April 2015

North Dakota

Local Road Safety Program
North Dakota
Local Road Safety Program

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On behalf of
North Dakota Department of Transportation
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NDDOT Reserves All Objections
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### Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>4Es</td>
<td>education, enforcement, engineering, and emergency medical services</td>
</tr>
<tr>
<td>100MVMT</td>
<td>100 million vehicle miles traveled</td>
</tr>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
</tr>
<tr>
<td>ADT</td>
<td>average daily traffic</td>
</tr>
<tr>
<td>CMC</td>
<td>county major collector</td>
</tr>
<tr>
<td>CMF</td>
<td>crash modification factor</td>
</tr>
<tr>
<td>CRS</td>
<td>Crash Reporting System (North Dakota Department of Transportation)</td>
</tr>
<tr>
<td>DUI</td>
<td>driving under the influence</td>
</tr>
<tr>
<td>EMS</td>
<td>emergency medical services</td>
</tr>
<tr>
<td>ERA</td>
<td>edge risk assessment</td>
</tr>
<tr>
<td>FHWA</td>
<td>Federal Highway Administration</td>
</tr>
<tr>
<td>GDL</td>
<td>graduated driver’s license</td>
</tr>
<tr>
<td>GHSA</td>
<td>Governors Highway Safety Association</td>
</tr>
<tr>
<td>HSIP</td>
<td>Highway Safety Improvement Program</td>
</tr>
<tr>
<td>LEAD</td>
<td>Listen, Educate, Ask, Discuss</td>
</tr>
<tr>
<td>LRSP</td>
<td>Local Road Safety Program</td>
</tr>
<tr>
<td>MUTCD</td>
<td>Manual on Uniform Traffic Control Devices</td>
</tr>
<tr>
<td>NCHRP</td>
<td>National Cooperative Highway Research Program</td>
</tr>
<tr>
<td>NDDOT</td>
<td>North Dakota Department of Transportation</td>
</tr>
<tr>
<td>NHTSA</td>
<td>National Highway Traffic Safety Administration</td>
</tr>
<tr>
<td>Plan</td>
<td>LRSP Safety Plan</td>
</tr>
<tr>
<td>PSA</td>
<td>public service announcement</td>
</tr>
<tr>
<td>SHSP</td>
<td>Strategic Highway Safety Plan</td>
</tr>
<tr>
<td>TSO</td>
<td>Traffic Safety Office</td>
</tr>
</tbody>
</table>
Executive Summary

This Local Road Safety Program (LRSP) Plan (Plan) was prepared for Turtle Mountain as part of North Dakota’s statewide highway safety planning process. The contents are the result of a data-driven process, with a goal to reduce severe crashes (defined as those crashes resulting in at least one fatality or incapacitating injury) by documenting at-risk locations, identifying effective low-cost safety improvement strategies, and better positioning local agencies to compete for available safety funds. The LRSP includes a description of the connection to safety planning efforts at the national, state (through North Dakota’s Strategic Highway Safety Plan and the Highway Safety Improvement Program), and regional levels.

This LRSP was commissioned by the North Dakota Department of Transportation (NDDOT) to provide a tool to assist counties, cities and Indian reservations in submitting proactive low-cost systemic safety projects for the NDDOT to fund as part of the Highway Safety Improvement Program (HSIP). The LRSP is not intended to be a complete safety plan for Turtle Mountain, because there may be other safety improvement strategies that are considered high-cost or low-cost that are also effective, but cannot be systemically applied across a local road system. While this LRSP addresses many of the safety concerns at high-risk locations within the Turtle Mountain Reservation, other equally important projects may be identified after this safety planning effort is complete.

Specifically, this LRSP includes the following:

- 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 local road systems 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 North Dakota where severe crashes have occurred.
- Development of approximately $1 million of suggested safety projects across the reservation (Table ES-1), including the filed out forms suitable for submittal to the NDDOT for their consideration for HSIP funding. These projects represent the application of high-priority safety strategies at the at-risk locations.
- Discussion of behavioral crash statistics, potential safety strategies, and current statewide resources available for implementation of behavioral safety strategies.
TABLE ES-1
Turtle Mountain Total Safety Project Estimated Costs

<table>
<thead>
<tr>
<th>Rural Projects</th>
<th>Roadway Segments</th>
<th>Intersections</th>
<th>Curves</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turtle Mountain</td>
<td>$89,788</td>
<td>$622,680</td>
<td>$61,085</td>
<td>$773,553</td>
</tr>
</tbody>
</table>

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 highway agencies statewide in an effort to reduce the number of severe crashes on the local road systems. It is understood that the final decision to implement any of the suggested projects resides with tribe staff.

It should also be noted that the rankings of reservation roadway facilities are based on a comparison with documented risk factors. There is no expectation or requirement that Turtle Mountain pursue safety projects in the exact ranking order. The ranking suggests a general priority, and it is understood that actual project development decisions will be made by tribe staff based on consideration of economic, social, and political issues, as well as in coordination with other projects already in the Capital Improvement Program.

It should also be noted that some of the at-risk locations and suggested safety projects involve the intersection of a local roadway and a state route. It is acknowledged that the tribe does not have the authority to implement projects on the state’s right-of-way. The tribe is encouraged to coordinate with the NDDOT to pursue a partnership that identifies a path toward implementation. This LRSP (1) does not set requirements or mandates; (2) is not a standard; and (3) is neither intended to be nor does it establish a legal standard of care.

Regarding the expected life of this LRSP, the shelf life of this document is limited (as with any transportation plan). This is because the distribution of crashes can change over time, just as roadway and traffic conditions change, contributing to the occurrence of crashes. This LRSP contains approximately $0.8 million of potential safety projects, which could provide Turtle Mountain with a sufficient backlog of projects for up to five years. As a result, the tribe is encouraged to periodically update this LRSP.

The tribe is also encouraged to apply for these projects through the NDDOT’s HSIP process. The anticipated annual HSIP process is shown in Table ES-2.

TABLE ES-2
HSIP Solicitation Schedule

<table>
<thead>
<tr>
<th>Month</th>
<th>Task Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>October/November</td>
<td>Solicitation for HSIP is sent out to all counties, districts, MPOs, cities, and tribes. The counties, districts, MPOs, cities, and tribes will have about 6 weeks to respond.</td>
</tr>
<tr>
<td>January through April</td>
<td>NDDOT reviews the requests and conducts additional studies if required.</td>
</tr>
<tr>
<td>Following Fall</td>
<td>HSIP approval notices are sent after program concurrence from the FHWA. Funding for an approved project will be provided as funding is available.</td>
</tr>
</tbody>
</table>
1.0 Introduction

1.1 Background

To fulfill a commitment in the 2013 North Dakota Strategic Highway Safety Plan (SHSP), the North Dakota Department of Transportation (NDDOT) began the Local Road Safety Program (LRSP). The purpose of the LRSP is to better engage local roadway agencies in the statewide safety planning process. The NDDOT’s commitment is based on two pieces of information:

- Based on 2007-to-2011 crash records, the SHSP identified that 56 percent of severe crashes (those crashes resulting in at least one fatality or incapacitating injury) in North Dakota occurred on roads operated by local agencies. (Note: More recent crash data from 2009 to 2013 indicates that 44 percent of severe crashes were on local agency roads.)
- The NDDOT had historically focused federal safety funds on interstates, U.S. highways, and state highways, even though slightly more than half of severe crashes occurred on those facilities.

The NDDOT set out to increase the level of participation of local agencies in safety planning and the amount of safety funds directed toward projects on local systems. To do this, the NDDOT partnered with local agencies (including all 53 counties, 12 major cities, 4 Indian reservations and 1 national park in the state) to prepare safety plans for every region of North Dakota.

Representatives from the NDDOT and Turtle Mountain participated in developing this LRSP Safety Plan (Plan) as part of a comprehensive effort to reduce the number of fatal and incapacitating injury crashes (referred collectively as severe crashes) that occur on North Dakota’s local road system. The area covered by the Plan includes portions of NDDOT District 3 – Devils Lake (Figure 1-1).

The purpose of this Plan is to identify and implement specific safety strategies at specific locations and to link these projects directly with the contributing factors associated with the majority of severe crashes on the local roads. These safety projects are intended to be comprehensive by addressing both infrastructure- and driver-behavior-related crashes by including proactive projects developed through a system-wide risk assessment process. These projects are intended to compliment reactive projects developed through a site analysis approach focused on high-crash locations.
The traffic safety priorities identified in this Plan are the result of a data-driven analysis of nearly 90,980 crashes (including 2,340 severe crashes) on all roads in North Dakota. Of these crashes, 21 severe crashes occurred within the Turtle Mountain Reservation over the 5-year period from 2009 to 2013.

![North Dakota Department of Transportation Districts](image)

**FIGURE 1-1**
North Dakota Department of Transportation’s Eight Districts

### 1.2 Traffic Safety – A National Perspective

According to the National Highway Traffic Safety Administration (NHTSA), 33,561 people were killed in traffic crashes in 2012—an average of 92 people killed every day—and an additional 2.4 million people were injured. The number of fatalities nationally decreased significantly and steadily in the 1970s and 1980s. Beginning in the early 1990s and continuing through the early 2000s, traffic fatalities began to increase. However, since 2005, traffic fatalities have decreased dramatically to the lowest number of fatalities in recent history—32,479 fatalities in 2011 and 33,561 in 2012.

Like the national trend, the North Dakota traffic fatality rate also decreased in the 1970s and 1980s. Likewise, North Dakota’s traffic fatalities slowly increased through the 1990s and early 2000s, and began to decrease again in 2005. However, unlike the national trend, North Dakota’s traffic fatality rate has increased since 2008. The 2013 North Dakota Strategic Highway Safety Plan recognizes the following issues likely account for much of the increase:
• Shifts in the age of the driving population.
• Steady increase in the number of vehicle miles traveled in North Dakota, which is counter to the flat or decreasing national trend in travel.
• Other states have a longer history using a systemic investment approach to focus on locations with risk factors for severe crashes.
• The growing challenges of providing emergency medical response and quick access to advanced health care in rural areas.

1.2.1 AASHTO’s Strategic Highway Safety Plan and Safety Emphasis Areas

In the late 1990s, the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) supported a comprehensive and data-driven approach to reduce the number of traffic-related fatalities. Both AASHTO and the FHWA concluded that up to that point, states’ efforts had not been effective in lowering the number of severe crashes because: (1) efforts were not focused on severe crashes nor the primary factors resulting in severe crashes; and (2) safety project selection was not part of a data-driven process that implemented effective strategies at locations most at risk for a severe crash.

AASHTO and the FHWA recommended a safety program development process that included 22 categories (or safety emphasis areas) in the areas of drivers, special users, vehicles, highways, emergency services, and management. The objective of this first step is to help agencies consider the 4Es of safety — education, enforcement, engineering, and emergency medical services (EMS) — when identifying safety priorities for their roads. In addition, selecting safety emphasis areas focuses agency efforts on safety strategies linked to the issue.

In 2007, AASHTO set a goal to reduce the number of traffic fatalities nationally by 1,000 each year for the next 20 years, which is an integral first step in a national Toward Zero Deaths safety vision. FHWA has determined that this goal will be reached only by partnering with individual states. This partnering will lead to more successful project implementation and will result in programs that target the factors contributing to the greatest number of fatal and severe injury crashes.

1.3 North Dakota’s Statewide Safety Planning Efforts

Through 2004, North Dakota had a fatality rate (1.34 fatalities per 100 million vehicle miles traveled [100MVMT] in 2004) that was less than the national average (1.44 fatalities per 100MVMT). However, in recent years, the North Dakota fatality rate (1.47 fatalities per 100MVMT in 2013) has risen above the national average (1.11 fatalities per 100MVMT) and the overall number of traffic fatalities has generally crept upward (see Figure 1-2). Although the highest fatality rate occurred in 2009, the most traffic fatalities reported in the state since 1982 occurred in 2012 when there were 170 fatalities on North Dakota roads. In 2013, the number of North Dakota traffic fatalities decreased to 148, matching 2011; differences in the vehicle miles of travel result in different fatality rates for these two years.
In 2013, the NDDOT updated the state’s SHSP. Based on severe crashes (Table 1-1), the 2013 SHSP identified the following safety emphasis areas, as well as priority safety strategies in each area:

- Young drivers (under age 21)
- Speeding or aggressive driving
- Alcohol-related
- Unbelted vehicle occupants
- Lane departure
- Intersections

North Dakota also adopted a long-term vision of zero fatalities on its roadways. Achieving this vision will require many years and dramatic shifts in the safety culture for North Dakota. An aggressive intermediate goal was set to reduce the 3-year traffic fatality average to 100 or fewer by 2020.
TABLE 1-1
North Dakota Fatal and Severe Injury Crashes by AASHTO Safety Emphasis Area

<table>
<thead>
<tr>
<th>Safety Emphasis Area</th>
<th>Statewide Crashes (All Roads)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
</tr>
<tr>
<td>Drivers</td>
<td></td>
</tr>
<tr>
<td>Involving Driver under Age 21</td>
<td>21%</td>
</tr>
<tr>
<td>Involving drivers over the age of 64</td>
<td>12%</td>
</tr>
<tr>
<td>Speeding or Aggressive Driving</td>
<td>25%</td>
</tr>
<tr>
<td>Alcohol-Related</td>
<td>28%</td>
</tr>
<tr>
<td>Distracted, asleep, or fatigued drivers</td>
<td>9%</td>
</tr>
<tr>
<td>Unbelted Vehicle Occupants</td>
<td>30%</td>
</tr>
<tr>
<td>Special Users</td>
<td></td>
</tr>
<tr>
<td>Pedestrians crashes</td>
<td>5%</td>
</tr>
<tr>
<td>Bicycle crashes</td>
<td>1%</td>
</tr>
<tr>
<td>Vehicles</td>
<td></td>
</tr>
<tr>
<td>Motorcycles crashes</td>
<td>11%</td>
</tr>
<tr>
<td>Highways</td>
<td></td>
</tr>
<tr>
<td>Train-vehicle collisions</td>
<td>1%</td>
</tr>
<tr>
<td>Lane-Departure including both lane-departure (1,094 severe crashes) and head-on/sideswipe-opposing crashes (204 severe crashes)</td>
<td>46%</td>
</tr>
<tr>
<td>Intersections</td>
<td>23%</td>
</tr>
<tr>
<td>Work zone crashes</td>
<td>2%</td>
</tr>
<tr>
<td>Total Severe (Fatal and Incapacitating Injury) Crashes</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
Information is from the 2009-to-2013 North Dakota crash data records, which is an update to the information in the 2013 North Dakota SHSP that used 2007-to-2011 crash records.
Numbers in this table do not add up to the statewide 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.

1.4 Local Road Safety Program Overview

North Dakota’s local road system encompasses more than 97,500 miles of roadway out of approximately 106,000 miles statewide. Although, historically, more than 50 percent of severe crashes in North Dakota occurred on local roads, the density of these crashes was very low (approximately 0.002 severe crash per mile per year). As a result, local agencies were unable to identify high-crash locations to nominate for funding through the Highway Safety Improvement Program (HSIP). Therefore, using stand-in data for the severe crashes, safety projects were identified using a systemic process to evaluate at-risk locations. The use of the systemic process was necessary due to the low crash density. Based on revised FHWA policy, the NDDOT expanded the HSIP to include projects identified through the systemic analysis of local roads.

The focus areas of the systemic risk assessment are rural, paved local highways\(^1\), and urban arterials and collectors in North Dakota’s larger cities (cities with a population greater

\(^1\) Does not include all paved roads outside municipal limits, but focuses on routes that serve regional travel. For example, a loop road that is paved and yet only provides access to a residential neighborhood was considered to be a local road given the type of traffic served by the facility.
than 5,000). Paved, rural local highways were selected based on an analysis of statewide crash data that indicated that approximately 59 percent of severe local road crashes occurred on rural county roads. Of these crashes, approximately 40 percent occurred on paved roads, which account for less than 10 percent of county roads (approximately 6,200 miles). Further analysis indicated that on these rural highways, the most at-risk elements were roadway segments (76 percent of severe crashes), horizontal curves (31 percent of severe crashes), and intersections (20 percent of severe crashes).

Major cities were selected as a focus because approximately 90 percent of the severe local roadway crashes occurred within the city boundaries of the 12 cities in this category. Furthermore, 56 percent of the severe crashes occurred on urban arterials and collectors. In addition, because these 12 cities are responsible for operation and maintenance of U.S. highway and state highway routes within the municipal limits (not including fully access-managed facilities, such as freeways), the U.S. and state highways were included in the review.

Figure 1-3 shows the approach used to develop this Plan. The process began with the crash analysis and concluded with this Plan, the culmination of the NDDOT and concerned local agencies working together for nearly half a year.
2.0 Turtle Mountain Safety Emphasis Areas and Crash Overview

The first step in the process to prepare the Plan was to conduct a crash analysis overview statewide for North Dakota.

2.1 Turtle Mountain Crash Overview

2.1.1 North Dakota Crash Mapping

Crash data was taken from NDDOT Crash Reporting System (CRS) and placed into ArcGIS for data exportation based on specific locations relative to local roads. The most recent five-year period of crash data (from 2009 to 2013) was analyzed and used to determine risk factors specific to the local roads. Consistent with the NDDOT’s SHSP, the analysis focused on severe (fatal and incapacitating injury) crashes.

2.1.2 Facilities Analyzed

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

- Rural local paved and major gravel roadway segments were analyzed. Other local gravel roads were removed from the analysis because of the relatively low percentage of severe crashes and the lack of infrastructure-based strategies that can be applied to this roadway type.

- Local rural road intersections with state highways or other local roads were included in the analysis. Local non-CMC gravel roads intersecting with other local roads were removed from the analysis due to the very low number of crashes at these intersections.

- Horizontal curves on paved rural local roads were included in the analysis.

- All other local roadway segments and intersections, including gravel roads, were reviewed for locations with multiple severe crashes or “hot spots.”

2.1.3 Crash Data Sets

Crash data for the five years from 2009 to 2013 was used for the crash analysis. In safety analysis, it is recommended that more than one year of data be studied to reduce the possibility of examining an unusual year. It is also important to include as many years as necessary to produce a data set that will provide statistically reliable results but not include too many years so that changed conditions are a concern (for example, reconstructed roads, addition of STOP signs, and changed speed limits). For Turtle Mountain, there were not enough crashes to be statistically reliable; therefore, the analysis also considered crashes from all Phases of the LRSP, statewide data, or national research.
The Turtle Mountain data set includes 58 crashes on local roads; of these, 13 were fatal or incapacitating injury crashes. Disaggregating statewide severe crashes by road type (paved, gravel, or local), area (urban versus rural), and crash type category (intersection versus roadway segment crashes) resulted in the distributions shown in Figure 2-1 and Figure 2-2. This review shows that, on the local system, severe lane departure crashes on paved roads and angle crashes at Thru-STOP intersections were overrepresented. Based on statewide traffic safety data, severe lane departure crashes along curves are also overrepresented.
CHAPTER 2: TURTLE MOUNTAIN SAFETY EMPHASIS AREAS AND CRASH OVERVIEW

FIGURE 2-1
Crash Data Overview – Statewide Rural Local Road Systems (2009 to 2013)

Note: Crash tree data may vary from data analysis due to overlap of crashes on road systems and data refinement throughout the process.
FIGURE 2-2
North Dakota Crash Data Overview – Statewide Urban Local Road Systems (2009 to 2013)

Note: Crash tree data may vary from data analysis due to overlap of crashes on road systems and data refinement throughout the process.
2.2 Turtle Mountain Safety Emphasis Areas

The total number of severe crashes (those crashes resulting in a fatality or incapacitating injury) in each region over the 5-year period from 2009 to 2013 was so few that the crash data was analyzed at statewide levels for various risk factors.

