE LAKE CORP LMTS to CSAH 1 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	83
	Verbal
Start:	BATTLE LAKE CORP LMTS
End:	CSAH 1
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	388
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3'
Shoulder Type:	gravel
Length (miles):	8.5
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	8	5	1
Density (per mile per year)	0.19	0.12	0.02
Rate (per MVM)	1.33	0.83	0.17

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	388	600 to 1199	
RD Density	0.12	0.08	★
Access Density	12.94	10.80	★
Curve Critical Radius Density	0.59	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	5.8	$20,230
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.7	$23,120

Notes - After 2011 Regrade. 6 miles receive 6" edgeline for 2010 HSIP. Project selection adjusted for North Turtle Lake, Elbow Lake and Deer Lake shoreline properties.

Implementation Cost

Federal Funds	$39,015
Local Match (10% of Total project cost)	$4,335
Total Project Cost	**$43,350**

Rank: 12
Segment ID: 83.02
Date: 5/17/2011

CNTY 122 from UNDERWOOD CORP LMTS to CSAH 83 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	122
	Verbal
Start:	UNDERWOOD CORP LMTS
End:	CSAH 83
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	611
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	paved/gravel
Length (miles):	5.4
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	4	3	1
Density (per mile per year)	0.15	0.11	0.04
Rate (per MVM)	0.66	0.50	0.17

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	611	600 to 1199	★
RD Density	0.11	0.08	★
Access Density	9.07	10.80	
Curve Critical Radius Density	0.37	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	2.7	$9,450
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.7	$22,950

Notes - Project selection adjusted for North and South Turtle Lake shoreline properties.

Implementation Cost

Federal Funds	$29,160
Local Match (10% of Total project cost)	$3,240
Total Project Cost	**$32,400**

Rank: 13
Segment ID: 122.02
Date: 5/17/2011

CSAH 3 from CSAH 24 to USTH 59 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	3
	Verbal
Start:	CSAH 24
End:	USTH 59
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	664
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	2'
Shoulder Type:	paved
Length (miles):	7.5
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	10	3	0
Density (per mile per year)	0.27	0.08	0.00
Rate (per MVM)	1.10	0.33	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	664	600 to 1199	★
RD Density	0.08	0.08	★
Access Density	10.13	10.80	
Curve Critical Radius Density	0.40	0.35	★
Edge Risk	2	2 or 3	★
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	6.6	$19,800
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	0.9	$7,650

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for South Arm Lida Lake shoreline properties.

Implementation Cost

Federal Funds	$24,705
Local Match (10% of Total project cost)	$2,745
Total Project Cost	**$27,450**

Rank: 14
Segment ID: 3.02
Date: 5/17/2011

CSAH 20 from CSAH 9 to USTH 59 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	20
	Verbal
Start:	CSAH 9
End:	USTH 59
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	994
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3'
Shoulder Type:	gravel
Length (miles):	5.1
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	6	5	0
Density (per mile per year)	0.24	0.20	0.00
Rate (per MVM)	0.65	0.54	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	994	600 to 1199	★
RD Density	0.20	0.08	★
Access Density	27.06	10.80	★
Curve Critical Radius Density	0.39	0.35	★
Edge Risk	1	2 or 3	
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	3.8	$13,388
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	1.3	$10,838

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Pelican Lake shoreline properties.

Implementation Cost

Federal Funds	$21,803
Local Match (10% of Total project cost)	$2,423
Total Project Cost	**$24,225**

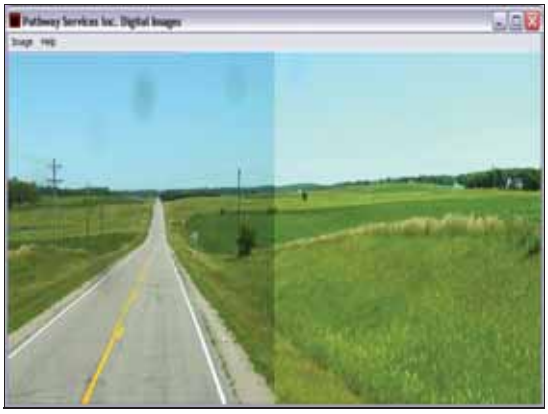
Rank: 15
Segment ID: 20.01
Date: 5/17/2011

CNTY 111 from FERGUS FALLS CORP LMTS to CSAH 10 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	111
	Verbal
Start:	FERGUS FALLS CORP LMTS
End:	CSAH 10
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	870
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	4.5
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	4	4	2
Density (per mile per year)	0.18	0.18	0.09
Rate (per MVM)	0.56	0.56	0.28

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	870	600 to 1199	★
RD Density	0.18	0.08	★
Access Density	11.11	10.80	★
Curve Critical Radius Density	0.89	0.35	★
Edge Risk	1	2 or 3	
			★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	4.5	$15,750	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$14,175
Local Match (10% of Total project cost)	$1,575
Total Project Cost	**$15,750**

Rank: 16
Segment ID: 111.02
Date: 5/17/2011

CSAH 4 from CSAH 31 to VERGAS CORP LMTS Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	4
	Verbal
Start:	CSAH 31
End:	VERGAS CORP LMTS
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1222
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	8.9
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	18	13	1
Density (per mile per year)	0.40	0.29	0.02
Rate (per MVM)	0.91	0.65	0.05

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1222	600 to 1199	
RD Density	0.29	0.08	★
Access Density	14.27	10.80	★
Curve Critical Radius Density	0.22	0.35	
Edge Risk	3	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	3.0	$10,591
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	5.9	$49,929

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Lida Lake, Crystal Lake, East Spirit Lake and Loon Lake shoreline properties.

Implementation Cost

Federal Funds	$54,468
Local Match (10% of Total project cost)	$6,052
Total Project Cost	**$60,520**

Rank: 17
Segment ID: 4.02
Date: 5/17/2011

CSAH 31 from CSAH 4 to USTH 59 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	31
	Verbal
Start:	CSAH 4
End:	USTH 59
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	573
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	1-2'
Shoulder Type:	gravel
Length (miles):	5.1
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	7	2	0
Density (per mile per year)	0.27	0.08	0.00
Rate (per MVM)	1.31	0.38	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	573	600 to 1199	
RD Density	0.08	0.08	
Access Density	18.43	10.80	★
Curve Critical Radius Density	0.78	0.35	★
Edge Risk	3	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	1.6	$5,534
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	3.5	$29,912

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Crystal Lake, Lake Lizzie, and Franklin Lake shoreline properties.

Implementation Cost

Federal Funds	$31,901
Local Match (10% of Total project cost)	$3,545
Total Project Cost	**$35,445**

Rank: 18
Segment ID: 31.01
Date: 5/17/2011

CSAH 67 from CSAH 52 to NEW YORK MILLS CORP LMTS Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	67
	Verbal
Start:	CSAH 52
End:	NEW YORK MILLS CORP LMTS
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	676
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3-10'
Shoulder Type:	paved/gravel
Length (miles):	6.9
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	10	2	0
Density (per mile per year)	0.29	0.06	0.00
Rate (per MVM)	1.17	0.23	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	676	600 to 1199	★
RD Density	0.06	0.08	
Access Density	9.28	10.80	
Curve Critical Radius Density	0.58	0.35	★
Edge Risk	3	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	6.9	$24,150	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$21,735
Local Match (10% of Total project cost)	$2,415
Total Project Cost	**$24,150**

Rank: 19
Segment ID: 67.03
Date: 5/17/2011

CSAH 35 from DALTON CORP LMTS to UNDERWOOD CORP LMTS MNTH 210 Project

Agency: Otter Tail County

Roadway Data

Type: CSAH
Number: 35

	Verbal
Start:	DALTON CORP LMTS
End:	UNDERWOOD CORP LMTS MNTH 2
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	559
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	3'
Shoulder Type:	gravel
Length (miles):	8.3
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	8	6	1
Density (per mile per year)	0.19	0.14	0.02
Rate (per MVM)	0.94	0.71	0.12

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	559	600 to 1199	
RD Density	0.14	0.08	★
Access Density	8.55	10.80	
Curve Critical Radius Density	0.72	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	8.3	$70,550	

Implementation Cost

Federal Funds	$63,495
Local Match (10% of Total project cost)	$7,055
Total Project Cost	**$70,550**

Rank: 20
Segment ID: 35.03
Date: 5/17/2011

CSAH 24 from ERHARD CORP LMTS to CSAH 3 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	24
	Verbal
Start:	ERHARD CORP LMTS
End:	CSAH 3
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	589
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	4.8
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	4	3	0
Density (per mile per year)	0.17	0.13	0.00
Rate (per MVM)	0.78	0.58	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	589	600 to 1199	
RD Density	0.13	0.08	★
Access Density	11.67	10.80	★
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	4.8	$16,800	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$15,120
Local Match (10% of Total project cost)	$1,680
Total Project Cost	**$16,800**

Rank: 21
Segment ID: 24.05
Date: 5/17/2011

CSAH 56 from NEW YORK MILLS CORP LMTS to CSAH 19 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	56
	Verbal
Start:	NEW YORK MILLS CORP LMTS
End:	CSAH 19
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	344
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3-4'
Shoulder Type:	gravel
Length (miles):	6.6
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	4	3	0
Density (per mile per year)	0.12	0.09	0.00
Rate (per MVM)	0.96	0.72	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	344	600 to 1199	
RD Density	0.09	0.08	★
Access Density	11.36	10.80	★
Curve Critical Radius Density	0.15	0.35	
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	6.6	$23,100	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$20,790
Local Match (10% of Total project cost)	$2,310
Total Project Cost	**$23,100**

Rank: 22
Segment ID: 56.02
Date: 5/17/2011

CSAH 55 from CSAH 16 to OTTERTAIL CORP LMTS Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	55
	Verbal
Start:	CSAH 16
End:	OTTERTAIL CORP LMTS
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	290
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3-5'
Shoulder Type:	gravel
Length (miles):	6.8
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	7	3	0
Density (per mile per year)	0.21	0.09	0.00
Rate (per MVM)	1.95	0.83	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	290	600 to 1199	
RD Density	0.09	0.08	★
Access Density	10.29	10.80	
Curve Critical Radius Density	0.74	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	6.8	$23,800	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$21,420
Local Match (10% of Total project cost)	$2,380
Total Project Cost	**$23,800**

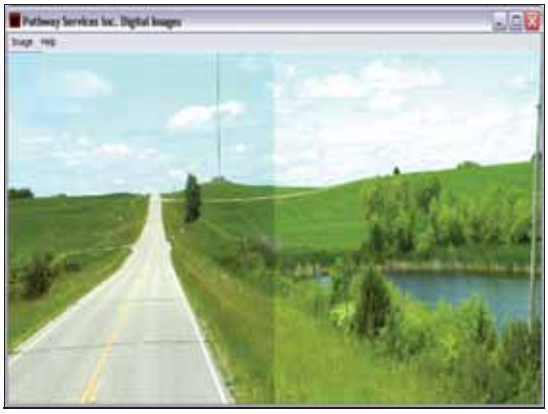
Rank: 23
Segment ID: 55.01
Date: 5/17/2011

CSAH 29 from CSAH 82 to MNTH 210 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	29
	Verbal
Start:	CSAH 82
End:	MNTH 210
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	471
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4-4.5'
Shoulder Type:	gravel
Length (miles):	7.4
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	3	3	0
Density (per mile per year)	0.08	0.08	0.00
Rate (per MVM)	0.47	0.47	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	471	600 to 1199	
RD Density	0.08	0.08	★
Access Density	9.73	10.80	
Curve Critical Radius Density	0.41	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	4.6	$16,058
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.8	$23,902

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Swan Lake and Chautauqua Lake shoreline properties.

Implementation Cost

Federal Funds	$35,964
Local Match (10% of Total project cost)	$3,996
Total Project Cost	**$39,960**

Rank: 24
Segment ID: 29.01
Date: 5/17/2011

CSAH 72 from MNTH 78 to CSAH 83 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	72
	Verbal
Start:	MNTH 78
End:	CSAH 83
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1358
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	1'
Shoulder Type:	gravel
Length (miles):	3.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	6	1	0
Density (per mile per year)	0.40	0.07	0.00
Rate (per MVM)	0.81	0.13	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1358	600 to 1199	
RD Density	0.07	0.08	
Access Density	25.00	10.80	★
Curve Critical Radius Density	0.67	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	3.0	$25,500

Notes - After 2012 Bridge Replacement. 6" edgeline 2010 HSIP

Implementation Cost

Federal Funds	$22,950
Local Match (10% of Total project cost)	$2,550
Total Project Cost	**$25,500**

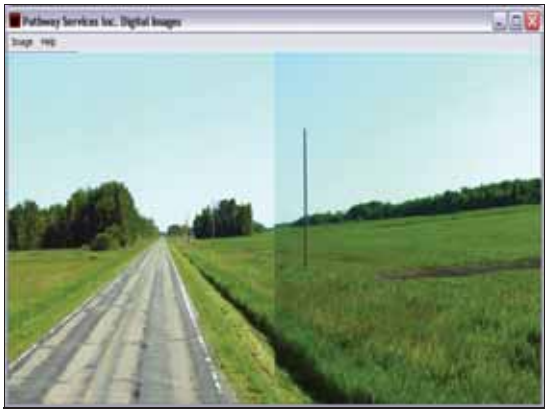
Rank: 25
Segment ID: 72.01
Date: 5/17/2011

CSAH 75 from CSAH 40 to MNTH 210 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	75
	Verbal
Start:	CSAH 40
End:	MNTH 210
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	140
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	2-3'
Shoulder Type:	gravel
Length (miles):	4.5
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	6	1	0
Density (per mile per year)	0.27	0.04	0.00
Rate (per MVM)	5.22	0.87	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	140	600 to 1199	
RD Density	0.04	0.08	
Access Density	12.44	10.80	★
Curve Critical Radius Density	0.67	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0

Notes - 6" edgeline 2010 HSIP, therefore no project assigned.

Implementation Cost

Federal Funds	$0
Local Match (10% of Total project cost)	$0
Total Project Cost	**$0**

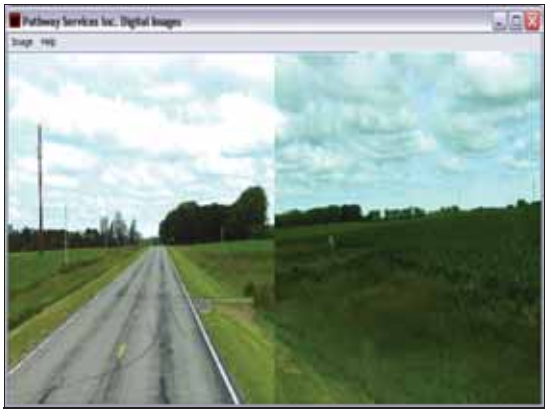
Rank: 26
Segment ID: 75.01
Date: 5/17/2011

CSAH 23 from CSAH 9 to MNTH 34 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	23
	Verbal
Start:	CSAH 9
End:	MNTH 34
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	165
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	5.2
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	5	1	0
Density (per mile per year)	0.19	0.04	0.00
Rate (per MVM)	3.19	0.64	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	165	600 to 1199	
RD Density	0.04	0.08	
Access Density	11.15	10.80	★
Curve Critical Radius Density	0.58	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	5.2	$3,380	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$3,042
Local Match (10% of Total project cost)	$338
Total Project Cost	**$3,380**

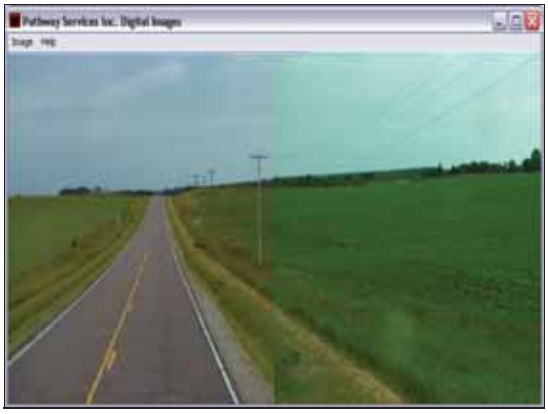
Rank: 27
Segment ID: 23.01
Date: 5/17/2011

CSAH 16 from MNTH 78 to CSAH 5 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	16
	Verbal
Start:	MNTH 78
End:	CSAH 5
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	607
Facility Type:	2-Lane
Lane Width:	11'-12'
Shoulder Width:	2-5'
Shoulder Type:	gravel
Length (miles):	5.7
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	7	1	0
Density (per mile per year)	0.25	0.04	0.00
Rate (per MVM)	1.11	0.16	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	607	600 to 1199	★
RD Density	0.04	0.08	
Access Density	8.07	10.80	
Curve Critical Radius Density	0.70	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	3.2	$11,172
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.5	$21,318

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for West Battle Lake shoreline properties and Gwenddlaugh Park.

Implementation Cost

Federal Funds	$29,241
Local Match (10% of Total project cost)	$3,249
Total Project Cost	**$32,490**

Rank: 28
Segment ID: 16.01
Date: 5/17/2011

CNTY 41 from CSAH 35 to MNTH 108 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	41
	Verbal
Start:	CSAH 35
End:	MNTH 108
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	547
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	1'
Shoulder Type:	gravel
Length (miles):	6.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	2	1	0
Density (per mile per year)	0.07	0.03	0.00
Rate (per MVM)	0.33	0.17	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	547	600 to 1199	
RD Density	0.03	0.08	
Access Density	11.83	10.80	★
Curve Critical Radius Density	0.50	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	3.7	$13,020
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.3	$19,380

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Star Lake shoreline properties.

Implementation Cost

Federal Funds	$29,160
Local Match (10% of Total project cost)	$3,240
Total Project Cost	**$32,400**

Rank: 29
Segment ID: 41.01
Date: 5/17/2011

CSAH 36 from CSAH 35 to MNTH 228 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	36
	Verbal
Start:	CSAH 35
End:	MNTH 228
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	290
Facility Type:	2-Lane
Lane Width:	11'-12'
Shoulder Width:	1-4'
Shoulder Type:	gravel
Length (miles):	6.6
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	4	1	0
Density (per mile per year)	0.12	0.03	0.00
Rate (per MVM)	1.15	0.29	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	290	600 to 1199	
RD Density	0.03	0.08	
Access Density	16.67	10.80	★
Curve Critical Radius Density	1.36	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	3.1	$10,857
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	3.5	$29,733

Notes - Project selection adjusted for Sybil Lake and Long Lake shoreline properties. 12' lanes from 1.0 mi SE of Vergas to TH 228. 11' lanes for rest of segment.

Implementation Cost

Federal Funds	$36,531
Local Match (10% of Total project cost)	$4,059
Total Project Cost	**$40,590**

Rank: 30
Segment ID: 36.01
Date: 5/17/2011

CSAH 45 from CSAH 1 to CSAH 74 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	45
	Verbal
Start:	CSAH 1
End:	CSAH 74
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	219
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	2'
Shoulder Type:	gravel
Length (miles):	3.9
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	0	0	0
Density (per mile per year)	0.00	0.00	0.00
Rate (per MVM)	0.00	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	219	600 to 1199	
RD Density	0.00	0.08	
Access Density	16.67	10.80	★
Curve Critical Radius Density	1.79	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	2.8	$9,828
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	1.1	$9,282

Notes - Project selection adjusted for Leon Lake shoreline properties.

Implementation Cost

Federal Funds	$17,199
Local Match (10% of Total project cost)	$1,911
Total Project Cost	**$19,110**

Rank: 31
Segment ID: 45.02
Date: 5/17/2011

CSAH 61 from CSAH 16 to MNTH 108 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	61
	Verbal
Start:	CSAH 16
End:	MNTH 108
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	224
Facility Type:	2-Lane
Lane Width:	11'-12'
Shoulder Width:	2-4'
Shoulder Type:	gravel
Length (miles):	7.5
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	1	0	0
Density (per mile per year)	0.03	0.00	0.00
Rate (per MVM)	0.33	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	224	600 to 1199	
RD Density	0.00	0.08	
Access Density	10.93	10.80	★
Curve Critical Radius Density	0.40	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	5.9	$20,738
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	1.6	$13,388

Notes - 6" edgeline 2010 HSIP. Wet-Reflective markings used where lane width is 11'.

Implementation Cost

Federal Funds	$30,713
Local Match (10% of Total project cost)	$3,413
Total Project Cost	**$34,125**

Rank: 32
Segment ID: 61.01
Date: 5/17/2011

CNTY 119 from CSAH 47 to MNTH 210 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	119
	Verbal
Start:	CSAH 47
End:	MNTH 210
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	191
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	6.1
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	0	0	0
Density (per mile per year)	0.00	0.00	0.00
Rate (per MVM)	0.00	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	191	600 to 1199	
RD Density	0.00	0.08	
Access Density	10.98	10.80	★
Curve Critical Radius Density	0.49	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	6.1	$3,965	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$3,569
Local Match (10% of Total project cost)	$397
Total Project Cost	**$3,965**

Rank: 33
Segment ID: 119.01
Date: 5/17/2011

CNTY 115 from CSAH 74 to CSAH 35 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	115
	Verbal
Start:	CSAH 74
End:	CSAH 35
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	235
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	2.5
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	0	0	0
Density (per mile per year)	0.00	0.00	0.00
Rate (per MVM)	0.00	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	235	600 to 1199	
RD Density	0.00	0.08	
Access Density	13.20	10.80	★
Curve Critical Radius Density	0.80	0.35	★
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	1.6	$5,600
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	0.9	$7,650

Notes - Project selection adjusted for Pickerel Lake shoreline properties.

Implementation Cost

Federal Funds	$11,925
Local Match (10% of Total project cost)	$1,325
Total Project Cost	**$13,250**

Rank: 34
Segment ID: 115.01
Date: 5/17/2011

CNTY 145 from CSAH 72 to CSAH 1 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	145
	Verbal
Start:	CSAH 72
End:	CSAH 1
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	630
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	1'
Shoulder Type:	gravel
Length (miles):	1.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	0	0	0
Density (per mile per year)	0.00	0.00	0.00
Rate (per MVM)	0.00	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	630	600 to 1199	★
RD Density	0.00	0.08	
Access Density	56.00	10.80	★
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	1.0	$8,500

Notes - Project selection adjusted for Otter Tail Lake shoreline properties.

Implementation Cost

Federal Funds	$7,650
Local Match (10% of Total project cost)	$850
Total Project Cost	**$8,500**

Rank: 35
Segment ID: 145.01
Date: 5/17/2011

CSAH 84 from NEW YORK MILLS CORP LMTS to USTH 10 EAST Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	84
	Verbal
Start:	NEW YORK MILLS CORP LMTS
End:	USTH 10 EAST
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1350
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	10'
Shoulder Type:	paved
Length (miles):	0.5
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	4	2	0
Density (per mile per year)	1.60	0.80	0.00
Rate (per MVM)	3.25	1.62	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1350	600 to 1199	
RD Density	0.80	0.08	★
Access Density	28.00	10.80	★
Curve Critical Radius Density	2.00	0.35	★
Edge Risk	1	2 or 3	
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.5	$1,500	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$1,350
Local Match (10% of Total project cost)	$150
Total Project Cost	**$1,500**

Rank: 36
Segment ID: 84.03
Date: 5/17/2011

CSAH 80 from PERHAM CORP LMTS to USTH 10 EAST Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	80
	Verbal
Start:	PERHAM CORP LMTS
End:	USTH 10 EAST
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	2599
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	6'
Shoulder Type:	paved
Length (miles):	1.7
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	6	4	0
Density (per mile per year)	0.71	0.47	0.00
Rate (per MVM)	0.74	0.50	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	2599	600 to 1199	
RD Density	0.47	0.08	★
Access Density	18.24	10.80	★
Curve Critical Radius Density	0.59	0.35	★
Edge Risk	1	2 or 3	
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	1.7	$5,100	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$4,590
Local Match (10% of Total project cost)	$510
Total Project Cost	**$5,100**

Rank: 37
Segment ID: 80.03
Date: 5/17/2011

CSAH 75 from MNTH 29 to USTH 10 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	75
	Verbal
Start:	MNTH 29
End:	USTH 10
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1050
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3'
Shoulder Type:	gravel
Length (miles):	1.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	10	2	0
Density (per mile per year)	2.00	0.40	0.00
Rate (per MVM)	5.22	1.04	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1050	600 to 1199	★
RD Density	0.40	0.08	★
Access Density	19.00	10.80	★
Curve Critical Radius Density	0.00	0.35	
Edge Risk	1	2 or 3	
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	1.0	$8,500

Notes - 6" edgeline 2010 HSIP. Amish Route.

Implementation Cost

Federal Funds	$7,650
Local Match (10% of Total project cost)	$850
Total Project Cost	**$8,500**

Rank: 38
Segment ID: 75.03
Date: 5/17/2011

CSAH 10 from ELIZABETH CORP LMTS to CSAH 1 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	10
	Verbal
Start:	ELIZABETH CORP LMTS
End:	CSAH 1
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1187
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	2.5'
Shoulder Type:	gravel
Length (miles):	6.5
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	14	8	0
Density (per mile per year)	0.43	0.25	0.00
Rate (per MVM)	0.99	0.57	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1187	600 to 1199	★
RD Density	0.25	0.08	★
Access Density	11.08	10.80	★
Curve Critical Radius Density	0.15	0.35	
Edge Risk	1	2 or 3	
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	6.5	$55,250	

Implementation Cost

Federal Funds	$49,725
Local Match (10% of Total project cost)	$5,525
Total Project Cost	**$55,250**

Rank: 39
Segment ID: 10.03
Date: 5/17/2011

CSAH 17 from VERGAS CORP LMTS to BECKER COUNTY LINE Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	17
	Verbal
Start:	VERGAS CORP LMTS
End:	BECKER COUNTY LINE
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	1400
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	6.3
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	10	7	2
Density (per mile per year)	0.32	0.22	0.06
Rate (per MVM)	0.62	0.43	0.12

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1400	600 to 1199	
RD Density	0.22	0.08	★
Access Density	11.11	10.80	★
Curve Critical Radius Density	0.48	0.35	★
Edge Risk	1	2 or 3	
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	6.3	$53,550	

Implementation Cost

Federal Funds	$48,195
Local Match (10% of Total project cost)	$5,355
Total Project Cost	**$53,550**

Rank: 40
Segment ID: 17.02
Date: 5/17/2011

CSAH 53 from USTH 10 to CSAH 8 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	53
	Verbal
Start:	USTH 10
End:	CSAH 8
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	294
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	2-4'
Shoulder Type:	gravel
Length (miles):	7.9
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	14	7	0
Density (per mile per year)	0.35	0.18	0.00
Rate (per MVM)	3.30	1.65	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	294	600 to 1199	
RD Density	0.18	0.08	★
Access Density	12.91	10.80	★
Curve Critical Radius Density	0.89	0.35	★
Edge Risk	1	2 or 3	
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	5.7	$19,908
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.2	$18,802

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Big Pine Lake shoreline properties.

Implementation Cost

Federal Funds	$34,839
Local Match (10% of Total project cost)	$3,871
Total Project Cost	**$38,710**

Rank: 41
Segment ID: 53.01
Date: 5/17/2011

CSAH 35 from CSAH 34 to CSAH 36 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	35
	Verbal
Start:	CSAH 34
End:	CSAH 36
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	986
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3.5'
Shoulder Type:	gravel
Length (miles):	7.5
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	6	1	1
Density (per mile per year)	0.16	0.03	0.03
Rate (per MVM)	0.44	0.07	0.07

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	986	600 to 1199	★
RD Density	0.03	0.08	
Access Density	13.20	10.80	★
Curve Critical Radius Density	0.93	0.35	★
Edge Risk	1	2 or 3	
			★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	4.6	$16,013
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.9	$24,863

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Sybil Lake, Loon Lake and Little McDonald Lake shoreline properties.

Implementation Cost

Federal Funds	$36,788
Local Match (10% of Total project cost)	$4,088
Total Project Cost	**$40,875**

Rank: 42
Segment ID: 35.10
Date: 5/17/2011

CSAH 10 from WILKIN COUNTY LINE CSAH 11 to ELIZABETH CORP LMTS Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	10
	Verbal
Start:	WILKIN COUNTY LINE CSAH 11
End:	ELIZABETH CORP LMTS
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	357
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	1-2'
Shoulder Type:	gravel
Length (miles):	6.7
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	6	3	0
Density (per mile per year)	0.18	0.09	0.00
Rate (per MVM)	1.37	0.69	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	357	600 to 1199	
RD Density	0.09	0.08	★
Access Density	9.85	10.80	
Curve Critical Radius Density	0.15	0.35	
Edge Risk	3	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	6.7	$23,450	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$21,105
Local Match (10% of Total project cost)	$2,345
Total Project Cost	**$23,450**

Rank: 43
Segment ID: 10.01
Date: 5/17/2011

CSAH 30 from CSAH 21 to MNTH 108 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	30
	Verbal
Start:	CSAH 21
End:	MNTH 108
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	255
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3.5'
Shoulder Type:	gravel
Length (miles):	4.4
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	2	0	0
Density (per mile per year)	0.09	0.00	0.00
Rate (per MVM)	0.98	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	255	600 to 1199	
RD Density	0.00	0.08	
Access Density	11.59	10.80	★
Curve Critical Radius Density	0.23	0.35	
Edge Risk	3	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	2.2	$7,700
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.2	$18,700

Notes - Project selection adjusted for Lake Olaf shoreline properties.

Implementation Cost

Federal Funds	$23,760
Local Match (10% of Total project cost)	$2,640
Total Project Cost	**$26,400**

Rank: 44
Segment ID: 30.02
Date: 5/17/2011

CNTY 131 from CSAH 35 to CSAH 35 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	131
	Verbal
Start:	CSAH 35
End:	CSAH 35
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	54
Facility Type:	2-Lane
Lane Width:	10'
Shoulder Width:	1'
Shoulder Type:	gravel
Length (miles):	1.5
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	3	2	0
Density (per mile per year)	0.40	0.27	0.00
Rate (per MVM)	20.29	13.53	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	54	600 to 1199	
RD Density	0.27	0.08	★
Access Density	10.00	10.80	
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	1.5	$975
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0

Notes - No ADT Data. ADT value is an estimate.

Implementation Cost

Federal Funds	$878
Local Match (10% of Total project cost)	$98
Total Project Cost	**$975**

Rank: 45
Segment ID: 131.01
Date: 5/17/2011

CSAH 19 from BLUFFTON CORP LMTS to CSAH 56 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	19
	Verbal
Start:	BLUFFTON CORP LMTS
End:	CSAH 56
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	460
Facility Type:	2-Lane
Lane Width:	11'-12'
Shoulder Width:	2-6'
Shoulder Type:	gravel
Length (miles):	4.9
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	12	4	0
Density (per mile per year)	0.49	0.16	0.00
Rate (per MVM)	2.92	0.97	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	460	600 to 1199	
RD Density	0.16	0.08	★
Access Density	10.00	10.80	
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 3 miles got 6" edgeline 2010 HSIP
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	1.8	$6,346	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	3.1	$26,240	

Implementation Cost

Federal Funds	$29,327
Local Match (10% of Total project cost)	$3,259
Total Project Cost	**$32,585**

Rank: 46
Segment ID: 19.02
Date: 5/17/2011

CNTY 113 from MNTH 108 to CSAH 23 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	113
	Verbal
Start:	MNTH 108
End:	CSAH 23
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	140
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	3.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	2	2	0
Density (per mile per year)	0.13	0.13	0.00
Rate (per MVM)	2.61	2.61	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	140	600 to 1199	
RD Density	0.13	0.08	★
Access Density	10.67	10.80	
Curve Critical Radius Density	0.33	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	3.0	$1,950	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$1,755
Local Match (10% of Total project cost)	$195
Total Project Cost	**$1,950**

Rank: 47
Segment ID: 113.01
Date: 5/17/2011

CSAH 50 from DEER CREEK CORP LMTS to CSAH 75 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	50
	Verbal
Start:	DEER CREEK CORP LMTS
End:	CSAH 75
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	330
Facility Type:	2-Lane
Lane Width:	11'-12'
Shoulder Width:	1-4'
Shoulder Type:	gravel
Length (miles):	6.1
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	7	3	1
Density (per mile per year)	0.23	0.10	0.03
Rate (per MVM)	1.91	0.82	0.27

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	330	600 to 1199	
RD Density	0.10	0.08	★
Access Density	10.33	10.80	
Curve Critical Radius Density	0.33	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	6.1	$51,850

Notes - 6" edgeline 2010 HSIP. Amish Route.

Implementation Cost

Federal Funds	$46,665
Local Match (10% of Total project cost)	$5,185
Total Project Cost	**$51,850**

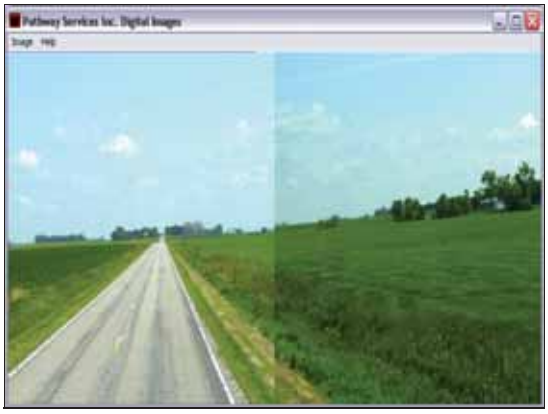
Rank: 48
Segment ID: 50.03
Date: 5/17/2011

CSAH 15 from GRANT COUNTY LINE CSAH 26 to CSAH 2 North Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	15
	Verbal
Start:	GRANT COUNTY LINE CSAH 26
End:	CSAH 2 North
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	153
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3'
Shoulder Type:	gravel
Length (miles):	6.7
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	4	3	0
Density (per mile per year)	0.12	0.09	0.00
Rate (per MVM)	2.13	1.60	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	153	600 to 1199	
RD Density	0.09	0.08	★
Access Density	6.72	10.80	
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0

Notes - 6" edgeline 2010 HSIP, therefore no project assigned.

Implementation Cost

Federal Funds	$0
Local Match (10% of Total project cost)	$0
Total Project Cost	**$0**

Rank: 49
Segment ID: 15.01
Date: 5/17/2011

CSAH 24 from ROTHSAY CORP LMTS to CSAH 21 South Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	24
	Verbal
Start:	ROTHSAY CORP LMTS
End:	CSAH 21 South
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	315
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	1-4'
Shoulder Type:	gravel
Length (miles):	2.6
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	1	1	0
Density (per mile per year)	0.08	0.08	0.00
Rate (per MVM)	0.67	0.67	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	315	600 to 1199	
RD Density	0.08	0.08	
Access Density	7.69	10.80	
Curve Critical Radius Density	0.38	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	2.6	$9,100	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$8,190
Local Match (10% of Total project cost)	$910
Total Project Cost	**$9,100**

Rank: 50
Segment ID: 24.02
Date: 5/17/2011

CSAH 52 from MNTH 108 to MNTH 106 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	52
	Verbal
Start:	MNTH 108
End:	MNTH 106
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	860
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	1-8'
Shoulder Type:	paved/gravel
Length (miles):	7.2
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	11	2	2
Density (per mile per year)	0.31	0.06	0.06
Rate (per MVM)	0.97	0.18	0.18

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	860	600 to 1199	★
RD Density	0.06	0.08	
Access Density	7.92	10.80	
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	3.1	$10,836
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	4.1	$34,884

Notes - 6" edgeline 2010 HSIP. Amish Route.

Implementation Cost

Federal Funds	$41,148
Local Match (10% of Total project cost)	$4,572
Total Project Cost	**$45,720**

Rank: 51
Segment ID: 52.01
Date: 5/17/2011

CNTY 142 from CSAH 67 to MNTH 106 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	142
	Verbal
Start:	CSAH 67
End:	MNTH 106
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	230
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	3.9
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	5	1	2
Density (per mile per year)	0.26	0.05	0.10
Rate (per MVM)	3.05	0.61	1.22

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	230	600 to 1199	
RD Density	0.05	0.08	
Access Density	12.82	10.80	★
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	3.9	$33,150

Notes - Amish Route.

Implementation Cost

Federal Funds	$29,835
Local Match (10% of Total project cost)	$3,315
Total Project Cost	**$33,150**

Rank: 52
Segment ID: 142.01
Date: 5/17/2011

CNTY 137 from USTH 10 to CSAH 53 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	137
	Verbal
Start:	USTH 10
End:	CSAH 53
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	290
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	6.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	2	1	1
Density (per mile per year)	0.07	0.03	0.03
Rate (per MVM)	0.63	0.31	0.31

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	290	600 to 1199	
RD Density	0.03	0.08	
Access Density	8.67	10.80	
Curve Critical Radius Density	0.50	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	6.0	$21,000	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$18,900
Local Match (10% of Total project cost)	$2,100
Total Project Cost	**$21,000**

Rank: 53
Segment ID: 137.01
Date: 5/17/2011

CSAH 42 from PARKERS PRAIRIE CORP LMTS to CSAH 40 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	42
	Verbal
Start:	PARKERS PRAIRIE CORP LMTS
End:	CSAH 40
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	161
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	2-4'
Shoulder Type:	gravel
Length (miles):	10.2
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	2	1	0
Density (per mile per year)	0.04	0.02	0.00
Rate (per MVM)	0.67	0.33	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	161	600 to 1199	
RD Density	0.02	0.08	
Access Density	6.67	10.80	
Curve Critical Radius Density	0.49	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0

Notes - 6" edgeline 2010 HSIP, therefore no project assigned.

Implementation Cost

Federal Funds	$0
Local Match (10% of Total project cost)	$0
Total Project Cost	**$0**

Rank: 54
Segment ID: 42.02
Date: 5/17/2011

CSAH 73 from MNTH 210 to MNTH 29 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	73
	Verbal
Start:	MNTH 210
End:	MNTH 29
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	218
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3'
Shoulder Type:	gravel
Length (miles):	6.7
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	5	0	0
Density (per mile per year)	0.15	0.00	0.00
Rate (per MVM)	1.88	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	218	600 to 1199	
RD Density	0.00	0.08	
Access Density	11.94	10.80	★
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	6.7	$56,950

Notes - Amish Route.

Implementation Cost

Federal Funds	$51,255
Local Match (10% of Total project cost)	$5,695
Total Project Cost	**$56,950**

Rank: 55
Segment ID: 73.02
Date: 5/17/2011

CNTY 126 from CSAH 47 to MNTH 78 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	126
	Verbal
Start:	CSAH 47
End:	MNTH 78
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	100
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	4.2
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	2	0	0
Density (per mile per year)	0.10	0.00	0.00
Rate (per MVM)	2.61	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	100	600 to 1199	
RD Density	0.00	0.08	
Access Density	10.71	10.80	
Curve Critical Radius Density	0.71	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	4.2	$2,730	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$2,457
Local Match (10% of Total project cost)	$273
Total Project Cost	**$2,730**

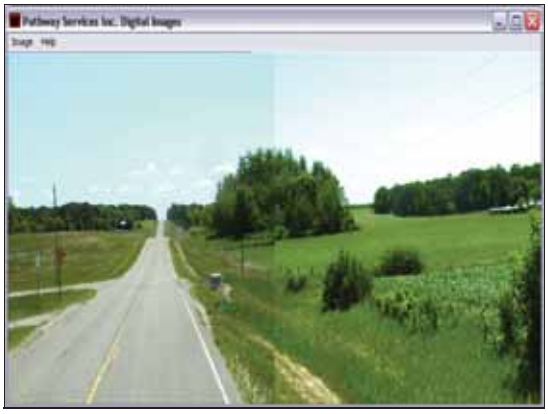
Rank: 56
Segment ID: 126.01
Date: 5/17/2011

CNTY 132 from CSAH 61 to MNTH 108 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	132
	Verbal
Start:	CSAH 61
End:	MNTH 108
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	150
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	2.0
Rumble Installed:	No



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	0	0	0
Density (per mile per year)	0.00	0.00	0.00
Rate (per MVM)	0.00	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	150	600 to 1199	
RD Density	0.00	0.08	
Access Density	12.00	10.80	★
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	2.0	$1,300	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$1,170
Local Match (10% of Total project cost)	$130
Total Project Cost	**$1,300**

Rank: 57
Segment ID: 132.01
Date: 5/17/2011

CNTY 146 from CSAH 13 to CSAH 53 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	146
	Verbal
Start:	CSAH 13
End:	CSAH 53
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	80
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	4'
Shoulder Type:	gravel
Length (miles):	3.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	0	0	0
Density (per mile per year)	0.00	0.00	0.00
Rate (per MVM)	0.00	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	80	600 to 1199	
RD Density	0.00	0.08	
Access Density	11.00	10.80	★
Curve Critical Radius Density	0.00	0.35	
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	3.0	$1,950	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$1,755
Local Match (10% of Total project cost)	$195
Total Project Cost	**$1,950**

Rank: 58
Segment ID: 146.01
Date: 5/17/2011

CSAH 5 from CSAH 16 to MNTH 78 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	5
	Verbal
Start:	CSAH 16
End:	MNTH 78
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	404
Facility Type:	2-Lane
Lane Width:	11'
Shoulder Width:	1'
Shoulder Type:	gravel
Length (miles):	4.8
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	0	0	0
Density (per mile per year)	0.00	0.00	0.00
Rate (per MVM)	0.00	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	404	600 to 1199	
RD Density	0.00	0.08	
Access Density	8.33	10.80	
Curve Critical Radius Density	0.42	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes - 6" edgeline 2010
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	HSIP
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	4.8	$40,800	

Implementation Cost

Federal Funds	$36,720
Local Match (10% of Total project cost)	$4,080
Total Project Cost	**$40,800**

Rank: 59
Segment ID: 5.04
Date: 5/17/2011

CSAH 32 from CSAH 74 to CSAH 14 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	32
	Verbal
Start:	CSAH 74
End:	CSAH 14
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	225
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3'
Shoulder Type:	gravel
Length (miles):	6.6
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	1	0	1
Density (per mile per year)	0.03	0.00	0.03
Rate (per MVM)	0.37	0.00	0.37

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	225	600 to 1199	
RD Density	0.00	0.08	
Access Density	7.73	10.80	
Curve Critical Radius Density	0.45	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	5.5	$19,173
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	1.1	$9,537

Notes - Project selection adjusted for Pickerel Lake shoreline properties.