Section 1.2 described the development of AASHTO’s emphasis areas, and how this process was applied to the State of North Dakota to identify statewide safety emphasis areas (Chapter 1). An identical process was followed for Turtle Mountain, resulting in the distribution of severe crashes among AASHTO’s 22 emphasis areas (Table 2-1). The safety emphasis areas for the reservation are consistent with the state’s emphasis areas. This process revealed where crashes were overrepresented based on a comparison to statewide averages or where a large enough number of crashes represented an opportunity to substantially reduce crashes. As a result, the following safety emphasis areas were identified as priorities for safety investments:

- Driver Behavior – Young drivers, aggressive drivers, alcohol-related, and unbelted vehicle occupants
- Highways – Lane departure and intersection crashes

<table>
<thead>
<tr>
<th>Safety Emphasis Areas</th>
<th>Statewide (% of Total)</th>
<th>Turtle Mountain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Severe Crashes</td>
<td>2,340</td>
<td>13</td>
</tr>
<tr>
<td>Involving Drivers Under Age 21</td>
<td>21%</td>
<td>23%</td>
</tr>
<tr>
<td>Involving Drivers Over Age 64</td>
<td>12%</td>
<td>15%</td>
</tr>
<tr>
<td>Excessive Speed or Aggressive Driving</td>
<td>25%</td>
<td>31%</td>
</tr>
<tr>
<td>Alcohol-Related</td>
<td>28%</td>
<td>54%</td>
</tr>
<tr>
<td>Distracted, Asleep, or Fatigued Drivers</td>
<td>9%</td>
<td>0%</td>
</tr>
<tr>
<td>Unbelted Vehicle Occupants</td>
<td>30%</td>
<td>31%</td>
</tr>
<tr>
<td>Pedestrian Crashes</td>
<td>65%</td>
<td>31%</td>
</tr>
<tr>
<td>Bicycle Crashes</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Motorcycle Crashes</td>
<td>11%</td>
<td>0%</td>
</tr>
<tr>
<td>Train-Vehicle Collisions</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Lane Departure (Run-Off-the-Road and Head-On) Crashes</td>
<td>46%</td>
<td>54%</td>
</tr>
<tr>
<td>Head-On</td>
<td>8%</td>
<td>31%</td>
</tr>
<tr>
<td>Run-off-the-Road Crashes</td>
<td>38%</td>
<td>23%</td>
</tr>
<tr>
<td>Intersection Crashes</td>
<td>23%</td>
<td>15%</td>
</tr>
<tr>
<td>Work Zone Crashes</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Deer Collisions</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Adverse (Winter) Weather Related</td>
<td>17%</td>
<td>8%</td>
</tr>
</tbody>
</table>

TABLE 2-1
Severe Crashes by Safety Emphasis Areas (2009 to 2013)
Strategies to reduce crashes depend on whether a safety emphasis area is infrastructure-based or driver behavior-based. Infrastructure-based emphasis areas refer to characteristics of the location (for example, a roadway segment, curve, or intersection) where crashes occurred. Driver behavior-based emphasis areas refer to motorist characteristics or actions that contribute to crashes. Because driver behavior is tied to laws made at the national and state levels, roadway agencies generally have less ability to address driver-behavior-based emphasis areas. The most effective approach for road authorities to address driver behavior-based emphasis areas is to focus on public education and law enforcement through cooperation and collaboration with other tribe staff. Generally, more opportunities exist for agency road authorities to address infrastructure-based emphasis areas, because many of the associated strategies can be implemented as separate roadway improvement projects, or along with other planned improvements. Specific infrastructure- and driver behavior-based strategies presented to the participants of the safety workshop held for the reservation are provided in Section 3.2.

2.3 Crash Risk Factors

The objective of the analytical process is to identify candidates for safety investment based on two criteria: high-crash locations and at-risk locations. A more detailed crash analysis was performed for each priority crash type to identify (1) locations where these priority crash types occur at a rate of one or more severe crashes per year, and (2) basic roadway and traffic characteristics of locations with severe crashes. These characteristics are not considered to be the cause of crashes, but instead are used to determine the risk that a future severe crash may occur at a particular location. Information from historic crashes was used to evaluate the remainder of the reservation’s local road system and prioritize locations for safety investment based on similar characteristics.

2.3.1 Rural Roadway Segments – Crashes on Paved Roads

Of the more than 97,500 miles of local road system in North Dakota, only 7 percent of the roads are paved. However, 40 percent of crashes occurred on paved roads. Therefore, the focus of the LRSP is on rural paved roadway segments.

There are 71 miles of studied rural paved roads in the reservation. From 2009 to 2013, 13 severe crashes were reported on these reservation roads. The predominant crash type on these types of roads statewide was single vehicle lane departure (Figure 2-3). The following five risk factors were identified for rural lane departure crashes on paved roads statewide:

1. **Average Daily Traffic (ADT)** – Of the rural paved roads, 28 percent of the segment miles have an ADT greater than 450 vehicles per day. However, 60 percent of the severe lane departure crashes occurred at or above this ADT (Figure 2-4). Therefore, any segment with an ADT greater than 450 vehicles per day received a star.

2. **Access Density** – Nationally, research has shown that an access density of eight or more access points per mile (including field entrances, commercial entrances, roadway access, etc.) increase the likelihood of a severe crash occurring. North Dakota’s review of severe crashes on their rural county roads (shown in Figure 2-5) demonstrates a similar relationship. Therefore, any roadway segment with an access density greater than or equal to eight access points per mile received a star.
3. **Lane Departure Crash Density** – The average lane departure crash density for Turtle Mountain was 0.064 crash per mile. Due to this limited number of crashes, any roadway segment where the lane departure crash density was greater than the average for the central region received a star.

4. **Critical Radius Curve Density** – Nationally, lane departure crashes frequently occur within curves. Curves with radii between 500 and 1,200 feet (that is, critical radius curves) have a higher severe crash rate than other curves and roadway segments with more curves in this range are considered to have greater risk. The risk factor is determined by the number of critical radius curves divided by the length of the segment. The average critical curve radius density for these types of curves along roadway segments was 0.218 curve per mile for the central region. Any segment with a critical radius curve density greater than or equal to the region average received a star.

5. **Edge Risk Assessment (ERA)** – 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 1. Roads with little or no usable shoulder but with a reasonable clear zone received a rating of 2, as did roads with a usable shoulder but with fixed objects in the clear zone. Roads with no usable shoulder and fixed objects in the clear zone received a rating of 3. Examples of these edge risks are shown in Figure 2-6. Roads with a rating of 2 or 3 received a star.

Detailed segment analyses and results for the reservation are provided in Chapter 4. A prioritization process for each roadway segment was put into place using the five risk factors by giving stars to each risk factor present. The highest priority roadway segments received the most stars. In cases where roadway segments received the same number of stars, the ERA, and ADT were used to break the tie.
FIGURE 2-3
Severe Crash Types on Rural Paved Road Segments Statewide (2009 to 2013)

FIGURE 2-4
Rural Roadway Segment Average Daily Traffic (ADT) Statewide Local Crash Data
Source: 2008-2012 (Phase 1 and Phase 2), 2009-2013 (Phase 3 and Phase 4)
FIGURE 2-5
Severe Crashes by Access Density on Rural County Roads Statewide
Source: 2008-2012 (Phase 1 and Phase 2), 2009-2013 (Phase 3 and Phase 4)
FIGURE 2-6
Sample Edge Risk Assessment Ratings and Descriptions

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
2.3.2 Rural Curves – Crashes on Paved Roads in Curves

Detailed crash analysis included horizontal curves on rural paved local roads. Research indicates horizontal curves with certain characteristics contribute to the overall frequency of lane departure crashes. The 71 miles of rural paved roads in the reservation contain 19 curves totaling approximately 3 miles in length (4 percent of the road system mileage).

With only 2 severe crashes along curves reported from 2009 to 2013, too few crashes occurred on these curves in Turtle Mountain to serve as a reliable indicator of the relative degree of risk. However, data statewide shows the importance of safety improvements on curves to reduce severe crashes since many severe lane departure crashes occur in curves. As a result, the LRSP team used characteristics of curves in the reservation where crashes had occurred, as well as available information from similar analysis of national and statewide data. Results from Cost-Benefit Analysis of In-Vehicle Technologies and Infrastructure Changes to Avoid Crashes Along Curves and Shoulders (compiled by the University of Minnesota and CH2M HILL in June 2009) were also used in curve analysis and prioritization.

Based on a review of these sources, the following five risk factors were identified for crashes along curves:

1. **Curve Radius** – The reservation did not have enough severe curve crashes to provide insight into North Dakota’s characteristics (Figure 2-7). National data shows that curves with mid-range radii had higher crash densities. An upper limit of 1,200 feet was used for at-risk curves, because 1,200 feet is a 60-mile-per-hour design speed based on AASHTO’s *A Policy on Geometric Design of Highways and Streets* (commonly referred to as the “Green Book,” 6th edition, 2011). A lower limit of 500 feet was used to represent the severe lane departure crashes that were reported in the region from 2009 to 2013. Any curve with a radius between 500 and 1,200 feet received a star.

2. **Average Daily Traffic (ADT)** – Traffic volumes over 450 vehicles per day represent a higher risk for crashes (Figure 2-8). Sixty-seven percent of severe lane departure crashes occurred along curves with this ADT and above, while only thirty-two percent of curves are represented in this range. Therefore, curves with an ADT over 450 vehicles per day received a star.

3. **Intersection within the Curve** – In the reservation, the presence of an intersection within a curve increased the risk for a severe crash. Curves with at least one intersection within the curve received a star.

4. **Visual Trap** – A visual trap exists when the crest of a vertical curve is located before a horizontal curve or where a minor road, tree line, or line of utility poles continues on a tangent to the curve, thereby creating the illusion that the road continues straight ahead (Figure 2-9). The presence of a visual trap increased the risk of crashes in the reservation and, therefore, received a star.

5. **Severe Crashes** – If a severe crash occurred on a curve between 2009 and 2013, the curve received a star.
FIGURE 2-7
Rural Curve Crashes by Radii – 500 to 1,200 feet Statewide
Source: 2008-2012 (Phase 1 and Phase 2), 2009-2013 (Phase 3 and Phase 4)

FIGURE 2-8
Rural Curve Crashes by Average Daily Traffic (ADT) – Greater than 450 Vehicles per Day Statewide
Source: 2008-2012 (Phase 1 and Phase 2), 2009-2013 (Phase 3 and Phase 4)
Based on 664 total crashes and 70 severe lane departure crashes along the curves on paved rural local roads statewide, those with intersections and visual traps have a higher crash density (are more at risk) than those without such features. These risk factors have also been observed nationally.

Detailed curve analyses and results for the reservation are provided in Chapter 4. The five risk factors were used to prioritize curves in the reservation, with the highest-priority curves receiving the most stars. Curves were reviewed for proximity to high-priority curves and existing conditions as well.

Curves in the reservation were screened for compliance with the *Manual on Uniform Traffic Control Devices* (MUTCD; 2009) requirement regarding traffic signs at horizontal curves. Under this requirement, a curve must have an advance horizontal alignment warning sign if the daily traffic is greater than 1,000 vehicles per day and if speed differential (the difference between the speed limit and the advisory speed) meets certain thresholds. A horizontal alignment sign and advisory speed plaque are recommended when the speed differential is 5 mph, and they are required if the speed differential is 10 mph or greater. Curve radius was used to estimate whether individual curves meet the speed differential requirements for advance warning signs and advisory speed plaques. The estimated advisory speeds (assuming a 55-mph speed limit, 6-percent superelevation, and friction factor that are consistent with the AASHTO Green Book) based on the curve radius are as follows:

- 900 to 1,100 feet – 50 mph
- 700 to 900 feet – 45 mph
- 500 to 700 feet – 40 mph
- 300 to 500 feet – 35 mph
- Under 300 feet – 30 mph or slower

For this analysis, no suggested advisory speed is provided for curves with a radius under 300 feet; these curves should be investigated further by the reservation to determine the appropriate advisory speed. Additionally, it is recommended that the reservation complete its own ball-bank indicator assessment of all curves to determine whether the curves on their road system meet the MUTCD requirement and to verify suggested advisory speeds.
If a curve was not selected as a project candidate through the LRSP risk assessment process (although the curve has an ADT greater than 1,000 vehicles per day and a radius under 1,100 feet), the curve was flagged for the reservation to determine the need for additional signs based on MUTCD guidance.

2.3.3 Rural Intersections – Crashes at Thru-STOP Intersections

At rural intersections, a severe crash is most common at Thru-STOP intersections,¹ where 87 percent of the severe intersection crashes occurred from 2009 to 2013 (Figure 2-10). Severe right-angle and single vehicle crashes are the most common types of crashes at these intersections (Figure 2-11).

---

¹ Those intersections where traffic on the more heavily used road may proceed through the intersection without stopping, while traffic on the less-used crossroad must stop at the STOP sign before proceeding through the intersection.
In the reservation, 56 rural intersections with 46 Thru-STOP locations were reviewed. The average severe crash density at rural Thru-STOP locations is 0.02 severe crash per intersection per year. This low density supports assessing an intersection risk based on the characteristics of the locations where severe crashes occurred. The following seven rural Thru-STOP risk factors were identified for severe right-angle crashes:

1. **ADT Cross Product** – 60 percent of the severe right angle crashes at rural Thru-STOP intersections occurred at intersections with an ADT Cross Product\(^2\) of major and minor entering vehicles greater than 80,000 (Figure 2-12). An intersection was considered to have a higher risk of severe right angle crashes if the ADT Cross Product was greater than 80,000. These intersections received a star.

2. **Skew** – As the intersection skew (the angle at which one road intersects another) increases, the crash risk also increases (Figure 2-13). At a 20-degree skew, the crash risk compared to that of a 90-degree intersection is increased by approximately 10 percent. While the reservation’s severe right-angle crash data set was too small to determine if skew plays a role in crashes, it has been proven nationally that the greater the skew, the greater the likelihood for a crash. Intersections with a skew greater received a star.

3. **Within or Near a Curve** – Research has shown that intersections located within or near a horizontal curve are subject to a higher level of risk. This risk factor was supported by the analysis (Figure 2-14). In this analysis, intersections located within or near a horizontal curve received a star.

4. **Development Present** – Research has shown that intersections with commercial or industrial development in one or more quadrants have a higher level of risk, possibly due to vehicles entering or exiting the development. Private residences or farms were not included.

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\(^2\) The ADT Cross Product is the major-street entering volume multiplied by the minor-street entering volume.
as development. Intersections with development present had more severe crash rates (Figure 2-14) and therefore received a star.

5. **Railroad Crossing** – Intersections on or near a railroad crossing are subject to increased risk because drivers must navigate the railroad tracks while approaching the intersection. The rural analysis supported this risk factor (Figure 2-14). An intersection with a railroad crossing on one of the approaches received a star.

6. **Previous STOP More than 1 Mile Before the Intersection** – When traveling longer distances without encountering a STOP sign, drivers lose attention, and research has shown those intersections to be at higher risk (Figure 2-14). National data were used to confirm this risk factor. Intersections at which either of the stopped approaches do not encounter a STOP sign within 1 mile received a star.

7. **Total Crashes** – If an intersection had any type of crash from 2009 to 2013, the intersection received a star.

---

**FIGURE 2-12**
Statewide Rural ADT Cross Product
Source: 2008-2012 (Phase 1 and Phase 2), 2009-2013 (Phase 3 and Phase 4)
Turtle Mountain had 27 total rural intersection crashes on the studied network from 2009 to 2013, and only 5 of those crashes were severe. Due to the small number of severe crashes, some of the data and risk factors may be misleading based on the reservation data alone. Therefore, national data were used to confirm intersection risk factors.
Detailed intersection analyses and results are provided in Chapter 4. Due to the large number of intersections, each intersection was prioritized using the seven risk factors by giving stars to each risk factor present. The highest-priority intersections received the most stars. In cases where two or more intersections received the same number of stars, crash costs were used to break the tie and determine priority.

### 2.4 Turtle Mountain Risk Summary

Table 2-2 summarizes the risk factors, ranges, and sources used in Turtle Mountain’s systemic analysis.

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Central Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rural Roadway Segments</strong></td>
<td></td>
</tr>
<tr>
<td>ADT Range</td>
<td>Minimum: 450</td>
</tr>
<tr>
<td></td>
<td>Maximum: Unlimited</td>
</tr>
<tr>
<td>Access Density</td>
<td>Minimum: 8</td>
</tr>
<tr>
<td></td>
<td>Maximum: Unlimited</td>
</tr>
<tr>
<td>Lane Departure Density</td>
<td>Minimum: 0.064</td>
</tr>
<tr>
<td></td>
<td>Maximum: Unlimited</td>
</tr>
<tr>
<td>Curve Critical Radius Density</td>
<td>Minimum: 0.218</td>
</tr>
<tr>
<td></td>
<td>Maximum: Unlimited</td>
</tr>
<tr>
<td>ERA</td>
<td>Minimum: 2</td>
</tr>
<tr>
<td></td>
<td>Maximum: 3</td>
</tr>
<tr>
<td><strong>Rural Curves</strong></td>
<td></td>
</tr>
<tr>
<td>Radius</td>
<td>Minimum: 500</td>
</tr>
<tr>
<td></td>
<td>Maximum: 1,200</td>
</tr>
<tr>
<td>ADT Range</td>
<td>Minimum: 450</td>
</tr>
<tr>
<td></td>
<td>Maximum: Unlimited</td>
</tr>
<tr>
<td>Intersection on Curve</td>
<td>Present</td>
</tr>
<tr>
<td>Visual Trap</td>
<td>Present</td>
</tr>
<tr>
<td>Severe Crashes</td>
<td>Minimum: 1</td>
</tr>
<tr>
<td></td>
<td>Maximum: Unlimited</td>
</tr>
<tr>
<td><strong>Rural Intersections</strong></td>
<td></td>
</tr>
<tr>
<td>ADT Cross Product</td>
<td>Minimum: 80,000</td>
</tr>
<tr>
<td></td>
<td>Maximum: Unlimited</td>
</tr>
<tr>
<td>Skew</td>
<td>Present</td>
</tr>
<tr>
<td>On/Near Curve</td>
<td>Present</td>
</tr>
<tr>
<td>Development</td>
<td>Present</td>
</tr>
<tr>
<td>Railroad Crossing</td>
<td>Present</td>
</tr>
<tr>
<td>Previous STOP &gt;1 Mile</td>
<td>Present</td>
</tr>
<tr>
<td>Total Crashes</td>
<td>Minimum: 1</td>
</tr>
<tr>
<td></td>
<td>Maximum: Unlimited</td>
</tr>
</tbody>
</table>
3.0 Turtle Mountain Priority Safety Strategies

3.1 Background

A variety of strategies are available to address each safety emphasis area. The implementation of high-priority strategies will assist state and local agencies in reducing traffic-related fatalities and incapacitating injuries. The primary sources for these strategies are the National Cooperative Highway Research Program (NCHRP) Report 500 series and the National Highway Traffic Safety Administration (NHTSA) Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, (Seventh Edition, 2013). Each guide includes a description of the problem, strategies, and model implementation processes. In addition, to assist practitioners in assessing the safety strategies, the guides document the expected effectiveness of each strategy. NCHRP Report 500 series assigns strategies to one of the following categories:

- **Proven**: These strategies have been used in multiple locations with multiple studies, and have been demonstrated to be effective.
- **Tried**: These strategies have been implemented in many locations; however, no rigorous evaluations have been completed to determine their effectiveness.
- **Experimental**: These strategies represent ideas that are considered to be effective; however, the ideas have not been widely implemented or evaluated.

3.2 Initial/Comprehensive List of Potential Strategies

NCHRP safety strategies were the basis for identifying safety strategies for the LRSP. For the LRSP process, NDDOT team members sought to identify viable safety strategies for the top safety emphasis areas. The LRSP 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 the LRSP team narrowed the list of strategies for all safety emphasis areas down to strategies considered to be the most applicable in North Dakota.

Behavioral strategies, described in Chapter 5, include information on the expected effectiveness of the strategy to influence driver behavior based on current best practice and evaluation research results when available.

3.3 Prioritizing Safety Strategies

The priority infrastructure safety strategies for the LRSP are:

- **Infrastructure strategies**
  - **Lane Departure**: Provide enhanced shoulders, lighting, delineation (for example, Chevrons), or pavement markings for sharp horizontal curves
  - **Lane Departure**: Install edge rumble strips (shoulder or edge line)
  - **Lane Departure**: Install enhanced pavement markings, 6-inch edge line, or embedded wet-reflective pavement markings on section with narrow or no paved shoulders
- **Unsignalized Intersection**: Install larger regulatory and warning signs at intersections, including the use of dynamic warning signs at appropriate intersections
- **Unsignalized Intersection**: Improve visibility of intersections by providing appropriate street lighting
- **Signalized Intersections**: Install countdown timers

Each infrastructure strategy includes information on the relative cost to implement or operate, along with the typical timeframe for implementation. Relative costs were separated into low, medium and high categories.

The relative costs for the lane departure and intersection strategies are:
- **Low**: less than $10,000 per mile or location
- **Medium**: between $10,000 and $100,000 per mile or location
- **High**: more than $100,000 per mile or location

The typical timeframe to implement the strategy was also separated into three categories:
- **Short**: less than 1 year to implement
- **Medium**: between 1 and 2 years to implement
- **Long**: more than 2 years to implement

Infrastructure safety projects that are developed as part of this LRSP are considered eligible for funding through the state’s Highway Safety Improvement Program (HSIP). The managers of this program have identified implementation cost and effectiveness as priorities in their evaluation process of selecting projects for funding. Low-cost projects allow the limited funding to support a wider deployment and the use of proven-effective strategies provides the highest level of confidence that a given project will result in an overall crash reduction.

The ability of the selected strategies to reduce crashes is based on information in the FHWA’s CMF [Crash Modification Factors] Clearinghouse and other published research. Table 3-1 provides a summary of the crash reduction factors that were found in the CMF Clearinghouse for infrastructure safety strategies considered and/or suggested for the central region, along with an estimated unit cost for each strategy. Most factors reported are based on research that was assigned higher-quality ratings.
### TABLE 3-1
Proposed Strategies, Crash Reduction Factors, and Typical Installation Costs

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Crash Reduction Factor</th>
<th>Typical Installation Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rural Segments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-inch latex edge line</td>
<td></td>
<td>$1,320 per mile</td>
</tr>
<tr>
<td>4-inch latex centerline</td>
<td></td>
<td>$660 per mile</td>
</tr>
<tr>
<td>6-inch latex edge line</td>
<td>10% to 45% all rural serious crashes</td>
<td>$1,980 per mile</td>
</tr>
<tr>
<td>Shoulder or edge line rumble strips</td>
<td>20% run off road crashes</td>
<td>$5,850 per mile</td>
</tr>
<tr>
<td>Ground in wet-reflective markings</td>
<td></td>
<td>$36,000 per mile</td>
</tr>
<tr>
<td>Centerline rumble strips</td>
<td>40% head-on/sideswipe-crashes</td>
<td>$3,600 per mile</td>
</tr>
<tr>
<td>6-inch centerline</td>
<td></td>
<td>$1,020 per mile</td>
</tr>
<tr>
<td><strong>Rural Curves</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chevrons</td>
<td>20% to 30%</td>
<td>$3,960 per curve</td>
</tr>
<tr>
<td>Arrow board only</td>
<td></td>
<td>$1,200 per curve</td>
</tr>
<tr>
<td>Advance warning sign and advisory speed plaque</td>
<td></td>
<td>$1,440 per curve</td>
</tr>
<tr>
<td>2-foot paved shoulder and shoulder</td>
<td>20% to 30% run-off-the-road crashes</td>
<td>$54,000 per mile  +$5,850 per mile</td>
</tr>
<tr>
<td>rumble strips</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rural Intersections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roundabout</td>
<td>20% to 50% all crashes/ 60% to 90% right-angle crashes</td>
<td>$4,200,000 per intersection</td>
</tr>
<tr>
<td>Directional median (RCI or J-Turn)</td>
<td>17% all crashes/ 100% angle crashes</td>
<td>$1,080,000 per intersection</td>
</tr>
<tr>
<td>Mainline dynamic warning sign</td>
<td>50% all crashes/ 75% serious right-angle crashes</td>
<td>$60,000 per intersection</td>
</tr>
<tr>
<td>Close median</td>
<td></td>
<td>$30,000 per intersection</td>
</tr>
<tr>
<td>Intersection lighting</td>
<td>25% to 40% nighttime crashes</td>
<td>$10,200 per streetlight</td>
</tr>
<tr>
<td>Upgrade signs and pavement markings</td>
<td>40% upgrade of all signs and pavement markings/ 15% for STOP AHEAD pavement marking</td>
<td>$2,640 per approach b</td>
</tr>
<tr>
<td>Clear sight triangle</td>
<td>37% serious injury crashes</td>
<td>$2,940 per intersection d</td>
</tr>
<tr>
<td><strong>Urban</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conversions (three-lane/five-lane)</td>
<td>30% to 50%</td>
<td>$48,000 per mile [three-lane]  $54,000 per mile [five-lane] +$36,000 per signalized intersection for updates (for example, loop and signal head placement)</td>
</tr>
<tr>
<td>Access management</td>
<td>5% to 31%</td>
<td>$360,000 per mile e</td>
</tr>
<tr>
<td>Signal – confirmation lights</td>
<td>25% to 84% reduction in violations</td>
<td>$1,200 per two approaches</td>
</tr>
<tr>
<td>Pedestrian/bicycle – advanced walk</td>
<td>Up to 60% pedestrian/ vehicle crashes</td>
<td>$600 per intersection</td>
</tr>
<tr>
<td>Pedestrian/bicycle – countdown timers</td>
<td>25% vehicle/pedestrian crashes</td>
<td>$12,000 per intersection</td>
</tr>
<tr>
<td>Pedestrian/bicycle – curb extensions</td>
<td>Increase in vehicles yielding to pedestrians</td>
<td>$36,000 per corner</td>
</tr>
<tr>
<td>Pedestrian/bicycle – median refuge island</td>
<td>46% in vehicle/pedestrian crashes</td>
<td>$24,000 per approach</td>
</tr>
</tbody>
</table>
TABLE 3-1
Proposed Strategies, Crash Reduction Factors, and Typical Installation Costs

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Crash Reduction Factor a</th>
<th>Typical Installation Costs</th>
</tr>
</thead>
</table>

Notes:

- Crash reduction factors based on review of CMF Clearinghouse and other published research
- Includes $540 per STOP sign, $540 per junction sign assembly, $600 per STOP AHEAD sign, $600 per STOP AHEAD pavement marking message, and $360 per stop bar
- Reduction based on increasing sight distance triangle
- Inclusive of sign upgrades identified and materials and labor for clearing of sight triangle.
- For management of unsignalized intersection movements within a corridor that has a divided median. Typical project may include minor street diverters, signed turn restrictions, and median closings.

N/A = not applicable
3.4 Safety Strategies Workshop

A Safety Planning Workshop was held as part of the LRSP process. The January 7, 2014 meeting in Bismarck included representatives from four of the Indian reservations in North Dakota, the Tribal Technical Assistance Program (TTAP), North Dakota Indian Affairs Commission, and the North Dakota Department of Transportation (NDDOT). The primary focus of the safety workshop was to discuss roadway safety concerns and initiatives, and to discuss the LRSP priority strategies outlined in Table 3-1.

The basic workshop structure included introductions and an overview of the current NDDOT safety program. Mark Nelson (Deputy Director, Driver and Vehicle Services) and Scott Davis (Director, North Dakota Indian Affairs Commission) shared information on funding, enforcement, data, and safety initiatives pertaining to Indian reservations in North Dakota.

Following the overview, the workshop participants discussed concerns and initiatives specific to each reservation, including updates on each tribal safety plan, which is now required by the Bureau of Indian Affairs (BIA) in order to receive funding. The final local speaker was Dennis Trusty of Northern Plains TTAP, who shared roadway safety resources pertaining to driver behavior issues.

Workshop participants included road safety engineering, traffic, enforcement, education, and NDDOT staff in order to include a variety of backgrounds and experiences to enable valuable interaction and discussions during the workshops.
4.0 Turtle Mountain Infrastructure Safety Projects

4.1 Turtle Mountain Proactive Project Decision Process

The primary objectives of the LRSP effort are to identify low-cost, safety-related infrastructure projects focused on each agency’s documented safety emphasis areas and target crash types. These emphasis areas account for the greatest number of severe crashes occurring on the local road system. Mitigating the factors that contribute to these crashes will assist each agency in reducing serious crashes on the local road system.

Projects were developed that include identifying a specific improvement at a specific location based on risk factors described in Chapter 2 and the high-priority safety strategies described in Chapter 3. Improvement strategies are consistent with the NDDOT’s SHSP with a focus on proven effectiveness at reducing the target crash type and low cost of implementation. Proven-effective strategies give safety program managers the highest level of confidence that the deployment will result in a reduction of crashes. Low-cost strategies allow improvements to be widely deployed across a system to address the low density of crashes and are less expensive than complete reconstruction of high-risk locations.

Project development and mitigation focused on the following improvements:

- **Rural**
  - Lane-departure crashes along roadway segments and in curves
  - Intersection-related crashes

- **Urban**
  - Rear-end and head-on crashes on roadway segments
  - Angle crashes and pedestrian and bicycle crashes at intersections

For consistency across the state, project decision trees were created so that locations with similar characteristics received the same suggested mitigation treatment. Projects were chosen based on the identification of at-risk locations and the availability of proven strategies for crash reduction. This resulted in a systemic focus on rural paved roadway segments, horizontal paved curves, and rural intersections. In cities with populations over 5,000, of which there were none on the reservation, the focus was on arterial and collector roadway segments and intersections along these segments. Projects were originally suggested based on the technical analysis and then revised in accordance with input from the local agencies and NDDOT.
High-priority rural roadway segment projects focused on addressing the most common type of serious segment-related crash—a single-vehicle, lane-departure crash—by implementing road edge improvements to alert drivers when they are drifting too far along the road edge (Figure 4-1).

High-priority rural curve projects focused on enhancing the curve delineation to improve the driver’s ability to successfully navigate the curves (Figure 4-2). As shown in the figure, a curve is eligible for a safety improvement project in three ways.

High-priority rural intersection projects (Figure 4-3) focused on addressing the most common type of serious intersection crash—a right-angle collision—by making the intersection more visible to drivers and by reducing the number of intersection conflicts. Examples of suggested projects are shown in Figure 4-4.
FIGURE 4-2
High-Priority Rural Curve Project Decision Tree

FIGURE 4-3
High-Priority Rural Intersection Project Decision Tree

Notes:
* Shoulder paving is of existing gravel shoulders only and will not include any grading to build shoulders.
* If County elects not to have rumble strips, no shoulder paving will be installed.
* Gravel roads were considered if the segment experienced a high frequency of severe curve-related crashes.
FIGURE 4-4
Intersection Safety Strategies Considered for Deployment

- Directional Median
- Upgraded Signs and Markings
- Streetlights

Prioritized/Phasing
1. Stop bar
2. Stop sign
3. Junction sign
4. Stop Ahead Message
5. Stop Ahead Sign

Provide three devices indicating upcoming intersection

Project may include some or all of the items based on detailed field assessment.

Source: Minnesota DOT District 3-13 County RSA, CH2M HILL, 2006
High-priority urban roadway segment projects focused on reducing rear-end and head-on crashes by creating buffer space in the middle of the roadway. This buffer space would be created by converting to a three-lane or five-lane roadway and by better managing access along divided arterials (Figure 4-5).

High-priority urban right-angle intersection projects focused on reducing right-angle crashes by reducing red-light running and managing access to reduce the number of conflict points along a corridor, particularly at signalized intersections (Figure 4-6).

High-priority urban pedestrian and bicycle intersection projects focused on reducing pedestrian and bicycle crashes by providing shorter crossing distances, curb extensions or median refuge islands, as well as advanced walk intervals and countdown timers at signalized intersections (Figure 4-7).

Project forms were completed for each high-priority intersection, curve, and roadway segment, including a description of the location, brief crash history, ranking factors, and the identified safety strategy. These forms were formatted so they could be submitted directly through the HSIP process, but may require supplemental information for the evaluation and scoring process.

---

**FIGURE 4-5**
High-Priority Urban Roadway Segment (Turning) Project Decision Tree

---
FIGURE 4-6
High-Priority Urban Right-Angle Intersection (Signalized) Project Decision Tree

*Note: At appropriate locations, assign median refuge island if there is room to add without widening the road.

FIGURE 4-7
High-Priority Urban Pedestrian and Bicyclist Intersection Project Decision Tree

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4.2 Turtle Mountain Project Summary

The suggested low-cost safety projects for Turtle Mountain are described below and in the Chapter 4 Appendix: Turtle Mountain. The costs assigned to each project are planning-level estimates and do not include right-of-way or some other supplemental costs. Because of funding limitations, all potential projects would not be completed in one year. The actual schedule for implementing individual projects will necessitate securing funding from the state’s HSIP. The safety planning process followed is consistent with the North Dakota SHSP. In addition, several of the high-priority safety strategies are among those recommended for the state road system in the state’s SHSP.

It is not expected or required that each agency pursue safety projects in the suggested ranking order. The ranking suggests general priorities, given that actual project development decisions will be made by staff based on economic, social, and political issues and in coordination with other pavement and reconstruction projects that are part of the Capital Improvement Program.

Many project details are still undetermined, including general project termini. Each agency will determine specific project details (such as termini and exceptions) as decisions regarding implementation of specific projects are made. These decisions may require that the agency coordinate with various municipal departments, the public, and other transportation departments.

The total project cost suggested for Turtle Mountain is $773,553. The project cost breakout for intersection, roadway segment, and curve projects are listed in Table 4-1. High-priority locations that received a project are shown in Figure 4-8. These locations are described in further detail in the Chapter 4 Appendix: Turtle Mountain, along with priority rankings and suggested project sheets.

### TABLE 4-1
Turtle Mountain Project Costs

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<tr>
<th>Project Type</th>
<th>Cost</th>
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<tr>
<td>Roadway Segments</td>
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<tr>
<td>Curves</td>
<td>$61,085</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$773,553</strong></td>
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</table>

One roadway segment identified as a high-priority location did not receive projects. This segment was too short to receive a project and was removed from consideration (Table 4-2).

### TABLE 4-2
Turtle Mountain Priority Segment Locations without Suggested Treatments

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<tr>
<th>Segment ID</th>
<th>Local Name</th>
<th>Segment Start</th>
<th>Segment End</th>
<th>Location Notes</th>
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<td>Unnamed road in/near town of Shell Valley</td>
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<td>Dead end</td>
<td>Short Segment – Removed From Consideration</td>
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</table>
FIGURE 4-8
Turtle Mountain Project Locations Map
23 USC 409
NDDOT Reserves All Objections

APPENDIX

Turtle Mountain Reservation
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<th>Corridor ID</th>
<th>Route #</th>
<th>Start</th>
<th>End</th>
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<th>Risk Ranking</th>
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<th>6&quot; Edge Lines</th>
<th>Edge Rumble Strip</th>
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NDDOT Reserves All Objections

3/16/2015
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### Edge Risk Legend

1. **Critical ADT Range - Lane Departure**
   - **3** - Risky - NEITHER shoulder or good clear zone
   - **2** - Either a shoulder OR good clear zone
   - **1** - BOTH shoulder and a good clear zone

2. **Average Density (Total/Mile)**
   - **15.3**
   - **0.07**
   - **0.06**

3. **Access**
   - **Total**
   - **1862**
   - **23**

4. **Lanes**
   - **Total Mileage**
   - **7.0**
   - **7.0**
   - **7.0**

5. **Years**
   - **5**

6. **Critical Radius Curves**
   - **Minimum**
   - **Maximum**

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3/16/2015  1/2
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<td>BIA 9</td>
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<td>2%</td>
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<td>2</td>
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<td>8%</td>
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<td>3</td>
<td>23%</td>
<td>12%</td>
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<tr>
<td>4</td>
<td>23%</td>
<td>12%</td>
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<tr>
<td>5</td>
<td>9%</td>
<td>6%</td>
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<td>6</td>
<td>0%</td>
<td>0%</td>
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% That Gets Star -- 77% 45% 100% 9% 59%
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION

North Dakota Department of Transportation Programming

SFN 59959 (06-2011)

BIA 10 from BIA 11 to US 281 / ND 5

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Telephone Number: Work: 701-477-0407 Ext. 223
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

- Start: BIA 11
- Lane Width: 11'
- End: US 281 / ND 5
- Speed Limit: High
- Facility Type: 2-Lane
- Shoulder Width: 0'
- ADT: 1563
- Length (miles): 4.3
- Road Type: Rural Paved
- Rumble: Installed: No
- County Road: BIA 10
- Local Name: BIA 10
- Shoulder Type: None
- ADT: 1563
- Shoulder Width: 0'
- Facility Type: 2-Lane

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009-2013 5 years

<table>
<thead>
<tr>
<th>Value</th>
<th>Critical Departure</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADT Range 1563</td>
<td>450 ≤ ADT ≤ 1000000</td>
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<tr>
<td>RD Density 0.046</td>
<td>0.064</td>
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<td>Access Density 13.2</td>
<td>8.0</td>
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<tr>
<td>Curve Critical Radius Density 0.232</td>
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<td>Edge Risk 2</td>
<td>2 or 3</td>
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Describe Proposed Safety Improvements

- Description: 4" Edge Lines
  - Type: Proactive
  - Cost per mi: $1,320
  - Mileage: 0.0
  - Cost: $ -