Implementation Cost

Federal Funds	$25,839
Local Match (10% of Total project cost)	$2,871
Total Project Cost	**$28,710**

Rank: 60
Segment ID: 32.01
Date: 5/17/2011

CSAH 71 from DOUGLAS COUNTY LINE to CSAH 46 Project

Agency: Otter Tail County

Roadway Data

Type:	CSAH
Number:	71
	Verbal
Start:	DOUGLAS COUNTY LINE
End:	CSAH 46
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	175
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	3'
Shoulder Type:	gravel
Length (miles):	4.3
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	1	0	0
Density (per mile per year)	0.05	0.00	0.00
Rate (per MVM)	0.73	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	175	600 to 1199	
RD Density	0.00	0.08	
Access Density	8.60	10.80	
Curve Critical Radius Density	0.93	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	4.3	$2,795	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$2,516
Local Match (10% of Total project cost)	$280
Total Project Cost	**$2,795**

Rank: 61
Segment ID: 71.01
Date: 5/17/2011

CNTY 128 from MNTH 78 to CSAH 55 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	128
	Verbal
Start:	MNTH 78
End:	CSAH 55
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	223
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	5'
Shoulder Type:	gravel
Length (miles):	4.0
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	3	0	0
Density (per mile per year)	0.15	0.00	0.00
Rate (per MVM)	1.85	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	223	600 to 1199	
RD Density	0.00	0.08	
Access Density	9.25	10.80	
Curve Critical Radius Density	0.75	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	4.0	$14,000	
6" edgelines	Proactive	$650	0.0	$0	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$12,600
Local Match (10% of Total project cost)	$1,400
Total Project Cost	**$14,000**

Rank: 62
Segment ID: 128.01
Date: 5/17/2011

CNTY 138 from MNTH 29 to CH 136 Project

Agency: Otter Tail County

Roadway Data

Type:	CNTY
Number:	138
	Verbal
Start:	MNTH 29
End:	CH 136
City/Rural:	Rural
County:	Otter Tail
ATP:	4
ADT:	115
Facility Type:	2-Lane
Lane Width:	12'
Shoulder Width:	5'
Shoulder Type:	gravel
Length (miles):	4.3
Rumble Installed:	No

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Road Dept	K+A
Crashes	0	0	0
Density (per mile per year)	0.00	0.00	0.00
Rate (per MVM)	0.00	0.00	0.00

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	115	600 to 1199	
RD Density	0.00	0.08	
Access Density	10.00	10.80	
Curve Critical Radius Density	0.47	0.35	★
Edge Risk	2	2 or 3	★
			★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost	Notes -
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	0.0	$0	
Rumble Strip	Proactive	$3,000	0.0	$0	
Rumble StripE	Proactive	$3,500	0.0	$0	
6" edgelines	Proactive	$650	4.3	$2,795	
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0	

Implementation Cost

Federal Funds	$2,516
Local Match (10% of Total project cost)	$280
Total Project Cost	**$2,795**

Rank: 63
Segment ID: 138.01
Date: 5/17/2011

Appendix C

Rural Horizontal Curve Prioritization and Project Sheets

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
1	10A					0	-	-	5,877						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
2	10B					0	-	-	3,867						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
3	10C	10.01	CSAH 10	WILKIN COUNTY LINE C	ELIZABETH CORP LMTS	0	-	-	722	1,275	420	Yes	Yes	Yes	driveway	★★★★	x	-	Installed
4	10D					0	-	-	240						Removed From Further Analysis-Urban Segment	N/A	-	-	-
5	10E					0	-	-	1,952						Removed From Further Analysis-Urban Segment	N/A	-	-	-
6	10F					0	-	-	1,322						Removed From Further Analysis-Urban Segment	N/A	-	-	-
7	10G	10.02	CSAH 10	ELIZABETH CORP LMTS	ELIZABETH CORP LMTS	0	-	-	1,232	1,006	1,250	Yes	No	No	driveway	★	-	-	-
8	10H	10.03	CSAH 10	ELIZABETH CORP LMTS	CSAH 1	2	-	-	2,774	2,296	1,250	Yes	No	No	driveway	★	-	-	-
9	10I	10.03	CSAH 10	ELIZABETH CORP LMTS	CSAH 1	1	-	-	1,259	920	1,250	No	No	Yes	driveway	★	-	-	-
10	10J	10.03	CSAH 10	ELIZABETH CORP LMTS	CSAH 1	3	-	-	770	701	1,150	Yes	Yes	No		★★	x	-	Installed
11	10K	10.04	CSAH 10	USTH 10	BECKER COUNTY LINE	2	-	-	747	700	1,050	Yes	No	Yes	driveway	★★★	-	-	Yes
12	111A					0	-	-	1,766						Removed From Further Analysis-Urban Segment	N/A	-	-	-
13	111B					0	-	-	2,151						Removed From Further Analysis-Urban Segment	N/A	-	-	-
14	111C					0	-	-	1,290						Removed From Further Analysis-Urban Segment	N/A	-	-	-
15	111D					0	-	-	1,353						Removed From Further Analysis-Urban Segment	N/A	-	-	-
16	111E	111.02	CNTY 111	FERGUS FALLS CORP LI	CSAH 10	1	-	1	1,155	1,521	960	No	No	No	driveway	★★	x	-	Yes
17	111F					0	-	-	4,302						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
18	111G	111.02	CNTY 111	FERGUS FALLS CORP LI	CSAH 10	2	1	-	1,057	775	550	Yes	Yes	No	driveway	★★★★	x	-	Installed
19	111H	111.02	CNTY 111	FERGUS FALLS CORP LI	CSAH 10	0	-	-	869	976	550	No	Yes	No		★★	x	-	Installed
20	111I	111.02	CNTY 111	FERGUS FALLS CORP LI	CSAH 10	0	-	-	1,109	614	550	No	Yes	Yes		★★★	x	-	Installed
21	113A	113.01	CNTY 113	MNTH 108	CSAH 23	0	-	-	2,051	561	140	No	No	No			-	-	-
22	113B	113.01	CNTY 113	MNTH 108	CSAH 23	0	-	-	1,011	534	140	No	No	No		★	x	-	Yes
23	113C	113.01	CNTY 113	MNTH 108	CSAH 23	0	-	-	2,308	532	140	No	No	No			-	-	-
24	113D	113.01	CNTY 113	MNTH 108	CSAH 23	0	-	-	371	434	140	No	Yes	Yes		★	-	-	Installed
25	114A	114.02	CNTY 114	CSAH 15	CSAH 15	0	-	-	812	1,249	70	No	Yes	No	driveway	★	-	-	Installed
26	114B	114.02	CNTY 114	CSAH 15	CSAH 15	0	-	-	821	1,473	70	Yes	Yes	No	driveway	★★	-	-	Installed
27	114C	114.02	CNTY 114	CSAH 15	CSAH 15	0	-	-	848	1,306	165	Yes	Yes	Yes		★★★	-	-	Installed
28	115A	115.01	CNTY 115	CSAH 74	CSAH 35	0	-	-	722	1,567	235	No	Yes	Yes	driveway	★★★	x	-	Installed
29	115B	115.01	CNTY 115	CSAH 74	CSAH 35	0	-	-	924	549	235	Yes	No	No		★★★	x	-	Yes
30	116A	116.01	CNTY 116	CSAH 21	MNTH 210	0	-	-	818	1,428	630	Yes	No	Yes	Turn Lanes	★★★	-	-	Yes
31	117A	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	858	1,113	185	Yes	No	No		★★	-	-	-
32	117B	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	816	950	185	No	No	No	driveway	★	-	-	-
33	117C	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	1,224	1,128	185	No	No	No	driveway		-	-	-
34	117D	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	1,787	1,124	185	Yes	No	No	driveway	★	-	-	-
35	117E	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	1,429	822	185	No	No	No	driveway		-	-	-
36	117F	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	1,012	920	185	No	No	No	driveway	★	-	-	-
37	117G	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	1,041	611	185	Yes	No	No		★★	-	-	-
38	117H	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	829	1,415	175	Yes	No	No		★★	-	-	-
39	117I	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	1,463	1,277	165	No	No	No	driveway		-	-	-
40	117J	117.01	CNTY 117	CSAH 82	CSAH 12	0	-	-	959	934	165	No	No	No	driveway	★	-	-	-
41	119A	119.01	CNTY 119	CSAH 47	MNTH 210	0	-	-	919	829	145	No	No	No	driveway	★	x	-	Yes
42	119B	119.01	CNTY 119	CSAH 47	MNTH 210	0	-	-	877	718	145	Yes	No	No		★★	x	-	Yes
43	119C	119.01	CNTY 119	CSAH 47	MNTH 210	0	-	-	1,240	927	145	No	No	No	driveway		-	x	-
44	119D	119.01	CNTY 119	CSAH 47	MNTH 210	0	-	-	1,466	877	145	No	No	No			-	x	-
45	119E	119.01	CNTY 119	CSAH 47	MNTH 210	0	-	-	1,566	1,233	145	No	No	No			-	x	-
46	119F	119.01	CNTY 119	CSAH 47	MNTH 210	0	-	-	1,044	1,145	145	Yes	No	No		★★	x	-	Yes
47	11A	11.01	CSAH 11	CSAH 21	CSAH 10	0	-	-	822	1,428	115	Yes	Yes	Yes		★★★	-	-	Installed
48	120A	120.01	CNTY 120	CSAH 29	CSAH 33	0	-	-	1,412	855	540	No	No	No	driveway	★	-	-	-
49	122A	122.02	CNTY 122	UNDERWOOD CORP LM	CSAH 83	0	-	-	1,148	1,248	660	No	Yes	No	Chevrons in increasing direction only, driveway	★	x	-	Installed
50	122B	122.02	CNTY 122	UNDERWOOD CORP LM	CSAH 83	0	-	-	1,584	1,346	660	Yes	No	No	driveway	★	-	x	-
51	122C					0	-	-	3,834						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
52	122D	122.02	CNTY 122	UNDERWOOD CORP LM	CSAH 83	0	-	-	1,083	1,332	495	No	Yes	No	driveway	★★	x	-	Installed
53	122E	122.02	CNTY 122	UNDERWOOD CORP LM	CSAH 83	1	-	-	1,753	790	495	No	No	No		★	-	x	-
54	124A	124.01	CNTY 124	CSAH 33	CSAH 35	1	-	-	304	302	190	Yes	No	No		★	-	-	-
55	124B	124.01	CNTY 124	CSAH 33	CSAH 35	0	-	-	1,018	1,168	190	No	No	No		★	-	-	-
56	124C	124.01	CNTY 124	CSAH 33	CSAH 35	0	-	-	990	1,097	190	No	No	No		★	-	-	-
57	124D	124.01	CNTY 124	CSAH 33	CSAH 35	0	-	-	1,150	685	190	No	No	No		★	-	-	-
58	124E	124.01	CNTY 124	CSAH 33	CSAH 35	0	-	-	1,016	790	190	Yes	No	No		★★	-	-	-
59	124F	124.01	CNTY 124	CSAH 33	CSAH 35	0	-	-	1,063	712	190	No	No	No	driveway	★	-	-	-
60	124G	124.01	CNTY 124	CSAH 33	CSAH 35	0	-	-	1,380	1,001	190	No	No	No	driveway		-	-	-
61	124H					0	-	-	7,033						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
62	124I	124.01	CNTY 124	CSAH 33	CSAH 35	0	-	-	2,179	581	190	No	No	No	driveway		-	-	-
63	124J	124.01	CNTY 124	CSAH 33	CSAH 35	0	-	-	1,957	671	190	No	No	No			-	-	-
64	126A	126.01	CNTY 126	CSAH 47	MNTH 78	0	-	-	1,646	562	100	No	No	No			-	-	-
65	126B	126.01	CNTY 126	CSAH 47	MNTH 78	0	-	-	1,225	906	100	No	No	No	driveway		-	x	-
66	126C	126.01	CNTY 126	CSAH 47	MNTH 78	0	-	-	1,141	1,038	100	No	No	No		★	x	-	Yes
67	126D	126.01	CNTY 126	CSAH 47	MNTH 78	0	-	-	1,468	901	100	Yes	No	No		★	-	x	-
68	126E	126.01	CNTY 126	CSAH 47	MNTH 78	0	-	-	1,759	956	100	No	No	No	driveway		-	-	-
69	126F	126.01	CNTY 126	CSAH 47	MNTH 78	0	-	-	1,570	1,009	100	No	No	No	driveway		-	x	-
70	126G	126.01	CNTY 126	CSAH 47	MNTH 78	0	-	-	1,142	947	100	Yes	No	No		★★	x	-	Yes
71	126H	126.01	CNTY 126	CSAH 47	MNTH 78	0	-	-	1,160	1,025	100	No	No	No	driveway	★	x	-	Yes
72	128A	128.01	CNTY 128	MNTH 78	CSAH 55	0	-	-	731	430	100	No	Yes	No	driveway	★	x	-	Installed
73	128B	128.01	CNTY 128	MNTH 78	CSAH 55	0	-	-	743	887	100	No	Yes	No	driveway	★	x	-	Installed
74	128C	128.01	CNTY 128	MNTH 78	CSAH 55	0	-	-	975	507	100	Yes	Yes	No		★★	x	-	Installed

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
75	129A	129.01	CNTY 129	MNTH 235	CSAH 6	0	-	-	1,070	432	165	No	No	Yes		★★	-	-	-
76	12A	12.02	CSAH 12	DALTON CORP LMTS	MNTH 78	2	-	-	1,261	1,260	830	No	No	No			-	-	-
77	12B	12.02	CSAH 12	DALTON CORP LMTS	MNTH 78	0	-	-	1,402	2,086	830	Yes	No	No	driveway	★	-	-	-
78	12C	12.02	CSAH 12	DALTON CORP LMTS	MNTH 78	0	-	-	1,637	1,040	830	No	No	No	driveway		-	-	-
79	12D					0	-	-	6,611						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
80	130A	130.01	CNTY 130	1.5 MILES WEST OF CSA	CSAH 4	0	-	-	967	1,050	260	Yes	Yes	No	driveway	★★★	-	-	Installed
81	131A	131.01	CNTY 131	CSAH 35	CSAH 35	1	-	-	2,593	639	N/A	Yes	No	No		★	-	-	-
82	131B	131.01	CNTY 131	CSAH 35	CSAH 35	0	-	-	1,408	499	N/A	No	No	No			-	-	-
83	131C	131.01	CNTY 131	CSAH 35	CSAH 35	0	-	-	490	764	N/A	No	No	No			-	-	-
84	135A	135.01	CNTY 135	CSAH 52	CSAH 84	0	-	-	1,951	547	105	No	No	No			-	-	-
85	135B	135.01	CNTY 135	CSAH 52	CSAH 84	0	-	-	2,090	889	105	No	No	No	driveway		-	-	-
86	136A	136.01	CNTY 136	CH 138	MNTH 29	0	-	-	771	756	105	No	Yes	No		★	-	-	Installed
87	136B	136.01	CNTY 136	CH 138	MNTH 29	0	-	-	818	1,330	105	No	Yes	Yes	driveway	★★	-	-	Installed
88	136C	136.02	CNTY 136	MNTH 29	CSAH 40	0	-	-	830	1,448	65	Yes	Yes	Yes		★★★	-	-	Installed
89	137A	137.01	CNTY 137	USTH 10	CSAH 53	0	-	-	819	1,303	290	Yes	Yes	No		★★★	x	-	Installed
90	137B	137.01	CNTY 137	USTH 10	CSAH 53	0	-	-	976	1,138	290	No	Yes	No	driveway	★★	x	-	Installed
91	137C	137.01	CNTY 137	USTH 10	CSAH 53	0	-	-	976	981	290	No	Yes	No		★★	x	-	Installed
92	138A	138.01	CNTY 138	MNTH 29	CH 136	0	-	-	789	1,233	115	No	Yes	No	driveway	★	x	-	Installed
93	138B	138.01	CNTY 138	MNTH 29	CH 136	0	-	-	841	910	115	Yes	Yes	Yes		★★★	x	-	Installed
94	141A	141.01	CNTY 141	CSAH 71	CSAH 46	0	-	-	358	352	80	Yes	Yes	Yes		★★	-	-	Installed
95	14A	14.01	CSAH 14	CSAH 1	RICHVILLE CORP LMTS	0	-	-	472	677	490	Yes	No	No		★★	-	-	-
96	14B	14.01	CSAH 14	CSAH 1	RICHVILLE CORP LMTS	0	-	-	946	1,034	490	Yes	No	No	driveway	★★★	-	-	Yes
97	14C	14.01	CSAH 14	CSAH 1	RICHVILLE CORP LMTS	0	-	-	1,076	562	615	Yes	No	No	driveway	★★	-	x	Yes
98	14D	14.01	CSAH 14	CSAH 1	RICHVILLE CORP LMTS	0	-	-	1,654	1,160	490	No	No	No	driveway	★	-	-	-
99	14E	14.01	CSAH 14	CSAH 1	RICHVILLE CORP LMTS	0	-	-	1,891	857	615	No	No	No	driveway		-	-	-
100	14F	14.01	CSAH 14	CSAH 1	RICHVILLE CORP LMTS	0	-	-	2,558	868	615	No	No	No			-	-	-
101	14G	14.01	CSAH 14	CSAH 1	RICHVILLE CORP LMTS	0	-	-	902	1,031	615	Yes	No	No	driveway	★★	-	-	-
102	14H	14.01	CSAH 14	CSAH 1	RICHVILLE CORP LMTS	1	-	-	1,025	1,748	960	Yes	Yes	Yes	driveway	★★★	-	-	Installed
103	14I					0	-	-	1,383						Removed From Further Analysis-Urban Segment	N/A	-	-	-
104	14J					0	-	-	1,173						Removed From Further Analysis-Urban Segment	N/A	-	-	-
105	14K					0	-	-	1,122						Removed From Further Analysis-Urban Segment	N/A	-	-	-
106	14L	14.04	CSAH 14	MNTH 78	CSAH 67	1	-	-	820	1,369	570	Yes	No	Yes		★★★★	-	-	Yes
107	14M	14.04	CSAH 14	MNTH 78	CSAH 67	0	-	-	1,522	870	440	No	No	No	driveway	★	-	x	-
108	14N	14.04	CSAH 14	MNTH 78	CSAH 67	0	-	-	1,301	879	440	No	No	No	driveway	★	-	x	-
109	14O	14.04	CSAH 14	MNTH 78	CSAH 67	0	-	-	819	1,270	440	No	No	No	driveway	★★	-	x	Yes
110	15A	15.02	CSAH 15	CSAH 2 North	FERGUS FALLS CORP L	0	-	-	1,052	437	410	No	Yes	No		★★	-	-	Installed
111	15B	15.02	CSAH 15	CSAH 2 North	FERGUS FALLS CORP L	0	-	-	968	531	410	No	Yes	No		★★	-	-	Installed
112	15C	15.02	CSAH 15	CSAH 2 North	FERGUS FALLS CORP L	0	-	-	869	1,769	505	Yes	Yes	Yes		★★★★	-	-	Installed
113	15D	15.02	CSAH 15	CSAH 2 North	FERGUS FALLS CORP L	0	-	-	826	1,500	600	Yes	Yes	Yes	driveway	★★★	-	-	Installed
114	15E	15.02	CSAH 15	CSAH 2 North	FERGUS FALLS CORP L	3	-	-	814	1,457	600	Yes	Yes	Yes	Turn Lane on Inside	★★★	-	-	Installed
115	15F					0	-	-	8,114						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
116	15G	15.03	CSAH 15	FERGUS FALLS CORP LI	CSAH 1	1	-	-	337	363	1,250	Yes	Yes	Yes		★★	-	-	Installed
117	16A	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	1,285	439	780	Yes	No	No	driveway	★	-	x	-
118	16B	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	1,092	542	780	Yes	No	No	driveway	★★	x	-	Yes
119	16C	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	1,283	388	780	No	No	No			-	x	-
120	16D	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	981	1,324	470	No	No	No		★★	x	-	Yes
121	16E	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	972	1,378	470	No	No	No		★★	x	-	Yes
122	16F	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	1,137	1,255	470	No	No	No		★★	x	-	Yes
123	16G	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	1,914	2,370	470	Yes	No	No	driveway	★★	-	x	-
124	16H	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	1,462	1,093	470	Yes	No	No	driveway	★★	-	x	-
125	16I	16.01	CSAH 16	MNTH 78	CSAH 5	0	-	-	1,862	1,467	470	No	No	No	driveway	★	-	x	-
126	16J	16.02	CSAH 16	CSAH 5	MNTH 108	0	-	-	377	612	540	Yes	Yes	Yes		★★★	-	-	Installed
127	16K					0	-	-	11,423						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
128	16L					0	-	-	14,390						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
129	17A	17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	1,082	1,302	1,550	No	Yes	No	driveway	★	x	-	Installed
130	17B	17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	2,004	3,412	1,450	Yes	No	No	driveway	★	-	x	-
131	17C	17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	2,316	650	1,350	Yes	No	No		★	-	x	-
132	17D	17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	968	1,109	1,350	Yes	Yes	No		★★	x	-	Installed
133	17E					0	-	-	3,576						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
134	17F	17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	1	-	-	2,294	853	1,350	No	Yes	No			-	-	Installed
135	17G	17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	2,420	683	1,350	Yes	No	No		★	-	x	-
136	17H	17.02	CSAH 17	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	809	1,380	1,350	Yes	Yes	Yes		★★★	x	-	Installed
137	17I					0	-	-	3,645						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
138	19A					0	-	-	778						Removed From Further Analysis-Urban Segment	N/A	-	-	-
139	1A					0	-	-	421						Removed From Further Analysis-Urban Segment	N/A	-	-	-
140	1B					0	-	-	742						Removed From Further Analysis-Urban Segment	N/A	-	-	-
141	1C					0	-	-	409						Removed From Further Analysis-Urban Segment	N/A	-	-	-
142	1D					0	-	-	2,243						Removed From Further Analysis-Urban Segment	N/A	-	-	-
143	1E					0	-	-	305						Removed From Further Analysis-Urban Segment	N/A	-	-	-
144	1F					0	-	-	372						Removed From Further Analysis-Urban Segment	N/A	-	-	-
145	1G					0	-	-	1,388						Removed From Further Analysis-Urban Segment	N/A	-	-	-
146	1H					0	-	-	1,528						Removed From Further Analysis-Urban Segment	N/A	-	-	-
147	1I	1.03	CSAH 1	FERGUS FALLS CORP LI	CSAH 10	4	-	-	1,249	2,082	4,625	Yes	No	Yes	driveway	★★	-	-	-
148	1J	1.03	CSAH 1	FERGUS FALLS CORP LI	CSAH 10	0	-	-	1,588	1,376	2,350	Yes	No	Yes	driveway	★★	-	-	-
149	1K	1.03	CSAH 1	FERGUS FALLS CORP LI	CSAH 10	0	-	-	1,503	1,419	2,350	Yes	No	No		★	-	-	-
150	1L	1.03	CSAH 1	FERGUS FALLS CORP LI	CSAH 10	1	-	-	1,606	2,442	2,350	Yes	Yes	No		★	-	-	Installed
151	1M	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	0	-	-	1,464	707	1,800	No	No	No			-	-	-
152	1N	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	2	-	-	1,099	919	1,800	Yes	No	No		★★	-	-	-
153	1O	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	0	-	-	1,152	1,438	1,800	Yes	No	No		★★	-	-	-
154	1P	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	0	-	-	1,422	784	1,800	No	No	No			-	-	-
155	1Q	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	1	-	-	1,462	1,281	1,800	Yes	Yes	No	Turn Lane on Outside	★	-	-	Installed
156	1R	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	1	-	-	1,563	1,156	1,225	Yes	No	Yes	driveway	★★	-	-	-
157	1S	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	2	-	-	1,362	1,882	1,400	Yes	Yes	Yes		★★	-	-	Installed
158	1T	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	1	-	-	1,556	899	1,400	No	No	Yes		★	-	x	-
159	1U	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	3	-	-	1,382	1,976	1,400	Yes	Yes	No		★	-	-	Installed
160	1V	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	0	-	-	1,385	1,947	1,400	Yes	Yes	Yes		★★	-	-	Installed
161	1W	1.05	CSAH 1	CSAH 35	Oak Ridge Beach Rd	0	-	-	729	785	1,400	Yes	Yes	No	driveway	★★	-	-	Installed
162	1X	1.06	CSAH 1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	0	-	-	748	698	1,400	No	No	No	driveway	★	-	-	-
163	1Y	1.06	CSAH 1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	1	-	-	842	604	1,400	Yes	No	No	driveway	★★	-	-	-
164	1Z	1.06	CSAH 1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	0	-	-	1,675	440	1,400	Yes	No	No	driveway	★	-	-	-
165	1ZA	1.06	CSAH 1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	0	-	-	180	192	1,400	No	Yes	No			-	-	Installed
166	1ZB	1.06	CSAH 1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	0	-	-	1,061	867	1,400	Yes	No	No	driveway	★★	-	-	-
167	1ZC					0	-	-	4,729						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
168	1ZD					0	-	-	3,029						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
169	1ZE					0	-	-	3,727						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
170	1ZF					0	-	-	6,467						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
171	1ZG	1.06	CSAH 1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	0	-	-	2,854	925	1,950	Yes	No	No	driveway	★	-	-	-
172	1ZH	1.06	CSAH 1	Oak Ridge Beach Rd	OTTERTAIL CORP LMTS	1	-	-	1,231	1,099	1,950	Yes	Yes	No	driveway	★	-	-	Installed
173	1ZI					0	-	-	980						Removed From Further Analysis-Urban Segment	N/A	-	-	-
174	20A	20.01	CSAH 20	CSAH 9	USTH 59	0	-	-	977	1,078	860	No	No	No	driveway	★	x	-	Yes
175	20B	20.01	CSAH 20	CSAH 9	USTH 59	0	-	-	2,206	499	860	No	No	No	driveway		-	x	-
176	20C	20.01	CSAH 20	CSAH 9	USTH 59	0	-	-	1,695	468	860	No	No	No	driveway		-	x	-
177	20D	20.01	CSAH 20	CSAH 9	USTH 59	0	-	-	1,352	1,071	860	No	No	No	driveway		-	x	-
178	20E	20.01	CSAH 20	CSAH 9	USTH 59	0	-	-	1,911	1,618	1,000	Yes	No	No	driveway	★	-	x	-
179	20F	20.01	CSAH 20	CSAH 9	USTH 59	0	-	-	1,742	1,175	1,000	Yes	No	No		★	-	x	-
180	20G					0	-	-	3,418						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
181	20H					0	-	-	3,244						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
182	20I	20.01	CSAH 20	CSAH 9	USTH 59	1	-	-	937	1,607	1,050	No	No	No	driveway	★	x	-	Yes
183	21A	21.01	CSAH 21	MNTH 210	CSAH 10	0	-	-	1,298	704	220	No	Yes	No	driveway	★	-	-	Installed
184	21B	21.01	CSAH 21	MNTH 210	CSAH 10	0	-	-	1,869	519	220	No	No	No		★	-	x	-
185	21C	21.01	CSAH 21	MNTH 210	CSAH 10	0	-	-	1,620	944	220	Yes	No	No	driveway	★★	-	x	-
186	21D	21.01	CSAH 21	MNTH 210	CSAH 10	0	-	-	848	1,077	220	No	No	No	driveway	★★	-	x	Yes
187	21E	21.01	CSAH 21	MNTH 210	CSAH 10	0	-	-	922	554	220	No	Yes	Yes	driveway	★★★	-	-	Installed
188	21F	21.02	CSAH 21	CSAH 10	CSAH 24	0	-	-	1,053	481	220	No	No	No		★★	-	-	-
189	21G	21.02	CSAH 21	CSAH 10	CSAH 24	0	-	-	1,545	588	220	No	No	No	driveway	★	-	-	-
190	21H	21.02	CSAH 21	CSAH 10	CSAH 24	0	-	-	2,611	821	175	No	No	No	driveway		-	-	-
191	21I	21.02	CSAH 21	CSAH 10	CSAH 24	0	-	-	1,948	1,394	175	No	No	No	driveway		-	-	-
192	21J	21.02	CSAH 21	CSAH 10	CSAH 24	0	-	-	1,865	1,011	175	No	No	No	driveway		-	-	-
193	21K	21.02	CSAH 21	CSAH 10	CSAH 24	0	-	-	819	1,415	180	Yes	Yes	Yes		★★★	-	-	Installed
194	21L	21.02	CSAH 21	CSAH 10	CSAH 24	0	-	-	738	628	185	Yes	Yes	Yes		★★★	-	-	Installed
195	21M					0	-	-	10,456						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
196	21N					0	-	-	8,779						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
197	21O	21.04	CSAH 21	MNTH 108	CLAY COUNTY LINE	0	-	-	1,622	750	245	No	No	No		★	-	-	-
198	21P	21.04	CSAH 21	MNTH 108	CLAY COUNTY LINE	0	-	-	1,367	575	245	No	No	No		★	-	-	-
199	22A	22.01	CSAH 22	CSAH 27	CSAH 3	1	-	-	806	1,432	680	Yes	Yes	Yes	driveway	★★★	-	-	Installed
200	22B	22.01	CSAH 22	CSAH 27	CSAH 3	0	-	-	1,652	2,797	680	Yes	Yes	No	driveway	★	-	-	Installed
201	22C	22.02	CSAH 22	CSAH 3	CSAH 35	0	-	-	1,464	709	365	No	Yes	No	driveway	★	-	-	Installed
202	22D	22.02	CSAH 22	CSAH 3	CSAH 35	0	-	-	860	1,022	365	No	Yes	No	driveway	★★	-	-	Installed
203	22E	22.02	CSAH 22	CSAH 3	CSAH 35	0	-	-	1,211	1,188	365	Yes	No	No	driveway	★★	-	x	-
204	22F	22.02	CSAH 22	CSAH 3	CSAH 35	0	-	-	1,723	1,056	365	No	No	No	driveway	★	-	x	-
205	23A	23.01	CSAH 23	CSAH 9	MNTH 34	0	-	-	853	1,370	165	Yes	Yes	Yes		★★★	x	-	Installed
206	23B	23.01	CSAH 23	CSAH 9	MNTH 34	0	-	-	848	1,144	165	Yes	Yes	No		★★	x	-	Installed
207	23C	23.01	CSAH 23	CSAH 9	MNTH 34	0	-	-	802	1,131	165	Yes	Yes	No		★★	x	-	Installed
208	23D	23.01	CSAH 23	CSAH 9	MNTH 34	0	-	-	1,489	301	165	No	No	No			-	x	-
209	23E	23.01	CSAH 23	CSAH 9	MNTH 34	0	-	-	1,614	395	165	No	No	No	driveway		-	x	-
210	23F					0	-	-	6,079						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
211	23G	23.02	CSAH 23	MNTH 34	CLAY COUNTY LINE	0	-	-	829	1,358	335	No	No	No		★★	-	x	Yes
212	23H	23.02	CSAH 23	MNTH 34	CLAY COUNTY LINE	0	-	-	836	1,385	335	No	No	No	driveway	★★	-	x	Yes
213	23I	23.02	CSAH 23	MNTH 34	CLAY COUNTY LINE	0	-	-	849	1,398	305	Yes	No	No		★★★	-	-	Yes

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
214	24A	24.02	CSAH 24	ROTHSAY CORP LMTS	CSAH 21 South	0	-	-	1,150	2,042	330	Yes	No	Yes	driveway, Turn/Passing Lanes on both sides	★★★★	x	-	Yes
215	24B	24.03	CSAH 24	CSAH 21 South	ERHARD CORP LMTS	0	-	-	1,146	2,085	340	Yes	No	Yes	driveway, Turn/Passing Lanes on both sides	★★★★	-	-	Yes
216	24C					0	-	-	5,595						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
217	24D	24.05	CSAH 24	ERHARD CORP LMTS	CSAH 3	0	-	-	1,682	1,460	550	Yes	No	No	driveway	★★	-	-	-
218	24E	24.05	CSAH 24	ERHARD CORP LMTS	CSAH 3	0	-	-	2,032	1,035	550	No	No	No	driveway	★	-	-	-
219	24F					0	-	-	3,991						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
220	24G	24.05	CSAH 24	ERHARD CORP LMTS	CSAH 3	0	-	-	2,884	1,174	550	No	No	No	driveway	★	-	-	-
221	24H					0	-	-	6,658						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
222	24H					0	-	-	3,799						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
223	24I					0	-	-	6,349						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
224	24J	24.06	CSAH 24	CSAH 3	CSAH 41	0	-	-	1,719	1,031	355	Yes	No	No		★★	-	-	-
225	24K	24.06	CSAH 24	CSAH 3	CSAH 41	0	-	-	1,520	1,782	355	Yes	No	No	driveway	★★	-	-	-
226	24L	24.06	CSAH 24	CSAH 3	CSAH 41	0	-	-	1,764	1,673	355	No	No	No	driveway	★	-	-	-
227	24M	24.06	CSAH 24	CSAH 3	CSAH 41	1	-	-	1,767	1,176	355	Yes	Yes	No	driveway	★★	-	-	Installed
228	24N	24.06	CSAH 24	CSAH 3	CSAH 41	0	-	-	1,010	1,272	355	No	Yes	No		★★	-	-	Installed
229	24O	24.06	CSAH 24	CSAH 3	CSAH 41	0	-	-	1,219	925	355	No	Yes	No	driveway	★	-	-	Installed
230	24P	24.06	CSAH 24	CSAH 3	CSAH 41	0	-	-	972	1,806	355	Yes	No	No	driveway	★★★	-	-	Yes
231	24Q	24.06	CSAH 24	CSAH 3	CSAH 41	0	-	-	975	1,533	355	No	Yes	No	driveway	★★	-	-	Installed
232	25A	25.01	CSAH 25	GRANT COUNTY LINE C	MNTH 210	1	-	-	962	1,628	265	Yes	Yes	No		★★★	-	-	Installed
233	25B	25.01	CSAH 25	GRANT COUNTY LINE C	MNTH 210	0	-	-	972	1,626	355	Yes	Yes	No	driveway	★★★	-	-	Installed
234	25C	25.01	CSAH 25	GRANT COUNTY LINE C	MNTH 210	0	-	-	1,000	1,409	440	No	Yes	No	driveway	★★	-	-	Installed
235	25D	25.01	CSAH 25	GRANT COUNTY LINE C	MNTH 210	0	-	-	986	1,288	440	No	Yes	No	driveway	★★	-	-	Installed
236	25E	25.01	CSAH 25	GRANT COUNTY LINE C	MNTH 210	1	-	-	832	959	440	No	Yes	No		★★	-	-	Installed
237	25F	25.01	CSAH 25	GRANT COUNTY LINE C	MNTH 210	1	-	-	873	955	440	Yes	Yes	No	driveway	★★★	-	-	Installed
238	25G					0	-	-	587	712					Removed From Further Analysis-Urban Segment	N/A	-	-	-
239	25H					0	-	-	1,175	493					Removed From Further Analysis-Urban Segment	N/A	-	-	-
240	25I					0	-	-	718	354					Removed From Further Analysis-Urban Segment	N/A	-	-	-
241	27A	27.03	CSAH 27	CSAH 10	CSAH 24	2	-	-	1,731	1,402	1,560	Yes	No	No		★	-	-	-
242	27B	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	1,527	1,345	870	No	No	No			-	-	-
243	27C					0	-	-	6,607						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
244	27D					0	-	-	5,120						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
245	27E	27.03	CSAH 27	CSAH 10	CSAH 24	2	1	-	1,222	1,424	530	Yes	No	No	driveway	★★★	-	-	-
246	27F	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	1,540	958	530	Yes	No	No		★★	-	x	-
247	27G	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	819	1,224	530	Yes	No	No		★★★	-	-	Yes
248	27H	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	1,567	589	530	No	No	No		★	-	x	-
249	27I	27.03	CSAH 27	CSAH 10	CSAH 24	1	-	-	971	1,643	410	Yes	No	No		★★★	-	-	Yes
250	27J	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	1,498	1,137	285	No	No	No	driveway	★	-	x	-
251	27K	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	1,764	1,313	285	No	No	No		★	-	x	-
252	27L	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	816	1,555	190	Yes	Yes	No	driveway	★★	-	-	Installed
253	27M	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	2,082	1,070	190	Yes	Yes	No		★	-	-	Installed
254	27N	27.03	CSAH 27	CSAH 10	CSAH 24	0	-	-	2,055	1,140	190	No	No	No			-	x	-
255	28A	28.02	CSAH 28	CSAH 21	USTH 59	1	-	-	808	1,313	145	Yes	Yes	Yes		★★★	-	-	Installed
256	28B	28.02	CSAH 28	CSAH 21	USTH 59	0	-	-	826	1,353	145	Yes	Yes	Yes		★★★	-	-	Installed
257	29A	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	842	1,465	305	Yes	Yes	Yes	driveway	★★★★	x	-	Installed
258	29B	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	911	1,256	425	Yes	Yes	No		★★★	x	-	Installed
259	29C	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	1,365	570	425	No	No	No	driveway	★	-	-	-
260	29D	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	1,436	647	425	No	No	No	driveway	★	-	-	-
261	29E	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	2,339	533	425	Yes	No	No		★★	-	-	-
262	29F	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	1,201	1,025	425	No	No	No		★	-	-	-
263	29G	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	1,303	1,188	425	No	No	No		★	-	x	-
264	29H	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	1,138	1,699	425	No	No	No	driveway	★★	x	-	Yes
265	29I	29.01	CSAH 29	CSAH 82	MNTH 210	0	-	-	1,940	2,290	715	Yes	No	No	driveway	★	-	-	-
266	29J	29.01	CSAH 29	CSAH 82	MNTH 210	3	-	-	1,442	1,779	1,000	No	No	No			-	-	-
267	2A	2.01	CSAH 2	WILKIN CNTY LINE	CSAH 1	0	-	-	410	710	145	Yes	Yes	Yes		★★	-	-	Installed
268	2B	2.01	CSAH 2	WILKIN CNTY LINE	CSAH 1	0	-	-	438	824	145	Yes	Yes	No		★	-	-	Installed
269	30A	30.01	CSAH 30	WILKIN COUNTY LINE	CSAH 21	0	-	-	825	1,505	125	Yes	Yes	Yes		★★★	-	-	Installed
270	30B					0	-	-	4,367						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
271	30C					0	-	-	4,080						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
272	30D	30.02	CSAH 30	CSAH 21	MNTH 108	0	-	-	1,536	1,343	255	Yes	No	No		★★	-	-	-
273	30E	30.02	CSAH 30	CSAH 21	MNTH 108	0	-	-	1,540	1,339	255	Yes	No	No		★★	-	-	-
274	30F	30.02	CSAH 30	CSAH 21	MNTH 108	1	-	-	976	1,605	255	Yes	No	Yes		★★★★	x	-	Yes
275	30G	30.02	CSAH 30	CSAH 21	MNTH 108	0	-	-	1,462	689	255	No	No	No		★	-	-	-
276	30H	30.02	CSAH 30	CSAH 21	MNTH 108	0	-	-	2,421	1,275	255	Yes	No	No		★★	-	-	-