- Description: 6" Edge Lines
  - Type: Proactive
  - Cost per mi: $1,980
  - Mileage: 4.3
  - Cost: $8,514

- Description: Edge Rumble Strip
  - Type: Proactive
  - Cost per mi: $5,850
  - Mileage: 0.0
  - Cost: $ -

- Description: Ground In Wet-Reflective Markings
  - Type: Proactive
  - Cost per mi: $36,000
  - Mileage: 0.0
  - Cost: $ -

- Description: Center Line Rumble Strip
  - Type: Proactive
  - Cost per mi: $3,600
  - Mileage: 4.3
  - Cost: $15,480

- Description: 4" Center Line
  - Type: Proactive
  - Cost per mi: $680
  - Mileage: 0.0
  - Cost: $ -

- Description: 6" Center Line
  - Type: Proactive
  - Cost per mi: $1,020
  - Mileage: 0.0
  - Cost: $ -

Project Cost Estimate (attach detailed copy)

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Cost per mi</th>
<th>Mileage</th>
<th>Cost</th>
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<tbody>
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<td>Local Match (10% of Total project cost)</td>
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</table>

NDDOT Central Office Only

Project Accepted? Yes No
Reference Number ID Number
Notes

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

Notes -

Northeastem Regional

Curb Aggressive Driving

Improvements to Address Lane Departure Crashes

Enhancing Emergency Medical Capabilities to Increase Survivability

Improve Intersection Safety

23 USC 409
NDDOT Reserves All Objections

Page: 1
Segment ID: 10.02
Date: 3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 8 from US 281 / ND 5 to BIA 15
Agency Name: Turtle Mountain Reservation  ND DOT District: 3
Contact Name: Ron Trottier  Telephone Number: Work: 701-477-0407 Ext. 223
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

Start: US 281 / ND 5  Lane Width: 11'
End: BIA 15  Speed Limit: High
Facility Type: 2-Lane
ADT: 812  Shoulder Type: None
Road Type Rural Paved
Length (miles): 5.0
County Road: BIA 8  Rumble Installed: No
Local Name: BIA 8  Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009-2013 5 years

<table>
<thead>
<tr>
<th>Total</th>
<th>Road Dept</th>
<th>K+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crashes</td>
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<tr>
<td>Density (per mile per year)</td>
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<td>0.08</td>
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<td>Rate (per MVM)</td>
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<td>ADT Range</td>
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<tr>
<td>RD Density</td>
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<tr>
<td>Access Density</td>
<td>13.8</td>
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<tr>
<td>Curve Critical Radius Density</td>
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</tr>
<tr>
<td>Edge Risk</td>
<td>2</td>
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</table>

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Cost per mi</th>
<th>Mileage</th>
<th>Cost</th>
<th>Notes</th>
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<tbody>
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<td>Proactive</td>
<td>$1,980</td>
<td>0.0</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Edge Rumble Strip</td>
<td>Proactive</td>
<td>$5,850</td>
<td>0.0</td>
<td>$</td>
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</tr>
<tr>
<td>Ground In Wet-Reflective Markings</td>
<td>Proactive</td>
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<td>0.0</td>
<td>$</td>
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<tr>
<td>Center Line Rumble Strip</td>
<td>Proactive</td>
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<td>0.0</td>
<td>$</td>
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<tr>
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<td>6&quot; Center Line</td>
<td>Proactive</td>
<td>$1,020</td>
<td>0.0</td>
<td>$</td>
<td></td>
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</tbody>
</table>

Project Cost Estimate (attach detailed copy)

| Federal Funds | $ 5,940 |
| Local Match (10% of Total project cost) | $660 |
| Total Project Cost | $6,600 |

NDDOT Central Office Only

Project Accepted?  Yes  No
Reference Number |
ID Number |
Notes |

23 USC 409
NDDOT Reserves All Objections
Page: 2  Segment ID: 8.01  Date: 3/16/2015
**Location Description**

<table>
<thead>
<tr>
<th>Start: 96th St NE</th>
<th>Lane Width: 11'</th>
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<tbody>
<tr>
<td>End: US 281 / ND 5</td>
<td>Speed Limit: High</td>
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<tr>
<td>Facility Type: 2-Lane</td>
<td>Shoulder Width: 0'</td>
</tr>
<tr>
<td>ADT: 690</td>
<td>Shoulder Type: None</td>
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<tr>
<td>Road Type: Rural Paved</td>
<td>Length (miles): 2.3</td>
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<tr>
<td>County Road: BIA 7</td>
<td>Rumble Installed: No</td>
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<tr>
<td>Local Name: BIA 7</td>
<td>Oil Project: No</td>
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</tbody>
</table>

**Location Description**

<table>
<thead>
<tr>
<th>Start: 96th St NE</th>
<th>Lane Width: 11'</th>
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</thead>
<tbody>
<tr>
<td>End: US 281 / ND 5</td>
<td>Speed Limit: High</td>
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<tr>
<td>Facility Type: 2-Lane</td>
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<tr>
<td>ADT: 690</td>
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**Describe Current Safety Issues & Systemic Ranking Review**

- North Dakota Crashes, 2009-2013, 5 years

<table>
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<th>Total Road Dept K+A</th>
<th>Crashes</th>
<th>Density (per mile per year)</th>
<th>Rate (per VMM)</th>
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**Value Critical Departure**

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<th>RD Density</th>
<th>Access Density</th>
<th>Curve Critical Radius Density</th>
<th>Edge Risk</th>
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**SHSP Emphasis Area (check all that apply)**

- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

**Describe Proposed Safety Improvements**

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Cost per mi</th>
<th>Mileage</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>4&quot; Edge Lines</td>
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<td>2.3</td>
<td>$3,036</td>
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</tr>
<tr>
<td>Edge Rumble Strip</td>
<td>Proactive</td>
<td>$5,850</td>
<td>0.0</td>
<td>$ -</td>
</tr>
<tr>
<td>Ground In Wet-Reflective Markings</td>
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<td>0.0</td>
<td>$ -</td>
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<tr>
<td>Center Line Rumble Strip</td>
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<td>$ -</td>
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**Project Cost Estimate (attach detailed copy)**

- Federal Funds: $2,732
- Local Match (10% of Total project cost): $304

**Total Project Cost**: $3,036

**NDDOT Central Office Only**

- Yes
- No
- Reference Number
- ID Number

**Notes**

- 23 USC 409
- NDDOT Reserves All Objections

**Segment ID**: 7.01

**Date**: 3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 10 from BIA 5 to BIA 3
Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Contact Phone: 701-477-0407 Ext. 223
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description
- Start: BIA 5
- End: BIA 3
- Facility Type: 2-Lane
- ADT: 600
- Road Type: Rural Paved
- County Road: BIA 10
- Local Name: BIA 10
- Lane Width: 11'
- Speed Limit: Low
- Shoulder Width: 0'
- Length (miles): 3.0
- Rumble Installed: No
- Oil Project: No

Location Description
- ADT: 600
- RD Density: 0.067
- Access Density: 15.6
- Curve Critical Radius Density: 0.000
- Edge Risk: 2

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009-2013 5 years

<table>
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<tbody>
<tr>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Density (per mile per year)</td>
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<tr>
<td>Rate (per MVM)</td>
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Value Critical Departure

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Cost per mi</th>
<th>Mileage</th>
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<th>Notes</th>
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<tr>
<td>4” Edge Lines Proactive</td>
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<td>Ground In Wet-Reflective Markings Proactive</td>
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<tr>
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<tr>
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Project Cost Estimate (attach detailed copy)

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NDDOT Central Office Only

Project Accepted? Yes No
Reference Number ID Number
Notes

NDDOT Reserves All Objections

Page: 4
Segment ID: 10.04
Date: 3/16/2015

23 USC 409

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 11 from US 281 / ND 5 to BIA 6
Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description
Start: US 281 / ND 5
End: BIA 6
Facility Type: 2-Lane
ADT: 572
Road Type: Rural Paved
County Road: BIA 11
Local Name: BIA 11
Lane Width: 11'
Shoulder Width: 0'
Speed Limit: High
Length (miles): 5.1
Rumble Installed: No

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009-2013 5 years

<table>
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<tr>
<td>Edge Risk</td>
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Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
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Project Cost Estimate (attach detailed copy) Proposed Year of Construction

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NDDOT Central Office Only
Project Accepted? Yes No
Reference Number ID Number

Notes

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NDDOT Reserves All Objections

Date: 3/16/2015
Segment ID: 11.01
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 10 from BIA 8 to BIA 11
Agency Name: Turtle Mountain Reservation  
Contact Name: Ron Trottier  
Telephone Number: Work: 701-477-0407 Ext. 223
Email Address: ronwtrottierjr25@gmail.com

Location Description
Start: BIA 8  
End: BIA 11  
Facility Type: 2-Lane  
ADT: 1,170  
Road Type: Rural Paved  
County Road: BIA 10  
Local Name: BIA 10
Lane Width: 11'  
Speed Limit: High  
Shoulder Width: 0'  
Length (miles): 4.9  
Rumble Installed: No  
Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009-2013 5 years

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Describe Proposed Safety Improvements

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<th>Mileage</th>
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<td>Ground In Wet-Reflective Markings</td>
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Project Cost Estimate (attach detailed copy)

Federal Funds $22,861
Local Match (10% of Total project cost) $2,540
Total Project Cost $25,402

NDDOT Central Office Only
Project Accepted?  
Reference Number  
ID Number

Notes
SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

NDDOT Reserves All Objections

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Segment ID: 10.01
Date: 3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 9 from BIA 12 to BIA 6
Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com
Telephone Number: Work: 701-477-0407 Ext. 223

Location Description
- Start: BIA 12
- Lane Width: 11'
- End: BIA 6
- Speed Limit: High
- Facility Type: 2-Lane
- ADT: 705
- Shoulder Type: None
- Road Type: Rural Paved
- Length (miles): 2.9
- County Road: BIA 9
- Rumble Installed: No
- Local Name: BIA 9
- Oil Project: No
- Shoulder Width: 0'
- ADT: 705

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009-2013 5 years

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<td>Edge Risk</td>
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Describe Proposed Safety Improvements

<table>
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<tr>
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<th>Type</th>
<th>Cost per mi</th>
<th>Mileage</th>
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<tr>
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</table>

Project Cost Estimate (attach detailed copy)

| Federal Funds | $6,339 |
| Local Match (10% of Total project cost) | $704 |
| Total Project Cost | $7,044 |

NDDOT Central Office Only
- Project Accepted?: Yes
- Reference Number
- ID Number

Notes

Page: 7
Segment ID: 9.01
Date: 3/16/2015
23 USC 409
NDDOT Reserves All Objections
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 4 from 1.6 miles East if BIA Rd 11 to BIA 7
Agency Name: Turtle Mountain Reservation
ND DOT District: 3
Contact Name: Ron Trottier
Telephone Number: Work: 701-477-0407 Ext. 223
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description
Start: 1.6 miles East if BIA Rd 11
End: BIA 7
Facility Type: 2-Lane
ADT: 525
Road Type: Rural Paved
County Road: BIA 4
Local Name: BIA 4
Lane Width: 11'
Shoulder Type: None
Length (miles): 3.9
Rumble Installed: No

Facility Type: 2-Lane
ADT: 525
Road Type: Rural Paved
County Road: BIA 4
Local Name: BIA 4
Lane Width: 11'
Shoulder Type: None
Length (miles): 3.9
Rumble Installed: No

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009-2013 5 years

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
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<tr>
<td>Rate (per MVM)</td>
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Value | Critical Departure
---|---
ADT Range | 525 | 450 ≤ ADT ≤ 1000000
RD Density | 0.000 | 0.064
Access Density | 11.7 | 8.0
Curve Critical Radius Density | 0.000 | 0.218
Edge Risk | 2 | 2 or 3

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

Describe Proposed Safety Improvements

<table>
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<tr>
<th>Description</th>
<th>Type</th>
<th>Cost per mi</th>
<th>Mileage</th>
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<tr>
<td>Ground In Wet-Reflective Markings</td>
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<td>Center Line Rumble Strip</td>
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Project Cost Estimate (attach detailed copy)

| Federal Funds | 6,950 |
| Local Match (10% of Total project cost) | 772 |
| Total Project Cost | $7,722 |

NDDOT Central Office Only
Project Accepted? [ ] Yes [ ] No
Reference Number
ID Number
Notes

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

Notes

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Segment ID: 4.02
Date: 3/16/2015

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NDDOT Reserves All Objections
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION

North Dakota Department of Transportation Programming

SFN 59959 (06-2011)

BIA 4 from BIA 7 to Rolette 6 / ND 30

Agency Name: Turtle Mountain Reservation

Contact Name: Ron Trottier

Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

**Location Description**

- **Start:** BIA 7
- **End:** Rolette 6 / ND 30
- **Facility Type:** 2-Lane
- **ADT:** 460
- **Road Type:** Rural Paved
- **County Road:** BIA 4
- **Local Name:** BIA 4
- **Lane Width:** 11'
- **Speed Limit:** High
- **Shoulder Width:** None
- **Length (miles):** 4.0
- **Rumble Installed:** No
- **Shoulder Type:** None

**Facility Type:** 2-Lane

- **Shoulder Width:** 0'
- **ADT:** 460
- **Road Type:** Rural Paved
- **County Road:** BIA 4
- **Local Name:** BIA 4
- **Lane Width:** 11'
- **Speed Limit:** High
- **Shoulder Width:** None
- **Length (miles):** 4.0
- **Rumble Installed:** No
- **Shoulder Type:** None

**Road Type:** Rural Paved

- **ADT:** 460
- **Road Type:** Rural Paved
- **Rumble Installed:** No
- **Shoulder Type:** None

**Project Accepted?**

- **Yes**
- **No**

**Notes**

- SHSP Emphasis Area (check all that apply)
  - Reduce Alcohol Impaired Driving
  - Increase the Use of Safety Restraints for all Occupants
  - Younger Driver/Older Driver Safety
  - Curb Aggressive Driving
  - Improvements to Address Lane Departure Crashes
  - Enhancing Emergency Medical Capabilities to Increase Survivability
  - Improve Intersection Safety

---

**Describe Current Safety Issues & Systemic Ranking Review**

**North Dakota Crashes, 2009-2013 5 years**

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**Describe Proposed Safety Improvements**

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<th>Description</th>
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<tr>
<td>Center Line Rumble Strip</td>
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</table>

**Project Cost Estimate (attach detailed copy)**

- **Federal Funds:** $7,128
- **Local Match (10% of Total project cost):** $792

**Total Project Cost:** $7,920

**NDDOT Central Office Only**

- **Project Accepted?**
  - **Yes**
  - **No**

**Notes**

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NDDOT Reserves All Objections
**Location Description**

- **Start:** BIA 10  
  **End:** US 281 / ND 5  
- **Facility Type:** 2-Lane  
  **ADT:** 450  
- **Road Type:** Rural Paved  
- **County Road:** BIA 1  
- **Local Name:** BIA 1  
- **Lane Width:** 12'  
- **Shake Shoulder: None**  
- **Speed Limit:** High  
- **Length (miles):** 1.0  
- **Road Type:** Rural Paved  
- **Rumble Installed:** No  
- **Oil Project:** No

**Describe Current Safety Issues & Systemic Ranking Review**

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**Describe Proposed Safety Improvements**

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**Project Cost Estimate (attach detailed copy)**

- **Federal Funds:** $1,782
- **Local Match (10% of total project cost):** $198
- **Total Project Cost:** $1,980

**SHSP Emphasis Area (check all that apply):**
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

**Notes:** Noise sensitive receiver - no edge rumbles

---

**SHSP Emphasis Area:**
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

---

**Notes:**
- Noise sensitive receiver - no edge rumbles
## Curve Projects

<table>
<thead>
<tr>
<th>Page</th>
<th>Corridor ID</th>
<th># of Curves</th>
<th>Route #</th>
<th>Start</th>
<th>End</th>
<th>Chevron</th>
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<th>Shoulder Pave</th>
<th>Edge Rumble Strips</th>
<th>Advanced Sign/Speed Plaque</th>
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<td>BIA 7</td>
<td>Rolette 6 / ND 30</td>
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<td>$282</td>
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<td>$5,682</td>
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<tr>
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<td>7.03</td>
<td>1</td>
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<td>BIA 8</td>
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$31,680 $ - $15,442 $6,763 $7,200 $61,085

23 USC 409
NDDOT Reserves All Objections

3/16/2015
## Turtle Mountain Reservation Curves

| Curve Count ID | Corridor | Segment | Start | End | Inside Shoulder Type | Outside Shoulder Type | Isolated Curve | Curvature Warning Sign | Warning Sign Type | Speed Advisory Sign | Advisory Speed | Arrow Board | Left Chevrons | Crashes Total | Total Severe | Radius (ft) | ADT | Intersection on Curve | Visual Trap | Speed Limit | Risk Ranking | Cheese Wheel (W1-8) | One Direction | Large Arrow (W1-6) | Curve RS | Advance Horizontal Alignment | Warning Sign |
|---------------|---------|---------|-------|-----|----------------------|-----------------------|-----------------|------------------------|------------------|----------------------|----------------|-------------|----------------|----------------|---------------|-------------|----------|------------------|-----------------|-------------|----------------|------------------|------------------|-------------------|
| 1             | 0004A   | 4.02    | BIA 4 | BIA 7 | None                 | None                  | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 1361         | 525     | No               | No             | No          | High          |                |                  |                   | x                   |
| 2             | 0004B   | 4.02    | BIA 4 | BIA 7 | None                 | None                  | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 1327         | 525     | Yes              | No             | No          | High          |                |                  |                   | x                   |
| 3             | 0004C   | 4.02    | BIA 4 | BIA 7 | None                 | None                  | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 1913         | 525     | No               | Yes            | No          | High          |                |                  |                   | x                   |
| 4             | 0004D   | 4.02    | BIA 4 | BIA 7 | None                 | None                  | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 1913         | 525     | No               | No             | No          | High          |                |                  |                   | x                   |
| 5             | 5004A   | 7.51    | BIA 7 | BIA 8 | None                 | None                  | Yes             | Yes                    | Curve Warning     | No               | No             | No           | No             | -              | -              | 397          | 525     | Yes              | No             | No          | High          |                |                  |                   | x                   |
| 6             | 5004B   | 8.03    | BIA 8 | BIA 11 | None                 | None                  | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 2756         | 525     | Yes              | Yes            | No          | High          |                |                  |                   | x                   |
| 7             | 5004C   | 8.02    | BIA 8 | BIA 11 | None                 | None                  | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 1464         | 525     | No               | No             | No          | High          |                |                  |                   | x                   |
| 8             | 5004D   | 8.02    | BIA 8 | BIA 11 | None                 | None                  | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 2561         | 525     | Yes              | No             | No          | High          |                |                  |                   | x                   |
| 9             | 0005A   | 10.01   | BIA 10 | BIA 8 | None                 | None                  | None            | Yes                    | Curve Warning     | Yes              | No             | No           | No             | -              | -              | 1959         | 525     | Yes              | No             | No          | High          |                |                  |                   | x                   |
| 10            | 0005B   | 10.02   | BIA 10 | BIA 8 | None                 | None                  | None            | Yes                    | Curve Warning     | Yes              | No             | No           | No             | -              | -              | 1373         | 525     | Yes              | No             | No          | High          |                |                  |                   | x                   |
| 11            | 0005C   | 10.02   | BIA 10 | BIA 8 | None                 | None                  | None            | Yes                    | Curve Warning     | Yes              | No             | No           | No             | -              | -              | 1373         | 525     | Yes              | No             | No          | High          |                |                  |                   | x                   |
| 12            | 0005D   | 10.02   | BIA 10 | BIA 8 | None                 | None                  | None            | Yes                    | Curve Warning     | Yes              | No             | No           | No             | -              | -              | 1459         | 525     | Yes              | No             | No          | High          |                |                  |                   | x                   |
| 13            | 0013A   | 13.01   | BIA 13 | BIA 10 | None                 | None                  | None            | Yes                    | S-Curve           | Yes               | 25             | No           | No             | -              | -              | 241          | 675     | Yes              | No             | No          | Low           |                |                  |                   | -                   |
| 14            | 0013B   | 13.01   | BIA 13 | BIA 10 | None                 | None                  | None            | Yes                    | S-Curve           | Yes               | 25             | No           | No             | -              | -              | 241          | 675     | Yes              | No             | No          | Low           |                |                  |                   | -                   |
| 15            | 0013C   | 13.01   | BIA 13 | BIA 10 | None                 | None                  | None            | Yes                    | S-Curve           | Yes               | 25             | No           | No             | -              | -              | 233          | 675     | Yes              | No             | No          | Low           |                |                  |                   | -                   |
| 16            | 0520A   | 520.01  | No     | Dead End near 38th Ave NE | US 281 / ND 5 | None                 | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 1501         | 675     | Yes              | No             | No          | Low           |                |                  |                   | -                   |
| 17            | 0520B   | 520.01  | No     | Dead End near 38th Ave NE | US 281 / ND 5 | None                 | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 1381         | 675     | Yes              | No             | No          | Low           |                |                  |                   | -                   |
| 18            | 0520C   | 520.01  | No     | Dead End near 38th Ave NE | US 281 / ND 5 | None                 | None            | No                     | Yes              | Curve Warning       | No             | No           | No             | -              | -              | 241          | 675     | Yes              | No             | No          | Low           |                |                  |                   | -                   |

### Critical Ranges

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©DOT Reserves All Objectors

3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION

North Dakota Department of Transportation Programming
SFN 59899 (06-2011)

Curves on BIA 4 from 1.6 miles East if BIA Rd 11 to BIA 7

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrrottier25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description (Corridor Containing Curves)

<table>
<thead>
<tr>
<th>Curve ID</th>
<th>Oil Proj</th>
<th>K</th>
<th>A</th>
<th>Radius (ft)</th>
<th>ADT</th>
<th>Start</th>
<th>End</th>
<th>Lane Width</th>
<th>Speed Limit</th>
<th>Facility Type</th>
<th>Shoulder Width</th>
<th>Shoulder Type</th>
<th>Road Type</th>
<th>Length (miles)</th>
<th>Rumble Installed</th>
<th>Facility Improvement Project</th>
<th>Shoulder Paving Project</th>
<th>Shoulder Rumble Strip Project</th>
<th>Advance Horizontal Alignment</th>
<th>Visual Trap</th>
<th>Risk Ranking</th>
<th>Proximity</th>
<th>Existing Arrow Board</th>
<th>Existing Chevrons</th>
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<td>Inside/Outside</td>
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Ranking Criteria

Curves are selected for project if:

- Severe Crashes > 0
- Radius 500 to 1200
- ADT 450 to 100000
- Intersection on Curve
- Visual Trap

Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit Cost</th>
<th>Quantity</th>
<th>Total Cost</th>
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<td>Chevrons</td>
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<td>$3,960 per curve</td>
<td>3</td>
<td>$11,880</td>
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<td>Arrow Board Only</td>
<td>Proactive</td>
<td>$1,200 per curve</td>
<td>0</td>
<td>$0</td>
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<tr>
<td>Advance Warning Sign/Speed Advisory</td>
<td>Proactive</td>
<td>$1,440 per curve</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Shoulder Rumble Strip</td>
<td>Proactive</td>
<td>$5,850 per mile</td>
<td>3</td>
<td>$1,626</td>
</tr>
<tr>
<td>Shoulder Paving</td>
<td>Proactive</td>
<td>$54,000 per mile</td>
<td>0.3</td>
<td>$16,210</td>
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</table>

Project Cost Estimate (attach detailed copy)

Federal Funds $ 12,155
Local Match (10% of Total project cost) $ 1,351
Total Project Cost $ 13,506

Project Accepted? Yes No

Reference Number ID Number

Notes

NDDOT Central Office Only

Page: 1
23 USC 409
NDDOT Reserves All Objections

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc.

Ranking Criteria

Curves are selected for project if:

- Severe Crashes > 0
- Radius 500 to 1200
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- Intersection on Curve
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Describe Proposed Safety Improvements

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</table>

Project Cost Estimate (attach detailed copy)

Federal Funds $ 12,155
Local Match (10% of Total project cost) $ 1,351
Total Project Cost $ 13,506

Project Accepted? Yes No

Reference Number ID Number

Notes
**Highway Safety Improvement Program (HSIP) Project Application**

North Dakota Department of Transportation Programming

SFN 89559 (06-2011)

**Curves on BIA 4 from BIA 7 to Rolette 6 / ND 30**

**Agency Name:** Turtle Mountain Reservation  
**Contact Name:** Ron Trottier  
**Email Address:** ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

### Location Description (Corridor Containing Curves)

<table>
<thead>
<tr>
<th>Curve ID</th>
<th>Oil Proj K A Radius (ft)</th>
<th>ADT</th>
<th>Start: BIA 7</th>
<th>End: Rolette 6 / ND 30</th>
<th>Facility Type: 2-Lane</th>
<th>Shoulder Width: 0'</th>
<th>Road Type: Rural Paved</th>
<th>Length (miles): 4.0</th>
<th>County Road: BIA 4</th>
<th>Local Name: BIA 4</th>
<th>Edge Line Installed: No</th>
<th>Shoulder Type: None</th>
<th>Shoulder Paving Project: 0 miles</th>
<th>Shoulder Rumble Strip Project: 0 miles</th>
<th>Advance Warning Sign Project: 0 miles</th>
<th>Speed Trap: Yes</th>
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<td>460</td>
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<td>-</td>
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<td>No</td>
<td>No</td>
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<td>No</td>
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</tbody>
</table>

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc.

### Ranking Criteria

- **Severe Crashes:** > 0
- **Radius:** 500 to 1200
- **ADT:** 450 to 1000
- **Intersection on Curve:** Yes
- **Visual Trap:** Yes

### Describe Current Safety Issues & Systemic Ranking Review

**North Dakota Crashes, 2009-2013** 5 years

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<th>ADT</th>
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<th>End: Rolette 6 / ND 30</th>
<th>Facility Type: 2-Lane</th>
<th>Shoulder Width: 0'</th>
<th>Road Type: Rural Paved</th>
<th>Length (miles): 4.0</th>
<th>County Road: BIA 4</th>
<th>Local Name: BIA 4</th>
<th>Edge Line Installed: No</th>
<th>Shoulder Type: None</th>
<th>Shoulder Paving Project: 0 miles</th>
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<th>Advance Warning Sign Project: 0 miles</th>
<th>Speed Trap: Yes</th>
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<td>0  0</td>
<td>310</td>
<td>460</td>
<td>-</td>
<td>-</td>
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<td>No</td>
<td>No</td>
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### Describe Proposed Safety Improvements

**Description** | **Type** | **Unit Cost** | **Quantity** | **Total cost** | **Notes** |
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<td>Chevrons</td>
<td>Proactive</td>
<td>$3,960 per curve</td>
<td>1</td>
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<td>$1,200 per curve</td>
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<tr>
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<td>Proactive</td>
<td>$5,850 per mile</td>
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<td>$54,000 per mile</td>
<td>0.5 miles</td>
<td>$27,000</td>
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**Project Cost Estimate (attach detailed copy)**

- **Federal Funds:** $1,113
- **Local Match (10% of Total project cost):** $568
- **Total Project Cost:** $5,682

**Proposed Year of Construction**

- **Federal Funds:** $1,113
- **Local Match (10% of Total project cost):** $568
- **Total Project Cost:** $5,682

**NDDOT Central Office Only**

- **Project Accepted?** Yes / No
- **Reference Number:**
- **ID Number:**

**Notes**

- **SHSP Emphasis Area (check all that apply):**
  - Reduce Alcohol Impaired Driving
  - Increase the Use of Safety Restraints for all Occupants
  - Younger Driver/Older Driver Safety
  - Curb Aggressive Driving
  - Improvements to Address Lane Departure Crashes
  - Enhancing Emergency Medical Capabilities to Increase Survivability
  - Improve Intersection Safety

- **SHSP Emphasis Area:**
  - Reduce Alcohol Impaired Driving
  - Increase the Use of Safety Restraints for all Occupants
  - Younger Driver/Older Driver Safety
  - Curb Aggressive Driving
  - Improvements to Address Lane Departure Crashes
  - Enhancing Emergency Medical Capabilities to Increase Survivability
  - Improve Intersection Safety

- **Ranking Criteria:**
  - **Severe Crashes:** > 0
  - **Radius:** 500 to 1200
  - **ADT:** 450 to 1000
  - **Intersection on Curve:** Yes
  - **Visual Trap:** Yes

- **Project Accepted?** Yes / No
- **Reference Number:**
- **ID Number:**

**Notes**

- **SHSP Emphasis Area (check all that apply):**
  - Reduce Alcohol Impaired Driving
  - Increase the Use of Safety Restraints for all Occupants
  - Younger Driver/Older Driver Safety
  - Curb Aggressive Driving
  - Improvements to Address Lane Departure Crashes
  - Enhancing Emergency Medical Capabilities to Increase Survivability
  - Improve Intersection Safety

- **Ranking Criteria:**
  - **Severe Crashes:** > 0
  - **Radius:** 500 to 1200
  - **ADT:** 450 to 1000
  - **Intersection on Curve:** Yes
  - **Visual Trap:** Yes

- **Project Accepted?** Yes / No
- **Reference Number:**
- **ID Number:**

**Notes**
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming

Curves on BIA 7 from BIA 8 to East end of Southern 105th St NE
Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description (Corridor Containing Curves)

Start: BIA 8
End: East end of Southern 105th St NE
Facility Type: 2-Lane
Road Type: Rural Paved
County Road: BIA 7
Local Name: BIA 7

Lane Width: 12'
Speed Limit: High
Shoulder Width: 2'
Shoulder Type: Paved
Length (miles): 5.4
Rumble Installed: No
Edge Line Installed: No

ADT: 1210

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009-2013 5 years

Curve ID Oil Proj K A Radius (ft) ADT Intersection on Curve Visual Trap Risk Ranking Proximity Existing Arrow Board Existing Chevrons Critical Radius Sign Improvement Project Shoulder Paving Project Shoulder Rumble Strip Project Advance Horizontal Alignment Warning Sign Advisory Speed Plaque

0007A No 0 0 927 1210 Yes No *** 0 - x x Chevron i Inside/Outside x 50

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc

Ranking Criteria

Curves are selected for project if:
--- 3 or more *s
- x in Proximity or Existing Chevron column
- within Critical Radius

Describe Proposed Safety Improvements

Description Type Unit Cost Quantity Total cost Notes
Chevrons Proactive $3,960 per curve 1 $3,960
Arrow Board Only Proactive $1,200 per curve 0 $ -
Advance Warning Sign/Speed Advisory Plaque Proactive $1,440 per curve 1 $1,440
Shoulder Rumble Strip Proactive $5,850 per mile .3 miles $1,658
Shoulder Paving Proactive $54,000 per mile .0 miles $ -

$7,008

Project Cost Estimate (attach detailed copy)

Federal Funds $6,308
Local Match (10% of Total project cost) $701
Total Project Cost $7,008

NDDOT Central Office Only

Notes

Project Accepted? Yes No Reference Number ID Number

Proposed Year of Construction

23 USC 409
NDDOT Reserves All Objections
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Turtle Mountain Reservation
Ron Trottier Work: 701-477-0407 Ext. 223
ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description (Corridor Containing Curves)

| Start: BIA 8 | Lane Width: 11" | Speed Limit: High |
| End: BIA 11 | Shoulder Width: 0" | ADT: 1170 |
| Facility Type: 2-Lane | Shoulder Type: None | Length (miles): 4.9 |
| Road Type: Rural Paved | Rumble Installed: No |
| County Road: BIA 10 | Edge Line Installed: No |
| Local Name: BIA 10 |

Location Description (Corridor Containing Curves) (continued)

| Facility Type: 2-Lane | Shoulder Width: 0" | ADT: 1170 |
| Shoulder Type: None | Length (miles): 4.9 |
| Rumble Installed: No | Edge Line Installed: No |
| Local Name: BIA 10 |

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description (Corridor Containing Curves) (continued)

| Facility Type: 2-Lane | Shoulder Width: 0" | ADT: 1170 |
| Shoulder Type: None | Length (miles): 4.9 |
| Rumble Installed: No | Edge Line Installed: No |
| Local Name: BIA 10 |

Please attach a location map(s). You may use additional sheets to further describe your project.

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009-2013 5 years

<table>
<thead>
<tr>
<th>Curve ID</th>
<th>Oil Proj K A Radius (ft)</th>
<th>ADT</th>
<th>Intersection on Curve</th>
<th>Visual Trap</th>
<th>Risk Ranking</th>
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<th>Existing Chevrons</th>
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*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc.

Ranking Criteria

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<th>Criteria</th>
<th>Curves are selected for project if:</th>
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<td>Severe Crashes &gt; 3</td>
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<td>Radius 500 to 1200</td>
<td>- x in Proximity or Existing Chevron column</td>
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<td>ADT 450 to 100000</td>
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<td>Intersection on Curve Yes</td>
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Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit Cost per curve</th>
<th>Quantity</th>
<th>Total cost</th>
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<tr>
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<td>$3,960</td>
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<td>Advance Warning Sign/Speed Advisory Plaque</td>
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<td>.3 miles</td>
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Project Cost Estimate (attach detailed copy)

| Federal Funds | $ 20,264 |
| Local Match (10% of Total project cost) | $ 2,252 |
| Total Project Cost | $ 22,515 |

NDDOT Central Office Only

| Project Accepted? | Yes | No |
| Reference Number | | |

Notes

SHSP Emphasis Area (check all that apply)

- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

NDDOT Reserves All Objections

23 USC 409

SHSP Emphasis Area (check all that apply)

- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

NDDOT Reserves All Objections
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 69595 (06-2011)

Curves on BIA 10 from BIA 11 to US 281 / ND 5

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description (Corridor Containing Curves)

Start: BIA 11
End: US 281 / ND 5
Facility Type: 2-Lane
ADT: 1563
Shoulder Type: None
Road Type: Rural Paved
Length (miles): 4.3
County Road: BIA 10
Local Name: BIA 10
Lane Width: 11'
Speed Limit: High
Shoulder Width: 0'


Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009-2013 5 years

<table>
<thead>
<tr>
<th>Curve ID</th>
<th>Oil Proj K A</th>
<th>Radius (ft)</th>
<th>ADT</th>
<th>Intersection on Curve</th>
<th>Visual Trap</th>
<th>Risk Ranking</th>
<th>Proximity</th>
<th>Existing Arrow Board</th>
<th>Existing Chevron</th>
<th>Critical Radius</th>
<th>Sign Improvement Project</th>
<th>Shoulder Paving Project</th>
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<td>Chevron</td>
<td>Inside/Outside</td>
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*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc.

Ranking Criteria

Criteria Curves are selected for project if:
- Severe Crashes > 0 - 3 or more *s
- Radius 500 to 1200 - x in Proximity or Existing Chevron column
- ADT 450 to 100000 - within Critical Radius
- Intersection on Curve Yes
- Visual Trap Yes

Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit Cost per curve</th>
<th>Quantity</th>
<th>Total Cost</th>
<th>Notes</th>
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Project Cost Estimate (attach detailed copy)

Federal Funds $ 5,400
Local Match (10% of Total project cost) $ 600
Total Project Cost $ 6,000

NDDOT Central Office Only

Project Accepted?

Yes

No

Reference Number

ID Number

Notes

NDDOT Reserves All Objections

Page: 5

23 USC 409

NDDOT Reserves All Objections

Page: 5

Segment ID: 10.02

Date: 3/16/2015
**Highway Safety Improvement Program (HSIP) Project Application**

North Dakota Department of Transportation Programming

SFN 59959 (06-2011)

**Turtle Mountain Reservation 3**

Ron Trottier
Work: 701-477-0407 Ext. 223
ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

**Location Description (Corridor Containing Curves)**

| Start: Dead End near 38th Ave NE | Lane Width: 12' |
| End: US 281/ND 5 | Speed Limit: Low |
| Facility Type: 2-Lane | Shoulder Width: 0' |
| Road Type: Rural Paved | Length (miles): 1.3 |
| County Road: No Designation | Rumble Installed: No |
| Local Name: Unnamed Road in Shell Valley | Edge Line Installed: Yes |

**Describe Current Safety Issues & Systemic Ranking Review**

North Dakota Crashes, 2009-2013 5 years

<table>
<thead>
<tr>
<th>Curve ID</th>
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<th>A</th>
<th>Radius (ft)</th>
<th>ADT</th>
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<th>Visual Trap</th>
<th>Risk Ranking</th>
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<th>Sign Improvement Project</th>
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<th>Advance Horizontal Alignment Warning Sign</th>
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</table>

*Curve numbering not consecutive, as some curves may have been removed from further analysis because a large radius, located on a gravel road, etc.