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
277	31A	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	493	354	550	Yes	No	No	Turn Lane on Outside	★★	-	-	-
278	31B	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	1,833	952	550	No	No	No		★	-	-	-
279	31C	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	1,523	995	550	No	No	No		★	-	-	-
280	31D	31.01	CSAH 31	CSAH 4	USTH 59	1	-	-	987	769	550	No	No	No		★★	x	-	Yes
281	31E	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	957	1,105	580	Yes	No	No	driveway	★★★	x	-	Yes
282	31F	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	1,221	950	580	Yes	No	No		★★	-	-	-
283	31G	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	2,215	735	580	No	No	No	driveway	★	-	-	-
284	31H	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	2,397	605	580	Yes	No	No	driveway	★★	-	-	-
285	31I	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	924	774	580	No	Yes	No		★★	x	-	Installed
286	31J	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	840	633	580	No	Yes	No	driveway	★★	x	-	Installed
287	31K	31.01	CSAH 31	CSAH 4	USTH 59	0	-	-	437	297	580	Yes	No	No	driveway	★★	-	-	-
288	31L	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	992	373	410	No	No	No		★★	x	-	Yes
289	31M	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	1,729	578	410	Yes	No	No	driveway	★★	-	x	-
290	31N	31.02	CSAH 31	USTH 59	CSAH 20	1	-	1	461	576	410	No	Yes	No	driveway	★★	-	-	Installed
291	31O	31.02	CSAH 31	USTH 59	CSAH 20	1	-	-	423	537	410	No	Yes	No	driveway	★	-	-	Installed
292	31P	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	803	580	410	Yes	No	No	driveway	★★★	x	-	Yes
293	31Q	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	639	520	410	No	No	No	driveway	★★	x	-	Yes
294	31R	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	983	622	410	No	No	No	driveway	★★	x	-	Yes
295	31S	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	1,926	490	410	No	No	No	driveway	★	-	x	-
296	31T	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	628	474	410	No	No	No		★★	x	-	Yes
297	31U	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	922	519	410	Yes	No	No	driveway	★★★	x	-	Yes
298	31V					0	-	-	3,279						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
299	31W	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	645	569	770	Yes	No	No	driveway	★★	x	-	Yes
300	31X	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	434	534	770	No	No	No	driveway		-	x	Yes
301	31Y	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	484	755	770	No	No	No			-	x	Yes
302	31Z	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	298	546	770	Yes	No	No		★	-	x	Yes
303	31ZA	31.02	CSAH 31	USTH 59	CSAH 20	0	-	-	845	264	770	No	No	No	driveway	★	x	-	Yes
304	32A	32.01	CSAH 32	CSAH 74	CSAH 14	0	-	-	854	1,123	345	No	No	No		★★	x	-	Yes
305	32B	32.01	CSAH 32	CSAH 74	CSAH 14	0	-	-	833	990	345	No	No	No		★★	x	-	Yes
306	32C	32.01	CSAH 32	CSAH 74	CSAH 14	0	-	-	1,406	1,005	195	No	No	No			-	x	-
307	32D	32.01	CSAH 32	CSAH 74	CSAH 14	0	-	-	815	1,265	195	Yes	Yes	No		★★	x	-	Installed
308	32E	32.01	CSAH 32	CSAH 74	CSAH 14	0	-	-	2,416	733	195	No	No	No			-	-	-
309	32F	32.01	CSAH 32	CSAH 74	CSAH 14	0	-	-	1,946	1,731	195	Yes	No	No	driveway	★	-	-	-
310	33A	33.01	CSAH 33	CSAH 35	MNTH 210	1	-	-	1,141	1,048	170	No	No	No	driveway	★	x	-	Yes
311	33B	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	1,477	1,492	170	No	No	No	driveway		-	x	-
312	33C	33.01	CSAH 33	CSAH 35	MNTH 210	1	-	-	971	1,618	170	No	No	No	driveway	★	x	-	Yes
313	33D	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	960	1,629	170	Yes	No	No		★★	x	-	Yes
314	33E	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	968	1,657	170	Yes	No	No	driveway	★★	x	-	Yes
315	33F	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	948	1,530	170	Yes	No	No		★★	x	-	Yes
316	33G	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	934	1,092	170	No	No	No		★	x	-	Yes
317	33H	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	1,922	834	170	No	No	No			-	-	-
318	33I	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	961	1,390	170	Yes	Yes	No	driveway	★★	x	-	Installed
319	33J	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	1,234	1,192	170	Yes	No	No		★	-	-	-
320	33K	33.01	CSAH 33	CSAH 35	MNTH 210	0	-	-	1,517	1,140	170	No	No	No			-	-	-
321	33L	33.01	CSAH 33	CSAH 35	MNTH 210	2	-	-	957	1,714	170	Yes	Yes	Yes	driveway	★★★	x	-	Installed
322	33M	33.01	CSAH 33	CSAH 35	MNTH 210	1	-	-	1,040	1,962	285	Yes	Yes	No	driveway	★★★	x	-	Installed
323	34A	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	0	-	-	1,968	1,650	620	No	No	No	driveway		-	x	-
324	34B	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	0	-	-	1,367	1,074	620	Yes	Yes	No	driveway	★	-	-	Installed
325	34C	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	1	-	-	1,598	1,255	620	Yes	No	No	driveway	★	-	x	-
326	34D	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	1	-	-	1,687	1,685	620	No	No	No	driveway		-	x	-
327	34E	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	0	-	-	1,419	1,254	620	Yes	No	No		★	-	x	-
328	34F	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	1	-	-	888	869	620	Yes	Yes	No	One Chevron in decreasing direction	★★	x	-	Installed
329	34G	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	0	-	-	1,966	1,022	1,100	No	No	No			-	x	-
330	34H	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	1	-	-	723	802	1,100	No	Yes	No	driveway	★	x	-	Installed
331	34I	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	4	-	-	826	1,118	1,100	No	Yes	No		★	x	-	Installed
332	34J	34.01	CSAH 34	CSAH 35	PERHAM CORP LMTS	0	-	-	973	536	1,100	No	Yes	No	driveway	★	x	-	Installed
333	35A	35.01	CSAH 35	USTH 59	DALTON CORP LMTS	0	-	-	1,392	1,119	365	Yes	Yes	No		★★	-	-	Installed
334	35B	35.01	CSAH 35	USTH 59	DALTON CORP LMTS	0	-	-	2,301	1,274	365	No	No	No	driveway	★	-	x	-
335	35C	35.01	CSAH 35	USTH 59	DALTON CORP LMTS	1	-	1	1,163	764	365	Yes	No	No	driveway	★★★★	x	-	Yes
336	35D	35.01	CSAH 35	USTH 59	DALTON CORP LMTS	0	-	-	1,491	1,075	365	Yes	No	No	driveway	★★	-	x	-
337	35E	35.01	CSAH 35	USTH 59	DALTON CORP LMTS	0	-	-	716	1,243	555	Yes	Yes	Yes		★★★★	x	-	Installed
338	35F					0	-	-	3,061						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
339	35G	35.01	CSAH 35	USTH 59	DALTON CORP LMTS	1	-	-	2,911	1,977	940	Yes	No	No	driveway	★	-	-	-
340	35H	35.01	CSAH 35	USTH 59	DALTON CORP LMTS	0	-	-	955	1,167	940	Yes	Yes	Yes	driveway	★★★	x	-	Installed
341	35I	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	0	-	-	1,565	1,119	740	No	Yes	No	driveway		-	-	Installed
342	35J	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	0	-	-	1,534	1,436	605	Yes	No	No	driveway	★	-	-	-
343	35K	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	1	-	-	2,658	790	465	No	No	No	driveway	★	-	-	-
344	35M	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	2	-	1	731	1,348	465	Yes	Yes	Yes		★★★★★	x	-	Installed
345	35N	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	0	-	-	733	1,274	465	Yes	Yes	No	driveway	★★★	x	-	Installed
346	35P	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	0	-	-	714	1,248	465	Yes	Yes	No		★★★	x	-	Installed
347	35Q	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	1	-	-	729	1,271	560	Yes	Yes	Yes		★★★★	x	-	Installed
348	35R	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	1	-	-	708	1,297	650	No	Yes	No	driveway	★	x	-	Installed
349	35S	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	0	-	-	712	1,127	650	No	Yes	No	driveway	★	x	-	Installed
350	35T	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	1	-	-	1,461	1,192	650	No	No	No			-	-	-
351	35U	35.03	CSAH 35	DALTON CORP LMTS	UNDERWOOD CORP LM	0	-	-	1,437	984	650	No	No	No	driveway		-	-	-
352	35V					0	-	-	572						Removed From Further Analysis-Urban Segment	N/A	-	-	-
353	35W					0	-	-	836						Removed From Further Analysis-Urban Segment	N/A	-	-	-
354	35X	35.05	CSAH 35	UNDERWOOD CORP LM	CSAH 1	1	-	-	1,127	674	1,300	Yes	No	No		★★	x	-	Yes
355	35Y	35.05	CSAH 35	UNDERWOOD CORP LM	CSAH 1	0	-	-	1,105	1,334	1,300	No	Yes	Yes	driveway	★★	x	-	Installed
356	35Z	35.05	CSAH 35	UNDERWOOD CORP LM	CSAH 1	4	-	-	1,062	1,148	1,300	No	Yes	No		★	x	-	Installed
357	35ZA	35.05	CSAH 35	UNDERWOOD CORP LM	CSAH 1	0	-	-	1,239	479	950	Yes	No	No		★	-	-	-
358	35ZB	35.05	CSAH 35	UNDERWOOD CORP LM	CSAH 1	0	-	-	2,781	517	950	No	No	No			-	-	-
359	35ZC	35.05	CSAH 35	UNDERWOOD CORP LM	CSAH 1	0	-	-	957	759	950	Yes	Yes	No		★★	x	-	Installed
360	35ZD	35.05	CSAH 35	UNDERWOOD CORP LM	CSAH 1	0	-	-	1,030	1,091	950	No	Yes	No		★	x	-	Installed

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
361	35ZE	35.06	CSAH 35	CSAH 1	CSAH 41	2	-	-	1,447	855	1,100	No	No	No	driveway		-	x	-
362	35ZF	35.06	CSAH 35	CSAH 1	CSAH 41	0	-	-	1,573	1,777	1,100	Yes	No	No	driveway	★	-	x	-
363	35ZG	35.06	CSAH 35	CSAH 1	CSAH 41	0	-	-	849	1,421	1,100	Yes	Yes	No	driveway	★★	-	-	Installed
364	35ZH	35.06	CSAH 35	CSAH 1	CSAH 41	0	-	-	1,308	883	1,100	Yes	No	No	driveway	★	-	x	-
365	35ZI	35.06	CSAH 35	CSAH 1	CSAH 41	0	-	-	1,358	2,442	830	Yes	No	No	driveway	★	-	-	-
366	35ZJ	35.06	CSAH 35	CSAH 1	CSAH 41	0	-	-	1,460	1,151	830	No	No	No			-	-	-
367	35ZK	35.06	CSAH 35	CSAH 1	CSAH 41	0	-	-	1,472	1,797	865	Yes	No	No	driveway	★	-	-	-
368	35ZL	35.06	CSAH 35	CSAH 1	CSAH 41	0	-	-	1,211	1,088	900	No	Yes	No	driveway		-	-	Installed
369	35ZM	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	1	-	-	2,744	869	620	No	No	No	driveway		-	-	-
370	35ZN	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	746	959	620	Yes	Yes	No		★★	x	-	Installed
371	35ZO	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	1	-	-	983	720	620	Yes	Yes	No	driveway	★★	x	-	Installed
372	35ZP	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	2,905	2,471	620	Yes	No	No	driveway	★	-	-	-
373	35ZQ	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	2,697	1,701	620	Yes	Yes	No	driveway	★	-	-	Installed
374	35ZR	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	697	850	620	Yes	Yes	No	driveway	★★	x	-	Installed
375	35ZS	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	1,439	537	620	No	Yes	No	driveway		-	-	Installed
376	35ZT	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	1,102	648	620	No	Yes	No	driveway	★	x	-	Installed
377	35ZU	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	1	-	1	1,063	818	620	Yes	Yes	No	driveway	★★★	x	-	Installed
378	35ZV	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	1,741	678	620	No	No	No	driveway		-	x	-
379	35ZW	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	2	-	-	1,899	809	620	Yes	No	No	driveway	★	-	x	-
380	35ZX	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	2,405	1,233	620	Yes	No	No	driveway	★	-	x	-
381	35ZY	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	3	-	-	921	895	620	No	Yes	No	driveway	★	x	-	Installed
382	35ZZ	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	967	1,353	620	No	Yes	No		★	x	-	Installed
383	35ZZA	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	2	-	-	730	1,463	885	Yes	Yes	No	driveway	★★	x	-	Installed
384	35ZZB	35.07	CSAH 35	CSAH 41	DENT CORP LMTS	0	-	-	1,351	1,136	1,150	No	No	No	driveway		-	x	-
385	35ZZC					0	-	-	517						Removed From Further Analysis-Urban Segment	N/A	-	-	-
386	35ZZD	35.09	CSAH 35	MNTH 108	CSAH 34	0	-	-	1,268	1,300	395	No	No	No		★	-	-	-
387	35ZZE	35.09	CSAH 35	MNTH 108	CSAH 34	0	-	-	1,134	1,184	600	Yes	Yes	No		★★	-	-	Installed
388	35ZZF	35.10	CSAH 35	CSAH 34	CSAH 36	0	-	-	936	934	800	Yes	Yes	No	driveway	★★	x	-	Installed
389	35ZZG	35.10	CSAH 35	CSAH 34	CSAH 36	0	-	-	1,112	1,980	800	Yes	Yes	Yes	driveway	★★★	x	-	Installed
390	35ZZH	35.10	CSAH 35	CSAH 34	CSAH 36	0	-	-	1,119	1,745	1,400	Yes	Yes	No	driveway	★★	x	-	Installed
391	35ZZI	35.10	CSAH 35	CSAH 34	CSAH 36	0	-	-	1,121	702	1,400	Yes	Yes	No	driveway	★★	x	-	Installed
392	35ZZJ	35.10	CSAH 35	CSAH 34	CSAH 36	0	-	-	668	1,099	1,400	Yes	Yes	No	driveway	★★	x	-	Installed
393	35ZZK	35.10	CSAH 35	CSAH 34	CSAH 36	0	-	-	1,063	719	1,400	Yes	Yes	No	driveway	★★	x	-	Installed
394	35ZZL	35.10	CSAH 35	CSAH 34	CSAH 36	0	-	-	1,072	1,133	1,400	Yes	Yes	No	driveway	★★	x	-	Installed
395	35ZZM					0	-	-	618						Removed From Further Analysis-Urban Segment	N/A	-	-	-
396	36A	36.01	CSAH 36	CSAH 35	MNTH 228	0	-	-	899	395	290	Yes	Yes	No		★★★	x	-	Installed
397	36B	36.01	CSAH 36	CSAH 35	MNTH 228	0	-	-	344	652	290	Yes	Yes	Yes		★★★	-	-	Installed
398	36C	36.01	CSAH 36	CSAH 35	MNTH 228	1	-	-	579	1,021	290	No	Yes	No	driveway	★★	x	-	Installed
399	36D	36.01	CSAH 36	CSAH 35	MNTH 228	0	-	-	1,733	1,217	290	Yes	No	No	driveway	★★	-	x	-
400	36E	36.01	CSAH 36	CSAH 35	MNTH 228	0	-	-	1,209	761	290	No	No	No	driveway	★	-	x	-
401	36F	36.01	CSAH 36	CSAH 35	MNTH 228	0	-	-	827	908	290	Yes	Yes	No	driveway	★★★	x	-	Installed
402	36G	36.01	CSAH 36	CSAH 35	MNTH 228	1	-	-	600	1,030	290	Yes	Yes	No	driveway	★★★	x	-	Installed
403	36H	36.01	CSAH 36	CSAH 35	MNTH 228	2	-	-	1,378	609	290	Yes	Yes	No	driveway	★★	-	-	Installed
404	36I	36.01	CSAH 36	CSAH 35	MNTH 228	1	-	-	823	1,349	290	Yes	Yes	Yes		★★★★	x	-	Installed
405	36J	36.01	CSAH 36	CSAH 35	MNTH 228	1	-	-	834	1,309	290	Yes	Yes	No		★★★	x	-	Installed
406	36K	36.01	CSAH 36	CSAH 35	MNTH 228	0	-	-	830	1,217	290	Yes	Yes	Yes	driveway	★★★★	x	-	Installed
407	36L	36.01	CSAH 36	CSAH 35	MNTH 228	0	-	-	1,188	818	290	No	Yes	No	driveway	★★	x	-	Installed
408	36M	36.01	CSAH 36	CSAH 35	MNTH 228	0	-	-	889	865	290	No	Yes	No	driveway	★★	x	-	Installed
409	38A	38.01	CSAH 38	MNTH 78	CSAH 5	0	-	-	2,998	1,133	330	No	No	No	driveway	★	-	-	-
410	38B	38.01	CSAH 38	MNTH 78	CSAH 5	0	-	-	965	1,057	330	No	No	No		★★	-	x	Yes
411	38C	38.01	CSAH 38	MNTH 78	CSAH 5	0	-	-	953	845	330	Yes	No	No	driveway	★★★	-	-	Yes
412	38D	38.01	CSAH 38	MNTH 78	CSAH 5	0	-	-	1,866	1,502	330	No	No	No	driveway	★	-	x	-
413	38E	38.01	CSAH 38	MNTH 78	CSAH 5	0	-	-	1,489	1,607	330	No	No	No	driveway	★	-	x	-
414	38F	38.01	CSAH 38	MNTH 78	CSAH 5	0	-	-	1,654	727	330	No	No	No	driveway	★	-	-	-
415	38G	38.02	CNTY 38	CSAH 5	URBANK CORP LMTS	1	-	-	725	1,276	500	Yes	Yes	Yes	driveway	★★★★	-	-	Installed
416	38H	38.02	CNTY 38	CSAH 5	URBANK CORP LMTS	2	-	-	729	1,167	500	Yes	Yes	No	driveway	★★★	-	-	Installed
417	38I	38.02	CNTY 38	CSAH 5	URBANK CORP LMTS	0	-	-	845	824	500	No	Yes	No	driveway	★★	-	-	Installed
418	38J	38.02	CNTY 38	CSAH 5	URBANK CORP LMTS	0	-	-	732	759	500	No	Yes	No	driveway	★★	-	-	Installed
419	39A	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	948	895	135	Yes	Yes	No		★★	-	-	Installed
420	39B	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	1,085	800	135	No	Yes	No		★	-	-	Installed
421	39C	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	1,389	927	135	No	No	No	driveway		-	-	-
422	39D	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	1,164	1,692	135	Yes	No	No		★★	-	-	-
423	39E	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	1,383	940	135	No	No	No	driveway		-	-	-
424	39F	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	834	1,530	135	No	Yes	No	driveway	★	-	-	Installed
425	39G	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	823	1,457	135	No	Yes	No		★	-	-	Installed
426	39H	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	842	1,474	135	Yes	Yes	Yes		★★★	-	-	Installed
427	39I	39.01	CNTY 39	CSAH 12	CSAH 35	0	-	-	725	637	135	Yes	No	Yes		★★★	-	-	Yes

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
428	3A					0	-	-	3,488						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
429	3B	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	2,342	1,318	820	Yes	No	No	driveway	★	-	-	-
430	3C					0	-	-	5,774						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
431	3D	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	2,158	1,666	420	No	No	No	Inside paved 6 feet, driveway	★	-	x	-
432	3E	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	705	168	420	No	Yes	No	Inside paved 6 feet, driveway	★★	x	-	Installed
433	3F	3.01	CSAH 3	CSAH 10	CSAH 24	1	-	-	2,502	3,072	420	No	No	No	Inside paved 6 feet, driveway	★	-	x	-
434	3G	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	1,003	667	500	Yes	No	No	Turn lanes on obth sides of roadway, driveway	★★★	x	-	Yes
435	3H	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	2,128	834	580	No	No	No		★	-	-	-
436	3I	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	1,963	1,372	580	No	No	No	driveway	★	-	-	-
437	3J	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	1,888	950	580	No	No	No	driveway	★	-	-	-
438	3K	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	2,756	1,114	580	No	No	No	driveway	★	-	-	-
439	3L	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	2,276	697	580	No	No	No	driveway	★	-	-	-
440	3M	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	767	1,143	580	No	Yes	No	driveway	★★	x	-	Installed
441	3N	3.01	CSAH 3	CSAH 10	CSAH 24	1	-	-	1,424	1,568	580	No	Yes	No	driveway	★	-	-	Installed
442	3O					0	-	-	4,219						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
443	3P	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	1,650	831	580	No	No	No		★	-	-	-
444	3Q	3.01	CSAH 3	CSAH 10	CSAH 24	0	-	-	2,520	560	580	Yes	No	No	driveway	★★	-	-	-
445	3R	3.02	CSAH 3	CSAH 24	USTH 59	1	-	-	956	1,219	580	Yes	No	No	driveway	★★★	x	-	Yes
446	3S	3.02	CSAH 3	CSAH 24	USTH 59	0	-	-	961	743	580	No	No	No	driveway	★★	x	-	Yes
447	3T	3.02	CSAH 3	CSAH 24	USTH 59	0	-	-	2,222	1,488	580	No	No	No	driveway	★	-	x	-
448	3U	3.02	CSAH 3	CSAH 24	USTH 59	1	-	-	1,545	2,178	580	No	No	No	driveway	★	-	x	-
449	3V	3.02	CSAH 3	CSAH 24	USTH 59	1	-	-	816	1,535	685	Yes	Yes	No		★★	x	-	Installed
450	40A					0	-	-	2,018						Removed From Further Analysis-Urban Segment	N/A	-	-	-
451	40B					0	-	-	1,999						Removed From Further Analysis-Urban Segment	N/A	-	-	-
452	40C	40.02	CNTY 40	VINING CORP LMTS	MNTH 29	1	1	-	1,426	1,014	300	No	No	No		★★	-	-	-
453	40D					0	-	-	3,615						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
454	40E	40.02	CNTY 40	VINING CORP LMTS	MNTH 29	0	-	-	1,787	900	300	No	No	No		★	-	-	-
455	40F					0	-	-	3,285						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
456	40G					0	-	-	5,881						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
457	40H	40.02	CNTY 40	VINING CORP LMTS	MNTH 29	0	-	-	938	1,484	250	No	Yes	No		★★	-	-	Installed
458	40I	40.02	CNTY 40	VINING CORP LMTS	MNTH 29	0	-	-	963	1,604	250	No	Yes	No	driveway	★★	-	-	Installed
459	40J	40.03	CNTY 40	MNTH 29	TODD COUNTY LINE	0	-	-	2,827	817	300	No	No	No	driveway	★	-	-	-
460	40K	40.03	CNTY 40	MNTH 29	TODD COUNTY LINE	0	-	-	1,993	1,503	300	No	No	No	driveway	★	-	-	-
461	40L	40.03	CNTY 40	MNTH 29	TODD COUNTY LINE	0	-	-	1,672	709	300	No	No	No	driveway	★	-	-	-
462	40M	40.03	CNTY 40	MNTH 29	TODD COUNTY LINE	0	-	-	707	1,123	300	Yes	Yes	Yes		★★★★	-	-	Installed
463	40N	40.03	CNTY 40	MNTH 29	TODD COUNTY LINE	0	-	-	729	1,192	300	Yes	Yes	Yes		★★★★	-	-	Installed
464	41A	41.01	CNTY 41	CSAH 35	MNTH 108	1	-	-	919	471	465	Yes	No	No	driveway	★★★	x	-	Yes
465	41B	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,408	1,257	465	No	No	No	driveway	★	-	x	-
466	41C	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,435	1,301	465	No	No	No	driveway	★	-	x	-
467	41D	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,238	1,304	465	No	No	No		★	-	-	-
468	41E	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,253	1,276	465	No	No	No	driveway	★	-	-	-
469	41F	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,864	882	465	No	No	No	driveway	★	-	-	-
470	41G	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	2,311	1,263	465	No	No	No	driveway	★	-	-	-
471	41H	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,250	1,250	465	No	No	No	driveway	★	-	-	-
472	41I	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,367	1,338	680	No	No	No	driveway		-	x	-
473	41J	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,868	1,256	680	Yes	No	No	Bridge on Curve with wider paved shoulders, driveway	★	-	x	-
474	41K	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	544	802	680	No	Yes	No		★	x	-	Installed
475	41L	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	790	671	680	No	Yes	No		★	x	-	Installed
476	41M	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	397	416	680	Yes	Yes	Yes	driveway	★★	-	-	Installed
477	41N	41.01	CNTY 41	CSAH 35	MNTH 108	0	-	-	1,437	1,002	680	No	No	No	driveway		-	x	-
478	41O	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	939	617	355	Yes	Yes	No	driveway	★★★	-	-	Installed
479	41P	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	839	1,289	355	Yes	Yes	No	driveway	★★★	-	-	Installed
480	41Q	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	1,003	888	355	Yes	Yes	No	driveway	★★★	-	-	Installed
481	41R	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	854	1,382	355	Yes	Yes	Yes		★★★★	-	-	Installed
482	41S	41.02	CSAH 41	MNTH 108	CSAH 4	1	-	-	839	1,396	355	Yes	Yes	No	driveway	★★★	-	-	Installed
483	41T	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	827	1,516	355	Yes	Yes	No	driveway	★★★	-	-	Installed
484	41U	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	825	1,488	355	Yes	Yes	No	driveway	★★★	-	-	Installed
485	41V					0	-	-	4,941						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
486	41W	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	2,249	573	520	No	No	No	driveway	★	-	-	-
487	41X					0	-	-	3,209						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
488	41Y	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	2,190	1,113	520	No	No	No	driveway	★	-	-	-
489	41Z	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	2,074	1,177	520	Yes	No	No	driveway	★★	-	-	-
490	41ZA	41.02	CSAH 41	MNTH 108	CSAH 4	0	-	-	2,412	1,005	520	No	No	No	driveway	★	-	-	-
491	42A					0	-	-	667						Removed From Further Analysis-Urban Segment	N/A	-	-	-
492	42B					0	-	-	641						Removed From Further Analysis-Urban Segment	N/A	-	-	-
493	42C	42.02	CSAH 42	PARKERS PRAIRIE COR	CSAH 40	0	-	-	872	711	310	No	No	No		★★	x	-	Yes
494	42D	42.02	CSAH 42	PARKERS PRAIRIE COR	CSAH 40	0	-	-	1,352	746	150	No	No	No	driveway		-	x	-
495	42E	42.02	CSAH 42	PARKERS PRAIRIE COR	CSAH 40	0	-	-	805	1,365	150	Yes	No	Yes		★★★	x	-	Yes
496	42F	42.02	CSAH 42	PARKERS PRAIRIE COR	CSAH 40	0	-	-	971	925	150	Yes	No	No		★★	x	-	Yes
497	42G	42.02	CSAH 42	PARKERS PRAIRIE COR	CSAH 40	1	-	-	996	1,045	150	No	No	Yes	driveway	★★	x	-	Yes
498	42H	42.02	CSAH 42	PARKERS PRAIRIE COR	CSAH 40	0	-	-	1,884	1,009	150	No	No	No			-	x	-
499	42I	42.02	CSAH 42	PARKERS PRAIRIE COR	CSAH 40	0	-	-	1,033	1,156	150	Yes	No	No	driveway	★★	x	-	Yes

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
500	43A	43.01	CSAH 43	CSAH 1	CSAH 22	1	-	-	2,050	592	380	No	No	No		★	-	-	-
501	43B	43.01	CSAH 43	CSAH 1	CSAH 22	0	-	-	1,692	961	380	Yes	No	No	driveway	★★	-	-	-
502	43C	43.01	CSAH 43	CSAH 1	CSAH 22	1	-	-	2,952	651	380	No	No	No	driveway	★	-	-	-
503	43D					0	-	-	4,326						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
504	43E					0	-	-	6,690						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
505	43F	43.01	CSAH 43	CSAH 1	CSAH 22	0	-	-	1,316	496	380	No	No	No	driveway	★	-	-	-
506	43G	43.01	CSAH 43	CSAH 1	CSAH 22	0	-	-	1,094	511	380	No	No	No	driveway	★★	-	-	-
507	43H	43.01	CSAH 43	CSAH 1	CSAH 22	0	-	-	829	391	380	No	No	No	driveway	★★	-	-	-
508	44A	44.01	CSAH 44	CSAH 14	CSAH 35	0	-	-	969	543	255	No	Yes	No	driveway	★★	-	-	Installed
509	44B	44.01	CSAH 44	CSAH 14	CSAH 35	0	-	-	816	702	255	No	Yes	No		★★	-	-	Installed
510	44C	44.01	CSAH 44	CSAH 14	CSAH 35	0	-	-	1,081	589	255	No	Yes	No	driveway	★★	-	-	Installed
511	44D	44.01	CSAH 44	CSAH 14	CSAH 35	0	-	-	1,429	2,409	320	Yes	Yes	Yes	driveway	★★★	-	-	Installed
512	44E	44.01	CSAH 44	CSAH 14	CSAH 35	0	-	-	1,390	1,377	380	No	No	No	driveway	★	-	x	-
513	44F	44.01	CSAH 44	CSAH 14	CSAH 35	1	-	-	1,382	1,238	380	Yes	No	No	driveway	★★	-	x	-
514	44G	44.01	CSAH 44	CSAH 14	CSAH 35	1	-	-	1,391	1,591	380	Yes	No	No	driveway	★★	-	x	-
515	45A	45.01	CSAH 45	3 MILES SOUTH OF CSA	CSAH 1	0	-	-	798	1,278	250	Yes	Yes	Yes		★★★★	-	-	Installed
516	45B	45.01	CSAH 45	3 MILES SOUTH OF CSA	CSAH 1	0	-	-	1,242	616	185	No	No	No			-	-	-
517	45C	45.01	CSAH 45	3 MILES SOUTH OF CSA	CSAH 1	0	-	-	1,474	1,297	185	No	No	No	driveway		-	-	-
518	45D	45.01	CSAH 45	3 MILES SOUTH OF CSA	CSAH 1	0	-	-	1,825	941	185	No	No	No			-	-	-
519	45E	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	868	805	330	No	No	No	driveway	★★	x	-	Yes
520	45F	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	963	478	330	No	No	No	driveway	★★	x	-	Yes
521	45G	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	718	1,425	330	Yes	Yes	No	driveway	★★★	x	-	Installed
522	45H	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	719	860	330	No	No	No		★★	x	-	Yes
523	45I	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	339	308	330	Yes	Yes	No	driveway	★★	-	-	Installed
524	45J	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	424	424	165	No	Yes	No	driveway		-	-	Installed
525	45K	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	1,045	618	165	No	No	No		★	x	-	Yes
526	45L	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	731	888	165	No	Yes	No	driveway	★	x	-	Installed
527	45M	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	1,904	1,767	165	No	No	No	driveway		-	x	-
528	45N	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	941	918	165	No	No	No	driveway	★	x	-	Yes
529	45O	45.02	CSAH 45	CSAH 1	CSAH 74	0	-	-	336	352	165	Yes	No	No		★	-	-	-
530	46A	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	0	-	-	671	617	790	No	Yes	No	driveway	★	-	-	Installed
531	46B	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	0	-	-	546	672	790	No	Yes	No		★	-	-	Installed
532	46C	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	0	-	-	714	503	790	No	Yes	No	driveway	★	-	-	Installed
533	46D	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	2	-	-	978	1,091	530	Yes	Yes	No		★★★	-	-	Installed
534	46E	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	0	-	-	951	912	530	Yes	Yes	No		★★★	-	-	Installed
535	46F	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	0	-	-	665	612	235	No	Yes	No		★★	-	-	Installed
536	46G	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	0	-	-	695	872	235	Yes	Yes	No	driveway	★★★	-	-	Installed
537	46H	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	1	-	-	568	1,043	235	Yes	Yes	No		★★★	-	-	Installed
538	46I	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	0	-	-	712	1,147	235	Yes	Yes	No	driveway	★★★	-	-	Installed
539	46J	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	0	-	-	713	1,067	235	Yes	Yes	Yes		★★★★	-	-	Installed
540	46K	46.02	CSAH 46	PARKERS PRAIRIE COR	TODD COUNTY LINE	2	-	-	703	1,148	235	Yes	Yes	No		★★★	-	-	Installed
541	47A	47.01	CSAH 47	GRANT COUNTY LINE	CSAH 12	2	-	-	830	1,552	365	Yes	Yes	Yes		★★★★	-	-	Installed
542	47B	47.01	CSAH 47	GRANT COUNTY LINE	CSAH 12	1	-	-	820	1,388	365	Yes	Yes	Yes		★★★★	-	-	Installed
543	47C	47.02	CSAH 47	CSAH 12	MNTH 210	0	-	-	1,773	1,424	200	No	No	No	driveway	★	-	x	-
544	47D	47.02	CSAH 47	CSAH 12	MNTH 210	0	-	-	1,455	2,378	200	Yes	No	No		★★	-	x	-
545	47E	47.02	CSAH 47	CSAH 12	MNTH 210	0	-	-	1,417	1,417	200	No	No	No	driveway	★	-	x	-
546	47F	47.02	CSAH 47	CSAH 12	MNTH 210	0	-	-	749	1,325	200	Yes	Yes	No		★★★	-	-	Installed
547	49A	49.02	CSAH 49	RICHVILLE CORP LMTS	MNTH 108	1	-	-	990	1,106	580	Yes	Yes	No	driveway	★★★	-	-	Installed
548	49B	49.02	CSAH 49	RICHVILLE CORP LMTS	MNTH 108	0	-	-	1,210	732	580	No	No	No		★	-	-	-
549	49C	49.02	CSAH 49	RICHVILLE CORP LMTS	MNTH 108	0	-	-	1,374	578	580	No	No	No	driveway	★	-	-	-
550	49D	49.02	CSAH 49	RICHVILLE CORP LMTS	MNTH 108	0	-	-	902	1,471	580	Yes	Yes	No	driveway	★★★	-	-	Installed
551	49E	49.02	CSAH 49	RICHVILLE CORP LMTS	MNTH 108	0	-	-	856	1,610	580	Yes	Yes	Yes	driveway	★★★★	-	-	Installed
552	4A					0	-	-	10,357						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
553	4B					0	-	-	9,733						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
554	4C					0	-	-	10,130						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
555	4D	4.01	CSAH 4	USTH 59	CSAH 31	0	-	-	1,803	1,020	1,300	No	No	No	6 foot paved inside shoulder		-	-	-
556	4E	4.01	CSAH 4	USTH 59	CSAH 31	0	-	-	1,091	920	1,300	No	No	No	driveway	★	-	-	-
557	4F					0	-	-	5,598						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
558	4G					0	-	-	4,388						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
559	4H	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	2,545	871	1,300	Yes	No	No	driveway	★	-	-	-
560	4J	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	1,058	619	1,300	No	No	No	driveway	★	x	-	Yes
561	4K	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	1	-	-	1,312	650	1,300	Yes	No	No	driveway	★	-	x	-
562	4L	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	1	-	-	2,924	1,708	1,300	Yes	No	No	driveway	★	-	-	-
563	4M					0	-	-	3,609						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
564	4N	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	1,588	759	1,000	No	No	No			-	-	-
565	4O	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	1,814	820	1,000	No	No	No	driveway		-	-	-
566	4P	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	2,581	1,281	1,000	Yes	No	No	driveway	★	-	-	-
567	4Q					0	-	-	3,946						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
568	4R					0	-	-	3,785						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
569	4S	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	1,110	1,249	1,000	Yes	No	No		★★	x	-	Yes
570	4T	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	1	-	-	2,000	1,167	1,000	No	No	No	driveway		-	x	-
571	4U	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	2,556	1,268	1,000	No	No	No	driveway		-	-	-
572	4V	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	1,485	1,260	1,000	No	No	No			-	-	-
573	4W	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	2,769	936	1,300	Yes	No	No		★	-	-	-
574	4X					0	-	-	6,967						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
575	4Y					0	-	-	16,879						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
576	4Z	4.02	CSAH 4	CSAH 31	VERGAS CORP LMTS	0	-	-	1,459	1,512	1,600	No	No	No	driveway		-	-	-
577	4ZA					0	-	-	1,192	1,876					Removed From Further Analysis-Urban Segment	N/A	-	-	-
578	4ZB					0	-	-	363	287					Removed From Further Analysis-Urban Segment	N/A	-	-	-
579	4ZC					0	-	-	311	306					Removed From Further Analysis-Urban Segment	N/A	-	-	-
580	4ZD					0	-	-	3,318						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
581	4ZE	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	706	731	1,250	No	Yes	No	driveway	★	x	-	Installed
582	4ZF	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	1,393	1,079	1,250	Yes	No	No	driveway	★	-	-	-
583	4ZG	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	1	-	-	1,446	683	1,250	No	No	No	driveway		-	-	-
584	4ZI	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	1,182	613	1,250	Yes	No	No	driveway	★★	x	-	Yes
585	4ZJ	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	598	961	1,150	Yes	Yes	Yes	driveway	★★★	x	-	Installed
586	4ZK	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	1	-	-	585	834	1,050	Yes	Yes	No	driveway	★★	x	-	Installed
587	4ZL	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	1,185	636	1,050	No	Yes	No		★	x	-	Installed
588	4ZM	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	1	-	-	1,141	509	1,050	No	Yes	No		★	x	-	Installed
589	4ZN	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	2,928	690	1,050	No	No	No			-	-	-
590	4ZO	4.04	CSAH 4	VERGAS CORP LMTS	BECKER COUNTY LINE	0	-	-	1,272	796	1,050	No	Yes	No			-	-	Installed
591	50A	50.01	CSAH 50	MNTH 108	DEER CREEK CORP LMT	0	-	-	723	1,160	345	Yes	Yes	Yes	driveway	★★★★	-	-	Installed
592	50B	50.01	CSAH 50	MNTH 108	DEER CREEK CORP LMT	1	-	-	588	1,012	455	Yes	Yes	No		★★★	-	-	Installed
593	50C	50.03	CSAH 50	DEER CREEK CORP LMT	CSAH 75	1	-	-	1,122	1,052	330	No	Yes	No	driveway	★★	x	-	Installed
594	50D	50.03	CSAH 50	DEER CREEK CORP LMT	CSAH 75	0	-	-	1,165	1,146	330	Yes	Yes	No		★★★	x	-	Installed
595	51A					0	-	-	951						Removed From Further Analysis-Urban Segment	N/A	-	-	-
596	51B					0	-	-	483						Removed From Further Analysis-Urban Segment	N/A	-	-	-
597	51C	51.02	CSAH 51	PERHAM CORP LMTS	BECKER COUNTY LINE	0	-	-	1,692	586	2,200	No	No	No	driveway		-	x	-
598	51D	51.02	CSAH 51	PERHAM CORP LMTS	BECKER COUNTY LINE	0	-	-	2,718	1,171	2,200	Yes	Yes	No	driveway	★	-	-	Installed
599	51E	51.02	CSAH 51	PERHAM CORP LMTS	BECKER COUNTY LINE	2	-	-	1,249	1,081	2,200	No	Yes	No			-	-	Installed
600	51F	51.02	CSAH 51	PERHAM CORP LMTS	BECKER COUNTY LINE	4	-	-	1,223	922	2,200	Yes	Yes	No		★	-	-	Installed
601	51G	51.02	CSAH 51	PERHAM CORP LMTS	BECKER COUNTY LINE	1	-	-	2,321	573	590	No	No	No		★	-	x	-
602	51H	51.02	CSAH 51	PERHAM CORP LMTS	BECKER COUNTY LINE	0	-	-	613	392	590	No	Yes	No	driveway	★★	-	-	Installed
603	52A	52.02	CSAH 52	MNTH 106	MNTH 29	0	-	-	1,072	1,068	560	Yes	No	Yes	Inside paved 6', right turn lane, driveway	★★★★	-	-	Yes
604	53A	53.01	CSAH 53	USTH 10	CSAH 8	0	-	-	828	1,482	260	Yes	Yes	Yes		★★★★	x	-	Installed
605	53B	53.01	CSAH 53	USTH 10	CSAH 8	0	-	-	876	1,423	260	Yes	Yes	Yes		★★★★	x	-	Installed
606	53C	53.01	CSAH 53	USTH 10	CSAH 8	0	-	-	2,997	865	330	Yes	No	No	driveway	★★	-	-	-
607	53D	53.01	CSAH 53	USTH 10	CSAH 8	0	-	-	1,134	1,077	395	Yes	No	No	driveway	★★★	x	-	Yes
608	53E	53.01	CSAH 53	USTH 10	CSAH 8	0	-	-	1,523	1,180	395	No	No	No	driveway	★	-	x	-
609	53F	53.01	CSAH 53	USTH 10	CSAH 8	0	-	-	815	1,210	395	Yes	Yes	No	driveway	★★★	x	-	Installed
610	53G	53.01	CSAH 53	USTH 10	CSAH 8	0	-	-	1,137	1,502	395	Yes	Yes	No	driveway	★★★	x	-	Installed
611	53H	53.01	CSAH 53	USTH 10	CSAH 8	0	-	-	1,041	801	255	No	No	No	driveway	★★	x	-	Yes
612	53I	53.01	CSAH 53	USTH 10	CSAH 8	1	-	-	917	739	255	No	No	No	driveway	★★	x	-	Yes
613	54A	54.01	CSAH 54	MNTH 78	CSAH 67	0	-	-	1,414	701	600	Yes	Yes	No		★	-	-	Installed
614	54B	54.01	CSAH 54	MNTH 78	CSAH 67	0	-	-	1,611	1,944	600	Yes	No	No	driveway	★	-	x	-
615	54C	54.01	CSAH 54	MNTH 78	CSAH 67	1	-	-	814	652	600	Yes	Yes	No	driveway	★★	-	-	Installed
616	54D	54.01	CSAH 54	MNTH 78	CSAH 67	0	-	-	824	1,284	600	Yes	Yes	No		★★	-	-	Installed
617	54E	54.01	CSAH 54	MNTH 78	CSAH 67	1	-	-	825	1,338	600	Yes	Yes	No		★★	-	-	Installed
618	54F	54.01	CSAH 54	MNTH 78	CSAH 67	0	-	-	2,802	590	600	No	Yes	Yes	driveway	★	-	-	Installed
619	54G	54.01	CSAH 54	MNTH 78	CSAH 67	0	-	-	1,370	455	600	No	Yes	No			-	-	Installed
620	54H	54.01	CSAH 54	MNTH 78	CSAH 67	0	-	-	1,199	813	600	No	Yes	No	driveway		-	-	Installed
621	54I	54.01	CSAH 54	MNTH 78	CSAH 67	0	-	-	1,306	474	600	No	Yes	No			-	-	Installed
622	54J	54.01	CSAH 54	MNTH 78	CSAH 67	1	-	-	657	399	600	No	Yes	Yes	driveway	★★	-	-	Installed
623	55A	55.01	CSAH 55	CSAH 16	OTTERTAIL CORP LMTS	1	-	-	813	1,394	290	Yes	Yes	No	driveway	★★★	x	-	Installed
624	55B	55.01	CSAH 55	CSAH 16	OTTERTAIL CORP LMTS	1	-	-	997	1,089	290	No	No	No	driveway	★★	x	-	Yes
625	55C	55.01	CSAH 55	CSAH 16	OTTERTAIL CORP LMTS	1	-	-	907	483	290	No	No	No		★★	x	-	Yes
626	55D	55.01	CSAH 55	CSAH 16	OTTERTAIL CORP LMTS	1	-	-	989	753	290	Yes	No	No	driveway	★★★	x	-	Yes
627	55E					0	-	-	4,217						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
628	55F					0	-	-	3,261						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
629	55G	55.01	CSAH 55	CSAH 16	OTTERTAIL CORP LMTS	0	-	-	2,227	818	290	No	No	No	driveway	★	-	x	-
630	55H	55.01	CSAH 55	CSAH 16	OTTERTAIL CORP LMTS	0	-	-	907	826	290	Yes	Yes	No	driveway	★★★	x	-	Installed
631	55I	55.01	CSAH 55	CSAH 16	OTTERTAIL CORP LMTS	0	-	-	1,521	653	290	No	Yes	No	driveway	★	-	-	Installed
632	56A	56.02	CSAH 56	NEW YORK MILLS CORP	CSAH 19	0	-	-	825	1,378	175	No	Yes	No		★	x	-	Installed
633	56B	56.02	CSAH 56	NEW YORK MILLS CORP	CSAH 19	0	-	-	1,332	392	175	No	Yes	Yes		★	-	-	Installed
634	56C	56.02	CSAH 56	NEW YORK MILLS CORP	CSAH 19	0	-	-	1,483	469	175	No	Yes	No			-	-	Installed
635	57A	57.01	CSAH 57	CSAH 6	MNTH 210	1	-	-	816	894	130	Yes	Yes	No		★★	-	-	Installed
636	57B	57.01	CSAH 57	CSAH 6	MNTH 210	0	-	-	832	812	130	Yes	Yes	No		★★	-	-	Installed
637	57C	57.01	CSAH 57	CSAH 6	MNTH 210	0	-	-	790	730	130	Yes	Yes	No		★★	-	-	Installed
638	57D	57.01	CSAH 57	CSAH 6	MNTH 210	0	-	-	796	700	130	No	Yes	No		★	-	-	Installed
639	58A	58.01	CSAH 58	CSAH 67	CSAH 19	0	-	-	840	1,384	160	Yes	Yes	Yes		★★★	-	-	Installed
640	58B	58.01	CSAH 58	CSAH 67	CSAH 19	0	-	-	1,908	1,257	135	No	No	No	driveway		-	x	-
641	58C	58.01	CSAH 58	CSAH 67	CSAH 19	0	-	-	900	716	135	Yes	No	No		★★	-	x	Yes
642	58D	58.01	CSAH 58	CSAH 67	CSAH 19	0	-	-	816	1,363	135	Yes	Yes	No		★★	-	-	Installed
643	59A					0	-	-	982						Removed From Further Analysis-Urban Segment	N/A	-	-	-
644	59B					0	-	-	1,143						Removed From Further Analysis-Urban Segment	N/A	-	-	-
645	59C	59.03	CSAH 59	URBANK CORP LMTS	CSAH 40	0	-	-	2,693	934	380	No	No	No	driveway	★	-	-	-
646	59D	59.03	CSAH 59	URBANK CORP LMTS	CSAH 40	0	-	-	978	1,015	380	No	No	No	driveway	★★	-	-	-
647	59E	59.03	CSAH 59	URBANK CORP LMTS	CSAH 40	0	-	-	1,288	700	380	No	No	No	driveway	★	-	-	-
648	59F					0	-	-	3,030						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
649	59G	59.03	CSAH 59	URBANK CORP LMTS	CSAH 40	2	-	-	1,165	815	300	No	No	No	driveway	★★	-	-	-
650	59H	59.03	CSAH 59	URBANK CORP LMTS	CSAH 40	0	-	-	2,151	982	300	No	No	No	driveway	★	-	-	-