**Ranking Criteria**

- Severe Crashes > 5
- Radius 500 to 1200 - x in Proximity or Existing Chevron column
- ADT 450 to 1000000 - within Critical Radius
- Intersection on Curve
- Visual Trap

**Describe Proposed Safety Improvements**

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit Cost per curve</th>
<th>Quantity</th>
<th>Total cost</th>
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<tr>
<td>Chevrons</td>
<td>Proactive</td>
<td>$3,960</td>
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**Project Cost Estimate**

- Federal Funds: $5,737
- Local Match (10% of Total project cost): $637
- Total Project Cost: $6,374

**NDDOT Central Office Only**

- Project Accepted? Yes
- Reference Number
- ID Number

**Notes**

- NDDOT Reserves All Objections
## Turtle Mountain Reservation
### Summary of Rural Intersection Projects

<table>
<thead>
<tr>
<th>Page</th>
<th>Intersection ID</th>
<th>Description</th>
<th>Risk Ranking</th>
<th>Directional Median</th>
<th>Mainline Dynamic Warning Sign</th>
<th>Close Median</th>
<th>Install Street Lights</th>
<th>Signs &amp; Markings</th>
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23 USC 409
NDDOT Reserves All Objections

0 5 0 13 15 $ 622,680

3/16/2015
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<th>Int #</th>
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<th>Skew</th>
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<td>BIA 6 &amp; BIA 9 / 43rd Ave NE</td>
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<td>BIA 8 &amp; BIA 11</td>
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<td>*</td>
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### Turtle Mountain Reservation

#### Rural Intersection Prioritization

<table>
<thead>
<tr>
<th>Rank</th>
<th>Int #</th>
<th>Intersection Description</th>
<th>Skew</th>
<th>On/Near Curve</th>
<th>Development</th>
<th>RR Xing</th>
<th>Previous STOP (&gt;5mi)</th>
<th>Total Crashes</th>
<th>ADT Cross Product &gt; 80000</th>
<th>Priority</th>
<th>Crash Cost</th>
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<td>45</td>
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<td>46</td>
<td>524.01</td>
<td>Residential Rd &amp; 46th Ave NE</td>
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<table>
<thead>
<tr>
<th>Stars</th>
<th>#</th>
<th>%</th>
<th>Total Stars --</th>
<th>% That Gets Star --</th>
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<tbody>
<tr>
<td>5</td>
<td>6</td>
<td>13%</td>
<td>6</td>
<td>13%</td>
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<tr>
<td>4</td>
<td>7</td>
<td>15%</td>
<td>7</td>
<td>15%</td>
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<tr>
<td>3</td>
<td>22</td>
<td>48%</td>
<td>32</td>
<td>70%</td>
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<tr>
<td>2</td>
<td>9</td>
<td>20%</td>
<td>10</td>
<td>22%</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>13%</td>
</tr>
</tbody>
</table>

- **Skew:** If intersection is skewed at an angle of 20 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 along the roadway within 5 miles
- **Total Crashes:** If intersection has at least 1 crash.
- **ADT Cross Product:** If intersection has an ADT cross product > 80000

---

NDDOT Reserves All Objections

3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

US 281 / ND 5 & BIA 5

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

ND DOT District: 3
Telephone Number: Work: 701-477-0407 Ext. 223

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

Configuration: X
Traffic Control Device: Thru-STOP
Configuration (2): Undivided
Urban/Rural: Rural
Reservation: Turtle Mountain
Jurisdiction: State

Street Lights: No
Flashers: No
Major Entering ADT: 3033
Minor Entering ADT: 520
Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
<tr>
<th>Total</th>
<th>Angle</th>
<th>K+A</th>
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<tbody>
<tr>
<td>2</td>
<td>1</td>
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<tr>
<td>Rate (per MVM) 0.3</td>
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</tbody>
</table>

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 Cross Product
  - Yes
  - ≥ 80000
  - *
- Total Crashes
  - 2
  - >0
  - *

Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
<th>Notes</th>
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<td>Roundabout</td>
<td>$4,200,000</td>
<td>0</td>
<td>$4,200,000</td>
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<tr>
<td>Directional Median</td>
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<td>Mainline Dynamic Warning Sign</td>
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<td>Close Median</td>
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<td>Installing Street Lights</td>
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<td>Upgrade Stop Sign</td>
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<td>Upgrade Junction Sign</td>
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<td>$1,200</td>
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<td>Upgrade Stop Ahead Marking</td>
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<td>$1,200</td>
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<td>Upgrade Stop Bar</td>
<td>$360 per marking</td>
<td>2</td>
<td>$720</td>
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<tr>
<td>Review Signs and CST</td>
<td>$2,940 per intersection</td>
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<td>$2,940</td>
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Total Cost: $85,680

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

Project Cost Estimate (attach detailed copy)

- Federal Funds: $77,112
- Local Match (10% of Total project cost): $8,568
- Total Project Cost: $85,680

NDDOT Central Office Only

Project Accepted?  Yes  No
Reference Number
ID Number
Notes

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

Notes -

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HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

US 281 / ND 5 & Aaniin Dr NE

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Telephone Number: Work: 701-477-0407 Ext. 223
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

**Location Description**

- Configuration: X
- Traffic Control Device: Thru-STOP
- Configuration (2): Undivided
- Street Lights: No
- Urban/Rural: Rural
- Reservation: Turtle Mountain
- Major Entering ADT: 5995
- Entering ADT: 7047
- Minor Entering ADT: 1052
- Jurisdiction: State
- Oil Project: No

**Describe Current Safety Issues & Systemic Ranking Review**

North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
<tr>
<th>Crashes</th>
<th>Angle</th>
<th>K+A</th>
</tr>
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<tbody>
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<td>Total</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>Rate (per MVM)</td>
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<td>0.1</td>
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<th>Critical</th>
<th>Risk Ranking</th>
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<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>On/Near Curve</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Development</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Near RR Crossing</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Distance from previous STOP</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Volume Cross Product</td>
<td>≥ 80000</td>
<td>Yes</td>
</tr>
<tr>
<td>Total Crashes</td>
<td>1 &gt;0</td>
<td>*</td>
</tr>
</tbody>
</table>

**Describe Proposed Safety Improvements**

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabout</td>
<td>$ 4,200,000</td>
<td>0</td>
<td>$ -</td>
</tr>
<tr>
<td>Directional Median</td>
<td>$ 1,080,000</td>
<td>0</td>
<td>$ -</td>
</tr>
<tr>
<td>Mainline Dynamic Warning Sign</td>
<td>$ 60,000</td>
<td>1</td>
<td>$ 60,000</td>
</tr>
<tr>
<td>Close Median</td>
<td>$ 30,000</td>
<td>0</td>
<td>$ -</td>
</tr>
<tr>
<td>Installing Street Lights</td>
<td>$ 10,200</td>
<td>2</td>
<td>$ 20,400</td>
</tr>
<tr>
<td>Upgrade Stop Sign</td>
<td>$ 540</td>
<td>2</td>
<td>$ 1,080</td>
</tr>
<tr>
<td>Upgrade Junction Sign</td>
<td>$ 540</td>
<td>2</td>
<td>$ 1,080</td>
</tr>
<tr>
<td>Upgrade Stop Ahead Sign</td>
<td>$ 600</td>
<td>1</td>
<td>$ 600</td>
</tr>
<tr>
<td>Upgrade Stop Ahead Marking</td>
<td>$ 600</td>
<td>1</td>
<td>$ 600</td>
</tr>
<tr>
<td>Upgrade Stop Bar</td>
<td>$ 360</td>
<td>2</td>
<td>$ 720</td>
</tr>
<tr>
<td>Review Signs and CST</td>
<td>$ 2,940</td>
<td>0</td>
<td>$ 84,480</td>
</tr>
</tbody>
</table>

Total Cost $ 84,480

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

**Project Cost Estimate (attach detailed copy)**

- Federal Funds $ 76,032
- Local Match (10% of Total project cost) $ 8,448
- Total Project Cost $ 84,480

**NDDOT Central Office Only**

- Project Accepted? [ ] Yes  [ ] No
- Reference Number
- ID Number

**Notes**

SHSP Emphasis Area (check all that apply)

- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

**23 USC 409**

NDDOT Reserves All Objections

Page: 2

Intersection ID: 10.05

Date: 3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 10 & BIA 9

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

Configuration: X
Traffic Control Device: Thru-STOP

Configuration (2): Undivided
Urban/Rural: Rural
Street Lights: No

Reservation: Turtle Mountain
Major Entering ADT: 2075

Entering ADT: 2795
Minor Entering ADT: 720

Jurisdiction: Reservation
Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
<tr>
<th>Total Crashes</th>
<th>Angle</th>
<th>K+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>1.00</td>
</tr>
<tr>
<td>Rate (per MVM)</td>
<td>0.8</td>
<td>0.6</td>
</tr>
</tbody>
</table>

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 Cross Product | Yes | ≥ 80000 | *
Total Crashes | 4 | >0 | *

Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabout</td>
<td>$4,200,000 per intersection</td>
<td>0</td>
<td>$ -</td>
<td>-</td>
</tr>
<tr>
<td>Directional Median</td>
<td>$1,080,000 per intersection</td>
<td>0</td>
<td>$ -</td>
<td>-</td>
</tr>
<tr>
<td>Mainline Dynamic Warning Sign</td>
<td>$60,000 per intersection</td>
<td>1</td>
<td>$60,000</td>
<td></td>
</tr>
<tr>
<td>Close Median</td>
<td>$30,000 per intersection</td>
<td>0</td>
<td>$ -</td>
<td>-</td>
</tr>
<tr>
<td>Installing Street Lights</td>
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<td>2</td>
<td>$20,400</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Sign</td>
<td>$540 per sign</td>
<td>2</td>
<td>$1,080</td>
<td></td>
</tr>
<tr>
<td>Upgrade Junction Sign</td>
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<td>$600 per sign</td>
<td>2</td>
<td>$1,200</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Ahead Marking</td>
<td>$600 per marking</td>
<td>2</td>
<td>$1,200</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Bar</td>
<td>$360 per marking</td>
<td>2</td>
<td>$720</td>
<td></td>
</tr>
<tr>
<td>Review Signs and CST</td>
<td>$2,940 per intersection</td>
<td>0</td>
<td>$85,680</td>
<td>$85,680</td>
</tr>
</tbody>
</table>

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

Project Cost Estimate (attach detailed copy)

Federal Funds $77,112
Local Match (10% of Total project cost) $8,568
Total Project Cost $85,680

NDDOT Central Office Only

Project Accepted? | Yes | No | Reference Number | ID Number |
|-----------------|-----|----|------------------|----------|

Notes

23 USC 409
NDDOT Reserves All Objections

Page: 3
Intersection ID: 10.04
Date: 3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION

North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 4 (102nd St NE)

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

| Configuration: X | Traffic Control Device: Thru-STOP |
| Configuration (2): Undivided Street Lights: No |
| Urban/Rural: Rural Flashers: No |
| Reservation: Turtle Mountain Major Entering ADT: 975 |
| Entering ADT: 1408 Minor Entering ADT: 433 |
| Jurisdiction: Reservation Oil Project: No |

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
<tr>
<th>Value</th>
<th>Critical</th>
<th>Risk Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skew No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>On/Near Curve No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Development No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Near RR Crossing No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Distance from previous STOP Yes</td>
<td>Yes</td>
<td>*</td>
</tr>
<tr>
<td>Volume Cross Product Yes</td>
<td>≥ 80000</td>
<td>*</td>
</tr>
<tr>
<td>Total Crashes 2</td>
<td>&gt;0</td>
<td>*</td>
</tr>
</tbody>
</table>

Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
<th>Notes -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabout</td>
<td>$4,200,000 per intersection</td>
<td>0</td>
<td>$ -</td>
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</tr>
<tr>
<td>Directional Median</td>
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<td></td>
</tr>
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<tr>
<td>Upgrade Stop Sign</td>
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<td>$ 1,080</td>
<td></td>
</tr>
<tr>
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<td>2</td>
<td>$ 1,080</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Ahead Sign</td>
<td>$600 per sign</td>
<td>2</td>
<td>$ 1,200</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Ahead Marking</td>
<td>$600 per marking</td>
<td>2</td>
<td>$ 1,200</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Bar</td>
<td>$360 per marking</td>
<td>2</td>
<td>$ 720</td>
<td></td>
</tr>
<tr>
<td>Review Signs and CST</td>
<td>$2,940 per intersection</td>
<td>0</td>
<td>$ -</td>
<td></td>
</tr>
</tbody>
</table>

Total $85,680

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

Project Cost Estimate (attach detailed copy)

| Federal Funds | $77,112 |
| Local Match (10% of Total project cost) | $8,568 |

Total Project Cost $85,680

NDDOT Central Office Only

Project Accepted? ☐ Yes ☐ No

NDDOT Reserves All Objections

Page: 4
Intersection ID: 4.03
Date: 3/16/2015
**HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION**

**North Dakota Department of Transportation Programming**

**SFN 59959 (06-2011)**

**Agency Name:** Turtle Mountain Reservation  
**Contact Name:** Ron Trottier  
**Telephone Number:** Work: 701-477-0407 Ext. 223  
**Email Address:** ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

### Location Description

- **Configuration:** X  
- **Traffic Control Device:** Thru-STOP

### Describe Current Safety Issues & Systemic Ranking Review

- **North Dakota Crashes, 2009 - 2013 5 years**
  - **Total Crashes:** 2
  - **Rate (per MVM):** 0.2
  - **Skew:** Yes
  - **On/Near Curve:** No
  - **Development:** No
  - **Near RR Crossing:** No
  - **Distance from previous STOP:** No
  - **Volume Cross Product:** Yes ≥ 80000
  - **Total Crashes:** 2

### Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
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<th>Notes</th>
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<td>Review Signs and CST</td>
<td>$2,940</td>
<td>per intersection</td>
<td>0</td>
<td>$ -</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25,680</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Project Cost Estimate (attach detailed copy)

- **Federal Funds:** $23,112
- **Local Match (10% of Total project cost):** $2,568
- **Total Project Cost:** $25,680

**NDDOT Central Office Only**

- **Project Accepted?**  
  - Yes
  - No

**Notes**

**SHSP Emphasis Area (check all that apply)**
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

---

23 USC 409

NDDOT Reserves All Objections

Page: 5  
Intersection ID: 9.01  
Date: 3/16/2015
## Location Description

**Configuration:** X  
**Traffic Control Device:** Thru-STOP  
**Configuration (2):** Undivided  
**Street Lights:** No  
**Urban/Rural:** Rural  
**Reserve:** Turtle Mountain  
**Major Entering ADT:** 1088  
**Entering ADT:** 1528  
**Minor Entering ADT:** 440  
**Jurisdiction:** Reservation  
**Oil Project:** No

## Describe Current Safety Issues & Systemic Ranking Review

<table>
<thead>
<tr>
<th>North Dakota Crashes, 2009 - 2013</th>
<th>5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crashes</strong></td>
<td><strong>0.00</strong></td>
</tr>
<tr>
<td><strong>Rate (per MVM)</strong></td>
<td><strong>0.00</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Value</th>
<th>Critical</th>
<th>Risk Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skew</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>On/Near Curve</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Near RR Crossing</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Distance from previous STOP</td>
<td>Yes</td>
<td>*</td>
</tr>
<tr>
<td>Volume Cross Product</td>
<td>Yes</td>
<td>≥ 80000</td>
</tr>
<tr>
<td>Total Crashes</td>
<td>1</td>
<td>&gt;0</td>
</tr>
</tbody>
</table>

## Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
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<th>Cost</th>
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<tbody>
<tr>
<td>Roundabout</td>
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<td>0</td>
<td>$ -</td>
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</tr>
<tr>
<td>Directional Median</td>
<td>$1,080,000</td>
<td>0</td>
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<tr>
<td>Upgrade Stop Bar</td>
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<td>1</td>
<td>$360</td>
<td></td>
</tr>
<tr>
<td>Review Signs and CST</td>
<td>$2,940</td>
<td>0</td>
<td>$24,720</td>
<td></td>
</tr>
</tbody>
</table>

**Federal Funds:** $22,248  
**Local Match (10% of Total project cost):** $2,472  
**Total Project Cost:** $24,720
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 6 / 5th Ave NE & ND 30
Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

<table>
<thead>
<tr>
<th>Configuration: X</th>
<th>Traffic Control Device: Thru-STOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration (2): Undivided</td>
<td>Street Lights: No</td>
</tr>
<tr>
<td>Urban/Rural: Urban</td>
<td>Flashers: No</td>
</tr>
<tr>
<td>Reservation: Turtle Mountain</td>
<td>Major Entering ADT: 1423</td>
</tr>
<tr>
<td>Entering ADT: 1623</td>
<td>Minor Entering ADT: 1430</td>
</tr>
<tr>
<td>Jurisdiction: State</td>
<td>Oil Project: No</td>
</tr>
</tbody>
</table>

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
<tr>
<th>Total</th>
<th>Angle</th>
<th>K+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>crashes</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

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 Cross Product | Yes | ≥ 80000 |

Total Crashes 0 > 0

Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabout</td>
<td>$420,000</td>
<td>per intersection</td>
<td>0</td>
<td>-</td>
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<tr>
<td>Directional Median</td>
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<td>Review Signs and CST</td>
<td>$2,940</td>
<td>per intersection</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

$25,080

Project Cost Estimate (attach detailed copy)

| Federal Funds | $22,572 |
| Local Match (10% of Total project cost) | $2,050 |

Total Project Cost $25,080

NDDOT Central Office Only

Project Accepted? Yes No

Notes

SHSP Emphasis Area (check all that apply)

Reduce Alcohol Impaired Driving
Increase the Use of Safety Restraints for all Occupants
Younger Driver/Older Driver Safety
Curb Aggressive Driving
Improvements to Address Lane Departure Crashes
Enhancing Emergency Medical Capabilities to Increase Survivability

Improve Intersection Safety
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

Location Description
Configuration: T  Traffic Control Device: Thru-STOP
Configuration (2): Undivided  Street Lights: No
Urban/Rural: Rural  Flashers: No
Reservation: Turtle Mountain  Major Entering ADT: 925
Entering ADT: 1035  Minor Entering ADT: 110
Jurisdiction: Reservation  Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
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<th></th>
<th>Total</th>
<th>Angle</th>
<th>K+A</th>
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<tr>
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<table>
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<tr>
<th>Value</th>
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<th>Risk Ranking</th>
</tr>
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<tr>
<td>Skew</td>
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<td>Yes</td>
</tr>
<tr>
<td>On/Near Curve</td>
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<td>Yes</td>
</tr>
<tr>
<td>Development</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Near RR Crossing</td>
<td>No</td>
<td>Yes</td>
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<td>Distance from previous STOP</td>
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<tr>
<td>Volume Cross Product</td>
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<td>≥ 80000</td>
</tr>
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Describe Proposed Safety Improvements

<table>
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<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Roundabout</td>
<td>$4,200,000</td>
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<td>$</td>
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<tr>
<td>Directional Median</td>
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<td>$</td>
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<tr>
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<td>Close Median</td>
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<tr>
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<tr>
<td>Upgrade Stop Bar</td>
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<tr>
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<td></td>
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Federal Funds: $1,512
Local Match (10% of Total project cost): $168
Total Project Cost: $1,680

Project Cost Estimate (attach detailed copy)  Proposed Year of Construction

<table>
<thead>
<tr>
<th>NDDOT Central Office Only</th>
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</thead>
<tbody>
<tr>
<td>Project Accepted?</td>
</tr>
<tr>
<td>Reference Number</td>
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<tr>
<td>ID Number</td>
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Notes

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

Notes -

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
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Notes -
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 6 & 31st Ave NE
Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description
Configuration: X
Traffic Control Device: Thru-STOP
Configuration (2): Undivided
Urban/Rural: Rural
Reservation: Turtle Mountain
Entering ADT: 600
Jurisdiction: Reservation

ND DOT District: 3
Telephone Number: Work: 701-477-0407 Ext. 223

Describe Current Safety Issues & Systemic Ranking Review
North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
<tr>
<th>Total</th>
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<td>Yes</td>
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<tr>
<td>Development</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Near RR Crossing</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Volume Cross Product</td>
<td>Yes</td>
<td>&gt; 80000</td>
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<tr>
<td>Total Crashes</td>
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<td>&gt; 0</td>
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Describe Proposed Safety Improvements

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<tbody>
<tr>
<td>Roundabout</td>
<td>$4,200,000 per intersection</td>
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<tr>
<td>Directional Median</td>
<td>$1,080,000 per intersection</td>
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<td>$ -</td>
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<tr>
<td>Mainline Dynamic Warning Sign</td>
<td>$60,000 per intersection</td>
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<tr>
<td>Close Median</td>
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<tr>
<td>Installing Street Lights</td>
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<td>$10,200</td>
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<td>Upgrade Stop Bar</td>
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<td>Review Signs and CST</td>
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</table>

72,840$

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

Project Cost Estimate (attach detailed copy)

Federal Funds $65,556
Local Match (10% of Total project cost) $7,284
Total Project Cost $72,840

ND DOT Central Office Only
Project Accepted? [ ] Yes [ ] No
Reference Number
ID Number
Notes

SHSP Emphasis Area (check all that apply)

- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

23 USC 409
ND DOT Reserves All Objections

Page: 9
Intersection ID: 6.02
Date: 3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 10 & BIA 11

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

ND DOT District: 3
Telephone Number: Work: 701-477-0407 Ext. 223

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

Configuration: X
Traffic Control Device: Thru-STOP
Configuration (2): Undivided
Urban/Rural: Rural
Reservation: Turtle Mountain
Entering ADT: 1653
Jurisdiction: Reservation

Traffic Control Device: Street Lights: No
Flashing: No
Major Entering ADT: 950
Minor Entering ADT: 703
Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009 - 2013 5 years

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<td>Yes</td>
</tr>
<tr>
<td>On/Near Curve</td>
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<td>Yes</td>
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<tr>
<td>Development</td>
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<td>Yes</td>
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<tr>
<td>Near RR Crossing</td>
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<td>Distance from previous STOP</td>
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<tr>
<td>Volume Cross Product</td>
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Total Crashes 2 >0 *

Describe Proposed Safety Improvements

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<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Roundabout</td>
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<td>Directional Median</td>
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<td>Close Median</td>
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<td>0</td>
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$30,960

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

Project Cost Estimate (attach detailed copy)

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NDDOT Central Office Only

Project Accepted? [ ] Yes [ ] No
Reference Number
ID Number
Notes

NDDOT Reserves All Objections

Page: 10
Intersection ID: 10.03
Date: 3/16/2015

23 USC 409
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 6 & BIA 7

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

Configuration: X  Traffic Control Device: Thru-STOP
Configuration (2): Undivided  Street Lights: No
Urban/Rural: Rural  Flashers: No
Reservation: Turtle Mountain  Major Entering ADT: 1588
Entering ADT: 1948  Minor Entering ADT: 360
Jurisdiction: Reservation  Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009 - 2013 5 years

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<td>Yes</td>
</tr>
<tr>
<td>On/Near Curve</td>
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<td>Yes</td>
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<tr>
<td>Development</td>
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<td>Yes</td>
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<tr>
<td>Near RR Crossing</td>
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<tr>
<td>Distance from previous STOP</td>
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<td>Yes</td>
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<tr>
<td>Volume Cross Product</td>
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<td>≥ 80000起了</td>
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<tr>
<td>Total Crashes</td>
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<td>&gt;0</td>
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Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabout $4,200,000 per intersection</td>
<td>0</td>
<td>$</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Directional Median $1,080,000 per intersection</td>
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<td>-</td>
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<tr>
<td>Mainline Dynamic Warning Sign $60,000 per intersection</td>
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<td></td>
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<tr>
<td>Close Median $30,000 per intersection</td>
<td>0</td>
<td>$</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Installing Street Lights $10,200 per street light</td>
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<td>$</td>
<td>20,400</td>
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<td>Upgrade Stop Sign $540 per sign</td>
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<td>$</td>
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<td>Upgrade Junction Sign $540 per sign</td>
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<td>$</td>
<td>1,080</td>
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<td>Review Signs and CST $2,940 per intersection</td>
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<td>$</td>
<td>2,940</td>
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<tr>
<td>Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.</td>
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<td>Total $25,680</td>
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Project Cost Estimate (attach detailed copy)

Federal Funds $23,112
Local Match (10% of Total project cost) $2,568
Total Project Cost $25,680

NDDOT Central Office Only

Project Accepted?  Yes  No
Reference Number  ID Number

Notes

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
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Notes -

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- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
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NDDOT Reserves All Objections

Page: 11
Intersection ID: 6.05
Date: 3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION
North Dakota Department of Transportation Programming
SFN 59959 (06-2011)

BIA 8 & BIA 9 / 43rd Ave NE

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Email Address: ronwtrottierjr25@gmail.com

ND DOT District: 3
Telephone Number: Work: 701-477-0407 Ext. 223

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

Configuration: X  Traffic Control Device: Thru-STOP
Configuration (2): Undivided  Street Lights: No
Urban/Rural: Rural  Flashers: No
Reservation: Turtle Mountain  Major Entering ADT: 913
Entering ADT: 1253  Minor Entering ADT: 340
Jurisdiction: Reservation  Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009 - 2013  5 years

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<td>Yes</td>
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<tr>
<td>Distance from previous STOP</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Volume Cross Product</td>
<td>Yes</td>
<td>≥ 8000</td>
</tr>
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<td>Total Crashes</td>
<td>1</td>
<td>&gt;0</td>
</tr>
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Describe Proposed Safety Improvements

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<td>per intersection</td>
<td>0</td>
<td>$ -</td>
</tr>
<tr>
<td>Mainline Dynamic Warning Sign</td>
<td>$60,000</td>
<td>per intersection</td>
<td>0</td>
<td>$ -</td>
</tr>
<tr>
<td>Close Median</td>
<td>$30,000</td>
<td>per intersection</td>
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<td>$ -</td>
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<tr>
<td>Installing Street Lights</td>
<td>$10,200</td>
<td>per street light</td>
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<td>$20,400</td>
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<td>Upgrade Stop Sign</td>
<td>$540</td>
<td>per sign</td>
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<td>Upgrade Junction Sign</td>
<td>$540</td>
<td>per sign</td>
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<td>Upgrade Stop Ahead Sign</td>
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<td>per sign</td>
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<td>Review Signs and CST</td>
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</table>

$25,680

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

Project Cost Estimate (attach detailed copy)

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<th>Description</th>
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NDDOT Central Office Only

Project Accepted? Yes No
Reference Number
ID Number
Notes

SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase survivability
- Improve Intersection Safety

Notes -

SHSP Emphasis Area (check all that apply)
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Notes -

SHSP Emphasis Area (check all that apply)
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Notes -

SHSP Emphasis Area (check all that apply)
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Notes -

SHSP Emphasis Area (check all that apply)
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Notes -

SHSP Emphasis Area (check all that apply)
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- Increase the Use of Safety Restraints for all Occupants
- Younger/Older Driver Safety
- Curb Aggressive Driving
- Improve Intersection Safety

Notes -

23 USC 409
NDDOT Reserves All Objections

Page: 12
Intersection ID: 8.04
Date: 3/16/2015
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION

North Dakota Department of Transportation Programming

SFN 59959 (06-2011)

US 281 / ND 5 & BIA 3

Agency Name: Turtle Mountain Reservation
Contact Name: Ron Trottier
Telephone Number: Work: 701-477-0407 Ext. 223
Email Address: ronwtrottierjr25@gmail.com

ND DOT District: 3

Please attach a location map(s). You may use additional sheets to further describe your project.

Location Description

- Configuration: X
- Traffic Control Device: Thru-STOP
- Configuration (2): Undivided Street Lights: No
- Urban/Rural: Rural Flashers: No
- Reservation: Turtle Mountain Major Entering ADT: 3905
- Entering ADT: 4100 Minor Entering ADT: 195
- Jurisdiction: State Oil Project: No

Describe Current Safety Issues & Systemic Ranking Review

North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
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<th>K+A</th>
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<tr>
<td>Rate (per MVM)</td>
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<table>
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<th>Risk Ranking</th>
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<tr>
<td>Skew</td>
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<td>On/Near Curve</td>
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<td>Yes</td>
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<tr>
<td>Development</td>
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<td></td>
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<td>Near RR Crossing</td>
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<td>Yes</td>
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</tr>
<tr>
<td>Distance from previous STOP</td>
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<td>Yes</td>
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<tr>
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<td></td>
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</table>

Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Roundabout</td>
<td>$ 4,200,000 per intersection</td>
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<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Directional Median</td>
<td>$ 1,080,000 per intersection</td>
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<td>$ -</td>
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<tr>
<td>Mainline Dynamic Warning Sign</td>
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<td>$ -</td>
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<tr>
<td>Close Median</td>
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<td>$ 20,400</td>
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<td>Upgrade Stop Sign</td>
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<tr>
<td>Upgrade Junction Sign</td>
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<td>2</td>
<td>$ 1,080</td>
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<tr>
<td>Upgrade Stop Ahead Sign</td>
<td>$ 600 per sign</td>
<td>2</td>
<td>$ 1,200</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Ahead Marking</td>
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<td>0</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Bar</td>
<td>$ 360 per marking</td>
<td>0</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Review Signs and CST</td>
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<td>$ -</td>
<td></td>
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<tr>
<td></td>
<td>$ 23,760</td>
<td></td>
<td></td>
<td></td>
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Signs and Markings and Street Light project costs vary by the number of minor legs associated with the intersection.

Project Cost Estimate (attach detailed copy) Proposed Year of Construction

<table>
<thead>
<tr>
<th></th>
<th>Federal Funds</th>
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<tr>
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<td>$ 2,376</td>
<td>$ 23,760</td>
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NDDOT Central Office Only

Project Accepted? [ ] Yes [ ] No Reference Number [ ] ID Number

Notes

SHSP Emphasis Area (check all that apply)

- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
- Improvements to Address Lane Departure Crashes
- Enhancing Emergency Medical Capabilities to Increase Survivability
- Improve Intersection Safety

23 USC 409

NDDOT Reserves All Objections

Page: 13
Intersection ID: 3.02
Date: 3/16/2015
**HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROJECT APPLICATION**

**Agency Name:** Turtle Mountain Reservation  
**Contact Name:** Ron Trottier  
**Email Address:** ronwtrottierjr25@gmail.com

Please attach a location map(s). You may use additional sheets to further describe your project.

### Location Description
- **Configuration:** T  
- **Traffic Control Device:** Thru-STOP
- **Configuration (2):** Undivided  
- **Urban/Rural:** Rural  
- **Street Lights:** No
- **Reservation:** Turtle Mountain  
- **Major Entering ADT:** 180  
- **Entering ADT:** 230  
- **Minor Entering ADT:** 50
- **Jurisdiction:** Reservation  
- **Oil Project:** No

### Describe Current Safety Issues & Systemic Ranking Review

#### North Dakota Crashes, 2009 - 2013 5 years

<table>
<thead>
<tr>
<th>Crashes</th>
<th>Angle</th>
<th>K+A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Rate (per MVM)</td>
<td>0.0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

#### Value Critical Risk Ranking
- **Skew:** Yes  
- **On/Near Curve:** Yes  
- **Development:** No  
- **Near RR Crossing:** No  
- **Volume Cross Product:** No ≥ 80000  
- **Total Crashes:** 0 >0

### Describe Proposed Safety Improvements

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabout</td>
<td>$4,200,000 per intersection</td>
<td>0</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Directional Median</td>
<td>$1,080,000 per intersection</td>
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<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Mainline Dynamic Warning Sign</td>
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<td>0</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Close Median</td>
<td>$30,000 per intersection</td>
<td>0</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Installing Street Lights</td>
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<td>0</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Sign</td>
<td>$540 per sign</td>
<td>1</td>
<td>$ 540</td>
<td></td>
</tr>
<tr>
<td>Upgrade Junction Sign</td>
<td>$540 per sign</td>
<td>1</td>
<td>$ 540</td>
<td></td>
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<tr>
<td>Upgrade Stop Ahead Sign</td>
<td>$600 per sign</td>
<td>1</td>
<td>$ 600</td>
<td></td>
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<tr>
<td>Upgrade Stop Ahead Marking</td>
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<td>0</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Upgrade Stop Bar</td>
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<td>Review Signs and CST</td>
<td>$2,940 per intersection</td>
<td>0</td>
<td>$ -</td>
<td>$ 2,940</td>
</tr>
</tbody>
</table>

**Project Cost Estimate (attach detailed copy)**

- **Federal Funds:** $1,836  
- **Local Match (10% of Total project cost):** $204

**Total Project Cost:** $2,040

### SHSP Emphasis Area (check all that apply)
- Reduce Alcohol Impaired Driving  
- Increase the Use of Safety Restraints for all Occupants  
- Younger Driver/Older Driver Safety  
- Curb Aggressive Driving  
- Improvements to Address Lane Departure Crashes  
- Enhancing Emergency Medical Capabilities to Increase Survivability  
- Improve Intersection Safety

**Notes**

**NDDOT Central Office Only**

- **Project Accepted?:** Yes  
- **Reference Number:**  
- **ID Number:**

---

BIA 13 & BIA 6  
**ND DOT District:** 3  
**Telephone Number:** Work: 701-477-0407 Ext. 223

23 USC 409  
NDDOT Reserves All Objections  
Date: 3/16/2015  
Intersection ID: 13.02
**Location Description**

- **Configuration:** X
- **Traffic Control Device:** Thru-STOP
- **Configuration (2):** Undivided
- **Urban/Rural:** Rural
- **Reservation:** Turtle Mountain
- **Entering ADT:** 6162
- **Jurisdiction:** State

**Location Description**

- **Street Lights:** No
- **Flashes:** No
- **Major Entering ADT:** 5990
- **Minor Entering ADT:** 172
- **Reservation:** Turtle Mountain
- **Jurisdiction:** State

**Describe Current Safety Issues & Systemic Ranking Review**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Angle</th>
<th>K+A</th>
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<tbody>
<tr>
<td><strong>Crashes</strong></td>
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<td>0</td>
<td>0.00</td>
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<tr>
<td><strong>Rate (per MVM)</strong></td>
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<td>0.0</td>
<td>0.0</td>
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</table>

**Value**

- **Skew:** Yes
- **On/Near Curve:** No
- **Development:** No
- **Near RR Crossing:** No
- **Distance from previous STOP:** No
- **Volume Cross Product:** Yes

**Critical**

- **≥ 80000**
- **0 > 0**

**Risk Ranking**

**SHSP Emphasis Area (check all that apply)**

- Reduce Alcohol Impaired Driving
- Increase the Use of Safety Restraints for all Occupants
- Younger Driver/Older Driver Safety
- Curb Aggressive Driving
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<th>Unit Cost</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Roundabout</td>
<td>$4,200,000 per intersection</td>
<td>0</td>
<td>$0</td>
<td>- markings on that approach</td>
</tr>
<tr>
<td>Directional Median</td>
<td>$1,080,000 per intersection</td>
<td>0</td>
<td>$0</td>
<td>-</td>
</tr>
<tr>
<td>Mainline Dynamic Warning Sign</td>
<td>$60,000 per intersection</td>
<td>0</td>
<td>$0</td>
<td>-</td>
</tr>
<tr>
<td>Close Median</td>
<td>$30,000 per intersection</td>
<td>0</td>
<td>$0</td>
<td>-</td>
</tr>
<tr>
<td>Installing Street Lights</td>
<td>$10,200 per street light</td>
<td>2</td>
<td>$20,400</td>
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<tr>
<td>Upgrade Stop Sign</td>
<td>$540 per sign</td>
<td>1</td>
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<tr>
<td>Upgrade Junction Sign</td>
<td>$540 per sign</td>
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<td>Upgrade Stop Ahead Sign</td>
<td>$600 per sign</td>
<td>1</td>
<td>$600</td>
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<tr>
<td>Upgrade Stop Ahead Marking</td>
<td>$600 per marking</td>
<td>1</td>
<td>$600</td>
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<tr>
<td>Upgrade Stop Bar</td>
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<td>$360</td>
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<tr>
<td>Review Signs and CST</td>
<td>$2,940 per intersection</td>
<td>0</td>
<td>$23,040</td>
<td></td>
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</table>

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

**Project Cost Estimate (attach detailed copy)**

- **Federal Funds:** $20,736
- **Local Match (10% of Total project cost):** $2,304

**Total Project Cost:** $23,040

**NDDOT Central Office Only**

- **Project Accepted:** Yes
- **Reference Number:**
- **ID Number:**

**Notes**

- North Dakota Crashes, 2009 - 2013 5 years
- Total Angle K+A
- Crashes 0 0 0.00
- Rate (per MVM) 0.0 0.0 0.0
- Value Critical Risk Ranking
- Skew Yes Yes
- On/Near Curve No Yes
- Development No Yes
- Near RR Crossing No Yes
- Distance from previous STOP No Yes
- Volume Cross Product Yes ≥ 80000
- Total Crashes 0 > 0

- **23 USC 409**
- **Intersection ID:** 200.03
- **Date:** 3/16/2015
5.0 Behavioral Safety Strategies

5.1 Purpose of Driver Behavior Safety Strategies

North Dakota’s Local Road Safety Program (LRSP) recognizes that driver behavior is a significant factor contributing to a majority of the severe crashes on North Dakota’s local and tribal roads. Traffic crashes may result from any combination of overlapping crash factors, such as the roadway, the vehicle, and driver behavior. Research supports and experts agree that in most cases driver behavior—risky decisions, driver error, lapses of attention, and driver limitations—is a chief factor contributing to traffic crashes (Lerner et al., 2010). Severe traffic crashes in North Dakota’s Central Region can be largely prevented and reduced if motorists, with an emphasis on younger drivers, were persuaded to engage in key safe driving practices to buckle up, drive at safe speeds, pay attention, and plan ahead to avoid impaired driving. For maximum safety benefit, these measures should be undertaken in addition to adopting infrastructure safety strategies to help ensure the safest and most forgiving roadway possible.

5.2 Overview of Behavioral Crash Data for Turtle Mountain Band of Chippewa Indians

Unbelted Vehicle Occupants: Traffic safety research demonstrates that a motorist’s seat belt is the most effective defense in the event of a crash. When lap and shoulder seat belts are used, the risk of fatal injury to front-seat passenger car occupants is reduced by 45 percent and the risk of moderate-to-critical injury is reduced by 50 percent (NHTSA, 2001). Safety benefits are even greater for light-truck occupants, with seat belts reducing fatalities by 60 percent and moderate-to-critical injury by 65 percent (NHTSA, 2009). Seat belts are extremely effective in preventing occupant ejection from the vehicle, the most injurious of crash outcomes (NHTSA, 2014). Reducing unbelted severe crashes is one of Turtle Mountain’s greatest opportunities to strengthen safety on reservation roadways. The trend of severe unbelted crashes is increasing statewide. However, Turtle Mountain is below the 55 percent statewide-unbelted severe crashes with 31 percent of the reservation’s severe crashes involving unbelted motorists.

Alcohol-Related Crashes: Nationally, although impaired driving fatalities have decreased since 2007, the percentage of alcohol-impaired fatalities in the U.S. has remained essentially unchanged (NHTSA, 2012). Similarly, over the last decade, each year nearly half of motor vehicle fatalities statewide in North Dakota continue to be alcohol-related. For Turtle Mountain, alcohol-related severe crashes are much higher at 54 percent than the statewide alcohol-related crashes at 34 percent.