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
651	5A	5.01	CSAH 5	CSAH 38	MNTH 210	0	-	-	721	1,094	295	Yes	Yes	Yes		★★★★	-	-	Installed
652	5B	5.01	CSAH 5	CSAH 38	MNTH 210	0	-	-	712	1,105	295	Yes	Yes	Yes	driveway	★★★★	-	-	Installed
653	5C					0	-	-	329						Removed From Further Analysis-Urban Segment	N/A	-	-	-
654	5D	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	0	-	-	727	1,228	840	Yes	Yes	Yes		★★★	x	-	Installed
655	5E	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	1	-	-	693	1,111	790	Yes				★★	x	-	Yes
656	5F	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	2	-	-	1,138	1,213	790	Yes	Yes	Yes	driveway	★★★	x	-	Installed
657	5G	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	0	-	-	2,512	1,016	790	No	No	No	driveway		-	-	-
658	5H	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	0	-	-	1,426	833	790	Yes	No	No	driveway	★	-	-	-
659	5I	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	0	-	-	1,381	881	635	Yes	No	No	driveway	★	-	-	-
660	5J	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	1	-	-	1,503	615	480	No	No	No	driveway	★	-	-	-
661	5K	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	0	-	-	1,900	1,376	480	No	No	No	driveway	★	-	x	-
662	5L	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	0	-	-	1,181	1,726	480	Yes	No	No	driveway	★★★	x	-	Yes
663	5M	5.03	CSAH 5	CLITHERALL CORP LMT	CSAH 16	0	-	-	1,326	979	480	No	No	No	driveway	★	-	x	-
664	5N	5.04	CSAH 5	CSAH 16	MNTH 78	0	-	-	1,294	690	440	Yes	Yes	No	driveway	★★	-	-	Installed
665	5O	5.04	CSAH 5	CSAH 16	MNTH 78	0	-	-	815	698	440	No	Yes	No	driveway	★★	x	-	Installed
666	5P	5.04	CSAH 5	CSAH 16	MNTH 78	0	-	-	547	586	440	Yes	Yes	No	driveway	★★★	x	-	Installed
667	60A	60.01	CSAH 60	USTH 10 and MNTH 228	CSAH 51	1	-	-	1,409	1,391	475	No	No	No	driveway	★	-	-	-
668	60B	60.01	CSAH 60	USTH 10 and MNTH 228	CSAH 51	0	-	-	2,174	1,232	475	No	No	No	driveway	★	-	-	-
669	60C					0	-	-	5,637						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
670	61A	61.01	CSAH 61	CSAH 16	MNTH 108	0	-	-	842	1,401	170	No	Yes	No	driveway	★	x	-	Installed
671	61B	61.01	CSAH 61	CSAH 16	MNTH 108	0	-	-	282	453	330	Yes	Yes	Yes		★★★	-	-	Installed
672	61C	61.01	CSAH 61	CSAH 16	MNTH 108	0	-	-	1,119	490	485	No	No	No	driveway	★★	x	-	Yes
673	61D	61.01	CSAH 61	CSAH 16	MNTH 108	0	-	-	905	205	485	No	No	No	driveway	★★	x	-	Yes
674	61E	61.01	CSAH 61	CSAH 16	MNTH 108	0	-	-	1,330	590	485	No	No	No	driveway	★	-	x	-
675	61F	61.01	CSAH 61	CSAH 16	MNTH 108	0	-	-	1,909	492	485	Yes	No	No	driveway	★★	-	x	-
676	62A	62.01	CSAH 62	CSAH 67	CSAH 19	0	-	-	847	1,552	165	No	Yes	No	driveway	★	-	-	Installed
677	62B	62.01	CSAH 62	CSAH 67	CSAH 19	0	-	-	829	1,472	165	Yes	Yes	Yes		★★★	-	-	Installed
678	63A	63.01	CSAH 63	DOUGLAS COUNTY LINE	MNTH 235	0	-	-	255	352	235	No	Yes	No		★	-	-	Installed
679	63B	63.01	CSAH 63	DOUGLAS COUNTY LINE	MNTH 235	0	-	-	1,252	357	235	No	No	No	driveway	★	-	-	-
680	64A	64.01	CSAH 64	MNTH 78	DOUGLAS COUNTY LINE	2	-	-	848	1,596	350	Yes	No	No		★★★	x	-	Yes
681	65A	65.01	CSAH 65	CSAH 6	CSAH 40	0	-	-	2,691	1,162	380	No	No	No	driveway	★	-	-	-
682	65B	65.01	CSAH 65	CSAH 6	CSAH 40	0	-	-	2,954	1,127	380	No	No	No	driveway	★	-	-	-
683	65C	65.01	CSAH 65	CSAH 6	CSAH 40	0	-	-	819	729	380	Yes	Yes	No		★★★	-	-	Installed
684	65D	65.01	CSAH 65	CSAH 6	CSAH 40	0	-	-	1,468	1,119	380	No	No	No	driveway	★	-	-	-
685	65E	65.01	CSAH 65	CSAH 6	CSAH 40	0	-	-	1,177	570	380	No	No	No		★★	-	-	-
686	65F	65.02	CSAH 65	CSAH 40	HENNING CORP LMTS	0	-	-	703	940	460	Yes	Yes	No		★★★	-	-	Installed
687	65G	65.02	CSAH 65	CSAH 40	HENNING CORP LMTS	0	-	-	709	1,046	460	No	Yes	No		★★	-	-	Installed
688	65H	65.02	CSAH 65	CSAH 40	HENNING CORP LMTS	0	-	-	1,918	797	460	No	No	No	driveway	★	-	x	-
689	65I	65.02	CSAH 65	CSAH 40	HENNING CORP LMTS	0	-	-	1,448	586	460	No	No	No		★	-	x	-
690	65J	65.02	CSAH 65	CSAH 40	HENNING CORP LMTS	0	-	-	1,209	487	460	No	Yes	No	driveway	★	-	-	Installed
691	65K	65.02	CSAH 65	CSAH 40	HENNING CORP LMTS	0	-	-	1,853	491	460	Yes	No	No	driveway	★★	-	x	-
692	65L	65.02	CSAH 65	CSAH 40	HENNING CORP LMTS	0	-	-	1,441	812	460	No	No	No		★	-	-	-
693	65M	65.02	CSAH 65	CSAH 40	HENNING CORP LMTS	0	-	-	1,433	786	460	Yes	No	No	Turn lanes in both directions	★★	-	-	-
694	66A	66.01	CSAH 66	CSAH 75	WADENA COUNTY LINE	0	-	-	808	1,319	160	Yes	No	No		★★	-	-	-
695	67A					0	-	-	1,452						Removed From Further Analysis-Urban Segment	N/A	-	-	-
696	67B	67.02	CSAH 67	HENNING CORP LMTS	CSAH 52	0	-	-	669	513	570	Yes	Yes	Yes		★★★★	-	-	Installed
697	67C	67.02	CSAH 67	HENNING CORP LMTS	CSAH 52	0	-	-	830	1,326	320	Yes	Yes	Yes		★★★★	-	-	Installed
698	67D	67.02	CSAH 67	HENNING CORP LMTS	CSAH 52	1	-	-	825	1,427	320	No	Yes	No	driveway	★★	-	-	Installed
699	67E	67.02	CSAH 67	HENNING CORP LMTS	CSAH 52	0	-	-	772	1,370	320	Yes	Yes	Yes		★★★★	-	-	Installed
700	67F	67.02	CSAH 67	HENNING CORP LMTS	CSAH 52	0	-	-	791	1,275	320	Yes	Yes	Yes		★★★★	-	-	Installed
701	67G	67.02	CSAH 67	HENNING CORP LMTS	CSAH 52	1	-	-	356	359	330	Yes	Yes	No		★★	-	-	Installed
702	67H	67.02	CSAH 67	HENNING CORP LMTS	CSAH 52	0	-	-	2,005	980	330	No	No	No	driveway	★	-	-	-
703	67I	67.02	CSAH 67	HENNING CORP LMTS	CSAH 52	1	-	-	2,060	662	330	Yes	No	No	driveway	★★	-	-	-
704	67J					0	-	-	4,860						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
705	67K	67.03	CSAH 67	CSAH 52	NEW YORK MILLS CORP	2	-	-	716	1,143	520	Yes	Yes	Yes		★★★★	x	-	Installed
706	67L	67.03	CSAH 67	CSAH 52	NEW YORK MILLS CORP	0	-	-	724	1,178	520	Yes	Yes	Yes		★★★★	x	-	Installed
707	67M	67.03	CSAH 67	CSAH 52	NEW YORK MILLS CORP	1	-	-	713	1,170	860	Yes	Yes	Yes		★★★	x	-	Installed
708	67N	67.03	CSAH 67	CSAH 52	NEW YORK MILLS CORP	0	-	-	726	1,151	1,200	Yes	Yes	Yes		★★★	x	-	Installed
709	67O					0	-	-	348						Removed From Further Analysis-Urban Segment	N/A	-	-	-
710	67P					0	-	-	2,523						Removed From Further Analysis-Urban Segment	N/A	-	-	-
711	67Q	67.05	CSAH 67	NEW YORK MILLS CORP	CSAH 8 EAST	0	-	-	1,265	1,633	1,100	Yes	No	No	Turn lanes in both directions, driveway	★	-	-	-
712	67R	67.05	CSAH 67	NEW YORK MILLS CORP	CSAH 8 EAST	0	-	-	1,432	1,336	1,100	Yes	No	No		★	-	-	-
713	67S	67.05	CSAH 67	NEW YORK MILLS CORP	CSAH 8 EAST	0	-	-	1,159	2,348	740	Yes	No	No	driveway	★★	-	-	-
714	67T	67.07	CSAH 67	CSAH 8 WEST	BECKER COUNTY LINE	0	-	-	832	1,366	315	No	Yes	Yes		★★★	-	-	Installed
715	67U	67.07	CSAH 67	CSAH 8 WEST	BECKER COUNTY LINE	0	-	-	1,878	1,937	315	No	No	No	driveway	★	-	x	-
716	6A	6.01	CSAH 6	CSAH 5	CSAH 65 and CH 129	0	-	-	1,940	762	295	No	No	No		★	-	-	-
717	6B	6.01	CSAH 6	CSAH 5	CSAH 65 and CH 129	0	-	-	1,169	1,077	295	No	No	No	driveway	★★	-	-	-
718	6C	6.01	CSAH 6	CSAH 5	CSAH 65 and CH 129	0	-	-	2,444	829	295	Yes	No	No		★★	-	-	-
719	71A	71.01	CSAH 71	DOUGLAS COUNTY LINE	CSAH 46	0	-	-	799	1,235	175	Yes	Yes	Yes		★★★	x	-	Installed
720	71B	71.01	CSAH 71	DOUGLAS COUNTY LINE	CSAH 46	0	-	-	829	1,277	175	Yes	Yes	Yes		★★★	x	-	Installed
721	71C	71.01	CSAH 71	DOUGLAS COUNTY LINE	CSAH 46	0	-	-	835	1,358	175	Yes	Yes	Yes	driveway	★★★	x	-	Installed
722	71D					0	-	-	5,071						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
723	71E	71.01	CSAH 71	DOUGLAS COUNTY LINE	CSAH 46	0	-	-	716	1,358	175	Yes	Yes	Yes	driveway	★★★	x	-	Installed
724	71F					0	-	-	3,017						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
725	72A	72.01	CSAH 72	MNTH 78	CSAH 83	0	-	-	203	365	1,500	Yes	Yes	Yes		★★	-	-	Installed
726	72B	72.01	CSAH 72	MNTH 78	CSAH 83	0	-	-	846	1,084	1,500	Yes	Yes	Yes	driveway	★★★	x	-	Installed
727	72C	72.01	CSAH 72	MNTH 78	CSAH 83	0	-	-	862	621	1,500	Yes	No	No	driveway	★★	x	-	Yes
728	72D	72.01	CSAH 72	MNTH 78	CSAH 83	0	-	-	2,414	1,148	1,500	Yes	No	No	driveway	★	-	-	-
729	72E					0	-	-	3,277						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
730	73A	73.01	CSAH 73	CSAH 40	MNTH 210	0	-	-	1,093	751	155	Yes	Yes	No	driveway	★★	-	-	Installed
731	73B	73.01	CSAH 73	CSAH 40	MNTH 210	0	-	-	995	686	155	No	Yes	No	driveway	★	-	-	Installed
732	73C	73.02	CSAH 73	MNTH 210	MNTH 29	0	-	-	2,552	534	210	Yes	No	No		★★	-	-	-
733	74A	74.01	CSAH 74	CSAH 35	CSAH 45	0	-	-	1,111	1,122	420	Yes	No	Yes		★★★★	-	-	Yes
734	74B	74.02	CSAH 74	CSAH 45	CSAH 1	0	-	-	1,299	1,188	420	No	No	No	Turn lanes in both directions	★	-	x	-
735	74C	74.02	CSAH 74	CSAH 45	CSAH 1	0	-	-	1,227	951	420	No	No	No		★	-	x	-
736	74D	74.02	CSAH 74	CSAH 45	CSAH 1	0	-	-	1,183	1,114	385	Yes	No	No	Turn lanes in both directions	★★★	-	-	Yes
737	74E	74.02	CSAH 74	CSAH 45	CSAH 1	0	-	-	1,788	1,773	345	Yes	No	No		★★	-	x	-
738	74F	74.02	CSAH 74	CSAH 45	CSAH 1	0	-	-	1,519	1,294	345	Yes	No	No	driveway	★★	-	x	-
739	74G	74.02	CSAH 74	CSAH 45	CSAH 1	0	-	-	596	689	345	Yes	Yes	No	driveway	★★★	-	-	Installed
740	75A	75.01	CSAH 75	CSAH 40	MNTH 210	0	-	-	482	648	140	Yes	No	No	Half of curve has 8' paved edges, driveway	★	-	x	Yes
741	75B	75.01	CSAH 75	CSAH 40	MNTH 210	0	-	-	726	852	140	Yes	Yes	Yes	driveway	★★★	x	-	Installed
742	75C	75.01	CSAH 75	CSAH 40	MNTH 210	0	-	-	845	849	140	Yes	Yes	Yes		★★★	x	-	Installed
743	75D	75.01	CSAH 75	CSAH 40	MNTH 210	1	-	-	830	932	140	Yes	Yes	No	driveway	★★	x	-	Installed
744	75E					0	-	-	3,106						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
745	75F	75.05	CSAH 75	CSAH 8	BECKER COUNTY LINE	0	-	-	828	1,575	245	Yes	Yes	Yes		★★★★	-	-	Installed
746	76A	76.01	CSAH 76	USTH 10	CSAH 19	0	-	-	935	679	220	Yes	Yes	No	Chevron in decreasing direction only	★★★	-	-	Installed
747	77A					0	-	-	958						Removed From Further Analysis-Urban Segment	N/A	-	-	-
748	77B					0	-	-	880						Removed From Further Analysis-Urban Segment	N/A	-	-	-
749	77C					0	-	-	293						Removed From Further Analysis-Urban Segment	N/A	-	-	-
750	79A	79.01	CSAH 79	DOUGLAS CNTY LINE	MNTH 235	0	-	-	804	1,319	175	No	Yes	Yes	driveway	★★	-	-	Installed
751	79B	79.01	CSAH 79	DOUGLAS CNTY LINE	MNTH 235	0	-	-	810	1,391	175	No	Yes	No	driveway	★	-	-	Installed
752	80A	80.01	CSAH 80	USTH 10 WEST	PERHAM CORP LMTS	0	-	-	2,901	1,001	2,650	No	No	No	interchange		-	-	-
753	80B	80.01	CSAH 80	USTH 10 WEST	PERHAM CORP LMTS	0	-	-	2,488	780	2,650	No	No	No	interchange		-	-	-
754	80C	80.01	CSAH 80	USTH 10 WEST	PERHAM CORP LMTS	0	-	-	2,259	526	3,500	Yes	No	No		★	-	-	-
755	80D					0	-	-	1,437						Removed From Further Analysis-Urban Segment	N/A	-	-	-
756	80E	80.03	CSAH 80	PERHAM CORP LMTS	USTH 10 EAST	1	-	-	2,759	803	2,550	No	No	No	driveway		-	-	-
757	80F	80.03	CSAH 80	PERHAM CORP LMTS	USTH 10 EAST	2	-	-	609	706	2,550	Yes	No	Yes		★★★	x	-	Yes
758	81A	81.01	CSAH 81	MNTH 78	CSAH 38	0	-	-	1,093	353	100	No	No	No		★	-	-	-
759	81B	81.01	CSAH 81	MNTH 78	CSAH 38	0	-	-	818	673	100	No	No	No		★	-	-	-
760	81C	81.01	CSAH 81	MNTH 78	CSAH 38	0	-	-	817	1,133	100	No	No	No	driveway	★	-	-	-
761	81D	81.01	CSAH 81	MNTH 78	CSAH 38	0	-	-	798	514	100	No	No	No	driveway	★	-	-	-
762	82A					0	-	-	5,683						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
763	82B					0	-	-	5,487						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
764	82C	82.01	CSAH 82	GRANT COUNTY LINE	DALTON CORP LMTS	0	-	-	2,384	842	700	Yes	No	No	Turn lanes in both directions, driveway	★	-	-	-
765	82D					0	-	-	1,869						Removed From Further Analysis-Urban Segment	N/A	-	-	-
766	82E	82.03	CSAH 82	DALTON CORP LMTS	USTH 59	1	-	-	2,041	1,187	1,300	No	No	No	driveway		-	-	-
767	82F					0	-	-	6,170						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
768	82G	82.03	CSAH 82	DALTON CORP LMTS	USTH 59	0	-	-	2,958	2,206	1,300	Yes	No	No		★	-	-	-
769	82H	82.03	CSAH 82	DALTON CORP LMTS	USTH 59	1	-	1	2,023	1,146	1,300	No	No	No		★	-	-	-
770	82I					0	-	-	4,805						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
771	82J	82.04	CSAH 82	USTH I 94	FERGUS FALLS CORP L	2	-	-	1,955	1,686	2,750	Yes	No	Yes	Turn lane or passing lane on side of roadway, driveway	★★	-	-	-
772	82K	82.04	CSAH 82	USTH I 94	FERGUS FALLS CORP L	1	-	-	2,859	1,441	2,750	No	No	No			-	-	-
773	82L					0	-	-	2,476						Removed From Further Analysis-Urban Segment	N/A	-	-	-
774	83A					0	-	-	1,991						Removed From Further Analysis-Urban Segment	N/A	-	-	-
775	83B	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	835	1,449	540	Yes	Yes	Yes	driveway	★★★★	x	-	Installed
776	83C	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	1,487	681	540	No	No	No		★	-	x	-
777	83D	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	1	-	-	1,502	917	540	No	No	No	driveway	★	-	-	-
778	83E	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	1,586	567	540	Yes	No	No		★★	-	-	-
779	83F	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	937	1,064	375	Yes	No	No		★★★	x	-	Yes
780	83G	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	977	1,007	210	Yes	No	No	driveway	★★★	x	-	Yes
781	83H	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	832	1,473	210	Yes	Yes	Yes		★★★★	x	-	Installed
782	83I	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	823	1,373	210	Yes	Yes	Yes		★★★★	x	-	Installed
783	83J	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	2,345	579	210	Yes	No	No	driveway	★★	-	-	-
784	83K	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	461	566	210	No	No	No	driveway	★	-	x	Yes
785	83L	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	388	396	210	No	Yes	No	driveway	★	-	-	Installed
786	83M	83.02	CSAH 83	BATTLE LAKE CORP LM	CSAH 1	0	-	-	179	149	210	Yes	No	No		★★	-	-	-
787	84A	84.01	CSAH 84	USTH 10 WEST	NEW YORK MILLS CORP	0	-	-	1,230	777	1,050	No	No	No			-	-	-
788	84B	84.03	CSAH 84	NEW YORK MILLS CORP	USTH 10 EAST	0	-	-	923	863	1,350	No	No	No		★	x	-	Yes
789	85A					0	-	-	3,117						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
790	85B	85.01	CSAH 85	MNTH 108	CSAH 35	0	-	-	2,855	1,677	465	No	No	No		★	-	-	-
791	86A					0	-	-	313						Removed From Further Analysis-Urban Segment	N/A	-	-	-
792	86B					0	-	-	1,317						Removed From Further Analysis-Urban Segment	N/A	-	-	-

Otter Tail County Curves

Curve Count	ID	Corridor	Segment	Start	End	Crashes Total	Crashes K	Crashes A	Radius (ft)	Length Curve (ft)	ADT	Intersection on Curve	Chevrons	Visual Trap	Notes	Rank	High Priority Segment + Radius	Proximity	Chevron Candidate
793	88A	88.01	CSAH 88	FERGUS FALLS CORP LI	USTH 59	1	-	-	1,254	1,065	3,200	No	No	No			-	-	-
794	88B	88.01	CSAH 88	FERGUS FALLS CORP LI	USTH 59	0	-	-	2,243	1,220	3,200	No	No	No	driveway		-	-	-
795	88C	88.01	CSAH 88	FERGUS FALLS CORP LI	USTH 59	3	-	-	1,259	1,446	3,200	Yes	No	No	Turn lanes in both directions, driveway	★	-	-	-
796	88D	88.01	CSAH 88	FERGUS FALLS CORP LI	USTH 59	1	-	-	1,540	1,528	2,800	Yes	No	No	Turn lane on outside, driveway	★	-	-	-
797	88E	88.01	CSAH 88	FERGUS FALLS CORP LI	USTH 59	0	-	-	2,245	2,116	2,800	No	No	No	driveway		-	-	-
798	88F	88.02	CSAH 88	USTH 59	CSAH 10	0	-	-	1,999	2,428	495	Yes	No	No		★★	-	-	-
799	88G					0	-	-	4,604						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
800	88H					0	-	-	8,976						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
801	88I					0	-	-	8,888						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
802	88J					0	-	-	6,342						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
803	88K					0	-	-	1,635						Removed From Further Analysis-Urban Segment	N/A	-	-	-
804	89A					0	-	-	191						Removed From Further Analysis-Urban Segment	N/A	-	-	-
805	89B					0	-	-	3,694						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
806	89C					0	-	-	1,042						Removed From Further Analysis-Urban Segment	N/A	-	-	-
807	89D					0	-	-	443						Removed From Further Analysis-Urban Segment	N/A	-	-	-
808	8A					0	-	-	412						Removed From Further Analysis-Urban Segment	N/A	-	-	-
809	8B					0	-	-	1,588						Removed From Further Analysis-Urban Segment	N/A	-	-	-
810	8C	8.02	CSAH 8	PERHAM CORP LMTS	CSAH 53	3	-	-	1,524	1,851	2,975	Yes	Yes	No	driveway	★	-	-	Installed
811	8D	8.02	CSAH 8	PERHAM CORP LMTS	CSAH 53	0	-	-	2,974	2,440	1,925	Yes	No	No	driveway	★	-	-	-
812	8E	8.02	CSAH 8	PERHAM CORP LMTS	CSAH 53	0	-	-	1,365	807	1,700	No	No	No	driveway		-	-	-
813	8F	8.02	CSAH 8	PERHAM CORP LMTS	CSAH 53	0	-	-	1,410	1,571	2,850	Yes	Yes	No	driveway	★	-	-	Installed
814	8G	8.04	CSAH 8	CSAH 67	WADENA COUNTY LINE	0	-	-	1,848	1,551	570	No	Yes	No	driveway	★	-	-	Installed
815	8H	8.04	CSAH 8	CSAH 67	WADENA COUNTY LINE	0	-	-	1,919	1,802	570	Yes	Yes	No		★★	-	-	Installed
816	8I	8.04	CSAH 8	CSAH 67	WADENA COUNTY LINE	0	-	-	1,001	1,318	570	Yes	Yes	No	driveway	★★★	-	-	Installed
817	8J	8.04	CSAH 8	CSAH 67	WADENA COUNTY LINE	1	-	-	992	1,162	570	No	Yes	No		★★	-	-	Installed
818	9A					0	-	-	122						Removed From Further Analysis-Urban Segment	N/A	-	-	-
819	9B					0	-	-	2,944						Removed From Further Analysis-Urban Segment	N/A	-	-	-
820	9C					0	-	-	3,879						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
821	9D					0	-	-	3,783						Removed From Further Analysis-Radius > 3000'	N/A	-	-	-
822	9E	9.02	CSAH 9	PELICAN RAPIDS CORP	MNTH 34	1	-	-	2,182	1,123	1,350	No	No	No			-	-	-
823	9F	9.02	CSAH 9	PELICAN RAPIDS CORP	MNTH 34	1	1	-	1,857	1,127	1,350	Yes	No	No		★★	-	-	-
824	9G	9.02	CSAH 9	PELICAN RAPIDS CORP	MNTH 34	4	-	-	233	317	1,350	Yes	No	No		★	-	-	-
825	9H	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	1,987	1,072	790	No	No	No	driveway		-	x	-
826	9I	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	1,907	1,103	790	Yes	No	No		★	-	x	-
827	9J	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	2,119	1,021	790	Yes	No	No		★	-	x	-
828	9K	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	1,151	1,057	790	No	No	No	driveway	★	x	-	Yes
829	9L	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	1	-	-	1,311	675	790	No	No	No			-	x	-
830	9M	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	1,325	838	790	No	No	No	driveway		-	x	-
831	9N	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	774	720	840	Yes	No	No	driveway	★★	x	-	Yes
832	9O	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	1,001	489	890	No	No	No	driveway	★	x	-	Yes
833	9P	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	968	229	890	No	No	No	driveway	★	x	-	Yes
834	9Q	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	240	260	890	No	Yes	No	driveway		-	-	Installed
835	9R	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	405	234	890	No	No	No	driveway		-	x	Yes
836	9S	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	1	-	-	546	317	890	Yes	Yes	No	driveway	★★	x	-	Installed
837	9T	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	712	258	890	No	No	No	driveway	★	x	-	Yes
838	9U	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	1,554	359	890	No	No	No	driveway		-	x	-
839	9V	9.03	CSAH 9	MNTH 34	BECKER COUNTY LINE	0	-	-	2,338	1,200	890	No	No	No	driveway		-	-	-
839						194	4	6											

Stars	Total #	Total %	Chevroned #	Chevroned %
★★★★★	1	0%	1	0%
★★★★	39	6%	32	12%
★★★	110	16%	84	31%
★★	201	28%	89	33%
★	249	35%	62	23%
-	107	15%	0	0%
	707	100%	268	100%

Critical	Min	Max
Radius	500	1,199
ADT	200	599

	#	%
Installed	281	33%
Chev. Proj	103	12%
Other	455	54%
Total	839	

Curves on CSAH 1 from FERGUS FALLS CORP LMTS to CSAH 10

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
1I	0	0	1249	4625	Yes	Yes	★★	-	-	-	-	-
1J	0	0	1588	2350	Yes	Yes	★★	-	-	-	-	-
1K	0	0	1503	2350	Yes	No	★	-	-	-	-	-
1L	0	0	1606	2350	Yes	No	★	-	-	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$0
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.5 miles	$1,388
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$1,388

Implementation Cost

Federal Funds	$1,249
Local Match (10% of Total project cost)	$139
Total Project Cost	$1,388

2005-2009 MnCMAT Crash Data

Curves on CSAH 1 from CSAH 35 to Oak Ridge Beach Rd

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
1M	0	0	1464	1800	No	No		-	-	-	-	-
1N	0	0	1099	1800	Yes	No	★★	-	-	-	-	-
1O	0	0	1152	1800	Yes	No	★★	-	-	-	-	-
1P	0	0	1422	1800	No	No		-	-	-	-	-
1Q	0	0	1462	1800	Yes	No	★	-	-	Installed	No	Yes
1R	0	0	1563	1225	Yes	Yes	★★	-	-	-	-	-
1S	0	0	1362	1400	Yes	Yes	★★	-	-	Installed	No	Yes
1T	0	0	1556	1400	No	Yes	★	x	-	-	No	Yes
1U	0	0	1382	1400	Yes	No	★	-	-	Installed	No	Yes
1V	0	0	1385	1400	Yes	Yes	★★	-	-	Installed	No	Yes
1W	0	0	729	1400	Yes	No	★★	-	-	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	5 curves	$3,301
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	1.7 miles	$4,983
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$8,283

Implementation Cost

Federal Funds	$7,455
Local Match (10% of Total project cost)	$828
Total Project Cost	$8,283

2005-2009 MnCMAT Crash Data

Curves on CSAH 1 from Oak Ridge Beach Rd to OTTERTAIL CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
1X	0	0	748	1400	No	No	★	-	-	-	-	-
1Y	0	0	842	1400	Yes	No	★★	-	-	-	-	-
1Z	0	0	1675	1400	Yes	No	★	-	-	-	-	-
1ZA	0	0	180	1400	No	No		-	-	Installed	No	Yes
1ZB	0	0	1061	1400	Yes	No	★★	-	-	-	-	-
1ZG	0	0	2854	1950	Yes	No	★	-	-	-	-	-
1ZH	0	0	1231	1950	Yes	No	★	-	-	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.2 miles	$734
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$4,034

Implementation Cost

Federal Funds	$3,630
Local Match (10% of Total project cost)	$403
Total Project Cost	$4,034

2005-2009 MnCMAT Crash Data

Curves on CSAH 2 from WILKIN CNTY LINE to CSAH 1

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
2A	0	0	410	145	Yes	Yes	★★	-	-	Installed	Yes	No
2B	0	0	438	145	Yes	No	★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$11,621
					$18,221

Implementation Cost

Federal Funds	$16,399
Local Match (10% of Total project cost)	$1,822
Total Project Cost	$18,221

2005-2009 MnCMAT Crash Data

Curves on CSAH 3 from CSAH 10 to CSAH 24

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
3B	0	0	2342	820	Yes	No	★	-	-	-	-	-
3D	0	0	2158	420	No	No	★	x	-	-	No	Yes
3E	0	0	705	420	No	No	★★	-	x	Installed	No	Yes
3F	0	0	2502	420	No	No	★	x	-	-	No	Yes
3G	0	0	1003	500	Yes	No	★★★	-	x	Yes	No	Yes
3H	0	0	2128	580	No	No	★	-	-	-	-	-
3I	0	0	1963	580	No	No	★	-	-	-	-	-
3J	0	0	1888	580	No	No	★	-	-	-	-	-
3K	0	0	2756	580	No	No	★	-	-	-	-	-
3L	0	0	2276	580	No	No	★	-	-	-	-	-
3M	0	0	767	580	No	No	★★	-	x	Installed	Outside	One Side Only
3N	0	0	1424	580	No	No	★	-	-	Installed	Outside	One Side Only
3P	0	0	1650	580	No	No	★	-	-	-	-	-
3Q	0	0	2520	580	Yes	No	★★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	1.3 miles	$3,937
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$10,269
					$24,106

Implementation Cost

Federal Funds	$21,695
Local Match (10% of Total project cost)	$2,411
Total Project Cost	$24,106

2005-2009 MnCMAT Crash Data

Curves on CSAH 3 from CSAH 24 to USTH 59

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
3R	0	0	956	580	Yes	No	★★★	-	x	Yes	Outside	One Side Only
3S	0	0	961	580	No	No	★★	-	x	Yes	Outside	One Side Only
3T	0	0	2222	580	No	No	★	x	-	-	Yes	No
3U	0	0	1545	580	No	No	★	x	-	-	Yes	No
3V	0	0	816	685	Yes	No	★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.2 miles	$557
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.2 miles	$46,833
					$57,291

Implementation Cost

Federal Funds	$51,562
Local Match (10% of Total project cost)	$5,729
Total Project Cost	$57,291

2005-2009 MnCMAT Crash Data

Curves on CSAH 4 from CSAH 31 to VERGAS CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
4H	0	0	2545	1300	Yes	No	★	-	-	-	-	-
4J	0	0	1058	1300	No	No	★	-	x	Yes	Yes	No
4K	0	0	1312	1300	Yes	No	★	x	-	-	No	Yes
4L	0	0	2924	1300	Yes	No	★	-	-	-	-	-
4N	0	0	1588	1000	No	No		-	-	-	-	-
4O	0	0	1814	1000	No	No		-	-	-	-	-
4P	0	0	2581	1000	Yes	No	★	-	-	-	-	-
4S	0	0	1110	1000	Yes	No	★★	-	x	Yes	Yes	No
4T	0	0	2000	1000	No	No		x	-	-	Yes	No
4U	0	0	2556	1000	No	No		-	-	-	-	-
4V	0	0	1485	1000	No	No		-	-	-	-	-
4W	0	0	2769	1300	Yes	No	★	-	-	-	-	-
4Z	0	0	1459	1600	No	No		-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$369
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.6 miles	$22,992
					$29,962

Implementation Cost

Federal Funds	$26,966
Local Match (10% of Total project cost)	$2,996
Total Project Cost	$29,962

2005-2009 MnCMAT Crash Data

Curves on CSAH 4 from VERGAS CORP LMTS to BECKER COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
4ZE	0	0	706	1250	No	No	★	-	x	Installed	Yes	No
4ZF	0	0	1393	1250	Yes	No	★	-	-	-	-	-
4ZG	0	0	1446	1250	No	No		-	-	-	-	-
4ZI	0	0	1182	1250	Yes	No	★★	-	x	Yes	Yes	No
4ZJ	0	0	598	1150	Yes	Yes	★★★	-	x	Installed	Yes	No
4ZK	0	0	585	1050	Yes	No	★★	-	x	Installed	Yes	No
4ZL	0	0	1185	1050	No	No	★	-	x	Installed	Yes	No
4ZM	0	0	1141	1050	No	No	★	-	x	Installed	Yes	No
4ZN	0	0	2928	1050	No	No		-	-	-	-	-
4ZO	0	0	1272	1050	No	No		-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	7 curves	$19,800
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.0 miles	$38,485
					$58,285

Implementation Cost

Federal Funds	$52,456
Local Match (10% of Total project cost)	$5,828
Total Project Cost	$58,285

2005-2009 MnCMAT Crash Data

Curves on CSAH 5 from CSAH 38 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
5A	0	0	721	295	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only
5B	0	0	712	295	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.2 miles	$625
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.2 miles	$8,330
					$15,554

Implementation Cost

Federal Funds	$13,999
Local Match (10% of Total project cost)	$1,555
Total Project Cost	$15,554

2005-2009 MnCMAT Crash Data

Curves on CSAH 5 from CLITHERALL CORP LMTS to CSAH 16

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
5D	0	0	727	840	Yes	Yes	★★★	-	x	Installed	Yes	No
5E	0	0	693	790	Yes	0	★★	-	x	Yes	Yes	No
5F	0	0	1138	790	Yes	Yes	★★★	-	x	Installed	Yes	No
5G	0	0	2512	790	No	No		-	-	-	-	-
5H	0	0	1426	790	Yes	No	★	-	-	-	-	-
5I	0	0	1381	635	Yes	No	★	-	-	-	-	-
5J	0	0	1503	480	No	No	★	-	-	-	-	-
5K	0	0	1900	480	No	No	★	x	-	-	Yes	No
5L	0	0	1181	480	Yes	No	★★★	-	x	Yes	Yes	No
5M	0	0	1326	480	No	No	★	x	-	-	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.4 miles	$57,826
					$71,026

Implementation Cost

Federal Funds	$63,923
Local Match (10% of Total project cost)	$7,103
Total Project Cost	$71,026

2005-2009 MnCMAT Crash Data

Curves on CSAH 5 from CSAH 16 to MNTH 78

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
5N	0	0	1294	440	Yes	No	★★	-	-	Installed	Yes	No
5O	0	0	815	440	No	No	★★	-	x	Installed	Yes	No
5P	0	0	547	440	Yes	No	★★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$14,955
					$21,555

Implementation Cost

Federal Funds	$19,399
Local Match (10% of Total project cost)	$2,155
Total Project Cost	$21,555

Curves on CSAH 8 from PERHAM CORP LMTS to CSAH 53

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
8C	0	0	1524	2975	Yes	No	★	-	-	Installed	Outside	One Side Only
8D	0	0	2974	1925	Yes	No	★	-	-	-	-	-
8E	0	0	1365	1700	No	No		-	-	-	-	-
8F	0	0	1410	2850	Yes	No	★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$0
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$972
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$12,962
					$13,934

Implementation Cost

Federal Funds	$12,541
Local Match (10% of Total project cost)	$1,393
Total Project Cost	$13,934

2005-2009 MnCMAT Crash Data

Curves on CSAH 8 from CSAH 67 to WADENA COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
8G	0	0	1848	570	No	No	★	-	-	Installed	Yes	No
8H	0	0	1919	570	Yes	No	★★	-	-	Installed	Yes	No
8I	0	0	1001	570	Yes	No	★★★	-	-	Installed	Yes	No
8J	0	0	992	570	No	No	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.1 miles	$44,189
					$50,790

Implementation Cost

Federal Funds	$45,711
Local Match (10% of Total project cost)	$5,079
Total Project Cost	$50,790

2005-2009 MnCMAT Crash Data

Curves on CSAH 9 from MNTH 34 to BECKER COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
9H	0	0	1987	790	No	No		x	-	-	Yes	No
9I	0	0	1907	790	Yes	No	★	x	-	-	Yes	No
9J	0	0	2119	790	Yes	No	★	x	-	-	Yes	No
9K	0	0	1151	790	No	No	★	-	x	Yes	Yes	No
9L	0	0	1311	790	No	No		x	-	-	Yes	No
9M	0	0	1325	790	No	No		x	-	-	Yes	No
9N	0	0	774	840	Yes	No	★★	-	x	Yes	Yes	No
9O	0	0	1001	890	No	No	★	-	x	Yes	Yes	No
9P	0	0	968	890	No	No	★	-	x	Yes	Yes	No
9Q	0	0	240	890	No	No		-	-	Installed	Yes	No
9R	0	0	405	890	No	No		x	-	Yes	Yes	No
9S	0	0	546	890	Yes	No	★★	-	x	Installed	Yes	No
9T	0	0	712	890	No	No	★	-	x	Yes	Yes	No
9U	0	0	1554	890	No	No		x	-	-	Yes	No
9V	0	0	2338	890	No	No		-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	8 curves	$26,401
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.6 miles	$65,394
					$91,795

Implementation Cost

Federal Funds	$82,615
Local Match (10% of Total project cost)	$9,179
Total Project Cost	$91,795

2005-2009 MnCMAT Crash Data

Curves on CSAH 10 from WILKIN COUNTY LINE CSAH 11 to ELIZABETH CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
10C	0	0	722	420	Yes	Yes	★★★★	-	x	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$362
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$4,830
					$8,492

Implementation Cost

Federal Funds	$7,643
Local Match (10% of Total project cost)	$849
Total Project Cost	$8,492

2005-2009 MnCMAT Crash Data

Curves on CSAH 10 from ELIZABETH CORP LMTS to CSAH 1

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
10H	0	0	2774	1250	Yes	No	★	-	-	-	-	-
10I	0	0	1259	1250	No	Yes	★	-	-	-	-	-
10J	0	0	770	1150	Yes	No	★★	-	x	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$398
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$3,698

Implementation Cost

Federal Funds	$3,328
Local Match (10% of Total project cost)	$370
Total Project Cost	$3,698

2005-2009 MnCMAT Crash Data

Curves on CSAH 10 from USTH 10 to BECKER COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
10K	0	0	747	1050	Yes	Yes	★★★	-	-	Yes	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$398
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$3,698

Implementation Cost

Federal Funds	$3,328
Local Match (10% of Total project cost)	$370
Total Project Cost	$3,698

2005-2009 MnCMAT Crash Data

Curves on CSAH 11 from CSAH 21 to CSAH 10

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
11A	0	0	822	115	Yes	Yes	★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$10,818
					$14,118

Implementation Cost

Federal Funds	$12,706
Local Match (10% of Total project cost)	$1,412
Total Project Cost	$14,118

2005-2009 MnCMAT Crash Data

Curves on CSAH 14 from CSAH 1 to RICHVILLE CORP LMTS CSAH 49

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
14A	0	0	472	490	Yes	No	★★	-	-	-	-	-
14B	0	0	946	490	Yes	No	★★★	-	-	Yes	Outside	One Side Only
14C	0	0	1076	615	Yes	No	★★	x	-	Yes	Outside	One Side Only
14D	0	0	1654	490	No	No	★	-	-	-	-	-
14E	0	0	1891	615	No	No		-	-	-	-	-
14F	0	0	2558	615	No	No		-	-	-	-	-
14G	0	0	902	615	Yes	No	★★	-	-	-	-	-
14H	0	0	1025	960	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$950
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$12,667
					$23,517

Implementation Cost

Federal Funds	$21,165
Local Match (10% of Total project cost)	$2,352
Total Project Cost	$23,517

2005-2009 MnCMAT Crash Data

Curves on CSAH 14 from MNTH 78 to CSAH 67

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
14L	0	0	820	570	Yes	Yes	★★★★	-	-	Yes	Outside	One Side Only
14M	0	0	1522	440	No	No	★	x	-	-	Outside	One Side Only
14N	0	0	1301	440	No	No	★	x	-	-	Outside	One Side Only
14O	0	0	819	440	No	No	★★	x	-	Yes	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.4 miles	$1,247
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,621
					$24,468

Implementation Cost

Federal Funds	$22,021
Local Match (10% of Total project cost)	$2,447
Total Project Cost	$24,468

2005-2009 MnCMAT Crash Data

Curves on CSAH 15 from CSAH 2 North to FERGUS FALLS CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
15A	0	0	1052	410	No	No	★★	-	-	Installed	Outside	One Side Only
15B	0	0	968	410	No	No	★★	-	-	Installed	Outside	One Side Only
15C	0	0	869	505	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only
15D	0	0	826	600	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only
15E	0	0	814	600	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	5 curves	$16,500
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.5 miles	$1,618
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.5 miles	$21,568
					$39,686

Implementation Cost

Federal Funds	$35,717
Local Match (10% of Total project cost)	$3,969
Total Project Cost	$39,686

2005-2009 MnCMAT Crash Data

Curves on CSAH 15 from FERGUS FALLS CORP LMTS to CSAH 1

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
15G	0	0	337	1250	Yes	Yes	★★	-	-	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$206
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$3,506

Implementation Cost

Federal Funds	$3,156
Local Match (10% of Total project cost)	$351
Total Project Cost	$3,506

2005-2009 MnCMAT Crash Data

Curves on CSAH 16 from MNTH 78 to CSAH 5

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
16A	0	0	1285	780	Yes	No	★	x	-	-	Outside	One Side Only
16B	0	0	1092	780	Yes	No	★★	-	x	Yes	Yes	No
16C	0	0	1283	780	No	No		x	-	-	Yes	No
16D	0	0	981	470	No	No	★★	-	x	Yes	Yes	No
16E	0	0	972	470	No	No	★★	-	x	Yes	Yes	No
16F	0	0	1137	470	No	No	★★	-	x	Yes	Yes	No
16G	0	0	1914	470	Yes	No	★★	x	-	-	Yes	No
16H	0	0	1462	470	Yes	No	★★	x	-	-	Yes	No
16I	0	0	1862	470	No	No	★	x	-	-	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,201
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$125
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.9 miles	$76,034
					$89,359

Implementation Cost

Federal Funds	$80,423
Local Match (10% of Total project cost)	$8,936
Total Project Cost	$89,359

2005-2009 MnCMAT Crash Data

Curves on CSAH 16 from CSAH 5 to MNTH 108

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
16J	0	0	377	540	Yes	Yes	★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$4,636
					$7,936

Implementation Cost

Federal Funds	$7,143
Local Match (10% of Total project cost)	$794
Total Project Cost	$7,936

2005-2009 MnCMAT Crash Data

Curves on CSAH 17 from VERGAS CORP LMTS to BECKER COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
17A	0	0	1082	1550	No	No	★	-	x	Installed	Outside	One Side Only
17B	0	0	2004	1450	Yes	No	★	x	-	-	Yes	No
17C	0	0	2316	1350	Yes	No	★	x	-	-	Yes	No
17D	0	0	968	1350	Yes	No	★★	-	x	Installed	Yes	No
17F	0	0	2294	1350	No	No		-	-	Installed	Yes	No
17G	0	0	2420	1350	Yes	No	★	x	-	-	Yes	No
17H	0	0	809	1350	Yes	Yes	★★★	-	x	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$762
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.5 miles	$60,970
					$71,632

Implementation Cost

Federal Funds	$64,469
Local Match (10% of Total project cost)	$7,163
Total Project Cost	$71,632

2005-2009 MnCMAT Crash Data

Curves on CSAH 20 from CSAH 9 to USTH 59

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
20A	0	0	977	860	No	No	★	-	x	Yes	No	Yes
20B	0	0	2206	860	No	No		x	-	-	No	Yes
20C	0	0	1695	860	No	No		x	-	-	No	Yes
20D	0	0	1352	860	No	No		x	-	-	No	Yes
20E	0	0	1911	1000	Yes	No	★	x	-	-	No	Yes
20F	0	0	1742	1000	Yes	No	★	x	-	-	No	Yes
20I	0	0	937	1050	No	No	★	-	x	Yes	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,601
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	1.4 miles	$4,270
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$10,871

Implementation Cost

Federal Funds	$9,784
Local Match (10% of Total project cost)	$1,087
Total Project Cost	$10,871

2005-2009 MnCMAT Crash Data

Curves on CSAH 21 from MNTH 210 to CSAH 10

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
21A	0	0	1298	220	No	No	★	-	-	Installed	Yes	No
21B	0	0	1869	220	No	No	★	x	-	-	Yes	No
21C	0	0	1620	220	Yes	No	★★	x	-	-	Yes	No
21D	0	0	848	220	No	No	★★	x	-	Yes	Yes	No
21E	0	0	922	220	No	Yes	★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.7 miles	$28,773
					$35,373

Implementation Cost

Federal Funds	$31,836
Local Match (10% of Total project cost)	$3,537
Total Project Cost	$35,373

Curves on CSAH 21 from CSAH 10 to CSAH 24

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
21F	0	0	1053	220	No	No	★★	-	-	-	-	-
21G	0	0	1545	220	No	No	★	-	-	-	-	-
21H	0	0	2611	175	No	No		-	-	-	-	-
21I	0	0	1948	175	No	No		-	-	-	-	-
21J	0	0	1865	175	No	No		-	-	-	-	-
21K	0	0	819	180	Yes	Yes	★★★	-	-	Installed	Yes	No
21L	0	0	738	185	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$178
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$13,098
					$19,877

Implementation Cost

Federal Funds	$17,889
Local Match (10% of Total project cost)	$1,988
Total Project Cost	$19,877

2005-2009 MnCMAT Crash Data

Curves on CSAH 22 from CSAH 27 to CSAH 3

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
22A	0	0	806	680	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only
22B	0	0	1652	680	Yes	No	★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.4 miles	$1,201
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,019
					$20,520

Implementation Cost

Federal Funds	$18,468
Local Match (10% of Total project cost)	$2,052
Total Project Cost	$20,520

2005-2009 MnCMAT Crash Data

Curves on CSAH 22 from CSAH 3 to CSAH 35

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
22C	0	0	1464	365	No	No	★	-	-	Installed	Yes	No
22D	0	0	860	365	No	No	★★	-	-	Installed	Yes	No
22E	0	0	1211	365	Yes	No	★★	x	-	-	Yes	No
22F	0	0	1723	365	No	No	★	x	-	-	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.8 miles	$30,114
					$33,414

Implementation Cost

Federal Funds	$30,073
Local Match (10% of Total project cost)	$3,341
Total Project Cost	$33,414

2005-2009 MnCMAT Crash Data

Curves on CSAH 23 from CSAH 9 to MNTH 34

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
23A	0	0	853	165	Yes	Yes	★★★	-	x	Installed	Outside	One Side Only
23B	0	0	848	165	Yes	No	★★	-	x	Installed	Outside	One Side Only
23C	0	0	802	165	Yes	No	★★	-	x	Installed	Outside	One Side Only
23D	0	0	1489	165	No	No		x	-	-	Outside	One Side Only
23E	0	0	1614	165	No	No		x	-	-	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.4 miles	$1,233
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,443
					$27,577

Implementation Cost

Federal Funds	$24,819
Local Match (10% of Total project cost)	$2,758
Total Project Cost	$27,577

2005-2009 MnCMAT Crash Data

Curves on CSAH 23 from MNTH 34 to CLAY COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
23G	0	0	829	335	No	No	★★	x	-	Yes	Outside	One Side Only
23H	0	0	836	335	No	No	★★	x	-	Yes	Outside	One Side Only
23I	0	0	849	305	Yes	No	★★★	-	-	Yes	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.4 miles	$1,176
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$15,686
					$26,762

Implementation Cost

Federal Funds	$24,086
Local Match (10% of Total project cost)	$2,676
Total Project Cost	$26,762

2005-2009 MnCMAT Crash Data

Curves on CSAH 24 from ROTHSAY CORP LMTS to CSAH 21 South

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
24A	0	0	1150	330	Yes	Yes	★★★★	-	x	Yes	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.2 miles	$580
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.2 miles	$7,735
					$11,615

Implementation Cost

Federal Funds	$10,453
Local Match (10% of Total project cost)	$1,161
Total Project Cost	$11,615

2005-2009 MnCMAT Crash Data

Curves on CSAH 24 from CSAH 21 South to ERHARD CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
24B	0	0	1146	340	Yes	Yes	★★★★	-	-	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$15,795
					$19,095

Implementation Cost

Federal Funds	$17,186
Local Match (10% of Total project cost)	$1,910
Total Project Cost	$19,095

2005-2009 MnCMAT Crash Data

Curves on CSAH 24 from CSAH 3 to CSAH 41

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
24J	0	0	1719	355	Yes	No	★★	-	-	-	-	-
24K	0	0	1520	355	Yes	No	★★	-	-	-	-	-
24L	0	0	1764	355	No	No	★	-	-	-	-	-
24M	0	0	1767	355	Yes	No	★★	-	-	Installed	Outside	One Side Only
24N	0	0	1010	355	No	No	★★	-	-	Installed	Outside	One Side Only
24O	0	0	1219	355	No	No	★	-	-	Installed	Outside	One Side Only
24P	0	0	972	355	Yes	No	★★★	-	-	Yes	Outside	One Side Only
24Q	0	0	975	355	No	No	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	5 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.5 miles	$1,471
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.8 miles	$31,231
					$42,603

Implementation Cost

Federal Funds	$38,342
Local Match (10% of Total project cost)	$4,260
Total Project Cost	$42,603

2005-2009 MnCMAT Crash Data

Curves on CSAH 25 from GRANT COUNTY LINE CSAH 26 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
25A	0	0	962	265	Yes	No	★★★	-	-	Installed	Outside	One Side Only
25B	0	0	972	355	Yes	No	★★★	-	-	Installed	Outside	One Side Only
25C	0	0	1000	440	No	No	★★	-	-	Installed	Outside	One Side Only
25D	0	0	986	440	No	No	★★	-	-	Installed	Outside	One Side Only
25E	0	0	832	440	No	No	★★	-	-	Installed	Outside	One Side Only
25F	0	0	873	440	Yes	No	★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	6 curves	$19,800
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.7 miles	$2,234
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.7 miles	$29,792
					$51,826

Implementation Cost

Federal Funds	$46,643
Local Match (10% of Total project cost)	$5,183
Total Project Cost	$51,826

2005-2009 MnCMAT Crash Data

Curves on CSAH 27 from CSAH 10 to CSAH 24

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
27A	0	0	1731	1560	Yes	No	★	-	-	-	-	-
27B	0	0	1527	870	No	No		-	-	-	-	-
27E	1	0	1222	530	Yes	No	★★★	-	-	-	Yes	No
27F	0	0	1540	530	Yes	No	★★	x	-	-	Yes	No
27G	0	0	819	530	Yes	No	★★★	-	-	Yes	Yes	No
27H	0	0	1567	530	No	No	★	x	-	-	Yes	No
27I	0	0	971	410	Yes	No	★★★	-	-	Yes	Yes	No
27J	0	0	1498	285	No	No	★	x	-	-	Yes	No
27K	0	0	1764	285	No	No	★	x	-	-	Yes	No
27L	0	0	816	190	Yes	No	★★	-	-	Installed	Yes	No
27M	0	0	2082	190	Yes	No	★	-	-	Installed	Yes	No
27N	0	0	2055	190	No	No		x	-	-	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$9,901
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	2.3 miles	$91,311
					$101,211

Implementation Cost

Federal Funds	$91,090
Local Match (10% of Total project cost)	$10,121
Total Project Cost	$101,211

2005-2009 MnCMAT Crash Data

Curves on CSAH 28 from CSAH 21 to USTH 59

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
28A	0	0	808	145	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only
28B	0	0	826	145	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$757
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$10,098
					$17,456

Implementation Cost

Federal Funds	$15,710
Local Match (10% of Total project cost)	$1,746
Total Project Cost	$17,456

2005-2009 MnCMAT Crash Data

Curves on CSAH 29 from CSAH 82 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
29A	0	0	842	305	Yes	Yes	★★★★	-	x	Installed	Outside	One Side Only
29B	0	0	911	425	Yes	No	★★★	-	x	Installed	Outside	One Side Only
29C	0	0	1365	425	No	No	★	-	-	-	-	-
29D	0	0	1436	425	No	No	★	-	-	-	-	-
29E	0	0	2339	425	Yes	No	★★	-	-	-	-	-
29F	0	0	1201	425	No	No	★	-	-	-	-	-
29G	0	0	1303	425	No	No	★	x	-	-	Outside	One Side Only
29H	0	0	1138	425	No	No	★★	-	x	Yes	Outside	One Side Only
29I	0	0	1940	715	Yes	No	★	-	-	-	-	-
29J	0	0	1442	1000	No	No		-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.5 miles	$1,593
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.5 miles	$21,242
					$32,736

Implementation Cost

Federal Funds	$29,462
Local Match (10% of Total project cost)	$3,274
Total Project Cost	$32,736

2005-2009 MnCMAT Crash Data

Curves on CSAH 30 from WILKIN COUNTY LINE to CSAH 21

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
30A	0	0	825	125	Yes	Yes	★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$11,402
					$14,702

Implementation Cost

Federal Funds	$13,231
Local Match (10% of Total project cost)	$1,470
Total Project Cost	$14,702

2005-2009 MnCMAT Crash Data

Curves on CSAH 30 from CSAH 21 to MNTH 108

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
30D	0	0	1536	255	Yes	No	★★	-	-	-	-	-
30E	0	0	1540	255	Yes	No	★★	-	-	-	-	-
30F	0	0	976	255	Yes	Yes	★★★★	-	x	Yes	Outside	One Side Only
30G	0	0	1462	255	No	No	★	-	-	-	-	-
30H	0	0	2421	255	Yes	No	★★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.2 miles	$456
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.2 miles	$6,080
					$9,836

Implementation Cost

Federal Funds	$8,852
Local Match (10% of Total project cost)	$984
Total Project Cost	$9,836

2005-2009 MnCMAT Crash Data

Curves on CSAH 31 from CSAH 4 to USTH 59

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
31A	0	0	493	550	Yes	No	★★	-	-	-	-	-
31B	0	0	1833	550	No	No	★	-	-	-	-	-
31C	0	0	1523	550	No	No	★	-	-	-	-	-
31D	0	0	987	550	No	No	★★	-	x	Yes	No	Yes
31E	0	0	957	580	Yes	No	★★★	-	x	Yes	Outside	One Side Only
31F	0	0	1221	580	Yes	No	★★	-	-	-	-	-
31G	0	0	2215	580	No	No	★	-	-	-	-	-
31H	0	0	2397	580	Yes	No	★★	-	-	-	-	-
31I	0	0	924	580	No	No	★★	-	x	Installed	Outside	One Side Only
31J	0	0	840	580	No	No	★★	-	x	Installed	Outside	One Side Only
31K	0	0	437	580	Yes	No	★★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.4 miles	$1,151
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.2 miles	$9,515
					$23,866

Implementation Cost

Federal Funds	$21,479
Local Match (10% of Total project cost)	$2,387
Total Project Cost	$23,866

2005-2009 MnCMAT Crash Data

Curves on CSAH 31 from USTH 59 to CSAH 20

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
31L	0	0	992	410	No	No	★★	-	x	Yes	Yes	No
31M	0	0	1729	410	Yes	No	★★	x	-	-	Yes	No
31N	0	1	461	410	No	No	★★	-	-	Installed	Yes	No
31O	0	0	423	410	No	No	★	-	-	Installed	Yes	No
31P	0	0	803	410	Yes	No	★★★	-	x	Yes	Yes	No
31Q	0	0	639	410	No	No	★★	-	x	Yes	Yes	No
31R	0	0	983	410	No	No	★★	-	x	Yes	Yes	No
31S	0	0	1926	410	No	No	★	x	-	-	Yes	No
31T	0	0	628	410	No	No	★★	-	x	Yes	Yes	No
31U	0	0	922	410	Yes	No	★★★	-	x	Yes	Yes	No
31W	0	0	645	770	Yes	No	★★	-	x	Yes	Yes	No
31X	0	0	434	770	No	No		x	-	Yes	Yes	No
31Y	0	0	484	770	No	No		x	-	Yes	Yes	No
31Z	0	0	298	770	Yes	No	★	x	-	Yes	Yes	No
31ZA	0	0	845	770	No	No	★	-	x	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost	Units	Total cost
Chevrons	Proactive	$3,300 per curve	13 curves	$42,900
Arrow Board Only	Proactive	$500 per curve	0 curves	$0
Rumble Strip	Proactive	$3,000 per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000 per mile	1.5 miles	$60,129
				$103,029

Implementation Cost

Federal Funds	$92,726
Local Match (10% of Total project cost)	$10,303
Total Project Cost	$103,029

2005-2009 MnCMAT Crash Data

Curves on CSAH 32 from CSAH 74 to CSAH 14

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
32A	0	0	854	345	No	No	★★	-	x	Yes	Yes	No
32B	0	0	833	345	No	No	★★	-	x	Yes	Yes	No
32C	0	0	1406	195	No	No		x	-	-	Yes	No
32D	0	0	815	195	Yes	No	★★	-	x	Installed	Yes	No
32E	0	0	2416	195	No	No		-	-	-	-	-
32F	0	0	1946	195	Yes	No	★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.8 miles	$33,205
					$43,105

Implementation Cost

Federal Funds	$38,794
Local Match (10% of Total project cost)	$4,310
Total Project Cost	$43,105

2005-2009 MnCMAT Crash Data

Curves on CSAH 33 from CSAH 35 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
33A	0	0	1141	170	No	No	★	-	x	Yes	Outside	One Side Only
33B	0	0	1477	170	No	No		x	-	-	Outside	One Side Only
33C	0	0	971	170	No	No	★	-	x	Yes	Outside	One Side Only
33D	0	0	960	170	Yes	No	★★	-	x	Yes	Outside	One Side Only
33E	0	0	968	170	Yes	No	★★	-	x	Yes	Outside	One Side Only
33F	0	0	948	170	Yes	No	★★	-	x	Yes	Outside	One Side Only
33G	0	0	934	170	No	No	★	-	x	Yes	Outside	One Side Only
33H	0	0	1922	170	No	No		-	-	-	-	-
33I	0	0	961	170	Yes	No	★★	-	x	Installed	Outside	One Side Only
33J	0	0	1234	170	Yes	No	★	-	-	-	-	-
33K	0	0	1517	170	No	No		-	-	-	-	-
33L	0	0	957	170	Yes	Yes	★★★	-	x	Installed	No	Yes
33M	0	0	1040	285	Yes	No	★★★	-	x	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	9 curves	$29,700
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	1.6 miles	$4,786
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.3 miles	$50,826
					$85,312

Implementation Cost

Federal Funds	$76,780
Local Match (10% of Total project cost)	$8,531
Total Project Cost	$85,312

2005-2009 MnCMAT Crash Data

Curves on CSAH 34 from CSAH 35 to PERHAM CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
34A	0	0	1968	620	No	No		x	-	-	No	Yes
34B	0	0	1367	620	Yes	No	★	-	-	Installed	Yes	No
34C	0	0	1598	620	Yes	No	★	x	-	-	Yes	No
34D	0	0	1687	620	No	No		x	-	-	Yes	No
34E	0	0	1419	620	Yes	No	★	x	-	-	Yes	No
34F	0	0	888	620	Yes	No	★★	-	x	Installed	Yes	No
34G	0	0	1966	1100	No	No		x	-	-	Yes	No
34H	0	0	723	1100	No	No	★	-	x	Installed	Yes	No
34I	0	0	826	1100	No	No	★	-	x	Installed	Yes	No
34J	0	0	973	1100	No	No	★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	5 curves	$16,501
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$938
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.8 miles	$72,841
					$90,279

Implementation Cost

Federal Funds	$81,251
Local Match (10% of Total project cost)	$9,028
Total Project Cost	$90,279

2005-2009 MnCMAT Crash Data

Curves on CSAH 35 from USTH 59 to DALTON CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
35A	0	0	1392	365	Yes	No	★★	-	-	Installed	Yes	No
35B	0	0	2301	365	No	No	★	x	-	-	Yes	No
35C	0	1	1163	365	Yes	No	★★★★	-	x	Yes	No	Yes
35D	0	0	1491	365	Yes	No	★★	x	-	-	Yes	No
35E	0	0	716	555	Yes	Yes	★★★★	-	x	Installed	Yes	No
35G	0	0	2911	940	Yes	No	★	-	-	-	-	-
35H	0	0	955	940	Yes	Yes	★★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$434
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.1 miles	$44,530
					$54,865

Implementation Cost

Federal Funds	$49,378
Local Match (10% of Total project cost)	$5,486
Total Project Cost	$54,865

2005-2009 MnCMAT Crash Data

Curves on CSAH 35 from DALTON CORP LMTS to UNDERWOOD CORP LMTS MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
35I	0	0	1565	740	No	No		-	-	Installed	Yes	No
35J	0	0	1534	605	Yes	No	★	-	-	-	-	-
35K	0	0	2658	465	No	No	★	-	-	-	-	-
35M	0	1	731	465	Yes	Yes	★★★★★	-	x	Installed	Yes	No
35N	0	0	733	465	Yes	No	★★★	-	x	Installed	Yes	No
35P	0	0	714	465	Yes	No	★★★	-	x	Installed	Yes	No
35Q	0	0	729	560	Yes	Yes	★★★★	-	x	Installed	Yes	No
35R	0	0	708	650	No	No	★	-	x	Installed	Outside	One Side Only
35S	0	0	712	650	No	No	★	-	x	Installed	Yes	No
35T	0	0	1461	650	No	No		-	-	-	-	-
35U	0	0	1437	650	No	No		-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	7 curves	$19,800
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$368
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.5 miles	$60,875
					$81,044

Implementation Cost

Federal Funds	$72,939
Local Match (10% of Total project cost)	$8,104
Total Project Cost	$81,044

Curves on CSAH 35 from UNDERWOOD CORP LMTS to CSAH 1

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
35X	0	0	1127	1300	Yes	No	★★	-	x	Yes	Yes	No
35Y	0	0	1105	1300	No	Yes	★★	-	x	Installed	Yes	No
35Z	0	0	1062	1300	No	No	★	-	x	Installed	Yes	No
35ZA	0	0	1239	950	Yes	No	★	-	-	-	-	-
35ZB	0	0	2781	950	No	No		-	-	-	-	-
35ZC	0	0	957	950	Yes	No	★★	-	x	Installed	Yes	No
35ZD	0	0	1030	950	No	No	★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	5 curves	$16,500
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.9 miles	$37,924
					$54,424

Implementation Cost

Federal Funds	$48,982
Local Match (10% of Total project cost)	$5,442
Total Project Cost	$54,424

2005-2009 MnCMAT Crash Data

Curves on CSAH 35 from CSAH 1 to CSAH 41

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
35ZE	0	0	1447	1100	No	No		x	-	-	No	Yes
35ZF	0	0	1573	1100	Yes	No	★	x	-	-	No	Yes
35ZG	0	0	849	1100	Yes	No	★★	-	-	Installed	No	Yes
35ZH	0	0	1308	1100	Yes	No	★	x	-	-	No	Yes
35ZI	0	0	1358	830	Yes	No	★	-	-	-	-	-
35ZJ	0	0	1460	830	No	No		-	-	-	-	-
35ZK	0	0	1472	865	Yes	No	★	-	-	-	-	-
35ZL	0	0	1211	900	No	No		-	-	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	1.1 miles	$3,423
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$6,723

Implementation Cost

Federal Funds	$6,051
Local Match (10% of Total project cost)	$672
Total Project Cost	$6,723

2005-2009 MnCMAT Crash Data

Curves on CSAH 35 from CSAH 41 to DENT CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
35ZM	0	0	2744	620	No	No		-	-	-	-	-
35ZN	0	0	746	620	Yes	No	★★	-	x	Installed	No	Yes
35ZO	0	0	983	620	Yes	No	★★	-	x	Installed	No	Yes
35ZP	0	0	2905	620	Yes	No	★	-	-	-	-	-
35ZQ	0	0	2697	620	Yes	No	★	-	-	Installed	No	Yes
35ZR	0	0	697	620	Yes	No	★★	-	x	Installed	No	Yes
35ZS	0	0	1439	620	No	No		-	-	Installed	No	Yes
35ZT	0	0	1102	620	No	No	★	-	x	Installed	No	Yes
35ZU	0	1	1063	620	Yes	No	★★★	-	x	Installed	No	Yes
35ZV	0	0	1741	620	No	No		x	-	-	No	Yes
35ZW	0	0	1899	620	Yes	No	★	x	-	-	No	Yes
35ZX	0	0	2405	620	Yes	No	★	x	-	-	No	Yes
35ZY	0	0	921	620	No	No	★	-	x	Installed	No	Yes
35ZZ	0	0	967	620	No	No	★	-	x	Installed	No	Yes
35ZZA	0	0	730	885	Yes	No	★★	-	x	Installed	No	Yes
35ZZB	0	0	1351	1150	No	No		x	-	-	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	10 curves	$26,401
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	2.5 miles	$7,518
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$4,303
					$38,222

Implementation Cost

Federal Funds	$34,400
Local Match (10% of Total project cost)	$3,822
Total Project Cost	$38,222

2005-2009 MnCMAT Crash Data

Curves on CSAH 35 from MNTH 108 to CSAH 34

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
35ZZD	0	0	1268	395	No	No	★	-	-	-	-	-
35ZZE	0	0	1134	600	Yes	No	★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$336
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$4,485
					$8,121

Implementation Cost

Federal Funds	$7,309
Local Match (10% of Total project cost)	$812
Total Project Cost	$8,121

2005-2009 MnCMAT Crash Data

Curves on CSAH 35 from CSAH 34 to CSAH 36

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
35ZZF	0	0	936	800	Yes	No	★★	-	x	Installed	Outside	One Side Only
35ZZG	0	0	1112	800	Yes	Yes	★★★	-	x	Installed	Yes	No
35ZZH	0	0	1119	1400	Yes	No	★★	-	x	Installed	Yes	No
35ZZI	0	0	1121	1400	Yes	No	★★	-	x	Installed	Yes	No
35ZZJ	0	0	668	1400	Yes	No	★★	-	x	Installed	Yes	No
35ZZK	0	0	1063	1400	Yes	No	★★	-	x	Installed	Yes	No
35ZZL	0	0	1072	1400	Yes	No	★★	-	x	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	7 curves	$23,100
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$909
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.3 miles	$50,848
					$74,858

Implementation Cost

Federal Funds	$67,372
Local Match (10% of Total project cost)	$7,486
Total Project Cost	$74,858

2005-2009 MnCMAT Crash Data

Curves on CSAH 36 from CSAH 35 to MNTH 228

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
36A	0	0	899	290	Yes	No	★★★	-	x	Installed	No	Yes
36B	0	0	344	290	Yes	Yes	★★★	-	-	Installed	Yes	No
36C	0	0	579	290	No	No	★★	-	x	Installed	Yes	No
36D	0	0	1733	290	Yes	No	★★	x	-	-	Yes	No
36E	0	0	1209	290	No	No	★	x	-	-	Yes	No
36F	0	0	827	290	Yes	No	★★★	-	x	Installed	Yes	No
36G	0	0	600	290	Yes	No	★★★	-	x	Installed	Yes	No
36H	0	0	1378	290	Yes	No	★★	-	-	Installed	Yes	No
36I	0	0	823	290	Yes	Yes	★★★★	-	x	Installed	Yes	No
36J	0	0	834	290	Yes	No	★★★	-	x	Installed	Yes	No
36K	0	0	830	290	Yes	Yes	★★★★	-	x	Installed	Yes	No
36L	0	0	1188	290	No	No	★★	-	x	Installed	Yes	No
36M	0	0	889	290	No	No	★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	11 curves	$33,000
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$224
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	2.2 miles	$89,061
					$122,285

Implementation Cost

Federal Funds	$110,057
Local Match (10% of Total project cost)	$12,229
Total Project Cost	$122,285

2005-2009 MnCMAT Crash Data

Curves on CSAH 38 from MNTH 78 to CSAH 5

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
38A	0	0	2998	330	No	No	★	-	-	-	-	-
38B	0	0	965	330	No	No	★★	x	-	Yes	Yes	No
38C	0	0	953	330	Yes	No	★★★	-	-	Yes	Yes	No
38D	0	0	1866	330	No	No	★	x	-	-	Outside	One Side Only
38E	0	0	1489	330	No	No	★	x	-	-	Outside	One Side Only
38F	0	0	1654	330	No	No	★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$883
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.7 miles	$26,186
					$33,669

Implementation Cost

Federal Funds	$30,302
Local Match (10% of Total project cost)	$3,367
Total Project Cost	$33,669

2005-2009 MnCMAT Crash Data

Curves on CNTY 38 from CSAH 5 to URBANK CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
38G	0	0	725	500	Yes	Yes	★★★★	-	-	Installed	Yes	No
38H	0	0	729	500	Yes	No	★★★	-	-	Installed	Yes	No
38I	0	0	845	500	No	No	★★	-	-	Installed	Yes	No
38J	0	0	732	500	No	No	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.8 miles	$30,500
					$43,700

Implementation Cost

Federal Funds	$39,330
Local Match (10% of Total project cost)	$4,370
Total Project Cost	$43,700

2005-2009 MnCMAT Crash Data

Curves on CNTY 39 from CSAH 12 to CSAH 35

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
39A	0	0	948	135	Yes	No	★★	-	-	Installed	Yes	No
39B	0	0	1085	135	No	No	★	-	-	Installed	Yes	No
39C	0	0	1389	135	No	No		-	-	-	-	-
39D	0	0	1164	135	Yes	No	★★	-	-	-	-	-
39E	0	0	1383	135	No	No		-	-	-	-	-
39F	0	0	834	135	No	No	★	-	-	Installed	Yes	No
39G	0	0	823	135	No	No	★	-	-	Installed	Yes	No
39H	0	0	842	135	Yes	Yes	★★★	-	-	Installed	Yes	No
39I	0	0	725	135	Yes	Yes	★★★	-	-	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	6 curves	$19,800
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.3 miles	$51,462
					$71,262

Implementation Cost

Federal Funds	$64,136
Local Match (10% of Total project cost)	$7,126
Total Project Cost	$71,262

2005-2009 MnCMAT Crash Data

Curves on CNTY 40 from VINING CORP LMTS to MNTH 29

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
40C	1	0	1426	300	No	No	★★	-	-	-	-	-
40E	0	0	1787	300	No	No	★	-	-	-	-	-
40H	0	0	938	250	No	No	★★	-	-	Installed	Yes	No
40I	0	0	963	250	No	No	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.6 miles	$23,394
					$29,994

Implementation Cost

Federal Funds	$26,995
Local Match (10% of Total project cost)	$2,999
Total Project Cost	$29,994

Curves on CNTY 40 from MNTH 29 to TODD COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
40J	0	0	2827	300	No	No	★	-	-	-	-	-
40K	0	0	1993	300	No	No	★	-	-	-	-	-
40L	0	0	1672	300	No	No	★	-	-	-	-	-
40M	0	0	707	300	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only
40N	0	0	729	300	Yes	Yes	★★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$319
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$13,284
					$20,203

Implementation Cost

Federal Funds	$18,183
Local Match (10% of Total project cost)	$2,020
Total Project Cost	$20,203

2005-2009 MnCMAT Crash Data

Curves on CNTY 41 from CSAH 35 to MNTH 108

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
41A	0	0	919	465	Yes	No	★★★	-	x	Yes	No	Yes
41B	0	0	1408	465	No	No	★	x	-	-	No	Yes
41C	0	0	1435	465	No	No	★	x	-	-	No	Yes
41D	0	0	1238	465	No	No	★	-	-	-	-	-
41E	0	0	1253	465	No	No	★	-	-	-	-	-
41F	0	0	1864	465	No	No	★	-	-	-	-	-
41G	0	0	2311	465	No	No	★	-	-	-	-	-
41H	0	0	1250	465	No	No	★	-	-	-	-	-
41I	0	0	1367	680	No	No		x	-	-	No	Yes
41J	0	0	1868	680	Yes	No	★	x	-	-	No	Yes
41K	0	0	544	680	No	No	★	-	x	Installed	No	Yes
41L	0	0	790	680	No	No	★	-	x	Installed	No	Yes
41M	0	0	397	680	Yes	Yes	★★	-	-	Installed	No	Yes
41N	0	0	1437	680	No	No		x	-	-	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,201
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	1.6 miles	$4,838
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$18,038

Implementation Cost

Federal Funds	$16,234
Local Match (10% of Total project cost)	$1,804
Total Project Cost	$18,038

2005-2009 MnCMAT Crash Data

Curves on CSAH 41 from MNTH 108 to CSAH 4

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
41O	0	0	939	355	Yes	No	★★★	-	-	Installed	Outside	One Side Only
41P	0	0	839	355	Yes	No	★★★	-	-	Installed	Outside	One Side Only
41Q	0	0	1003	355	Yes	No	★★★	-	-	Installed	Outside	One Side Only
41R	0	0	854	355	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only
41S	0	0	839	355	Yes	No	★★★	-	-	Installed	Outside	One Side Only
41T	0	0	827	355	Yes	No	★★★	-	-	Installed	Outside	One Side Only
41U	0	0	825	355	Yes	No	★★★	-	-	Installed	Outside	One Side Only
41W	0	0	2249	520	No	No	★	-	-	-	-	-
41Y	0	0	2190	520	No	No	★	-	-	-	-	-
41Z	0	0	2074	520	Yes	No	★★	-	-	-	-	-
41ZA	0	0	2412	520	No	No	★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	7 curves	$23,100
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.8 miles	$2,436
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.8 miles	$32,485
					$58,021

Implementation Cost

Federal Funds	$52,219
Local Match (10% of Total project cost)	$5,802
Total Project Cost	$58,021

2005-2009 MnCMAT Crash Data

Curves on CSAH 42 from PARKERS PRAIRIE CORP LMTS to CSAH 40

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
42C	0	0	872	310	No	No	★★	-	x	Yes	Yes	No
42D	0	0	1352	150	No	No		x	-	-	Yes	No
42E	0	0	805	150	Yes	Yes	★★★	-	x	Yes	Yes	No
42F	0	0	971	150	Yes	No	★★	-	x	Yes	Yes	No
42G	0	0	996	150	No	Yes	★★	-	x	Yes	Yes	No
42H	0	0	1884	150	No	No		x	-	-	Yes	No
42I	0	0	1033	150	Yes	No	★★	-	x	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	5 curves	$16,500
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.3 miles	$52,705
					$69,205

Implementation Cost

Federal Funds	$62,284
Local Match (10% of Total project cost)	$6,920
Total Project Cost	$69,205

2005-2009 MnCMAT Crash Data

Curves on CSAH 44 from CSAH 14 to CSAH 35

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
44A	0	0	969	255	No	No	★★	-	-	Installed	Outside	One Side Only
44B	0	0	816	255	No	No	★★	-	-	Installed	Outside	One Side Only
44C	0	0	1081	255	No	No	★★	-	-	Installed	Outside	One Side Only
44D	0	0	1429	320	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only
44E	0	0	1390	380	No	No	★	x	-	-	Outside	One Side Only
44F	0	0	1382	380	Yes	No	★★	x	-	-	Outside	One Side Only
44G	0	0	1391	380	Yes	No	★★	x	-	-	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.8 miles	$2,400
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.8 miles	$32,004
					$44,304

Implementation Cost

Federal Funds	$39,874
Local Match (10% of Total project cost)	$4,430
Total Project Cost	$44,304

2005-2009 MnCMAT Crash Data

Curves on CSAH 45 from 3 MILES SOUTH OF CSAH 1 to CSAH 1

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
45A	0	0	798	250	Yes	Yes	★★★★	-	-	Installed	Yes	No
45B	0	0	1242	185	No	No		-	-	-	-	-
45C	0	0	1474	185	No	No		-	-	-	-	-
45D	0	0	1825	185	No	No		-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.2 miles	$9,682
					$12,982

Implementation Cost

Federal Funds	$11,684
Local Match (10% of Total project cost)	$1,298
Total Project Cost	$12,982

2005-2009 MnCMAT Crash Data

Curves on CSAH 45 from CSAH 1 to CSAH 74

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
45E	0	0	868	330	No	No	★★	-	x	Yes	Yes	No
45F	0	0	963	330	No	No	★★	-	x	Yes	Yes	No
45G	0	0	718	330	Yes	No	★★★	-	x	Installed	Yes	No
45H	0	0	719	330	No	No	★★	-	x	Yes	Yes	No
45I	0	0	339	330	Yes	No	★★	-	-	Installed	Yes	No
45J	0	0	424	165	No	No		-	-	Installed	Yes	No
45K	0	0	1045	165	No	No	★	-	x	Yes	Yes	No
45L	0	0	731	165	No	No	★	-	x	Installed	Yes	No
45M	0	0	1904	165	No	No		x	-	-	Yes	No
45N	0	0	941	165	No	No	★	-	x	Yes	Yes	No
45O	0	0	336	165	Yes	No	★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	9 curves	$29,700
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.6 miles	$64,326
					$94,026

Implementation Cost

Federal Funds	$84,623
Local Match (10% of Total project cost)	$9,403
Total Project Cost	$94,026

Curves on CSAH 46 from PARKERS PRAIRIE CORP LMTS to TODD COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
46A	0	0	671	790	No	No	★	-	-	Installed	Yes	No
46B	0	0	546	790	No	No	★	-	-	Installed	Yes	No
46C	0	0	714	790	No	No	★	-	-	Installed	Yes	No
46D	0	0	978	530	Yes	No	★★★	-	-	Installed	Yes	No
46E	0	0	951	530	Yes	No	★★★	-	-	Installed	Yes	No
46F	0	0	665	235	No	No	★★	-	-	Installed	Outside	One Side Only
46G	0	0	695	235	Yes	No	★★★	-	-	Installed	Outside	One Side Only
46H	0	0	568	235	Yes	No	★★★	-	-	Installed	Outside	One Side Only
46I	0	0	712	235	Yes	No	★★★	-	-	Installed	Outside	One Side Only
46J	0	0	713	235	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only
46K	0	0	703	235	Yes	No	★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	11 curves	$36,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.6 miles	$1,673
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.3 miles	$51,057
					$89,030

Implementation Cost

Federal Funds	$80,127
Local Match (10% of Total project cost)	$8,903
Total Project Cost	$89,030

2005-2009 MnCMAT Crash Data

Curves on CSAH 47 from GRANT COUNTY LINE to CSAH 12

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
47A	0	0	830	365	Yes	Yes	★★★★	-	-	Installed	Yes	No
47B	0	0	820	365	Yes	Yes	★★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.6 miles	$22,273
					$28,873

Implementation Cost

Federal Funds	$25,985
Local Match (10% of Total project cost)	$2,887
Total Project Cost	$28,873

2005-2009 MnCMAT Crash Data

Curves on CSAH 47 from CSAH 12 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
47C	0	0	1773	200	No	No	★	x	-	-	Yes	No
47D	0	0	1455	200	Yes	No	★★	x	-	-	Yes	No
47E	0	0	1417	200	No	No	★	x	-	-	Yes	No
47F	0	0	749	200	Yes	No	★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.2 miles	$49,576
					$52,876

Implementation Cost

Federal Funds	$47,588
Local Match (10% of Total project cost)	$5,288
Total Project Cost	$52,876

2005-2009 MnCMAT Crash Data

Curves on CSAH 49 from RICHVILLE CORP LMTS to MNTH 108

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
49A	0	0	990	580	Yes	No	★★★	-	-	Installed	Outside	One Side Only
49B	0	0	1210	580	No	No	★	-	-	-	-	-
49C	0	0	1374	580	No	No	★	-	-	-	-	-
49D	0	0	902	580	Yes	No	★★★	-	-	Installed	Outside	One Side Only
49E	0	0	856	580	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.4 miles	$1,189
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$15,860
					$26,949

Implementation Cost

Federal Funds	$24,254
Local Match (10% of Total project cost)	$2,695
Total Project Cost	$26,949

2005-2009 MnCMAT Crash Data

Curves on CSAH 50 from MNTH 108 to DEER CREEK CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
50A	0	0	723	345	Yes	Yes	★★★★	-	-	Installed	Yes	No
50B	0	0	588	455	Yes	No	★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,455
					$23,055

Implementation Cost

Federal Funds	$20,749
Local Match (10% of Total project cost)	$2,305
Total Project Cost	$23,055

2005-2009 MnCMAT Crash Data

Curves on CSAH 50 from DEER CREEK CORP LMTS to CSAH 75

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
50C	0	0	1122	330	No	No	★★	-	x	Installed	Yes	No
50D	0	0	1165	330	Yes	No	★★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,652
					$23,252

Implementation Cost

Federal Funds	$20,926
Local Match (10% of Total project cost)	$2,325
Total Project Cost	$23,252

2005-2009 MnCMAT Crash Data

Curves on CSAH 51 from PERHAM CORP LMTS to BECKER COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
51C	0	0	1692	2200	No	No		x	-	-	No	Yes
51D	0	0	2718	2200	Yes	No	★	-	-	Installed	Yes	No
51E	0	0	1249	2200	No	No		-	-	Installed	Yes	No
51F	0	0	1223	2200	Yes	No	★	-	-	Installed	Yes	No
51G	0	0	2321	590	No	No	★	x	-	-	Yes	No
51H	0	0	613	590	No	No	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$3,301
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$333
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.8 miles	$31,356
					$34,990

Implementation Cost

Federal Funds	$31,491
Local Match (10% of Total project cost)	$3,499
Total Project Cost	$34,990

2005-2009 MnCMAT Crash Data

Curves on CSAH 52 from MNTH 106 to MNTH 29

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
52A	0	0	1072	560	Yes	Yes	★★★★	-	-	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.2 miles	$8,091
					$11,391

Implementation Cost

Federal Funds	$10,252
Local Match (10% of Total project cost)	$1,139
Total Project Cost	$11,391

Curves on CSAH 53 from USTH 10 to CSAH 8

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
53A	0	0	828	260	Yes	Yes	★★★★	-	x	Installed	Outside	One Side Only
53B	0	0	876	260	Yes	Yes	★★★★	-	x	Installed	Outside	One Side Only
53C	0	0	2997	330	Yes	No	★★	-	-	-	-	-
53D	0	0	1134	395	Yes	No	★★★	-	x	Yes	Outside	One Side Only
53E	0	0	1523	395	No	No	★	x	-	-	Outside	One Side Only
53F	0	0	815	395	Yes	No	★★★	-	x	Installed	Outside	One Side Only
53G	0	0	1137	395	Yes	No	★★★	-	x	Installed	Outside	One Side Only
53H	0	0	1041	255	No	No	★★	-	x	Yes	Outside	One Side Only
53I	0	0	917	255	No	No	★★	-	x	Yes	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	7 curves	$23,100
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.9 miles	$2,674
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.9 miles	$35,659
					$61,434

Implementation Cost

Federal Funds	$55,290
Local Match (10% of Total project cost)	$6,143
Total Project Cost	$61,434

2005-2009 MnCMAT Crash Data

Curves on CSAH 54 from MNTH 78 to CSAH 67

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
54A	0	0	1414	600	Yes	No	★	-	-	Installed	Yes	No
54B	0	0	1611	600	Yes	No	★	x	-	-	Yes	No
54C	0	0	814	600	Yes	No	★★	-	-	Installed	Yes	No
54D	0	0	824	600	Yes	No	★★	-	-	Installed	Yes	No
54E	0	0	825	600	Yes	No	★★	-	-	Installed	Yes	No
54F	0	0	2802	600	No	Yes	★	-	-	Installed	Yes	No
54G	0	0	1370	600	No	No		-	-	Installed	Yes	No
54H	0	0	1199	600	No	No		-	-	Installed	Yes	No
54I	0	0	1306	600	No	No		-	-	Installed	Yes	No
54J	0	0	657	600	No	Yes	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	9 curves	$29,700
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.6 miles	$65,530
					$95,230

Implementation Cost

Federal Funds	$85,707
Local Match (10% of Total project cost)	$9,523
Total Project Cost	$95,230

2005-2009 MnCMAT Crash Data

Curves on CSAH 55 from CSAH 16 to OTTERTAIL CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
55A	0	0	813	290	Yes	No	★★★	-	x	Installed	Outside	One Side Only
55B	0	0	997	290	No	No	★★	-	x	Yes	Outside	One Side Only
55C	0	0	907	290	No	No	★★	-	x	Yes	Outside	One Side Only
55D	0	0	989	290	Yes	No	★★★	-	x	Yes	Outside	One Side Only
55G	0	0	2227	290	No	No	★	x	-	-	Outside	One Side Only
55H	0	0	907	290	Yes	No	★★★	-	x	Installed	Outside	One Side Only
55I	0	0	1521	290	No	No	★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	6 curves	$16,500
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.6 miles	$1,709
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.6 miles	$22,788
					$40,997

Implementation Cost

Federal Funds	$36,897
Local Match (10% of Total project cost)	$4,100
Total Project Cost	$40,997

Curves on CSAH 56 from NEW YORK MILLS CORP LMTS to CSAH 19

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
56A	0	0	825	175	No	No	★	-	x	Installed	Yes	No
56B	0	0	1332	175	No	Yes	★	-	-	Installed	Yes	No
56C	0	0	1483	175	No	No		-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,962
					$20,262

Implementation Cost

Federal Funds	$18,236
Local Match (10% of Total project cost)	$2,026
Total Project Cost	$20,262

2005-2009 MnCMAT Crash Data

Curves on CSAH 57 from CSAH 6 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
57A	0	0	816	130	Yes	No	★★	-	-	Installed	Outside	One Side Only
57B	0	0	832	130	Yes	No	★★	-	-	Installed	Outside	One Side Only
57C	0	0	790	130	Yes	No	★★	-	-	Installed	Outside	One Side Only
57D	0	0	796	130	No	No	★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$891
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$11,879
					$25,970

Implementation Cost

Federal Funds	$23,373
Local Match (10% of Total project cost)	$2,597
Total Project Cost	$25,970

2005-2009 MnCMAT Crash Data

Curves on CSAH 58 from CSAH 67 to CSAH 19

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
58A	0	0	840	160	Yes	Yes	★★★	-	-	Installed	Yes	No
58B	0	0	1908	135	No	No		x	-	-	Yes	No
58C	0	0	900	135	Yes	No	★★	x	-	Yes	Yes	No
58D	0	0	816	135	Yes	No	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.9 miles	$35,758
					$45,658

Implementation Cost

Federal Funds	$41,092
Local Match (10% of Total project cost)	$4,566
Total Project Cost	$45,658

2005-2009 MnCMAT Crash Data

Curves on CSAH 61 from CSAH 16 to MNTH 108

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
61A	0	0	842	170	No	No	★	-	x	Installed	Yes	No
61B	0	0	282	330	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only
61C	0	0	1119	485	No	No	★★	-	x	Yes	Yes	No
61D	0	0	905	485	No	No	★★	-	x	Yes	Yes	No
61E	0	0	1330	485	No	No	★	x	-	-	Yes	No
61F	0	0	1909	485	Yes	No	★★	x	-	-	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$129
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.6 miles	$25,792
					$39,121

Implementation Cost

Federal Funds	$35,209
Local Match (10% of Total project cost)	$3,912
Total Project Cost	$39,121

2005-2009 MnCMAT Crash Data

Curves on CSAH 62 from CSAH 67 to CSAH 19

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
62A	0	0	847	165	No	No	★	-	-	Installed	Outside	One Side Only
62B	0	0	829	165	Yes	Yes	★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$859
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$11,455
					$18,914

Implementation Cost

Federal Funds	$17,022
Local Match (10% of Total project cost)	$1,891
Total Project Cost	$18,914

2005-2009 MnCMAT Crash Data

Curves on CSAH 63 from DOUGLAS COUNTY LINE to MNTH 235

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
63A	0	0	255	235	No	No	★	-	-	Installed	Yes	No
63B	0	0	1252	235	No	No	★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$2,667
					$5,967

Implementation Cost

Federal Funds	$5,370
Local Match (10% of Total project cost)	$597
Total Project Cost	$5,967

2005-2009 MnCMAT Crash Data

Curves on CSAH 64 from MNTH 78 to DOUGLAS COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
64A	0	0	848	350	Yes	No	★★★	-	x	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$12,091
					$15,391

Implementation Cost

Federal Funds	$13,852
Local Match (10% of Total project cost)	$1,539
Total Project Cost	$15,391

2005-2009 MnCMAT Crash Data

Curves on CSAH 65 from CSAH 6 to CSAH 40

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
65A	0	0	2691	380	No	No	★	-	-	-	-	-
65B	0	0	2954	380	No	No	★	-	-	-	-	-
65C	0	0	819	380	Yes	No	★★★	-	-	Installed	Yes	No
65D	0	0	1468	380	No	No	★	-	-	-	-	-
65E	0	0	1177	380	No	No	★★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$5,523
					$8,823

Implementation Cost

Federal Funds	$7,940
Local Match (10% of Total project cost)	$882
Total Project Cost	$8,823

2005-2009 MnCMAT Crash Data

Curves on CSAH 65 from CSAH 40 to HENNING CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
65F	0	0	703	460	Yes	No	★★★	-	-	Installed	Outside	One Side Only
65G	0	0	709	460	No	No	★★	-	-	Installed	Outside	One Side Only
65H	0	0	1918	460	No	No	★	x	-	-	Outside	One Side Only
65I	0	0	1448	460	No	No	★	x	-	-	Outside	One Side Only
65J	0	0	1209	460	No	No	★	-	-	Installed	Outside	One Side Only
65K	0	0	1853	460	Yes	No	★★	x	-	-	Outside	One Side Only
65L	0	0	1441	460	No	No	★	-	-	-	-	-
65M	0	0	1433	460	Yes	No	★★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.4 miles	$1,235
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,466
					$24,301

Implementation Cost

Federal Funds	$21,871
Local Match (10% of Total project cost)	$2,430
Total Project Cost	$24,301

2005-2009 MnCMAT Crash Data

Curves on CSAH 67 from HENNING CORP LMTS to CSAH 52

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
67B	0	0	669	570	Yes	Yes	★★★★	-	-	Installed	Yes	No
67C	0	0	830	320	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only
67D	0	0	825	320	No	No	★★	-	-	Installed	Outside	One Side Only
67E	0	0	772	320	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only
67F	0	0	791	320	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only
67G	0	0	356	330	Yes	No	★★	-	-	Installed	No	Yes
67H	0	0	2005	330	No	No	★	-	-	-	-	-
67I	0	0	2060	330	Yes	No	★★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	6 curves	$19,800
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.6 miles	$1,738
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.6 miles	$24,333
					$45,871

Implementation Cost

Federal Funds	$41,284
Local Match (10% of Total project cost)	$4,587
Total Project Cost	$45,871

Curves on CSAH 67 from CSAH 52 to NEW YORK MILLS CORP LMTS

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
67K	0	0	716	520	Yes	Yes	★★★★	-	x	Installed	Yes	No
67L	0	0	724	520	Yes	Yes	★★★★	-	x	Installed	Yes	No
67M	0	0	713	860	Yes	Yes	★★★	-	x	Installed	Yes	No
67N	0	0	726	1200	Yes	Yes	★★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.9 miles	$35,167
					$48,367

Implementation Cost

Federal Funds	$43,530
Local Match (10% of Total project cost)	$4,837
Total Project Cost	$48,367

2005-2009 MnCMAT Crash Data

Curves on CSAH 67 from CSAH 8 WEST to BECKER COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
67T	0	0	832	315	No	Yes	★★★	-	-	Installed	Outside	One Side Only
67U	0	0	1878	315	No	No	★	x	-	-	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$938
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$12,511
					$16,750

Implementation Cost

Federal Funds	$15,075
Local Match (10% of Total project cost)	$1,675
Total Project Cost	$16,750

2005-2009 MnCMAT Crash Data

Curves on CSAH 71 from DOUGLAS COUNTY LINE to CSAH 46

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
71A	0	0	799	175	Yes	Yes	★★★	-	x	Installed	Outside	One Side Only
71B	0	0	829	175	Yes	Yes	★★★	-	x	Installed	Outside	One Side Only
71C	0	0	835	175	Yes	Yes	★★★	-	x	Installed	Outside	One Side Only
71E	0	0	716	175	Yes	Yes	★★★	-	x	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.5 miles	$1,485
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.5 miles	$19,803
					$34,488

Implementation Cost

Federal Funds	$31,039
Local Match (10% of Total project cost)	$3,449
Total Project Cost	$34,488

2005-2009 MnCMAT Crash Data

Curves on CSAH 72 from MNTH 78 to CSAH 83

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
72A	0	0	203	1500	Yes	Yes	★★	-	-	Installed	Yes	No
72B	0	0	846	1500	Yes	Yes	★★★	-	x	Installed	Yes	No
72C	0	0	862	1500	Yes	No	★★	-	x	Yes	Yes	No
72D	0	0	2414	1500	Yes	No	★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$15,682
					$25,582

Implementation Cost

Federal Funds	$23,024
Local Match (10% of Total project cost)	$2,558
Total Project Cost	$25,582

2005-2009 MnCMAT Crash Data

Curves on CSAH 73 from CSAH 40 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
73A	0	0	1093	155	Yes	No	★★	-	-	Installed	Yes	No
73B	0	0	995	155	No	No	★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$10,886
					$17,486

Implementation Cost

Federal Funds	$15,738
Local Match (10% of Total project cost)	$1,749
Total Project Cost	$17,486

2005-2009 MnCMAT Crash Data

Curves on CSAH 74 from CSAH 35 to CSAH 45

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
74A	0	0	1111	420	Yes	Yes	★★★★	-	-	Yes	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$319
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$4,250
					$7,869

Implementation Cost

Federal Funds	$7,082
Local Match (10% of Total project cost)	$787
Total Project Cost	$7,869

2005-2009 MnCMAT Crash Data

Curves on CSAH 74 from CSAH 45 to CSAH 1

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
74B	0	0	1299	420	No	No	★	x	-	-	No	Yes
74C	0	0	1227	420	No	No	★	x	-	-	Outside	One Side Only
74D	0	0	1183	385	Yes	No	★★★	-	-	Yes	No	Yes
74E	0	0	1788	345	Yes	No	★★	x	-	-	Outside	One Side Only
74F	0	0	1519	345	Yes	No	★★	x	-	-	Outside	One Side Only
74G	0	0	596	345	Yes	No	★★★	-	-	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.9 miles	$2,841
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$15,220
					$24,661

Implementation Cost

Federal Funds	$22,195
Local Match (10% of Total project cost)	$2,466
Total Project Cost	$24,661

2005-2009 MnCMAT Crash Data

Curves on CSAH 75 from CSAH 40 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
75A	0	0	482	140	Yes	No	★	x	-	Yes	Yes	No
75B	0	0	726	140	Yes	Yes	★★★	-	x	Installed	Yes	No
75C	0	0	845	140	Yes	Yes	★★★	-	x	Installed	Yes	No
75D	0	0	830	140	Yes	No	★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.6 miles	$24,856
					$38,056

Implementation Cost

Federal Funds	$34,250
Local Match (10% of Total project cost)	$3,806
Total Project Cost	$38,056

2005-2009 MnCMAT Crash Data

Curves on CSAH 75 from CSAH 8 to BECKER COUNTY LINE

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
75F	0	0	828	245	Yes	Yes	★★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$447
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$5,966
					$9,713

Implementation Cost

Federal Funds	$8,742
Local Match (10% of Total project cost)	$971
Total Project Cost	$9,713

2005-2009 MnCMAT Crash Data

Curves on CSAH 76 from USTH 10 to CSAH 19

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
76A	0	0	935	220	Yes	No	★★★	-	-	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$193
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$2,572
					$6,065

Implementation Cost

Federal Funds	$5,458
Local Match (10% of Total project cost)	$606
Total Project Cost	$6,065

2005-2009 MnCMAT Crash Data

Curves on CSAH 79 from DOUGLAS CNTY LINE to MNTH 235

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
79A	0	0	804	175	No	Yes	★★	-	-	Installed	Yes	No
79B	0	0	810	175	No	No	★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.5 miles	$20,530
					$27,130

Implementation Cost

Federal Funds	$24,417
Local Match (10% of Total project cost)	$2,713
Total Project Cost	$27,130

2005-2009 MnCMAT Crash Data

Curves on CSAH 80 from PERHAM CORP LMTS to USTH 10 EAST

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
80E	0	0	2759	2550	No	No		-	-	-	-	-
80F	0	0	609	2550	Yes	Yes	★★★	-	x	Yes	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$401
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$3,701

Implementation Cost

Federal Funds	$3,331
Local Match (10% of Total project cost)	$370
Total Project Cost	$3,701

2005-2009 MnCMAT Crash Data

Curves on CSAH 83 from BATTLE LAKE CORP LMTS to CSAH 1

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
83B	0	0	835	540	Yes	Yes	★★★★	-	x	Installed	Yes	No
83C	0	0	1487	540	No	No	★	x	-	-	Yes	No
83D	0	0	1502	540	No	No	★	-	-	-	-	-
83E	0	0	1586	540	Yes	No	★★	-	-	-	-	-
83F	0	0	937	375	Yes	No	★★★	-	x	Yes	Yes	No
83G	0	0	977	210	Yes	No	★★★	-	x	Yes	Yes	No
83H	0	0	832	210	Yes	Yes	★★★★	-	x	Installed	Yes	No
83I	0	0	823	210	Yes	Yes	★★★★	-	x	Installed	Yes	No
83J	0	0	2345	210	Yes	No	★★	-	-	-	-	-
83K	0	0	461	210	No	No	★	x	-	Yes	Yes	No
83L	0	0	388	210	No	No	★	-	-	Installed	Yes	No
83M	0	0	179	210	Yes	No	★★	-	-	-	-	-

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	7 curves	$23,100
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.5 miles	$60,674
					$83,774

Implementation Cost

Federal Funds	$75,397
Local Match (10% of Total project cost)	$8,377
Total Project Cost	$83,774

2005-2009 MnCMAT Crash Data

Curves on CSAH 84 from NEW YORK MILLS CORP LMTS to USTH 10 EAST

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
84B	0	0	923	1350	No	No	★	-	x	Yes	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.2 miles	$490
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$3,790

Implementation Cost

Federal Funds	$3,411
Local Match (10% of Total project cost)	$379
Total Project Cost	$3,790

2005-2009 MnCMAT Crash Data

Curves on CNTY 111 from FERGUS FALLS CORP LMTS to CSAH 10

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
111E	0	1	1155	960	No	No	★★	-	x	Yes	Outside	One Side Only
111G	1	0	1057	550	Yes	No	★★★★	-	x	Installed	Yes	No
111H	0	0	869	550	No	No	★★	-	x	Installed	Yes	No
111I	0	0	1109	550	No	Yes	★★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	4 curves	$13,200
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$432
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.6 miles	$23,678
					$37,310

Implementation Cost

Federal Funds	$33,579
Local Match (10% of Total project cost)	$3,731
Total Project Cost	$37,310

2005-2009 MnCMAT Crash Data

Curves on CNTY 113 from MNTH 108 to CSAH 23

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
113A	0	0	2051	140	No	No		-	-	-	-	-
113B	0	0	1011	140	No	No	★	-	x	Yes	Yes	No
113C	0	0	2308	140	No	No		-	-	-	-	-
113D	0	0	371	140	No	Yes	★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.2 miles	$7,333
					$13,933

Implementation Cost

Federal Funds	$12,540
Local Match (10% of Total project cost)	$1,393
Total Project Cost	$13,933

2005-2009 MnCMAT Crash Data

Curves on CNTY 114 from CSAH 15 to CSAH 15

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
114A	0	0	812	70	No	No	★	-	-	Installed	No	Yes
114B	0	0	821	70	Yes	No	★★	-	-	Installed	No	Yes
114C	0	0	848	165	Yes	Yes	★★★	-	-	Installed	No	Yes

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.8 miles	$2,289
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.0 miles	$0
					$12,189

Implementation Cost

Federal Funds	$10,970
Local Match (10% of Total project cost)	$1,219
Total Project Cost	$12,189

2005-2009 MnCMAT Crash Data

Curves on CNTY 115 from CSAH 74 to CSAH 35

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
115A	0	0	722	235	No	Yes	★★★	-	x	Installed	Yes	No
115B	0	0	924	235	Yes	No	★★★	-	x	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,030
					$22,630

Implementation Cost

Federal Funds	$20,367
Local Match (10% of Total project cost)	$2,263
Total Project Cost	$22,630

2005-2009 MnCMAT Crash Data

Curves on CNTY 116 from CSAH 21 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
116A	0	0	818	630	Yes	Yes	★★★	-	-	Yes	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.1 miles	$406
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$5,409
					$9,115

Implementation Cost

Federal Funds	$8,203
Local Match (10% of Total project cost)	$911
Total Project Cost	$9,115

2005-2009 MnCMAT Crash Data

Curves on CNTY 119 from CSAH 47 to MNTH 210

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
119A	0	0	919	145	No	No	★	-	x	Yes	Yes	No
119B	0	0	877	145	Yes	No	★★	-	x	Yes	Yes	No
119C	0	0	1240	145	No	No		x	-	-	Yes	No
119D	0	0	1466	145	No	No		x	-	-	Yes	No
119E	0	0	1566	145	No	No		x	-	-	Yes	No
119F	0	0	1044	145	Yes	No	★★	-	x	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.1 miles	$43,402
					$53,302

Implementation Cost

Federal Funds	$47,972
Local Match (10% of Total project cost)	$5,330
Total Project Cost	$53,302

2005-2009 MnCMAT Crash Data

Curves on CNTY 122 from UNDERWOOD CORP LMTS to CSAH 83

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
122A	0	0	1148	660	No	No	★	-	x	Installed	Outside	One Side Only
122B	0	0	1584	660	Yes	No	★	x	-	-	Outside	One Side Only
122D	0	0	1083	495	No	No	★★	-	x	Installed	Outside	One Side Only
122E	0	0	1753	495	No	No	★	x	-	-	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost	Units	Total cost
Chevrons	Proactive	$3,300 per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500 per curve	0 curves	$0
Rumble Strip	Proactive	$3,000 per mile	.4 miles	$1,340
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000 per mile	.4 miles	$17,864
				$25,804

Implementation Cost

Federal Funds	$23,223
Local Match (10% of Total project cost)	$2,580
Total Project Cost	$25,804

2005-2009 MnCMAT Crash Data

Curves on CNTY 126 from CSAH 47 to MNTH 78

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
126A	0	0	1646	100	No	No		-	-	-	-	-
126B	0	0	1225	100	No	No		x	-	-	Yes	No
126C	0	0	1141	100	No	No	★	-	x	Yes	Yes	No
126D	0	0	1468	100	Yes	No	★	x	-	-	Yes	No
126E	0	0	1759	100	No	No		-	-	-	-	-
126F	0	0	1570	100	No	No		x	-	-	Yes	No
126G	0	0	1142	100	Yes	No	★★	-	x	Yes	Yes	No
126H	0	0	1160	100	No	No	★	-	x	Yes	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	1.1 miles	$44,136
					$54,037

Implementation Cost

Federal Funds	$48,633
Local Match (10% of Total project cost)	$5,404
Total Project Cost	$54,037

2005-2009 MnCMAT Crash Data

Curves on CNTY 128 from MNTH 78 to CSAH 55

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
128A	0	0	731	100	No	No	★	-	x	Installed	Yes	No
128B	0	0	743	100	No	No	★	-	x	Installed	Yes	No
128C	0	0	975	100	Yes	No	★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$13,818
					$23,718

Implementation Cost

Federal Funds	$21,346
Local Match (10% of Total project cost)	$2,372
Total Project Cost	$23,718

2005-2009 MnCMAT Crash Data

Curves on CNTY 130 from 1.5 MILES WEST OF CSAH 4 to CSAH 4

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
130A	0	0	967	260	Yes	No	★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.2 miles	$7,955
					$11,255

Implementation Cost

Federal Funds	$10,129
Local Match (10% of Total project cost)	$1,125
Total Project Cost	$11,255

2005-2009 MnCMAT Crash Data

Curves on CNTY 136 from CH 138 to MNTH 29

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
136A	0	0	771	105	No	No	★	-	-	Installed	Yes	No
136B	0	0	818	105	No	Yes	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$15,803
					$22,403

Implementation Cost

Federal Funds	$20,163
Local Match (10% of Total project cost)	$2,240
Total Project Cost	$22,403

2005-2009 MnCMAT Crash Data

Curves on CNTY 136 from MNTH 29 to CSAH 40

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
136C	0	0	830	65	Yes	Yes	★★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$10,970
					$14,270

Implementation Cost

Federal Funds	$12,843
Local Match (10% of Total project cost)	$1,427
Total Project Cost	$14,270

2005-2009 MnCMAT Crash Data

Curves on CNTY 137 from USTH 10 to CSAH 53

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
137A	0	0	819	290	Yes	No	★★★	-	x	Installed	Outside	One Side Only
137B	0	0	976	290	No	No	★★	-	x	Installed	Outside	One Side Only
137C	0	0	976	290	No	No	★★	-	x	Installed	Outside	One Side Only

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	3 curves	$9,900
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.3 miles	$972
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.3 miles	$12,962
					$23,834

Implementation Cost

Federal Funds	$21,451
Local Match (10% of Total project cost)	$2,383
Total Project Cost	$23,834

2005-2009 MnCMAT Crash Data

Curves on CNTY 138 from MNTH 29 to CH 136

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
138A	0	0	789	115	No	No	★	-	x	Installed	Yes	No
138B	0	0	841	115	Yes	Yes	★★★	-	x	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	2 curves	$6,600
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.4 miles	$16,235
					$22,835

Implementation Cost

Federal Funds	$20,551
Local Match (10% of Total project cost)	$2,283
Total Project Cost	$22,835

2005-2009 MnCMAT Crash Data

Curves on CNTY 141 from CSAH 71 to CSAH 46

Agency: Otter Tail County

Curve Data

Curve ID	K	A	Radius (ft)	ADT	Intersection on Curve	Visual Trap	Risk Ranking	Proximity	High Priority Segment + Critical Radius	Chevron Candidate	2' Shoulder Pave+RS+Safety Wedge Candidate	RS Candidate
141A	0	0	358	80	Yes	Yes	★★	-	-	Installed	Yes	No

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc
**Curves with radius greater than 1,200 feet did not receive a new or replacement chevron project.

Ranking Criteria

	Criteria
Severe Crashes	> 0
Radius	500 to 1200
ADT	200 to 600
Intersection on Curve	Yes
Visual Trap	Yes

Curves are selected for project if:
- 3 or more ★s
- x in proximity column
- x in High Priority Segment + Critical Radius column
- Curve currently has chevrons installed

Short List of Strategies Considered

Description	Type	Unit Cost		Units	Total cost
Chevrons	Proactive	$3,300	per curve	1 curves	$3,300
Arrow Board Only	Proactive	$500	per curve	0 curves	$0
Rumble Strip	Proactive	$3,000	per mile	.0 miles	$0
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	per mile	.1 miles	$2,667
					$5,967

Implementation Cost

Federal Funds	$5,370
Local Match (10% of Total project cost)	$597
Total Project Cost	$5,967

2005-2009 MnCMAT Crash Data

Appendix D

Rural Thru/Stop Intersection Prioritization and Project Sheets

Otter Tail County
Rural Intersection Listing

Int #	Sys	Num	Intersection Description	Skew	On/Near Curve	Development	RR Xing	ADT	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Crash Cost
1.01	CSAH	1	CSAH 1 and CSAH 26	No	No	No	No	995	Yes	3	0.38	$ 115,000
1.02	CSAH	1	CSAH 1 and T 1196 CNTY 110 RT (120TH	No	No	No	No	774.5	Yes	1	0.11	$ 12,000
1.03	CSAH	1	CSAH 1 and CNTY 112 140TH ST	No	No	No	No	767.5	No	1	0.19	$ 12,000
1.04	CSAH	1	CSAH 1 and CSAH 2 (170TH ST)	No	No	No	No	974.5	No	1	0.11	$ 91,000
1.06	CSAH	1	CSAH 1 and CSAH 15	No	Yes	No	No	3487	Yes	1	0.38	$ 91,000
1.22	CSAH	1	CSAH 1 and CSAH 18	No	No	No	No	3225	Yes	1	0.26	$ 12,000
1.23	CSAH	1	CSAH 1 and CSAH 10	No	Yes	No	No	2925	No	1	0.49	$ 91,000
1.24	CSAH	1	CSAH 1 and CSAH 43	No	No	No	No	2540	No	0	0.16	$ -
1.25	CSAH	1	CSAH 1 and CSAH 35	No	No	No	No	3150	Yes	5	0.48	$ 342,000
1.26	CSAH	1	CSAH 1 and CSAH 45 WEST	No	No	No	No	1893	Yes	0	0.10	$ -
1.27	CSAH	1	CSAH 1 and CSAH 45 EAST	No	No	No	No	1965	No	0	0.18	$ -
1.28	CSAH	1	CSAH 1 and CSAH 83	Yes	Yes	No	No	1905	Yes	0	0.12	$ -
1.29	CSAH	1	CSAH 1 and CNTY 145	No	Yes	Yes	No	1540	No	1	0.51	$ 91,000
1.30	CSAH	1	CSAH 1 and CSAH 74	No	Yes	No	No	1573	Yes	0	0.25	$ -
1.31	CSAH	1	CSAH 1 and CSAH 14	No	Yes	No	No	1645	Yes	0	0.35	$ -
2.01	CSAH	2	CSAH 2 and T 1152 CSAH 7	No	No	No	No	184.5	Yes	0	0.54	$ -
2.02	CSAH	2	CSAH 2 and CSAH 15 , T 1153 SOUTH	No	No	No	No	262	Yes	0	0.50	$ -
2.03	CSAH	2	CSAH 2 and CSAH 15 NORTH	No	No	No	No	412	Yes	0	0.32	$ -
3.01	CSAH	3	CSAH 3 and CSAH 10	No	Yes	No	No	1560	Yes	2	0.71	$ 24,000
3.02	CSAH	3	CSAH 3 and CSAH 22	No	Yes	No	No	865	Yes	0	0.73	$ -
3.03	CSAH	3	CSAH 3 and CSAH 24	No	Yes	No	No	1033	Yes	0	0.78	$ -
3.04	CSAH	3	CSAH 3 and USTH 59	No	No	No	No	4345	Yes	0	0.20	$ -
4.01	CSAH	4	CSAH 4 and USTH 59	No	Yes	No	No	3950	Yes	3	0.39	$ 273,000
4.02	CSAH	4	CSAH 4 and CSAH 31	No	Yes	No	No	1575	Yes	1	0.42	$ 12,000
4.03	CSAH	4	CSAH 4 and CSAH 41	Yes	No	No	No	1560	Yes	1	0.40	$ 12,000
4.04	CSAH	4	CSAH 4 and CNTY 130	No	Yes	Yes	No	1730	No	0	0.16	$ -
4.05	CSAH	4	CSAH 4 and CSAH 35	No	Yes	No	No	3135	Yes	0	0.39	$ -
4.07	CSAH	4	CSAH 4 and MNTH 228 NORTH	Yes	Yes	No	No	2005	Yes	2	0.91	$ 424,000
5.01	CSAH	5	CSAH 5 and CSAH 38	No	No	No	No	562.5	Yes	1	0.71	$ 136,000
5.02	CSAH	5	CSAH 5 and CSAH 6	No	No	No	No	370	No	0	0.51	$ -
5.03	CSAH	5	CSAH 5 and MNTH 210 , T 1461 EAST	Yes	No	Yes	No	2210	Yes	2	0.30	$ 272,000
5.05	CSAH	5	CSAH 5 and CSAH 16 , T 264 EAST	No	No	No	No	787	Yes	0	0.51	$ -
5.06	CSAH	5	CSAH 5 and CSAH 16 WEST	No	No	No	No	725	Yes	2	0.96	$ 548,000
5.07	CSAH	5	CSAH 5 and CNTY 128	No	No	No	No	617.5	No	0	0.56	$ -
5.08	CSAH	5	CSAH 5 and MNTH 78	Yes	No	No	No	1575	Yes	0	0.25	$ -
6.01	CSAH	6	CSAH 6 and CSAH 57	No	No	No	No	215	Yes	0	0.87	$ -
6.02	CSAH	6	CSAH 6 and CSAH 59	No	No	No	No	562.5	Yes	0	0.65	$ -
6.03	CSAH	6	CSAH 6 and CSAH 65, CNTY 129	No	No	No	No	705	Yes	0	0.63	$ -
6.04	CSAH	6	CSAH 6 and MNTH 29	No	Yes	No	No	3210	Yes	3	0.19	$ 273,000
7.01	CSAH	7	CSAH 7 and CSAH 26	No	No	No	No	165	Yes	0	0.18	$ -
8.03	CSAH	8	CSAH 8 and CSAH 13	Yes	Yes	No	No	1825	Yes	1	0.56	$ 12,000
8.04	CSAH	8	CSAH 8 and CSAH 53	No	No	No	No	1198	Yes	1	0.41	$ 91,000
8.05	CSAH	8	CSAH 8 and CSAH 67 NORTH	No	No	No	No	835	Yes	0	0.98	$ -
8.06	CSAH	8	CSAH 8 and CSAH 67 SOUTH	No	No	No	No	935	Yes	0	0.85	$ -
8.07	CSAH	8	CSAH 8 and CSAH 19 WEST	No	No	No	No	872.5	Yes	1	0.38	$ 136,000
8.08	CSAH	8	CSAH 8 and CSAH 19 EAST	No	No	No	No	1028	Yes	0	0.30	$ -
8.09	CSAH	8	CSAH 8 and CSAH 75 WEST	No	No	No	No	1065	Yes	0	0.38	$ -
8.10	CSAH	8	CSAH 8 and CSAH 75 EAST	No	No	No	No	1143	Yes	2	0.55	$ 227,000
9.02	CSAH	9	CSAH 9 and CSAH 23 450TH ST	No	No	No	No	1460	Yes	2	0.08	$ 148,000
9.03	CSAH	9	CSAH 9 and MNTH 34 WEST	Yes	Yes	No	No	3075	Yes	4	0.56	$ 251,000
9.04	CSAH	9	CSAH 9 and MNTH 34 T 665 EAST	No	No	No	No	2147	Yes	1	0.24	$ 12,000
9.05	CSAH	9	CSAH 9 and CSAH 20	Yes	Yes	Yes	No	1450	Yes	0	0.76	$ -
10.01	CSAH	10	CSAH 10 and CSAH 11 WILKIN CO CSAH	No	No	No	No	372	Yes	1	0.23	$ 12,000
10.02	CSAH	10	CSAH 10 and CSAH 11	No	No	No	No	350	Yes	0	0.22	$ -
10.03	CSAH	10	CSAH 10 and CSAH 88	Yes	No	No	Yes	750	Yes	1	0.72	$ 12,000
10.04	CSAH	10	CSAH 10 and CSAH 21	No	No	No	No	587.5	No	1	0.60	$ 91,000
10.06	CSAH	10	CSAH 10 and CSAH 27	No	No	No	No	3450	No	6	0.53	$ 433,000
10.07	CSAH	10	CSAH 10 and CNTY 111	No	No	No	No	1425	Yes	0	0.48	$ -
10.08	CSAH	10	CSAH 10 and USTH 10	No	Yes	No	No	7625	No	4	0.15	$ 206,000
11.01	CSAH	11	CSAH 11 and CSAH 21 CNTY 116	No	No	No	No	402.5	Yes	0	0.83	$ -
11.02	CSAH	11	CSAH 11 and WILKIN CO CSAH 20	No	No	No	No	125	No	0	0.47	$ -
11.05	CSAH	11	CSAH 11 and CSAH 28 WILKIN CO CNTY :	No	No	No	No	387.5	No	0	0.34	$ -
11.06	CSAH	11	CSAH 11 and MNTH 108	No	No	No	No	1465	Yes	1	0.17	$ 12,000
12.01	CSAH	12	CSAH 12 and CSAH 82	No	Yes	No	No	1375	No	0	0.75	$ -
12.03	CSAH	12	CSAH 12 and CSAH 39 CNTY 117	No	No	No	No	980	Yes	0	0.18	$ -
12.04	CSAH	12	CSAH 12 and CSAH 47 WEST	No	No	No	No	547.5	Yes	1	0.55	$ 12,000
12.05	CSAH	12	CSAH 12 and CSAH 47 EAST	No	No	No	No	525	Yes	0	0.47	$ -
12.06	CSAH	12	CSAH 12 and MNTH 78	No	No	No	No	1288	Yes	1	0.40	$ 12,000
13.01	CSAH	13	CSAH 13 and CSAH 60	No	No	No	No	845	Yes	0	0.58	$ -
13.02	CSAH	13	CSAH 13 and CNTY 146 RT	No	No	No	No	550	No	0	0.16	$ -
14.01	CSAH	14	CSAH 14 and CSAH 32	No	Yes	No	No	677	Yes	0	0.23	$ -
14.02	CSAH	14	CSAH 14 and CSAH 44	No	No	No	No	915	Yes	0	0.32	$ -
14.04	CSAH	14	CSAH 14 and MNTH 78 SOUTH	No	No	No	No	4475	Yes	2	0.24	$ 148,000
14.05	CSAH	14	CSAH 14 and MNTH 78 NORTH	No	No	No	No	4552	Yes	1	0.09	$ 91,000
14.06	CSAH	14	CSAH 14 and CSAH 67	Yes	Yes	No	No	1080	Yes	1	0.51	$ 12,000
15.01	CSAH	15	CSAH 15 and CSAH 26	No	No	No	No	207.5	Yes	0	0.96	$ -

Otter Tail County
Rural Intersection Listing

Int #	Sys	Num	Intersection Description	Skew	On/Near Curve	Development	RR Xing	ADT	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Crash Cost
15.02	CSAH	15	CSAH 15 and CNTY 112	No	No	No	No	197	No	1	0.46	$ 12,000
15.03	CSAH	15	CSAH 15 and CNTY 114	No	No	No	No	480	Yes	0	0.17	$ -
15.04	CSAH	15	CSAH 15 and CSAH 86	No	Yes	No	No	755	No	2	0.52	$ 182,000
15.05	CSAH	15	CSAH 15 and CNTY 114	No	No	No	No	727.5	Yes	0	0.43	$ -
16.01	CSAH	16	CSAH 16 and MNTH 78	No	No	No	No	2270	Yes	1	0.42	$ 91,000
16.02	CSAH	16	CSAH 16 and CSAH 89	No	No	No	No	902.5	No	1	0.30	$ 12,000
16.03	CSAH	16	CSAH 16 and CSAH 55	No	No	No	No	872	Yes	0	0.25	$ -
16.04	CSAH	16	CSAH 16 and CSAH 61	No	No	No	No	1012	Yes	1	0.12	$ 12,000
16.05	CSAH	16	CSAH 16 and MNTH 108	No	Yes	No	No	1770	Yes	4	0.68	$ 251,000
18.01	CSAH	18	CSAH 18 and CSAH 35	No	No	No	No	1655	Yes	1	0.47	$ 12,000
19.03	CSAH	19	CSAH 19 and CSAH 76	No	No	No	No	712.5	No	2	0.45	$ 103,000
19.04	CSAH	19	CSAH 19 and CNTY 144	No	No	No	No	415	No	0	0.37	$ -
19.05	CSAH	19	CSAH 19 and CSAH 56	No	Yes	No	No	395	Yes	1	0.57	$ 12,000
19.06	CSAH	19	CSAH 19 and CSAH 58	No	No	No	No	332.5	Yes	0	0.51	$ -
19.07	CSAH	19	CSAH 19 and CSAH 62	No	No	No	No	389.5	No	0	0.39	$ -
20.01	CSAH	20	CSAH 20 and CSAH 31	No	Yes	No	No	1435	No	1	0.73	$ 136,000
20.02	CSAH	20	CSAH 20 and USTH 59	No	Yes	No	No	3600	Yes	0	0.34	$ -
21.01	CSAH	21	CSAH 21 and MNTH 210	No	No	No	No	3160	Yes	0	0.07	$ -
21.02	CSAH	21	CSAH 21 and CSAH 88	Yes	No	No	Yes	655	Yes	1	0.51	$ 136,000
21.03	CSAH	21	CSAH 21 and CNTY 118	No	No	No	No	244.5	No	0	0.40	$ -
21.04	CSAH	21	CSAH 21 and CSAH 24 SOUTH	No	Yes	No	No	420	Yes	0	0.56	$ -
21.05	CSAH	21	CSAH 21 and CSAH 24 NORTH	No	Yes	No	No	470	Yes	0	0.76	$ -
21.06	CSAH	21	CSAH 21 and CSAH 28	No	No	No	No	405	Yes	1	0.56	$ 136,000
21.07	CSAH	21	CSAH 21 and MNTH 108	No	No	No	No	1503	Yes	1	0.20	$ 12,000
22.01	CSAH	22	CSAH 22 and CSAH 27	Yes	Yes	No	No	1927	Yes	2	0.24	$ 148,000
22.02	CSAH	22	CSAH 22 and CSAH 43	No	Yes	No	No	555	No	0	0.96	$ -
22.03	CSAH	22	CSAH 22 and CSAH 35	No	No	No	No	1175	Yes	1	0.22	$ 12,000
23.01	CSAH	23	CSAH 23 and CNTY 113	No	Yes	No	No	235	No	0	0.85	$ -
23.02	CSAH	23	CSAH 23 and MNTH 34	No	No	No	No	2650	Yes	1	0.10	$ 136,000
24.03	CSAH	24	CSAH 24 and CSAH 27	No	Yes	No	No	645	Yes	2	0.35	$ 103,000
24.04	CSAH	24	CSAH 24 and CSAH 41	No	No	No	No	642.5	Yes	0	0.76	$ -
25.01	CSAH	25	CSAH 25 and CSAH 26	No	No	No	No	385	No	2	0.40	$ 103,000
25.02	CSAH	25	CSAH 25 and CNTY 110	No	No	No	No	265	No	0	0.56	$ -
25.03	CSAH	25	CSAH 25 and MNTH 210	No	Yes	No	No	2825	No	0	0.69	$ -
26.01	CSAH	26	CSAH 26 and GRANT CO CSAH 3	No	No	No	No	165	No	0	0.36	$ -
28.01	CSAH	28	CSAH 28 and USTH 59	Yes	Yes	No	No	4000	Yes	2	0.04	$ 103,000
29.01	CSAH	29	CSAH 29 and CSAH 82	Yes	Yes	No	No	1390	Yes	0	0.14	$ -
29.02	CSAH	29	CSAH 29 and CNTY 120	Yes	Yes	No	No	982.5	No	0	0.76	$ -
29.03	CSAH	29	CSAH 29 and MNTH 210	Yes	No	Yes	No	6837	Yes	0	0.14	$ -
30.01	CSAH	30	CSAH 30 and MNTH 108	No	Yes	No	No	1603	No	0	0.17	$ -
31.01	CSAH	31	CSAH 31 and USTH 59	Yes	Yes	No	No	3345	Yes	0	0.17	$ -
32.01	CSAH	32	CSAH 32 and CSAH 74	Yes	Yes	No	No	555	Yes	0	0.90	$ -
33.01	CSAH	33	CSAH 33 and CSAH 35	No	Yes	No	No	687.5	Yes	0	0.28	$ -
33.02	CSAH	33	CSAH 33 and CNTY 124	No	Yes	No	No	265	No	0	0.89	$ -
33.03	CSAH	33	CSAH 33 and CNTY 120	No	Yes	No	No	555	No	1	0.53	$ 136,000
33.04	CSAH	33	CSAH 33 and MNTH 210	No	Yes	No	No	5500	Yes	2	0.08	$ 103,000
34.01	CSAH	34	CSAH 34 and CSAH 35	No	Yes	No	No	907.5	Yes	0	0.96	$ -
34.02	CSAH	34	CSAH 34 and CNTY 123	Yes	Yes	No	No	962.5	No	1	0.24	$ 91,000
34.03	CSAH	34	CSAH 34 and CNTY 125	No	No	No	No	1767	No	2	0.26	$ 836,000
35.01	CSAH	35	CSAH 35 and USTH 59	No	No	No	No	1483	Yes	0	0.28	$ -
35.02	CSAH	35	CSAH 35 and CSAH 37	No	Yes	No	No	747.5	No	0	0.71	$ -
35.04	CSAH	35	CSAH 35 and CSAH 82	Yes	Yes	No	No	2045	Yes	2	0.96	$ 24,000
35.05	CSAH	35	CSAH 35 and CNTY 124	Yes	Yes	No	No	560	No	1	0.41	$ 91,000
35.06	CSAH	35	CSAH 35 and CSAH 39	No	Yes	No	No	625	Yes	1	0.24	$ 91,000
35.07	CSAH	35	CSAH 35 and MNTH 210	No	Yes	Yes	No	4900	Yes	2	0.44	$ 103,000
35.09	CSAH	35	CSAH 35 and CSAH 74	No	No	No	No	1337	Yes	0	0.22	$ -
35.10	CSAH	35	CSAH 35 and CNTY 115	No	Yes	No	No	982.5	No	0	0.27	$ -
35.11	CSAH	35	CSAH 35 and CSAH 41	Yes	Yes	No	No	992.5	Yes	2	0.61	$ 103,000
35.12	CSAH	35	CSAH 35 and CSAH 44	Yes	Yes	No	No	1075	Yes	2	0.43	$ 103,000
35.14	CSAH	35	CSAH 35 and MNTH 108 EAST	Yes	No	No	Yes	1498	Yes	0	0.30	$ -
35.15	CSAH	35	CSAH 35 and CNTY 131 SOUTH	No	No	No	No	422	No	0	0.14	$ -
35.16	CSAH	35	CSAH 35 and CNTY 131 NORTH	No	No	No	No	422	No	0	0.14	$ -
35.17	CSAH	35	CSAH 35 and CSAH 85	No	No	No	No	1033	No	1	0.58	$ 12,000
36.01	CSAH	36	CSAH 36 and MNTH 228	No	No	No	No	1107	Yes	0	0.18	$ -
38.01	CSAH	38	CSAH 38 and MNTH 78, T 1221	No	No	No	No	1042	Yes	3	0.23	$ 239,000
38.02	CSAH	38	CSAH 38 and CSAH 81	Yes	No	No	No	407	Yes	1	0.23	$ 91,000
38.03	CSAH	38	CSAH 38 and CSAH 87	No	No	No	No	677.5	No	1	0.97	$ 12,000
38.04	CSAH	38	CSAH 38 and CENTRAL AVE CSAH 59 MN	No	No	Yes	No	895	Yes	0	0.82	$ -
40.02	CSAH	40	CSAH 40 and CSAH 59	No	No	No	No	450	Yes	0	1.00	$ -
40.03	CSAH	40	CSAH 40 and CSAH 65	No	Yes	No	No	695	Yes	1	0.65	$ 412,000
40.04	CSAH	40	CSAH 40 and CNTY 136	No	No	No	No	309.5	No	0	0.24	$ -
40.05	CSAH	40	CSAH 40 and MNTH 29 NORTH	No	No	No	No	2575	No	1	0.10	$ 12,000
40.06	CSAH	40	CSAH 40 and MNTH 29 SOUTH	No	No	No	No	2600	Yes	0	0.12	$ -
40.07	CSAH	40	CSAH 40 and CSAH 73	No	No	No	No	404.5	Yes	1	0.35	$ 12,000
40.08	CSAH	40	CSAH 40 and CSAH 42	No	No	No	No	402	Yes	0	0.34	$ -
40.09	CSAH	40	CSAH 40 and CSAH 75	Yes	Yes	No	No	370	No	1	0.47	$ 91,000
41.01	CSAH	41	CSAH 41 and MNTH 108 EAST	No	Yes	No	No	1060	Yes	1	0.94	$ 91,000
41.02	CSAH	41	CSAH 41 and MNTH 108 , T 803 WEST	No	Yes	No	No	774.5	Yes	0	0.36	$ -
42.03	CSAH	42	CSAH 42 and CNTY 139	No	No	No	No	190	No	0	0.27	$ -
42.04	CSAH	42	CSAH 42 and CSAH 48	No	Yes	No	No	219.5	No	0	0.46	$ -
45.01	CSAH	45	CSAH 45 and CSAH 74	No	Yes	No	No	502.5	No	0	0.39	$ -
45.02	CSAH	45	CSAH 45 and CNTY 115	No	No	No	No	564.5	No	0	0.34	$ -

Otter Tail County
Rural Intersection Listing

Int #	Sys	Num	Intersection Description	Skew	On/Near Curve	Development	RR Xing	ADT	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Crash Cost
46.02	CSAH	46	CSAH 46 and CSAH 69	No	No	No	No	483	No	2	0.52	$ 272,000
46.03	CSAH	46	CSAH 46 and T 31 CSAH 71	No	No	No	No	350	Yes	0	0.49	$ -
46.04	CSAH	46	CSAH 46 and CNTY 141	No	Yes	No	No	275	No	0	0.34	$ -
47.01	CSAH	47	CSAH 47 and CNTY 126	No	No	No	No	442	No	0	0.21	$ -
47.02	CSAH	47	CSAH 47 and CNTY 119	Yes	Yes	No	No	273	Yes	0	0.73	$ -
47.03	CSAH	47	CSAH 47 and MNTH 210	Yes	No	No	No	2,847	Yes	0	0.07	$ -
49.01	CSAH	49	CSAH 49 and MNTH 108	No	No	No	No	1,867	No	1	0.20	$ 91,000
50.01	CSAH	50	CSAH 50 and MNTH 108 and CNTY 132	No	No	No	No	930	Yes	0	0.26	$ -
50.02	CSAH	50	CSAH 50 and CSAH 67 SOUTH	Yes	Yes	No	No	503	Yes	0	0.93	$ -
50.03	CSAH	50	CSAH 50 and CSAH 67 NORTH	No	Yes	No	No	620	No	1	0.73	$ 136,000
50.06	CSAH	50	CSAH 50 and CSAH 73	No	No	No	No	560	No	3	0.70	$ 273,000
50.07	CSAH	50	CSAH 50 and CSAH 75	No	No	No	No	770	Yes	0	0.55	$ -
51.02	CSAH	51	CSAH 51 and CSAH 60WEST	No	No	No	No	855	No	0	0.60	$ -
51.03	CSAH	51	CSAH 51 and CSAH 60 EAST	No	No	No	No	635	No	1	0.62	$ 91,000
52.01	CSAH	52	CSAH 52 and MNTH 108	Yes	Yes	No	No	1,477	Yes	2	0.45	$ 103,000
52.02	CSAH	52	CSAH 52 and CSAH 67	No	No	No	No	1,285	Yes	1	0.49	$ 412,000
52.03	CSAH	52	CSAH 52 and CNTY 135	No	Yes	No	No	940	Yes	0	0.09	$ -
52.04	CSAH	52	CSAH 52 and MNTH 106	No	No	No	No	1,860	Yes	3	0.62	$ 594,000
52.05	CSAH	52	CSAH 52 and CNTY 143	No	No	No	No	595	No	0	0.13	$ -
52.06	CSAH	52	CSAH 52 and MNTH 29	No	Yes	No	No	2,830	No	1	0.22	$ 136,000
53.01	CSAH	53	CSAH 53 and USTH 10	Yes	Yes	No	No	6,857	Yes	9	0.02	$ 740,000
53.02	CSAH	53	CSAH 53 and CNTY 137	No	No	No	No	473	Yes	1	0.89	$ 12,000
53.03	CSAH	53	CSAH 53 and CNTY 146	No	No	No	No	480	No	0	0.18	$ -
54.01	CSAH	54	CSAH 54 and MNTH 78	No	No	No	No	4,300	Yes	4	0.15	$ 375,000
54.02	CSAH	54	CSAH 54 and CNTY 127	No	No	No	No	810	No	0	0.35	$ -
54.03	CSAH	54	CSAH 54 and CSAH 67	No	Yes	No	No	820	Yes	1	0.87	$ 91,000
55.01	CSAH	55	CSAH 55 and CNTY 128	No	Yes	No	No	340	No	0	0.34	$ -
57.01	CSAH	57	CSAH 57 and MNTH 210	No	Yes	No	No	1,765	Yes	1	0.08	$ 136,000
58.01	CSAH	58	CSAH 58 and CSAH 67	No	No	No	No	1,040	Yes	1	0.13	$ 12,000
60.01	CSAH	60	CSAH 60 and USTH 10	Yes	Yes	No	Yes	8,018	Yes	6	0.10	$ 275,000
61.01	CSAH	61	CSAH 61 and CNTY 132	No	No	No	No	272	No	0	0.60	$ -
61.02	CSAH	61	CSAH 61 and MNTH 108	No	No	No	No	1,718	Yes	0	0.33	$ -
62.01	CSAH	62	CSAH 62 and CSAH 67	No	No	No	No	547	No	0	0.25	$ -
63.01	CSAH	63	CSAH 63 and MNTH 235	No	No	No	No	538	Yes	1	0.56	$ 12,000
64.01	CSAH	64	CSAH 64 and MNTH 78	Yes	Yes	No	No	1,025	No	2	0.41	$ 148,000
65.01	CSAH	65	CSAH 65 and CNTY 134	Yes	Yes	No	No	552	No	0	0.20	$ -
66.01	CSAH	66	CSAH 66 and CSAH 75 CNTY 144	No	No	No	No	708	Yes	0	0.26	$ -
67.02	CSAH	67	CSAH 67 and CSAH 67	No	Yes	No	No	988	Yes	0	0.52	$ -
67.03	CSAH	67	CSAH 67 and MNTH 210	No	Yes	No	No	2,035	No	0	0.33	$ -
67.04	CSAH	67	CSAH 67 and CNTY 140	No	Yes	No	No	368	No	0	0.30	$ -
67.05	CSAH	67	CSAH 67 and CNTY 142	No	Yes	No	No	635	No	0	0.44	$ -
67.08	CSAH	67	CSAH 67 and CNTY 148	No	No	No	No	387	No	0	0.23	$ -
68.01	CSAH	68	CSAH 68 and CSAH 75	No	No	No	No	548	No	0	0.21	$ -
70.01	CSAH	70	CSAH 70 and CSAH 75	No	No	No	No	390	No	0	0.33	$ -
71.01	CSAH	71	CSAH 71 and CNTY 141	Yes	Yes	No	No	242	No	0	0.90	$ -
72.01	CSAH	72	CSAH 72 and MNTH 78	No	Yes	No	No	2,250	No	0	1.00	$ -
72.03	CSAH	72	CSAH 72 and CSAH 83	No	No	No	No	675	No	2	0.23	$ 182,000
73.01	CSAH	73	CSAH 73 and MNTH 210	No	No	No	No	1,223	Yes	2	0.16	$ 424,000
73.02	CSAH	73	CSAH 73 and MNTH 29	Yes	No	No	No	2,342	No	0	0.06	$ -
74.01	CSAH	74	CSAH 74 and CNTY 115	No	No	No	No	565	No	0	0.34	$ -
75.01	CSAH	75	CSAH 75 and W JCT MNTH 210 WEST	No	No	No	No	1,193	No	0	0.27	$ -
75.02	CSAH	75	CSAH 75 and E JCT MNTH 210 EAST	No	No	No	No	1,120	Yes	0	0.13	$ -
75.03	CSAH	75	CSAH 75 and MNTH 29	No	No	No	No	4,080	Yes	4	0.29	$ 127,000
75.04	CSAH	75	CSAH 75 and USTH 10	Yes	No	No	Yes	8,040	Yes	5	0.12	$ 218,000
75.05	CSAH	75	CSAH 75 and CSAH 76	No	No	No	No	767	No	1	0.22	$ 91,000
76.01	CSAH	76	CSAH 76 and USTH 10	No	Yes	No	No	6,910	No	0	0.03	$ -
77.01	CSAH	77	CSAH 77 and MNTH 29	Yes	No	No	No	3,067	No	2	0.06	$ 103,000
79.01	CSAH	79	CSAH 79 and MNTH 235	No	No	No	No	508	No	0	0.42	$ -
80.01	CSAH	80	CSAH 80 and USTH 10 EAST	Yes	Yes	No	No	7,125	No	1	0.44	$ 12,000
81.01	CSAH	81	CSAH 81 and MNTH 78	No	No	No	No	1,420	Yes	0	0.09	$ -
82.01	CSAH	82	CSAH 82 and USTH 59	No	No	No	No	2,800	Yes	3	0.60	$ 436,000
82.02	CSAH	82	CSAH 82 and CNTY 117	Yes	No	No	No	820	No	0	0.17	$ -
83.02	CSAH	83	CSAH 83 and CNTY 122	No	No	No	No	788	Yes	1	0.92	$ 12,000
84.01	CSAH	84	CSAH 84 and USTH 10 WEST	No	Yes	No	No	6,875	No	2	0.17	$ 24,000
84.02	CSAH	84	CSAH 84 and N CROMWELL AVE CNTY 1:	Yes	No	No	Yes	1,962	No	0	0.25	$ -
84.03	CSAH	84	CSAH 84 and USTH 10 EAST	No	Yes	Yes	No	7,075	No	3	0.21	$ 239,000
85.01	CSAH	85	CSAH 85 and MNTH 108	Yes	Yes	No	No	1,175	No	1	0.28	$ 12,000
88.01	CSAH	88	CSAH 88 and JCT USTH 59 (OLD USTH 52	No	No	No	No	6,125	No	2	0.84	$ 24,000
110.01	CNTY	110	CNTY 110 and USTH 59	No	No	No	No	1,348	No	0	0.07	$ -
113.01	CNTY	113	CNTY 113 and MNTH 108	No	No	No	No	1,797	No	1	0.06	$ 136,000
116.01	CNTY	116	CNTY 116 and MNTH 210	No	Yes	No	No	3,575	No	3	0.34	$ 115,000
118.01	CNTY	118	CNTY 118 and USTH 59	No	No	No	No	3,915	No	0	0.03	$ -
119.01	CNTY	119	CNTY 119 and MNTH 210	Yes	Yes	No	No	2,895	Yes	0	0.09	$ -
123.01	CNTY	123	CNTY 123 and MNTH 108	No	No	No	No	1,368	No	0	0.10	$ -
125.01	CNTY	125	CNTY 125 and MNTH 108	No	No	No	No	1,667	No	1	0.28	$ 12,000
126.01	CNTY	126	CNTY 126 and MNTH 78	No	No	No	No	900	No	2	0.12	$ 24,000
128.01	CNTY	128	CNTY 128 and MNTH 78	Yes	Yes	No	No	1,350	No	0	0.17	$ -
129.01	CNTY	129	CNTY 129 and MNTH 235	No	Yes	No	No	503	No	1	0.39	$ 12,000
135.01	CNTY	135	CNTY 135 and CNTY 142	No	No	No	No	445	No	1	0.93	$ 412,000
136.01	CNTY	136	CNTY 136 and MNTH 29	No	No	No	No	2,535	Yes	0	0.03	$ -

Otter Tail County
Rural Intersection Listing

Int #	Sys	Num	Intersection Description	Skew	On/Near Curve	Development	RR Xing	ADT	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Crash Cost
137.01	CNTY	137	CNTY 137 and USTH 10	Yes	No	No	Yes	6,868	Yes	0	0.03	$ -
138.01	CNTY	138	CNTY 138 and MNTH 29	No	No	No	No	2,535	Yes	1	0.03	$ 12,000
138.02	CNTY	138	CNTY 138 and CNTY 139	No	No	No	No	135	No	0	0.35	$ -
140.01	CNTY	140	CNTY 140 and MNTH 29	No	No	No	No	2,542	No	0	0.04	$ -
142.01	CNTY	142	CNTY 142 and MNTH 106	No	No	No	No	1,292	No	3	0.12	$ 848,000
143.01	CNTY	143	CNTY 143 and USTH 10	Yes	No	No	Yes	7,267	No	1	0.01	$ 12,000

Otter Tail County
Rural Intersection Prioritization

Rank	Int #	Sys	#	Intersection Description	Skew	On/Near Curve	Development	RR Xing	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Priority	Crash Cost
1	60.01	CSAH	60	CSAH 60 and USTH 10	★	★		★	★	★		★★★★★	$ 275,000
2	9.03	CSAH	9	CSAH 9 and MNTH 34 WEST	★	★			★	★	★	★★★★★	$ 251,000
3	21.02	CSAH	21	CSAH 21 and CSAH 88	★			★	★	★	★	★★★★★	$ 136,000
4	35.07	CSAH	35	CSAH 35 and MNTH 210		★	★		★	★	★	★★★★★	$ 103,000
5	35.11	CSAH	35	CSAH 35 and CSAH 41	★	★			★	★	★	★★★★★	$ 103,000
6	35.12	CSAH	35	CSAH 35 and CSAH 44	★	★			★	★	★	★★★★★	$ 103,000
7	52.01	CSAH	52	CSAH 52 and MNTH 108	★	★			★	★	★	★★★★★	$ 103,000
8	8.03	CSAH	8	CSAH 8 and CSAH 13	★	★			★	★	★	★★★★★	$ 12,000
9	10.03	CSAH	10	CSAH 10 and CSAH 88	★			★	★	★	★	★★★★★	$ 12,000
10	14.06	CSAH	14	CSAH 14 and CSAH 67	★	★			★	★	★	★★★★★	$ 12,000
11	9.05	CSAH	9	CSAH 9 and CSAH 20	★	★	★		★		★	★★★★★	$ -
12	53.01	CSAH	53	CSAH 53 and USTH 10	★	★			★	★		★★★★	$ 740,000
13	4.07	CSAH	4	CSAH 4 and MNTH 228 NORTH	★	★			★	★		★★★★	$ 424,000
14	40.03	CSAH	40	CSAH 40 and CSAH 65		★			★	★	★	★★★★	$ 412,000
15	5.03	CSAH	5	CSAH 5 and MNTH 210 , T 1461	★		★		★	★		★★★★	$ 272,000
16	16.05	CSAH	16	CSAH 16 and MNTH 108		★			★	★	★	★★★★	$ 251,000
17	75.04	CSAH	75	CSAH 75 and USTH 10	★			★	★	★		★★★★	$ 218,000
18	64.01	CSAH	64	CSAH 64 and MNTH 78	★	★				★	★	★★★★	$ 148,000
19	22.01	CSAH	22	CSAH 22 and CSAH 27	★	★			★	★		★★★★	$ 148,000
20	28.01	CSAH	28	CSAH 28 and USTH 59	★	★			★	★		★★★★	$ 103,000
21	1.29	CSAH	1	CSAH 1 and CNTY 145		★	★			★	★	★★★★	$ 91,000
22	35.05	CSAH	35	CSAH 35 and CNTY 124	★	★				★	★	★★★★	$ 91,000
23	40.09	CSAH	40	CSAH 40 and CSAH 75	★	★				★	★	★★★★	$ 91,000
24	35.04	CSAH	35	CSAH 35 and CSAH 82	★	★			★	★		★★★★	$ 24,000
25	3.01	CSAH	3	CSAH 3 and CSAH 10		★			★	★	★	★★★★	$ 24,000
26	80.01	CSAH	80	CSAH 80 and USTH 10 EAST	★	★				★	★	★★★★	$ 12,000
27	4.02	CSAH	4	CSAH 4 and CSAH 31		★			★	★	★	★★★★	$ 12,000
28	4.03	CSAH	4	CSAH 4 and CSAH 41	★				★	★	★	★★★★	$ 12,000
29	19.05	CSAH	19	CSAH 19 and CSAH 56		★			★	★	★	★★★★	$ 12,000
30	47.02	CSAH	47	CSAH 47 and CNTY 119	★	★			★		★	★★★★	$ -
31	52.04	CSAH	52	CSAH 52 and MNTH 106					★	★	★	★★★	$ 594,000
32	82.01	CSAH	82	CSAH 82 and USTH 59					★	★	★	★★★	$ 436,000
33	52.02	CSAH	52	CSAH 52 and CSAH 67					★	★	★	★★★	$ 412,000
34	1.25	CSAH	1	CSAH 1 and CSAH 35					★	★	★	★★★	$ 342,000
35	4.01	CSAH	4	CSAH 4 and USTH 59		★			★	★		★★★	$ 273,000
36	6.04	CSAH	6	CSAH 6 and MNTH 29		★			★	★		★★★	$ 273,000
37	84.03	CSAH	84	CSAH 84 and USTH 10 EAST		★	★			★		★★★	$ 239,000
38	8.10	CSAH	8	CSAH 8 and CSAH 75 EAST					★	★	★	★★★	$ 227,000
39	15.04	CSAH	15	CSAH 15 and CSAH 86		★				★	★	★★★	$ 182,000
40	50.03	CSAH	50	CSAH 50 and CSAH 67 NORTH		★				★	★	★★★	$ 136,000
41	5.01	CSAH	5	CSAH 5 and CSAH 38					★	★	★	★★★	$ 136,000
42	20.01	CSAH	20	CSAH 20 and CSAH 31		★				★	★	★★★	$ 136,000
43	33.03	CSAH	33	CSAH 33 and CNTY 120		★				★	★	★★★	$ 136,000
44	57.01	CSAH	57	CSAH 57 and MNTH 210		★			★	★		★★★	$ 136,000
45	21.06	CSAH	21	CSAH 21 and CSAH 28					★	★	★	★★★	$ 136,000
46	24.03	CSAH	24	CSAH 24 and CSAH 27		★			★	★		★★★	$ 103,000
47	33.04	CSAH	33	CSAH 33 and MNTH 210		★			★	★		★★★	$ 103,000
48	1.06	CSAH	1	CSAH 1 and CSAH 15		★			★	★		★★★	$ 91,000
49	1.23	CSAH	1	CSAH 1 and CSAH 10		★				★	★	★★★	$ 91,000
50	8.04	CSAH	8	CSAH 8 and CSAH 53					★	★	★	★★★	$ 91,000
51	16.01	CSAH	16	CSAH 16 and MNTH 78					★	★	★	★★★	$ 91,000
52	34.02	CSAH	34	CSAH 34 and CNTY 123	★	★				★		★★★	$ 91,000
53	35.06	CSAH	35	CSAH 35 and CSAH 39		★			★	★		★★★	$ 91,000
54	38.02	CSAH	38	CSAH 38 and CSAH 81	★				★	★		★★★	$ 91,000
55	41.01	CSAH	41	CSAH 41 and MNTH 108 EAST		★			★	★		★★★	$ 91,000
56	54.03	CSAH	54	CSAH 54 and CSAH 67		★			★	★		★★★	$ 91,000
57	85.01	CSAH	85	CSAH 85 and MNTH 108	★	★				★		★★★	$ 12,000
58	143.01	CNTY	143	CNTY 143 and USTH 10	★			★		★		★★★	$ 12,000
59	12.04	CSAH	12	CSAH 12 and CSAH 47 WEST					★	★	★	★★★	$ 12,000
60	63.01	CSAH	63	CSAH 63 and MNTH 235					★	★	★	★★★	$ 12,000
61	18.01	CSAH	18	CSAH 18 and CSAH 35					★	★	★	★★★	$ 12,000
62	1.28	CSAH	1	CSAH 1 and CSAH 83	★	★			★			★★★	$ -
63	3.02	CSAH	3	CSAH 3 and CSAH 22		★			★		★	★★★	$ -
64	3.03	CSAH	3	CSAH 3 and CSAH 24		★			★		★	★★★	$ -
65	21.05	CSAH	21	CSAH 21 and CSAH 24 NORTH		★			★		★	★★★	$ -
66	29.02	CSAH	29	CSAH 29 and CNTY 120	★	★					★	★★★	$ -
67	31.01	CSAH	31	CSAH 31 and USTH 59	★	★			★			★★★	$ -
68	35.14	CSAH	35	CSAH 35 and MNTH 108 EAST	★			★	★			★★★	$ -
69	50.02	CSAH	50	CSAH 50 and CSAH 67 SOUTH	★	★			★			★★★	$ -
70	67.02	CSAH	67	CSAH 67 and CSAH 67		★			★		★	★★★	$ -
71	119.01	CNTY	119	CNTY 119 and MNTH 210	★	★			★			★★★	$ -
72	137.01	CNTY	137	CNTY 137 and USTH 10	★			★	★			★★★	$ -
73	21.04	CSAH	21	CSAH 21 and CSAH 24 SOUTH		★			★		★	★★★	$ -
74	29.01	CSAH	29	CSAH 29 and CSAH 82	★	★			★			★★★	$ -
75	29.03	CSAH	29	CSAH 29 and MNTH 210	★		★		★			★★★	$ -
76	32.01	CSAH	32	CSAH 32 and CSAH 74	★	★			★			★★★	$ -

Otter Tail County
Rural Intersection Prioritization

Rank	Int #	Sys	#	Intersection Description	Skew	On/Near Curve	Development	RR Xing	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Priority	Crash Cost
77	5.06	CSAH	5	CSAH 5 and CSAH 16 WEST					★	★		★★	$ 548,000
78	10.06	CSAH	10	CSAH 10 and CSAH 27						★	★	★★	$ 433,000
79	73.01	CSAH	73	CSAH 73 and MNTH 210					★	★		★★	$ 424,000
80	54.01	CSAH	54	CSAH 54 and MNTH 78					★	★		★★	$ 375,000
81	50.06	CSAH	50	CSAH 50 and CSAH 73						★	★	★★	$ 273,000
82	46.02	CSAH	46	CSAH 46 and CSAH 69						★	★	★★	$ 272,000
83	38.01	CSAH	38	CSAH 38 and MNTH 78, T 1221					★	★		★★	$ 239,000
84	10.08	CSAH	10	CSAH 10 and USTH 10		★				★		★★	$ 206,000
85	9.02	CSAH	9	CSAH 9 and CSAH 23 450TH ST					★	★		★★	$ 148,000
86	14.04	CSAH	14	CSAH 14 and MNTH 78 SOUTH					★	★		★★	$ 148,000
87	52.06	CSAH	52	CSAH 52 and MNTH 29		★				★		★★	$ 136,000
88	8.07	CSAH	8	CSAH 8 and CSAH 19 WEST					★	★		★★	$ 136,000
89	23.02	CSAH	23	CSAH 23 and MNTH 34					★	★		★★	$ 136,000
90	75.03	CSAH	75	CSAH 75 and MNTH 29					★	★		★★	$ 127,000
91	116.01	CNTY	116	CNTY 116 and MNTH 210		★				★		★★	$ 115,000
92	1.01	CSAH	1	CSAH 1 and CSAH 26					★	★		★★	$ 115,000
93	77.01	CSAH	77	CSAH 77 and MNTH 29	★					★		★★	$ 103,000
94	19.03	CSAH	19	CSAH 19 and CSAH 76						★	★	★★	$ 103,000
95	25.01	CSAH	25	CSAH 25 and CSAH 26						★	★	★★	$ 103,000
96	10.04	CSAH	10	CSAH 10 and CSAH 21						★	★	★★	$ 91,000
97	14.05	CSAH	14	CSAH 14 and MNTH 78 NORTH					★	★		★★	$ 91,000
98	51.03	CSAH	51	CSAH 51 and CSAH 60 EAST						★	★	★★	$ 91,000
99	84.01	CSAH	84	CSAH 84 and USTH 10 WEST		★				★		★★	$ 24,000
100	129.01	CNTY	129	CNTY 129 and MNTH 235		★				★		★★	$ 12,000
101	1.02	CSAH	1	CSAH 1 and T 1196 CNTY 110 R					★	★		★★	$ 12,000
102	1.22	CSAH	1	CSAH 1 and CSAH 18					★	★		★★	$ 12,000
103	9.04	CSAH	9	CSAH 9 and MNTH 34 T 665 EA					★	★		★★	$ 12,000
104	10.01	CSAH	10	CSAH 10 and CSAH 11 WILKIN					★	★		★★	$ 12,000
105	11.06	CSAH	11	CSAH 11 and MNTH 108					★	★		★★	$ 12,000
106	12.06	CSAH	12	CSAH 12 and MNTH 78					★	★		★★	$ 12,000
107	15.02	CSAH	15	CSAH 15 and CNTY 112						★	★	★★	$ 12,000
108	16.04	CSAH	16	CSAH 16 and CSAH 61					★	★		★★	$ 12,000
109	21.07	CSAH	21	CSAH 21 and MNTH 108					★	★		★★	$ 12,000
110	22.03	CSAH	22	CSAH 22 and CSAH 35					★	★		★★	$ 12,000
111	35.17	CSAH	35	CSAH 35 and CSAH 85						★	★	★★	$ 12,000
112	40.07	CSAH	40	CSAH 40 and CSAH 73					★	★		★★	$ 12,000
113	53.02	CSAH	53	CSAH 53 and CNTY 137					★	★		★★	$ 12,000
114	58.01	CSAH	58	CSAH 58 and CSAH 67					★	★		★★	$ 12,000
115	83.02	CSAH	83	CSAH 83 and CNTY 122					★	★		★★	$ 12,000
116	138.01	CNTY	138	CNTY 138 and MNTH 29					★	★		★★	$ 12,000
117	12.01	CSAH	12	CSAH 12 and CSAH 82		★					★	★★	$ -
118	84.02	CSAH	84	CSAH 84 and N CROMWELL AVE	★			★				★★	$ -
119	128.01	CNTY	128	CNTY 128 and MNTH 78	★	★						★★	$ -
120	1.30	CSAH	1	CSAH 1 and CSAH 74		★			★			★★	$ -
121	1.31	CSAH	1	CSAH 1 and CSAH 14		★			★			★★	$ -
122	2.01	CSAH	2	CSAH 2 and T 1152 CSAH 7					★		★	★★	$ -
123	2.02	CSAH	2	CSAH 2 and CSAH 15 , T 1153 S					★		★	★★	$ -
124	4.04	CSAH	4	CSAH 4 and CNTY 130		★	★					★★	$ -
125	4.05	CSAH	4	CSAH 4 and CSAH 35		★			★			★★	$ -
126	5.05	CSAH	5	CSAH 5 and CSAH 16 , T 264 EA					★		★	★★	$ -
127	5.08	CSAH	5	CSAH 5 and MNTH 78	★				★			★★	$ -
128	6.02	CSAH	6	CSAH 6 and CSAH 59					★		★	★★	$ -
129	6.03	CSAH	6	CSAH 6 and CSAH 65, CNTY 129					★		★	★★	$ -
130	10.07	CSAH	10	CSAH 10 and CNTY 111					★		★	★★	$ -
131	12.05	CSAH	12	CSAH 12 and CSAH 47 EAST					★		★	★★	$ -
132	13.01	CSAH	13	CSAH 13 and CSAH 60					★		★	★★	$ -
133	14.01	CSAH	14	CSAH 14 and CSAH 32		★			★			★★	$ -
134	15.05	CSAH	15	CSAH 15 and CNTY 114					★		★	★★	$ -
135	19.06	CSAH	19	CSAH 19 and CSAH 58					★		★	★★	$ -
136	20.02	CSAH	20	CSAH 20 and USTH 59		★			★			★★	$ -
137	25.03	CSAH	25	CSAH 25 and MNTH 210		★					★	★★	$ -
138	34.01	CSAH	34	CSAH 34 and CSAH 35		★			★			★★	$ -
139	35.02	CSAH	35	CSAH 35 and CSAH 37		★					★	★★	$ -
140	38.04	CSAH	38	CSAH 38 and CENTRAL AVE CS			★		★			★★	$ -
141	41.02	CSAH	41	CSAH 41 and MNTH 108 , T 803		★			★			★★	$ -
142	42.04	CSAH	42	CSAH 42 and CSAH 48		★					★	★★	$ -
143	46.03	CSAH	46	CSAH 46 and T 31 CSAH 71					★		★	★★	$ -
144	47.03	CSAH	47	CSAH 47 and MNTH 210	★				★			★★	$ -
145	52.03	CSAH	52	CSAH 52 and CNTY 135		★			★			★★	$ -
146	65.01	CSAH	65	CSAH 65 and CNTY 134	★	★						★★	$ -
147	67.05	CSAH	67	CSAH 67 and CNTY 142		★					★	★★	$ -
148	71.01	CSAH	71	CSAH 71 and CNTY 141	★	★						★★	$ -
149	24.04	CSAH	24	CSAH 24 and CSAH 41					★		★	★★	$ -
150	33.01	CSAH	33	CSAH 33 and CSAH 35		★			★			★★	$ -
151	50.07	CSAH	50	CSAH 50 and CSAH 75					★		★	★★	$ -
152	142.01	CNTY	142	CNTY 142 and MNTH 106						★		★	$ 848,000
153	34.03	CSAH	34	CSAH 34 and CNTY 125						★		★	$ 836,000
154	135.01	CNTY	135	CNTY 135 and CNTY 142						★		★	$ 412,000
155	72.03	CSAH	72	CSAH 72 and CSAH 83						★		★	$ 182,000
156	113.01	CNTY	113	CNTY 113 and MNTH 108						★		★	$ 136,000
157	1.04	CSAH	1	CSAH 1 and CSAH 2 (170TH ST)						★		★	$ 91,000
158	49.01	CSAH	49	CSAH 49 and MNTH 108						★		★	$ 91,000

Otter Tail County
Rural Intersection Prioritization

Rank	Int #	Sys	#	Intersection Description	Skew	On/Near Curve	Development	RR Xing	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Priority	Crash Cost
159	75.05	CSAH	75	CSAH 75 and CSAH 76						★		★	$ 91,000
160	88.01	CSAH	88	CSAH 88 and JCT USTH 59 (OLD						★		★	$ 24,000
161	126.01	CNTY	126	CNTY 126 and MNTH 78						★		★	$ 24,000
162	125.01	CNTY	125	CNTY 125 and MNTH 108						★		★	$ 12,000
163	1.03	CSAH	1	CSAH 1 and CNTY 112 140TH ST						★		★	$ 12,000
164	16.02	CSAH	16	CSAH 16 and CSAH 89						★		★	$ 12,000
165	38.03	CSAH	38	CSAH 38 and CSAH 87						★		★	$ 12,000
166	40.05	CSAH	40	CSAH 40 and MNTH 29 NORTH						★		★	$ 12,000
167	5.02	CSAH	5	CSAH 5 and CSAH 6							★	★	$ -
168	30.01	CSAH	30	CSAH 30 and MNTH 108		★						★	$ -
169	67.03	CSAH	67	CSAH 67 and MNTH 210		★						★	$ -
170	72.01	CSAH	72	CSAH 72 and MNTH 78		★						★	$ -
171	73.02	CSAH	73	CSAH 73 and MNTH 29	★							★	$ -
172	76.01	CSAH	76	CSAH 76 and USTH 10		★						★	$ -
173	79.01	CSAH	79	CSAH 79 and MNTH 235							★	★	$ -
174	1.26	CSAH	1	CSAH 1 and CSAH 45 WEST					★			★	$ -
175	2.03	CSAH	2	CSAH 2 and CSAH 15 NORTH					★			★	$ -
176	3.04	CSAH	3	CSAH 3 and USTH 59					★			★	$ -
177	5.07	CSAH	5	CSAH 5 and CNTY 128							★	★	$ -
178	6.01	CSAH	6	CSAH 6 and CSAH 57					★			★	$ -
179	7.01	CSAH	7	CSAH 7 and CSAH 26					★			★	$ -
180	8.05	CSAH	8	CSAH 8 and CSAH 67 NORTH					★			★	$ -
181	8.06	CSAH	8	CSAH 8 and CSAH 67 SOUTH					★			★	$ -
182	8.08	CSAH	8	CSAH 8 and CSAH 19 EAST					★			★	$ -
183	8.09	CSAH	8	CSAH 8 and CSAH 75 WEST					★			★	$ -
184	10.02	CSAH	10	CSAH 10 and CSAH 11					★			★	$ -
185	11.02	CSAH	11	CSAH 11 and WILKIN CO CSAH							★	★	$ -
186	14.02	CSAH	14	CSAH 14 and CSAH 44					★			★	$ -
187	15.01	CSAH	15	CSAH 15 and CSAH 26					★			★	$ -
188	15.03	CSAH	15	CSAH 15 and CNTY 114					★			★	$ -
189	16.03	CSAH	16	CSAH 16 and CSAH 55					★			★	$ -
190	21.01	CSAH	21	CSAH 21 and MNTH 210					★			★	$ -
191	22.02	CSAH	22	CSAH 22 and CSAH 43		★						★	$ -
192	23.01	CSAH	23	CSAH 23 and CNTY 113		★						★	$ -
193	25.02	CSAH	25	CSAH 25 and CNTY 110							★	★	$ -
194	33.02	CSAH	33	CSAH 33 and CNTY 124		★						★	$ -
195	35.01	CSAH	35	CSAH 35 and USTH 59					★			★	$ -
196	35.09	CSAH	35	CSAH 35 and CSAH 74					★			★	$ -
197	35.10	CSAH	35	CSAH 35 and CNTY 115		★						★	$ -
198	40.02	CSAH	40	CSAH 40 and CSAH 59					★			★	$ -
199	40.06	CSAH	40	CSAH 40 and MNTH 29 SOUTH					★			★	$ -
200	40.08	CSAH	40	CSAH 40 and CSAH 42					★			★	$ -
201	45.01	CSAH	45	CSAH 45 and CSAH 74		★						★	$ -
202	46.04	CSAH	46	CSAH 46 and CNTY 141		★						★	$ -
203	50.01	CSAH	50	CSAH 50 and MNTH 108 and CN					★			★	$ -
204	51.02	CSAH	51	CSAH 51 and CSAH 60WEST							★	★	$ -
205	55.01	CSAH	55	CSAH 55 and CNTY 128		★						★	$ -
206	61.01	CSAH	61	CSAH 61 and CNTY 132							★	★	$ -
207	61.02	CSAH	61	CSAH 61 and MNTH 108					★			★	$ -
208	66.01	CSAH	66	CSAH 66 and CSAH 75 CNTY 14					★			★	$ -
209	67.04	CSAH	67	CSAH 67 and CNTY 140		★						★	$ -
210	75.02	CSAH	75	CSAH 75 and E JCT MNTH 210 E					★			★	$ -
211	81.01	CSAH	81	CSAH 81 and MNTH 78					★			★	$ -
212	82.02	CSAH	82	CSAH 82 and CNTY 117	★							★	$ -
213	136.01	CNTY	136	CNTY 136 and MNTH 29					★			★	$ -
214	11.01	CSAH	11	CSAH 11 and CSAH 21 CNTY 11					★			★	$ -
215	12.03	CSAH	12	CSAH 12 and CSAH 39 CNTY 11					★			★	$ -
216	36.01	CSAH	36	CSAH 36 and MNTH 228					★			★	$ -
217	19.07	CSAH	19	CSAH 19 and CSAH 62									$ -
218	40.04	CSAH	40	CSAH 40 and CNTY 136									$ -
219	62.01	CSAH	62	CSAH 62 and CSAH 67									$ -
220	68.01	CSAH	68	CSAH 68 and CSAH 75									$ -
221	70.01	CSAH	70	CSAH 70 and CSAH 75									$ -
222	75.01	CSAH	75	CSAH 75 and W JCT MNTH 210									$ -
223	110.01	CNTY	110	CNTY 110 and USTH 59									$ -
224	118.01	CNTY	118	CNTY 118 and USTH 59									$ -
225	123.01	CNTY	123	CNTY 123 and MNTH 108									$ -
226	140.01	CNTY	140	CNTY 140 and MNTH 29									$ -
227	1.24	CSAH	1	CSAH 1 and CSAH 43									$ -
228	1.27	CSAH	1	CSAH 1 and CSAH 45 EAST									$ -
229	11.05	CSAH	11	CSAH 11 and CSAH 28 WILKIN C									$ -
230	13.02	CSAH	13	CSAH 13 and CNTY 146 RT									$ -
231	19.04	CSAH	19	CSAH 19 and CNTY 144									$ -
232	21.03	CSAH	21	CSAH 21 and CNTY 118									$ -
233	26.01	CSAH	26	CSAH 26 and GRANT CO CSAH									$ -
234	35.15	CSAH	35	CSAH 35 and CNTY 131 SOUTH									$ -
235	35.16	CSAH	35	CSAH 35 and CNTY 131 NORTH									$ -
236	42.03	CSAH	42	CSAH 42 and CNTY 139									$ -
237	45.02	CSAH	45	CSAH 45 and CNTY 115									$ -
238	47.01	CSAH	47	CSAH 47 and CNTY 126									$ -

Otter Tail County
Rural Intersection Prioritization

Rank	Int #	Sys	#	Intersection Description	Skew	On/Near Curve	Development	RR Xing	Previous STOP (>5mi)	Total Crashes	Ratio (Min/Maj)	Priority	Crash Cost
239	52.05	CSAH	52	CSAH 52 and CNTY 143									$ -
240	53.03	CSAH	53	CSAH 53 and CNTY 146									$ -
241	54.02	CSAH	54	CSAH 54 and CNTY 127									$ -
242	67.08	CSAH	67	CSAH 67 and CNTY 148									$ -
243	74.01	CSAH	74	CSAH 74 and CNTY 115									$ -
244	138.02	CNTY	138	CNTY 138 and CNTY 139									$ -
				Total Stars --	46	89	8	8	140	114	79		
				% That Gets Star --	19%	36%	3%	3%	57%	47%	32%		

	Totals #	%
★★★★★★★	0	0%
★★★★★★	0	0%
★★★★★	11	5%
★★★★	19	8%
★★★	46	19%
★★	75	31%
★	65	27%
-	28	11%
	244	100%

Skew -	If intersection is skewed at an angle of 15 degrees or greater.
On/Near Curve -	If intersection is on or within 1,000 feet of curve.
Development -	If intersection aerial shows a commercial development with access near intersection.
RR Xing -	If intersection has a railroad crossing on any approach within 500 feet.
Previous STOP (>5 mi) -	If vehicles approaching the stop control have not had a previous stop control along the roadway within 5 miles
Total Crashes -	If intersection has at least 1 crash.
Ratio (Min/Maj) -	If intersection has an ADT ratio in the range of 0.4 to 0.8.

CSAH 60 and USTH 10

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Divided
True Mile: 0.01
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 8018
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 7300
Minor ADT: 718

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	6	3	0
Rate (per MVM)	0.4	0.2	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	Yes	Yes	★
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.10	0.4 - 0.8	
Total Crashes	6	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	x
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	x
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	x
Upgrade Stop Bar Only	$500	per intersection	-
Review Signs and CST	$4,900	per intersection	-

Notes - -

Notes - Due to the railroad crossing, a 48" stop sign is recommended on the approach with the crossing to increase the sign visibility.

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$150,030
Local Match (10% of Total project cost)	$16,670
Total Project Cost	**$166,700**

Rank: 1
Intersection ID: 60.01
Date: 5/18/2011

CSAH 9 and MNTH 34 WEST

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 5.4
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 3075
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 2400
Minor ADT: 1350

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	4	0	0
Rate (per MVM)	0.7	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.56	0.4 - 0.8	★
Total Crashes	4	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 2
Intersection ID: 9.03
Date: 5/18/2011

CSAH 21 and CSAH 88

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 6.07
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 655
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 435
Minor ADT: 220

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.8	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	Yes	Yes	★
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.51	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	x
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	x
Upgrade Stop Bar Only	$500	per intersection	-
Review Signs and CST	$4,900	per intersection	-

Notes - -

Notes - Due to the railroad crossing, a 48" stop sign is recommended on the approach with the crossing to increase the sign visibility.

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 3
Intersection ID: 21.02
Date: 5/18/2011

CSAH 35 and MNTH 210

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 14.66
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 4900
Traffic Control Device: Thru STOP
Street Lights: Yes
Flashers: No
Major ADT: 3400
Minor ADT: 1500

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	1	0
Rate (per MVM)	0.2	0.1	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	Yes	Yes	★
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.44	0.4 - 0.8	★
Total Crashes	2	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	x
Installing Street Lights	$13,000	per intersection	Installed
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	x
Upgrade Stop Bar Only	$500	per intersection	-
Review Signs and CST	$4,900	per intersection	-

Notes - This intersection is currently on a list of projects considered for a demo ITS dynamic warning sign.

Notes -

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$30,330
Local Match (10% of Total project cost)	$3,370
Total Project Cost	**$33,700**

Rank: 4
Intersection ID: 35.07
Date: 5/18/2011

CSAH 35 and CSAH 41

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 28.8
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 993
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 760
Minor ADT: 465

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	1.1	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.61	0.4 - 0.8	★
Total Crashes	2	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 5
Intersection ID: 35.11
Date: 5/18/2011

CSAH 35 and CSAH 44

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 36.99
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1075
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 885
Minor ADT: 380

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	1.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.43	0.4 - 0.8	★
Total Crashes	2	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 6
Intersection ID: 35.12
Date: 5/18/2011

CSAH 52 and MNTH 108

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1477
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1020
Minor ADT: 457

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	0.7	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.45	0.4 - 0.8	★
Total Crashes	2	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 7
Intersection ID: 52.01
Date: 5/18/2011

CSAH 8 and CSAH 13

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 5.225
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1825
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 1425
Minor ADT: 800

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.3	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.56	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

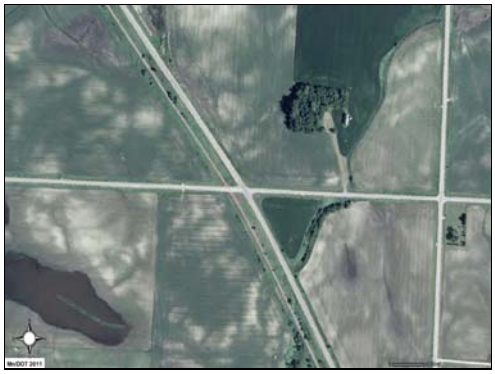
Rank: 8
Intersection ID: 8.03
Date: 5/18/2011

CSAH 10 and CSAH 88

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 3.64
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 750
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 435
Minor ADT: 315



Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	1	0
Rate (per MVM)	0.7	0.7	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	Yes	Yes	★
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.72	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	x
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	x
Upgrade Stop Bar Only	$500	per intersection	-
Review Signs and CST	$4,900	per intersection	-

Notes - -

Notes - Due to the railroad crossing, a 48" stop sign is recommended on the approach with the crossing to increase the sign visibility.

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 9
Intersection ID: 10.03
Date: 5/18/2011

CSAH 14 and CSAH 67

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 20.61
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1080
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 860
Minor ADT: 440

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.5	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.51	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 10
Intersection ID: 14.06
Date: 5/18/2011

CSAH 53 and USTH 10

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Divided
True Mile: 0.015
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 6857
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 6700
Minor ADT: 157

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	9	3	0
Rate (per MVM)	0.7	0.2	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.02	0.4 - 0.8	
Total Crashes	9	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 12
Intersection ID: 53.01
Date: 5/18/2011

CSAH 9 and CSAH 20

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 10.55
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1450
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1150
Minor ADT: 875

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	Yes	Yes	★
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.76	0.4 - 0.8	★
Total Crashes	0	>0	
			★★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 11
Intersection ID: 9.05
Date: 5/18/2011

CSAH 4 and MNTH 228 NORTH

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 14.9
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 2005
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1380
Minor ADT: 1250

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	1
Rate (per MVM)	0.5	0.0	0.3

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.91	0.4 - 0.8	
Total Crashes	2	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 13
Intersection ID: 4.07
Date: 5/18/2011

CSAH 40 and CSAH 65

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 5.38
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 695
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 420
Minor ADT: 275

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	1	1
Rate (per MVM)	0.8	0.8	0.8

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.65	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 14
Intersection ID: 40.03
Date: 5/18/2011

CSAH 5 and MNTH 210 , T 1461 EAST

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 10.15
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 2210
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1700
Minor ADT: 510

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	1	0
Rate (per MVM)	0.5	0.2	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	Yes	Yes	★
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.30	0.4 - 0.8	
Total Crashes	2	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 15
Intersection ID: 5.03
Date: 5/18/2011

CSAH 16 and MNTH 108

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 12.8
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1770
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1320
Minor ADT: 900

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	4	0	0
Rate (per MVM)	1.2	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.68	0.4 - 0.8	★
Total Crashes	4	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 16
Intersection ID: 16.05
Date: 5/18/2011

CSAH 75 and USTH 10

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 14.01
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 8040
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 7200
Minor ADT: 840

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	5	2	0
Rate (per MVM)	0.3	0.1	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	Yes	Yes	★
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.12	0.4 - 0.8	
Total Crashes	5	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	x
Installing Street Lights	$13,000	per intersection	x
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	x
Upgrade Stop Bar Only	$500	per intersection	-
Review Signs and CST	$4,900	per intersection	-

Notes - -

Notes - Due to the railroad crossing, a 48" stop sign is recommended on the approach with the crossing to increase the sign visibility.

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$42,030
Local Match (10% of Total project cost)	$4,670
Total Project Cost	**$46,700**

Rank: 17
Intersection ID: 75.04
Date: 5/18/2011

CSAH 64 and MNTH 78

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1025
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 850
Minor ADT: 350

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	1.1	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.41	0.4 - 0.8	★
Total Crashes	2	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 18
Intersection ID: 64.01
Date: 5/18/2011

CSAH 22 and CSAH 27

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1927
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1560
Minor ADT: 367

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	0.6	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.24	0.4 - 0.8	
Total Crashes	2	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 19
Intersection ID: 22.01
Date: 5/18/2011

CSAH 28 and USTH 59

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 9.63
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 4000
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 3850
Minor ADT: 150

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	0.3	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.04	0.4 - 0.8	
Total Crashes	2	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 20
Intersection ID: 28.01
Date: 5/18/2011

CSAH 1 and CNTY 145

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 35
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1540
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 1225
Minor ADT: 630

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.4	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	Yes	Yes	★
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.51	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 21
Intersection ID: 1.29
Date: 5/18/2011

CSAH 35 and CNTY 124

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 12.16
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 560
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 465
Minor ADT: 190

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	1.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.41	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	-	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$1,665
Local Match (10% of Total project cost)	$185
Total Project Cost	**$1,850**

Rank: 22
Intersection ID: 35.05
Date: 5/18/2011

CSAH 40 and CSAH 75

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 19.93
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 370
Traffic Control Device: Side YIELD
Street Lights: No
Flashers: No
Major ADT: 300
Minor ADT: 140

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	1	0
Rate (per MVM)	1.5	1.5	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.47	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	-	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$1,665
Local Match (10% of Total project cost)	$185
Total Project Cost	**$1,850**

Rank: 54
Intersection ID: 40.09
Date: 5/18/2011

CSAH 35 and CSAH 82

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 2.6
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 2045
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1045
Minor ADT: 1000

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	1	0
Rate (per MVM)	0.5	0.3	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.96	0.4 - 0.8	
Total Crashes	2	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 23
Intersection ID: 35.04
Date: 5/18/2011

CSAH 3 and CSAH 10

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1560
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1150
Minor ADT: 820

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	0.7	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.71	0.4 - 0.8	★
Total Crashes	2	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 24
Intersection ID: 3.01
Date: 5/18/2011

CSAH 80 and USTH 10 EAST

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Divided
True Mile: 0.024
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 7125
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 5850
Minor ADT: 2550

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.1	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.44	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 25
Intersection ID: 80.01
Date: 5/18/2011

CSAH 4 and CSAH 31

Agency: Otter Tail County

Intersection Data

Configuration:	T
Configuration (2):	Undivided
True Mile:	4.1
Urban/Rural:	Rural
County:	Otter Tail
ATP:	4
Entering ADT:	1575
Traffic Control Device:	Side STOP
Street Lights:	No
Flashers:	No
Major ADT:	1300
Minor ADT:	550

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.3	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.42	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 26
Intersection ID: 4.02
Date: 5/18/2011

CSAH 4 and CSAH 41

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 10.81
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1560
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 1300
Minor ADT: 520

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	1	0
Rate (per MVM)	0.4	0.4	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.40	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 27
Intersection ID: 4.03
Date: 5/18/2011

CSAH 19 and CSAH 56

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 5.48
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 395
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 308
Minor ADT: 175

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	1.4	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.57	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 28
Intersection ID: 19.05
Date: 5/18/2011

CSAH 47 and CNTY 119

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 9.69
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 273
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 200
Minor ADT: 145

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.73	0.4 - 0.8	★
Total Crashes	0	>0	
			★★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 29
Intersection ID: 47.02
Date: 5/18/2011

CSAH 52 and MNTH 106

Agency: Otter Tail County

Intersection Data

Configuration:	X
Configuration (2):	Undivided
True Mile:	7.27
Urban/Rural:	Rural
County:	Otter Tail
ATP:	4
Entering ADT:	1860
Traffic Control Device:	Thru STOP
Street Lights:	No
Flashers:	Sign Mounted
Major ADT:	1150
Minor ADT:	710

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	3	3	1
Rate (per MVM)	0.9	0.9	0.3

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.62	0.4 - 0.8	★
Total Crashes	3	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 30
Intersection ID: 52.04
Date: 5/18/2011

CSAH 82 and USTH 59

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 2800
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 2150
Minor ADT: 1300

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	3	0	1
Rate (per MVM)	0.6	0.0	0.2

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.60	0.4 - 0.8	★
Total Crashes	3	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 31
Intersection ID: 82.01
Date: 5/18/2011

CSAH 52 and CSAH 67

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 3.18
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1285
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 860
Minor ADT: 425

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	1
Rate (per MVM)	0.4	0.0	0.4

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.49	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 32
Intersection ID: 52.02
Date: 5/18/2011

CSAH 1 and CSAH 35

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 28.08
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 3150
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 2125
Minor ADT: 1025

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	5	4	0
Rate (per MVM)	0.9	0.7	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.48	0.4 - 0.8	★
Total Crashes	5	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 33
Intersection ID: 1.25
Date: 5/18/2011

CSAH 4 and USTH 59

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 3950
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 3300
Minor ADT: 1300

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	3	1	0
Rate (per MVM)	0.4	0.1	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.39	0.4 - 0.8	
Total Crashes	3	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 34
Intersection ID: 4.01
Date: 5/18/2011

CSAH 6 and MNTH 29

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 13.22
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 3210
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 2925
Minor ADT: 570

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	3	1	0
Rate (per MVM)	0.5	0.2	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.19	0.4 - 0.8	
Total Crashes	3	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 35
Intersection ID: 6.04
Date: 5/18/2011

CSAH 84 and USTH 10 EAST

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Divided
True Mile: 2.4
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 7075
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 6400
Minor ADT: 1350

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	3	0	0
Rate (per MVM)	0.2	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	Yes	Yes	★
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.21	0.4 - 0.8	
Total Crashes	3	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 36
Intersection ID: 84.03
Date: 5/18/2011

CSAH 8 and CSAH 75 EAST

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 22.82
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1143
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 895
Minor ADT: 495

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	1	0
Rate (per MVM)	1.0	0.5	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.55	0.4 - 0.8	★
Total Crashes	2	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 37
Intersection ID: 8.10
Date: 5/18/2011

CSAH 15 and CSAH 86

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 12.331
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 755
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 600
Minor ADT: 310

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	1.5	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.52	0.4 - 0.8	★
Total Crashes	2	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 38
Intersection ID: 15.04
Date: 5/18/2011

CSAH 50 and CSAH 67 NORTH

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 3.4
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 620
Traffic Control Device: Side YIELD
Street Lights: No
Flashers: No
Major ADT: 455
Minor ADT: 330

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.9	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.73	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 39
Intersection ID: 50.03
Date: 5/18/2011

CSAH 5 and CSAH 38

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 563
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 415
Minor ADT: 295

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	1.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.71	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 40
Intersection ID: 5.01
Date: 5/18/2011

CSAH 20 and CSAH 31

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 5
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1435
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 1050
Minor ADT: 770

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.4	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.73	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 41
Intersection ID: 20.01
Date: 5/18/2011

CSAH 33 and CNTY 120

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 7.12
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 555
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 540
Minor ADT: 285

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	1.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.53	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 42
Intersection ID: 33.03
Date: 5/18/2011

CSAH 57 and MNTH 210

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 6.62
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1765
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1700
Minor ADT: 130

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.3	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.08	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	-	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$1,665
Local Match (10% of Total project cost)	$185
Total Project Cost	**$1,850**

Rank: 43
Intersection ID: 57.01
Date: 5/18/2011

CSAH 21 and CSAH 28

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 16.65
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 405
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 260
Minor ADT: 145

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	1.4	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.56	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	-	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$3,330
Local Match (10% of Total project cost)	$370
Total Project Cost	**$3,700**

Rank: 44
Intersection ID: 21.06
Date: 5/18/2011

CSAH 24 and CSAH 27

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 12.88
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 645
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 550
Minor ADT: 190

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	1	0
Rate (per MVM)	1.7	0.8	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.35	0.4 - 0.8	
Total Crashes	2	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	-	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$1,665
Local Match (10% of Total project cost)	$185
Total Project Cost	**$1,850**

Rank: 45
Intersection ID: 24.03
Date: 5/18/2011

CSAH 33 and MNTH 210

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 8.52
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 5500
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 5300
Minor ADT: 400

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	2	0	0
Rate (per MVM)	0.2	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.08	0.4 - 0.8	
Total Crashes	2	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 46
Intersection ID: 33.04
Date: 5/18/2011

CSAH 1 and CSAH 15

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 11.566
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 3487
Traffic Control Device: Side STOP
Street Lights: Yes
Flashers: No
Major ADT: 2525
Minor ADT: 962

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.2	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.38	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	Installed	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$3,330
Local Match (10% of Total project cost)	$370
Total Project Cost	**$3,700**

Rank: 47
Intersection ID: 1.06
Date: 5/18/2011

CSAH 1 and CSAH 10

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 22.36
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 2925
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 2350
Minor ADT: 1150

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.2	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.49	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 48
Intersection ID: 1.23
Date: 5/18/2011

CSAH 8 and CSAH 53

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 8.32
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1198
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 850
Minor ADT: 348

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	1	0
Rate (per MVM)	0.5	0.5	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.41	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 49
Intersection ID: 8.04
Date: 5/18/2011

CSAH 16 and MNTH 78

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 2270
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1875
Minor ADT: 790

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.2	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.42	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 50
Intersection ID: 16.01
Date: 5/18/2011

CSAH 34 and CNTY 123

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 2.52
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 963
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 860
Minor ADT: 205

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.6	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.24	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 51
Intersection ID: 34.02
Date: 5/18/2011

CSAH 35 and CSAH 39

Agency: Otter Tail County

Intersection Data

Configuration:	T
Configuration (2):	Undivided
True Mile:	12.43
Urban/Rural:	Rural
County:	Otter Tail
ATP:	4
Entering ADT:	625
Traffic Control Device:	Side STOP
Street Lights:	No
Flashers:	No
Major ADT:	558
Minor ADT:	135

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.9	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.24	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	-	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$1,665
Local Match (10% of Total project cost)	$185
Total Project Cost	**$1,850**

Rank: 52
Intersection ID: 35.06
Date: 5/18/2011

CSAH 38 and CSAH 81

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 2.03
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 407
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 330
Minor ADT: 77

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	1.3	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.23	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	-
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	0.5
Upgrade Stop Bar Only	$500	per intersection	0.5
Review Signs and CST	$4,900	per intersection	-

Notes - NB approach is gravel

Notes -

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$2,925
Local Match (10% of Total project cost)	$325
Total Project Cost	**$3,250**

Rank: 53
Intersection ID: 38.02
Date: 5/18/2011

CSAH 41 and MNTH 108 EAST

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 6
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1060
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 720
Minor ADT: 680

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.5	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.94	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 55
Intersection ID: 41.01
Date: 5/18/2011

CSAH 54 and CSAH 67

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 8.6
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 820
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 600
Minor ADT: 520

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.7	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.87	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 56
Intersection ID: 54.03
Date: 5/18/2011

CSAH 85 and MNTH 108

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1175
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 915
Minor ADT: 260

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	0.5	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.28	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 57
Intersection ID: 85.01
Date: 5/18/2011

CNTY 143 and USTH 10

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Divided
True Mile: 3.1
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 7267
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 7200
Minor ADT: 67

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	1	0
Rate (per MVM)	0.1	0.1	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	Yes	Yes	★
Distance from previous STOP	No	Yes	
Volume Ratio	0.01	0.4 - 0.8	
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	-
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	0.5
Upgrade Stop Bar Only	$500	per intersection	0.5
Review Signs and CST	$4,900	per intersection	-

Notes - -

Notes - Due to the railroad crossing, a 48" stop sign is recommended on the approach with the crossing to increase the sign visibility.

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$2,925
Local Match (10% of Total project cost)	$325
Total Project Cost	**$3,250**

Rank: 58
Intersection ID: 143.01
Date: 5/18/2011

CSAH 12 and CSAH 47 WEST

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 6.8
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 548
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 430
Minor ADT: 235

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	1.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.55	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 59
Intersection ID: 12.04
Date: 5/18/2011

CSAH 63 and MNTH 235

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 1.43
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 538
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 420
Minor ADT: 235

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	0	0
Rate (per MVM)	1.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.56	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
				Notes - -
Roundabout	$1,000,000	per intersection	-	
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 60
Intersection ID: 63.01
Date: 5/18/2011

CSAH 18 and CSAH 35

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 6.49
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1655
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1125
Minor ADT: 530

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	1	1	0
Rate (per MVM)	0.3	0.3	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.47	0.4 - 0.8	★
Total Crashes	1	>0	★
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 61
Intersection ID: 18.01
Date: 5/18/2011

CSAH 1 and CSAH 83

Agency: Otter Tail County

Intersection Data

Configuration:	T
Configuration (2):	Undivided
True Mile:	33.35
Urban/Rural:	Rural
County:	Otter Tail
ATP:	4
Entering ADT:	1905
Traffic Control Device:	Side STOP
Street Lights:	No
Flashers:	No
Major ADT:	1800
Minor ADT:	210

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.12	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 62
Intersection ID: 1.28
Date: 5/18/2011

CSAH 3 and CSAH 22

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 4.24
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 865
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 500
Minor ADT: 365

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.73	0.4 - 0.8	★
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 63
Intersection ID: 3.02
Date: 5/18/2011

CSAH 3 and CSAH 24

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 8.39
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1033
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 580
Minor ADT: 453

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.78	0.4 - 0.8	★
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 64
Intersection ID: 3.03
Date: 5/18/2011

CSAH 21 and CSAH 24 NORTH

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 14.5
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 470
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 340
Minor ADT: 260

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.76	0.4 - 0.8	★
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 65
Intersection ID: 21.05
Date: 5/18/2011

CSAH 29 and CNTY 120

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 5.95
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 983
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 713
Minor ADT: 540

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.76	0.4 - 0.8	★
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 66
Intersection ID: 29.02
Date: 5/18/2011

CSAH 31 and USTH 59

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 5.14
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 3345
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 2850
Minor ADT: 495

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.17	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 67
Intersection ID: 31.01
Date: 5/18/2011

CSAH 35 and MNTH 108 EAST

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1498
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1300
Minor ADT: 395

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	Yes	Yes	★
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.30	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$8,000	per intersection	x
Upgrade Signs	$1,150	per intersection	x
Upgrade Markings	$700	per intersection	x
Upgrade Stop Bar Only	$250	per intersection	-
Review Signs and CST	$2,450	per intersection	-

Notes - -

Notes - Due to the railroad crossing, a 48" stop sign is recommended on the approach with the crossing to increase the sign visibility.

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 68
Intersection ID: 35.14
Date: 5/18/2011

CSAH 67 and CSAH 67

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 1.333
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 988
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 785
Minor ADT: 405

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.52	0.4 - 0.8	★
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 70
Intersection ID: 67.02
Date: 5/18/2011

CSAH 50 and CSAH 67 SOUTH

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 3.06
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 503
Traffic Control Device: Side YIELD
Street Lights: No
Flashers: No
Major ADT: 343
Minor ADT: 320

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.93	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 69
Intersection ID: 50.02
Date: 5/18/2011

CNTY 119 and MNTH 210

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 6.11
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 2895
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 2650
Minor ADT: 245

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.09	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	x
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	x
Upgrade Stop Bar Only	$500	per intersection	-
Review Signs and CST	$4,900	per intersection	-

Notes - SB approach is gravel

Notes -

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 71
Intersection ID: 119.01
Date: 5/18/2011

CNTY 137 and USTH 10

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Divided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 6868
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 6700
Minor ADT: 168

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	Yes	Yes	★
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.03	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	x
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	0.5
Upgrade Stop Bar Only	$500	per intersection	0.5
Review Signs and CST	$4,900	per intersection	-

Notes - NB approach is gravel

Notes - Due to the railroad crossing, a 48" stop sign is recommended on the approach with the crossing to increase the sign visibility.

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$14,625
Local Match (10% of Total project cost)	$1,625
Total Project Cost	**$16,250**

Rank: 72
Intersection ID: 137.01
Date: 5/18/2011

CSAH 29 and CSAH 82

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 1390
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 1300
Minor ADT: 180

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.14	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	-	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$1,665
Local Match (10% of Total project cost)	$185
Total Project Cost	**$1,850**

Rank: 74
Intersection ID: 29.01
Date: 5/18/2011

CSAH 29 and MNTH 210

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 7.44
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 6837
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 6000
Minor ADT: 837

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	No	Yes	
Development	Yes	Yes	★
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.14	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$13,000	per intersection	x	
Upgrade Signs	$2,300	per intersection	x	Notes -
Upgrade Markings	$1,400	per intersection	x	
Upgrade Stop Bar Only	$500	per intersection	-	
Review Signs and CST	$4,900	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: 75
Intersection ID: 29.03
Date: 5/18/2011

CSAH 21 and CSAH 24 SOUTH

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 13.73
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 420
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 328
Minor ADT: 185

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.56	0.4 - 0.8	★
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	-	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$1,665
Local Match (10% of Total project cost)	$185
Total Project Cost	**$1,850**

Rank: 73
Intersection ID: 21.04
Date: 5/18/2011

CSAH 32 and CSAH 74

Agency: Otter Tail County

Intersection Data

Configuration: T
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 555
Traffic Control Device: Thru STOP
Street Lights: No
Flashers: No
Major ADT: 383
Minor ADT: 345

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	0	0	0
Rate (per MVM)	0.0	0.0	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	Yes	Yes	★
On/Near Curve	Yes	Yes	★
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.90	0.4 - 0.8	
Total Crashes	0	>0	
			★★★

Short List of Strategies Considered

Description		Unit Cost	Selected	
Roundabout	$1,000,000	per intersection	-	Notes - -
Directional Median	$150,000	per intersection	-	
Mainline Dynamic Warning Sign	$30,000	per intersection	-	
Installing Street Lights	$8,000	per intersection	x	
Upgrade Signs	$1,150	per intersection	x	Notes -
Upgrade Markings	$700	per intersection	x	
Upgrade Stop Bar Only	$250	per intersection	-	
Review Signs and CST	$2,450	per intersection	-	

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$8,865
Local Match (10% of Total project cost)	$985
Total Project Cost	**$9,850**

Rank: 76
Intersection ID: 32.01
Date: 5/18/2011

CSAH 1 and CSAH 26

Agency: Otter Tail County

Intersection Data

Configuration: X
Configuration (2): Undivided
True Mile: 0
Urban/Rural: Rural
County: Otter Tail
ATP: 4
Entering ADT: 995
Traffic Control Device: Side STOP
Street Lights: No
Flashers: No
Major ADT: 720
Minor ADT: 275

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	3	1	0
Rate (per MVM)	1.7	0.6	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	Yes	Yes	★
Volume Ratio	0.38	0.4 - 0.8	
Total Crashes	3	>0	★
			★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	x
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	x
Upgrade Stop Bar Only	$500	per intersection	-
Review Signs and CST	$4,900	per intersection	-

Notes - County Nominated Project

Notes -

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: CN 1
Intersection ID: 1.01
Date: 5/24/2011

CSAH 10 and CSAH 27

Agency: Otter Tail County

Intersection Data

Configuration:	X
Configuration (2):	Undivided
True Mile:	10.46
Urban/Rural:	Rural
County:	Otter Tail
ATP:	4
Entering ADT:	3450
Traffic Control Device:	Thru STOP
Street Lights:	No
Flashers:	No
Major ADT:	2250
Minor ADT:	1200

Crash Data

2005-2009 MnCMAT Crash Data 5 years

	Total	Angle	K+A
Crashes	6	4	0
Rate (per MVM)	1.0	0.6	0.0

Ranking Criteria

	Value	Critical	Risk Ranking
Skew	No	Yes	
On/Near Curve	No	Yes	
Development	No	Yes	
Near RR Crossing	No	Yes	
Distance from previous STOP	No	Yes	
Volume Ratio	0.53	0.4 - 0.8	★
Total Crashes	6	>0	★
			★★

Short List of Strategies Considered

Description		Unit Cost	Selected
Roundabout	$1,000,000	per intersection	-
Directional Median	$150,000	per intersection	-
Mainline Dynamic Warning Sign	$30,000	per intersection	-
Installing Street Lights	$13,000	per intersection	x
Upgrade Signs	$2,300	per intersection	x
Upgrade Markings	$1,400	per intersection	x
Upgrade Stop Bar Only	$500	per intersection	-
Review Signs and CST	$4,900	per intersection	-

Notes - County Nominated Project

Notes -

Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Implementation Cost

Federal Funds	$15,030
Local Match (10% of Total project cost)	$1,670
Total Project Cost	**$16,700**

Rank: CN 2
Intersection ID: 10.06
Date: 5/24/2011

Appendix E

Sample County Response and Related Legal Code

LINCOLN COUNTY HIGHWAY DEPARTMENT

Post Office Box 97
Ivanhoe, Minnesota 56142

Lee E. Amundson, P.E.
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Phone 507-694-1464
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Road Safety Audit - Lincoln County, MN

PLAN OF ACTION

March 2008

In 2007 SRF Consulting Group, Inc. under took a Road Safety Audit study for Lincoln County, MN. The Final Report was produced in January 2008.

On June 26, 2007 a Kick off Meeting was held at the Lincoln County Highway Department in Ivanhoe, Minnesota. The agenda and attendance list are attached.

A Stakeholder Meeting was held on July 30, 2007 at the Lincoln County Highway Department in Ivanhoe, Minnesota. A copy of the attendance list and list of study sites are attached. Discussion about history at each location gave background for the team that did the field reviews.

Following the field review a Safety Audit Follow-up Meeting was also held at the Lincoln County Highway Department on August 2, 2007.

On November 8, 2007 the Final Meeting for the Lincoln County Road Safety Audit was held in the Assembly Room, Lincoln County Courthouse, 319 North Rebecca Street in Ivanhoe, Minnesota. The Agenda and attendance list information is attached.

Plan of Action:

Lincoln County will work to insure driver safety as a result of the Road Safety Audit by the following actions/goals:

1. Insure proper advisory speeds for curves by working with the Minnesota Department of Transportation, testing the curves and installing appropriate advisory speed signs.
2. Curve warnings will be reviewed and chevrons will be installed when funding allows.
3. Appropriate size STOP and STOP AHEAD signs will be reviewed when replacements are needed. STOP AHEAD (symbol type) signs will be used when old signs are replaced. Double STOP signs may be used to get driver attention at sites where failure to stop is a problem.
4. Size of curve Advisory Speed signs will be studied and applied if appropriate.
5. Efforts will be made to repaint striping on all routes to properly delineate roadways.
6. A Distance plaque below “School Bus Stop Ahead” signs will be used to show how far ahead the bus stop is located.
7. Horizontal and vertical curve alignments will be reviewed and degree of curvature reduced when feasible with future reconstruction.
8. Guardrails on County Roads will be eliminated or replaced with guardrail that meets current MnDOT standards when road reconstruction occurs.
9. Warning signs will be reviewed for accuracy when replacements are necessary; including size of signs.
10. Speed zone studies by the Minnesota Department of Transportation will be requested for sites where a safet speed may be considered warranted.
11. Lincoln County will continue to work with the Minnesota Department of Transportation and railroad owner(s) to install proper warnings for at-grade railroad crossings.
12. Rumble strips will be maintained for reasonable warning; getting driver attention for STOP and YIELD conditions.
13. Use of STOP bars will be considered at intersections where there is apparent failure to stop.

Lincoln County has applied for safety funds to address safety at county road intersections throughout the county; using reflective can-delineators which are attached to Stop or Yield sign supports. It is a low cost method to help drivers locate side road locations. Also, District 8 Counties applied for safety funds to help address run off road incidents: 6” edgelines on high risk rural routes and chevrons for horizontal curves.

23 U.S.C. § 409 : US Code - Section 409: Discovery and admission as evidence of certain reports and surveys

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data

Pierce County, Washington v. Guillen

Supreme Court of the United States, 2003
123 U.S. 720

Brief Fact Summary

The Court addressed whether 23 U.S.C. section 409, which protects information "compiled or collected" in connection with certain federal highway safety programs from being discovered or admitted in certain federal or state trials, is a valid exercise of Congress's authority under the Constitution.

Rule of Law and Holding

This Court lacks jurisdiction to hear the tort portion of the case but has jurisdiction to hear the Public Disclosure Act portion. Certain state-court judgments can be treated as final for jurisdictional purposes even though further proceedings are to take place in the state courts.

Edited Opinion

Note: The following opinion was edited by CVN Law School staff. © 2008 Courtroom Connect, Inc.

JUSTICE THOMAS delivered the opinion of the Court.

We address in this case whether 23 U. S. C. § 409, which protects information "compiled or collected" in connection with certain federal highway safety programs from being discovered or admitted in certain federal or state trials, is a valid exercise of Congress' authority under the Constitution.

Beginning with the Highway Safety Act of 1966, Congress has endeavored to improve the safety of our Nation's highways by encouraging closer federal and state cooperation with respect to road improvement projects. To that end, Congress has adopted several programs to assist the States in identifying highways in need of improvements and in funding those improvements. Of relevance to this case is the Hazard Elimination Program (Program) which provides state and local governments with funding to improve the most dangerous sections of their roads. To be eligible for funds under the Program, a state or local government must undertake a thorough evaluation of its public roads. Specifically, § 152(a)(1) requires them to "conduct and systematically maintain an engineering survey of all public roads to identify hazardous locations, sections, and elements, including roadside obstacles and unmarked or poorly marked roads, which may constitute a danger to motorists, bicyclists, and pedestrians, assign priorities for the correction of such

locations, sections, and elements, and establish and implement a schedule of projects for their improvement."

Not long after the adoption of the Program, the Secretary of Transportation reported to Congress that the States objected to the absence of any confidentiality with respect to their compliance measures. According to the Secretary's report, the States feared that diligent efforts to identify roads eligible for aid under the Program would increase the risk of liability for accidents that took place at hazardous locations before improvements could be made. In 1983, concerned that the States' reluctance to be forthcoming and thorough in their data collection efforts undermined the Program's effectiveness, the United States Department of Transportation (DOT) recommended the adoption of legislation prohibiting the disclosure of information compiled in connection with the Program.

To address the concerns expressed by the States and the DOT, in 1987, Congress adopted 23 U. S. C. § 409, which provided:"Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled for the purpose of identifying[,] evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 152 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be admitted into evidence in Federal or State court or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data."

The proper scope of § 409 became the subject of some dispute among the lower courts. Some state courts, for example, concluded that § 409 addressed only the admissibility of relevant documents at trial and did not apply to pretrial discovery. According to these courts, although information compiled for § 152 purposes would be inadmissible at trial, it nevertheless remained subject to discovery. Other state courts reasoned that § 409 protected only materials actually generated by a governmental agency for § 152 purposes, and documents collected by that agency to prepare its § 152 funding application remained both admissible and discoverable.

As amended, § 409 now reads:

"Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 152 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data."

Ignacio Guillen's wife, Clementina Guillen-Alejandre, died on July 5, 1996, in an automobile accident at the intersection of 168th Street East and B Street East (168/B intersection), in Pierce County, Washington. Several months before the accident, petitioner had requested § 152 funding for this intersection, but the request had been denied. Petitioner renewed its application for funding on April 3, 1996, and the second request was approved on July 26, 1996, only three weeks after the accident occurred.

Beginning on August 16, 1996, counsel for respondents sought to obtain from petitioner information about accidents that had occurred at the 168/B intersection.1 Petitioner declined to provide any responsive information, asserting that any relevant documents were protected by § 409. After informal efforts failed to resolve this discovery dispute, respondents turned to the Washington courts.

While the appeal in the PDA action was pending, respondents filed a separate action, asserting that petitioner had been negligent in failing to install proper traffic controls at the 168/B intersection. In connection with the tort action, respondents served petitioner with interrogatories seeking information regarding accidents that had occurred at the 168/B intersection. Petitioner refused to comply with the discovery request, once again relying on § 409. Respondents successfully sought an order to compel, and petitioner moved for discretionary appellate review of the trial judge's interlocutory order.

Having determined that § 409 protects only information compiled or collected for § 152 purposes, and does not protect information compiled or collected for purposes unrelated to § 152, as held by the agencies that compiled or collected that information, we now consider whether § 409 is a proper exercise of Congress' authority under the Constitution. We conclude that it is.

It is well established that the Commerce Clause gives Congress authority to "regulate the use of the channels of interstate commerce." In addition, under the Commerce Clause, Congress "is empowered to regulate and protect the instrumentalities of interstate commerce, or persons or things in interstate commerce, even though the threat may come only from intrastate activities." As already discussed, Congress adopted § 152 to assist state and local governments in reducing hazardous conditions in the Nation's channels of commerce. That effort was impeded, however, by the States' reluctance to comply fully with the requirements of § 152, as such compliance would make state and local governments easier targets for negligence actions by providing would-be plaintiffs a centralized location from which they could obtain much of the evidence necessary for such actions. In view of these circumstances, Congress could reasonably believe that adopting a measure eliminating an unforeseen side effect of the information-gathering requirement of § 152 would result in more diligent efforts to collect the relevant information, more candid discussions of hazardous locations, better informed decisionmaking, and, ultimately, greater safety on our Nation's roads.

Consequently, both the original § 409 and the 1995 amendment can be viewed as legislation aimed at improving safety in the channels of commerce and increasing protection for the instrumentalities of interstate commerce. As such, they fall within Congress' Commerce Clause power. Accordingly, the judgment of the Washington Supreme Court is reversed, and the case is remanded for further proceedings not inconsistent with this opinion.

It is so ordered.

COUNTY ROADWAY

Safety PLAN

Moving Toward ZERO Deaths

MINNESOTA DEPARTMENT OF TRANSPORTATION