Young Driver-Involved: Young drivers typically have the highest involvement in fatal crashes of any age group. Nationally, the fatal crash involvement of drivers age 16 to 20 is nearly twice that of drivers’ age 21 and older (NHTSA, 2012a). Key underlying factors to their high crash risk are the developmental and behavioral issues of adolescence coupled with driving inexperience. Young drivers too often immaturely take risks while driving without thinking through the potential consequences of their life-threatening decisions (Keating, 2007). Such high-risk behaviors typically include lack of seat belt use, aggressive driving/speeding, and distractions.
while driving. Although severe injury crashes involving young drivers have gradually declined statewide, young drivers under the age of 21 continue to be overrepresented in severe crashes. Turtle Mountain’s severe crashes involving young drivers are similar to the statewide young driver crashes at 23 percent and 24 percent respectively.

**Excessive Speed:** Speeding is common and the percentage of speeding-related fatal crashes has changed little over the years. Although drivers generally acknowledge that speeding is an unsafe behavior, speeding remains common because the perceived risk of injury is low relative to the perceived benefits of driving fast such as saving time and driving pleasure (Lerner et al., 2010). Excessive or inappropriate speeds result from two basic problems: drivers choosing to drive above the posted speed limit and drivers driving too fast and failing to adjust speed to accommodate existing road conditions. Consequently, the percentage of speeding-related fatal crashes has remained essentially unchanged over the years and remains a contributing factor in 31 percent of traffic fatalities in the U.S. (NHTSA, 2012b). Speeding and aggressive driving continue to account for 29 percent of all severe crashes in North Dakota. For Turtle Mountain, speed or aggressive driving accounts for 31 percent of its severe injury crashes.

**5.3 Importance of Traffic Safety Culture Change**

**5.3.1 The Influence of Traffic Safety Culture**

Turtle Mountain, together with its traffic safety partners, seeks to develop and implement traffic safety strategies within the broader societal context of motorists’ behavior and the reservation’s traffic safety culture. Traffic safety culture can be defined as the implicit shared values, beliefs, and perceptions that shape motorists’ behavior.

**5.3.2 Social Norms Inhibiting a Strong Traffic Safety Culture**

At the core of the nation’s and tribal reservations’ traffic safety challenge is complacency toward risk-taking by drivers and a tolerance for traffic crashes and the resulting deaths and serious injuries. Contributing factors include a sense of individual driver invulnerability, perceived driving skills and vehicle control, and a sense of anonymity and entitlement on the road. The latest data from the 2012 Traffic Safety Culture Index Survey reports that, as in previous years, the safety culture in the United States surrounding distracted driving can best be described as “do as I say, not as I do” — due to the high numbers of people who object to certain behaviors, yet will admit that they, themselves, engage in them (AAA, 2012). Real progress in traffic safety depends largely on addressing and changing this culture of indifference to effectively implement and see results from tribal safety strategies.
5.3.3 Social Levels Influencing Safety Culture

Efforts to change individual driver and motorist behaviors should be planned and executed from an ecological viewpoint—one that examines the driving public and their interaction with their social environments. Traffic safety culture and its influence operate at different levels within society. Therefore, a broader definition of traffic safety culture includes the values, beliefs, and perceptions of not only the individual driver, but of those shared by the various communities of which the driver is a part (Figure 5-1). The individual driver exists within a system that includes the following levels, each embodying factors that influence driving culture and crash risk (Ward et al., 2010; Dahlberg and Krug, 2002):

- **Individual level** – Factors such as driver age, driving experience, self-esteem, income, and substance abuse
- **Relationship level** – Factors such as relationships with peers, co-workers, supervisors, and family members
- **Community level** – Factors include the settings or environments in which relationships occur such as school, church, workplaces, and neighborhoods
- **Societal level** – Large-scale factors such as safety, health, economic, and educational policies, as well as tribal government commitments and priorities

![FIGURE 5-1 Social Ecological Perspective of Culture](image)


Social norms at each level and within each group point to what behaviors are perceived as important. Norms create conformity to expectations that allows people (that is, drivers) to successfully socialize to the subcultures in which they belong. These norms create a climate in which unsafe driving behavior is either encouraged or discouraged. Perceived social norms condoning high-risk driving behaviors provide the case for drivers to rationalize their own high-risk behaviors. To accomplish the culture change, traffic safety behavioral strategies seek to make safe-driving behaviors the accepted norm across all social ecological levels.
The implication of the social ecological model for LRSP and tribal road safety efforts is that implementation plans should attempt to:

- Increase perceived social pressure to comply with traffic safety laws and practices, thereby, producing safety behavioral norms (Ward et al., 2010)
- Shift the social acceptance of high-risk behaviors to one of perceived unacceptance by significant others and one’s peers.

5.4 Behavioral Safety Strategies

5.4.1 Role of Policy, Education, and Enforcement

Techniques or strategies to change driver behavior essentially fall into one of three categories: 1) policy change or change to tribal traffic safety codes, regulations, sanctions and penalties; 2) enforcement of the laws; and 3) education or public information, media, and training. These three categories of behavioral safety strategies work together to have the greatest impact on changing risky driver behavior. The degree of effectiveness of any one strategy on behavioral change depends not only on how effectively the strategy is implemented, but also on how these three categories of policy, enforcement, and education are working together.

For example, if Turtle Mountain is seeking to increase motorists’ seat belt use and decides to use a “buckle up” public information campaign (behavioral change strategy). The effectiveness of the campaign not only depends on the quality of the education or public information campaign (relevance to target group, duration, saturation of the messaging), but also the strength of the tribal law in place (primary vs. secondary seat belt law; all passengers vs. front seat only; higher penalty/fee vs. low penalty/fee) and, most important, the degree of seat belt use enforcement (enforcement coverage, intensity, visible by the public).

Consequently, the strength of driver safety policy, enforcement, and education surrounding a behavioral strategy selected greatly impact its effectiveness. Therefore, when selecting and implementing a behavioral strategy, tribal leaders must examine the related policy or tribal laws, enforcement available, and the supporting educational and public outreach available to support the strategy and explore ways to strengthen each, as appropriate, to gain the most safety benefit from a selected strategy.

Finally, it is critically important that traffic safety enforcement is viewed as a priority within the tribal community and its leadership, the tribal council. It is imperative that tribal leaders actively address political and community resistance and provide a pathway to deploy the leading safety strategy to save lives on Turtle Mountain’s roadways—effective traffic enforcement coupled with public outreach. By advocating for enforcement, educating tribal council members, and equipping officers to effectively enforce traffic safety laws, Turtle Mountain will reap far greater life-saving outcomes from its local safety initiatives.

5.4.2 Effective Use of Public Information Strategies

Public information (education) strategies are often popular among communities seeking to change risky driving behaviors. Education or public information campaigns can range from brochures and mailings to peer-to-peer safety messaging. Brochures and mailings are a passive approach, while peer-to-peer messaging provides a more effective behavioral change approach. In general, a key challenge in influencing driver behavior is that most drivers know what they
are supposed to do to drive safely, yet due to successfully driving with risky patterns with no incidence of crash, drivers underestimate the risk of their choices. For this reason, research supports that education, coupled with enforcement, will have the strongest impact in changing driver behavior (NHTSA, 2013).

Following are key characteristics of impactful public information/education campaigns (Williams, 2007):

- Implemented in support of a high-visibility enforcement program
- Focused messaging for a target group
- Longer-term programs delivering messages of sufficient intensity over time
- Messages communicating new information not previously well known
- Messages that are part of a broader-based, longer-term community program with similar messaging coming from multiple sources
- Using behavior change models including interactive methods teaching skills to resist social pressure (such as role playing, group discussion)

5.4.3 Turtle Mountain’s Priority Strategies

As previously described in Section 3.5, a Tribal Safety Workshop was held as part of the LRSP process on January 7, 2014 at the United Tribes Technical College (UTTC) in Bismarck. Turtle Mountain participated, together with representatives from the other three Indian reservations in North Dakota, to begin exploring specific infrastructure strategies outlined in Table 3-1 as well as discussing existing tribal behavioral safety initiatives.

Following the Tribal Safety Workshop, Turtle Mountain traffic safety staff was contacted to further discuss existing behavioral safety initiatives and identify priority new or expanded safety strategies to advance tribal efforts to influence and change risky driver behaviors.

Table 5-1 reflects Turtle Mountain’s priority behavioral safety strategies to consider for tribal implementation and indicates strategy consistency with North Dakota’s Strategic Highway Safety Plan.

<table>
<thead>
<tr>
<th>TABLE 5-1</th>
<th>Turtle Mountain’s Priority Behavioral Safety Strategies</th>
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<tbody>
<tr>
<td>LRSP Turtle Mountain Band of Chippewa Indians’ Priority Driver Behavior Strategies and Their Relationship with the North Dakota SHSP</td>
<td>2013 ND SHSP</td>
</tr>
<tr>
<td>Impaired Driving</td>
<td></td>
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<tr>
<td>• Promote BAC test “No Refusal” law to high-risk audiences</td>
<td>X</td>
</tr>
<tr>
<td>• Promote sobriety initiatives for DUI offenders (24/7 Program and DUI Courts)</td>
<td>X</td>
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</tbody>
</table>
The following subsections provide a more complete description of each priority strategy and suggested resources to help launch or expand tribal behavioral safety efforts. It is important to note that tribal traffic safety professionals seeking to leverage their safety initiatives described in the following subsections are encouraged to coordinate with and/or engage in the statewide SHSP implementation teams including: lane departure, unbelted vehicle occupants, alcohol-related, speed or aggressive drivers, young drivers, and intersections.

### 5.4.4 Impaired Driving

**Turtle Mountain Priority Strategy** – *Promote the BAC test “No Refusal” law to high-risk audiences.*

**Description:** Drinking drivers, particularly those who are at risk of receiving a repeat DUI offense, often refuse to provide a breath or blood sample for a BAC test. A driver’s BAC is critical evidence in an alcohol-impaired driving charge. The absence of a BAC test can make it more difficult to convict the impaired driver. If the penalties for refusal are less severe than the penalties for failing the test, many drivers will refuse. Research supports that BAC test refusal rates are lower in States where the consequences of test refusal are greater than the consequences of test failure (NHTSA, 2005).

In an effort to stiffen penalties for drunken driving, North Dakota law criminalizes a drinking driver’s refusal to submit to an on-site screening test or a chemical test. By refusing the test, a North Dakota drinking driver is automatically considered guilty of the offense, and must face criminal consequences and may lose driving privileges through administrative license revocation for up to four years.

Criminalizing BAC test refusal helps to ensure the necessary evidence of impairment while driving, thereby, decreasing the likelihood that impaired drivers can avoid penalties by refusing to be tested. It also ensures the driver will be identified as a repeat offender upon subsequent arrests.
Getting Started:

- Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as impaired driving, in the SHSP.

- Enlist the support of tribal traffic safety stakeholders (e.g., enforcement, educators, corrections, treatment professionals) to conduct a proactive publicity and education campaign on BAC test “no refusal” law:
  - Educate tribal council members, tribal judges, prosecutors, defense attorneys, treatment officials and other concerned stakeholders of the benefits and the importance of the “no refusal” law in combating hard-core drunk drivers.
  - Strengthen “no refusal” deterrence effect by targeting outreach efforts to high-risk audiences and by putting potential repeat offenders on notice that BAC test refusal results in an automatic guilty charge with strong criminal penalties and administrative license revocation.

Implementation Resources:

- See Section 5.5, Traffic Safety Office Supporting Resources.

- For further information on the BAC test “no refusal” law, contact ND Traffic Safety Resource Prosecutors:
  - Aaron Birst at aaron.birst@ndaco.org, 701-328-7342
  - Kristi Pettit Venhuizen at 701-780-9276


- For information on No Refusal programs and other impaired driving resources, see the Foundation for Advancing Alcohol Responsibility at: http://responsibility.org/judicial-guide/no-refusal-programs

- For North Dakota road safety information including impaired driver facts sheets, issue briefs, and other education and outreach resources, visit the NDSU Rural Transportation Safety and Security Center (RTSSC) at: http://www.ugpti.org/rtssc/resources/

  The NDSU Upper Great Plains Transportation Institute at:
  http://www.ugpti.org/resources/

- Other impaired-driving safety resources:
  - Insurance Institute for Highway Safety: http://www.iihs.org/research/topics/alcohol_drugs.html
Turtle Mountain Priority Strategy – Promote Sobriety Initiatives for DUI Offenders – 24/7 and DUI Courts.

**Description:** To reduce impaired driving on tribal roadways, in addition to regular high-visibility DUI enforcement saturation patrols and DUI sobriety checkpoints, Turtle Mountain is encouraged to further incorporate 24/7 program components and explore DUI court programs to effectively monitor hardcore DUI offenders. Most hardcore repeat DUI offenders are alcohol dependent and often unable to control their drinking and driving behavior. For this reason, these programs are proven effective in combating impaired driving.

**24/7 –** North Dakota’s 24/7 Sobriety Program provides an alternative to jail time for DUI offenders charged with or convicted of two or more or drunk driving offenses; first-time drunk driving offenders under the age of 18 are also required to participate in the 24/7 program. The program requires offenders to abstain from alcohol use and submit to sobriety testing twice per day through preliminary breath test (PBTs) or through continuous monitoring via a SCRAM; requiring sobriety 24 hours per day, 7 days per week. If the arrestee’s test registers any alcohol use then he or she is immediately taken into custody. If the arrestee fails to show for testing, his or her jail bond is revoked. An offender may participate in the 24/7 Sobriety Program as a condition of bond or pre-trial release and to participate in the program as a condition of sentence or probation.

**DUI Courts –** North Dakota’s four Drug/DUI Courts are hybrid courts; namely, they are drug courts that also work with DUI offenders. North Dakota Drug/DUI Courts are an effective tool to combat the hardcore impaired driver by using intensive supervision and treatment to change the offender’s behavior. DUI Courts use all the criminal justice stakeholders (judge, prosecutor, defense attorney, law enforcement, probation, and treatment) using a cooperative approach to change the offender’s behavior by meeting regularly as a team to discuss the status of each offender’s case and to assure that alcohol treatment and all sentencing requirements are satisfied. With the input of all parties, tribal judges are more informed and can immediately revise restrictions when necessary.

**Getting Started:**

- Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as impaired driving, in the SHSP.

- Enlist the support of tribal traffic safety stakeholders to conduct a proactive publicity and education campaign on 24/7 and DUI Courts to:
  - Educate tribal council members, tribal judges, prosecutors, defense attorneys, treatment officials and other concerned stakeholders of the importance of 24/7 and DUI court programs in combating hard core drunk drivers.
  - Educate the public on the nature of the impaired driving problem on the reservations and how these tools will provide necessary sanctions on the offenders as well as enhance the safety of all roadway users; and
  - Act as a general deterrent by putting potential offenders on notice that if they are arrested for impaired driving they may become subject to a highly supervised sanction with the costs and stigma associated with its use.
Explore the tribal adoption of ignition interlock devices preventing DUI offenders from operating a vehicle if the offender has been drinking. Before starting the vehicle, the driver must breathe into the device and if the driver’s breath alcohol reading is above a preset blood alcohol concentration (BAC) limit, the interlock device will not allow the vehicle to start. In North Dakota, the use of alcohol ignition interlocks is discretionary for all DUI offenders.

Implementation Resources:
- See Section 5.5, Traffic Safety Office Supporting Resources.
- For assistance with ND sobriety initiatives (24/7, DUI/Drug Courts) and for DUI data sources, contact ND Traffic Safety Resource Prosecutors:
  - Aaron Birst at aaron.birst@ndaco.org, 701-328-7342
  - Kristi Pettit Venhuizen at 701-780-9276
- For location information on ND DUI/Drug Courts, see: [http://ndadcp.org/courts.html](http://ndadcp.org/courts.html)
- For information on the North Dakota’s 24/7 Program: [http://www.ag.nd.gov/TwentyFourSeven/](http://www.ag.nd.gov/TwentyFourSeven/)
- For North Dakota road safety information including impaired driver facts sheets, issue briefs, and other education and outreach resources, visit the NDSU Rural Transportation Safety and Security Center (RTSSC) at: [http://www.ugpti.org/rtssc/resources/](http://www.ugpti.org/rtssc/resources/)
The NDSU Upper Great Plains Transportation Institute at: [http://www.ugpti.org/resources/](http://www.ugpti.org/resources/)
- Other impaired-driving safety resources:
  - Insurance Institute for Highway Safety: [http://www.iihs.org/research/topics/alcohol_drugs.html](http://www.iihs.org/research/topics/alcohol_drugs.html)

Turtle Mountain Priority Strategy – Expand the use of high-visibility DUI enforcement saturation patrols including sobriety checkpoints.

Description: High-visibility DUI enforcement is a high-priority, proven safety strategy to reduce alcohol-impaired severe crashes across the reservation. The most effective way to deter
impaired driving is through a highly visible enforcement effort to reinforce the tribal members’ belief that impaired drivers are at high risk of being arrested, prosecuted, and adjudicated. High-visibility enforcement consists of multiple jurisdictions and/or multiple squads patrolling a segment of roadway at the same time, often using brightly colored vests and signs. Planned enforcement is publicized extensively through tribal community kickoff events involving the media, social media, and public education campaigns about the enforcement. In addition to deterring driving after drinking by increasing the perceived risk of arrest, high-visibility enforcement extends the safety impact of the enforcement campaign for a longer period following the campaign.

**What are saturation patrols?**
Saturation patrols, also known as “dedicated DUI patrols,” are stepped-up enforcement involving a greater number of enforcement officers patrolling a specific area for a set time to identify and arrest impaired drivers. Multiple agencies often combine and concentrate their resources with a defined roadway segment to conduct saturation patrols.

**What are sobriety checkpoints?**
At sobriety checkpoints, tribal enforcement officials evaluate drivers for signs of alcohol or drug impairment at certain points on the roadway. Vehicles are stopped in a specific sequence, such as every other vehicle or every fourth, fifth, etc. The frequency of which vehicles are stopped depends on the traffic conditions and the number of enforcement personnel available to staff the checkpoint.

**Getting Started:**
- Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as impaired driving, in the SHSP.
- Explore enforcement saturation and high-visibility enforcement cooperative agreements through piloting limited weekend agreements between tribal police and ND Highway Patrol, BIA, and/or local sheriff and police to strengthen enforcement presence and community impact.
- Tribal law enforcement, together with Tribal behavioral safety and traffic engineering staff, attend Tribal Council and community leadership meetings to speak on the importance of reducing impaired driving and the important role of both enforcement and engineering safety strategies working together to save lives on Tribal roads.
- Utilize Traffic Safety Office’s DUI campaign materials to conduct community outreach on high-visibility enforcement campaigns.

**Implementation Resources:**
- For crash data to focus DUI enforcement efforts, contact the NDDOT Traffic Safety Office (TSO) at (701) 328-4692.
- To learn about traffic safety enforcement activities and enforcement grant opportunities, contact the TSO and the TSO Law Enforcement Liaison.
- See Section 5.5, Traffic Safety Office Supporting Resources.
• For statewide impaired-driving enforcement mobilizations, the TSO distributes media outreach materials to enforcement agencies, which may include press releases, talking points, camera-ready artwork and posters, impaired driving fact sheets, handouts for the public at checkpoints, a print public service announcement (PSA), and live-read radio PSAs. (Note: TSO to assemble available information resources.)

• For guidance on planning and publicizing saturation patrols and sobriety checkpoints:

• For information on the effective adjudication of DUI arrests and to inquire about DUI data sources, contact ND Traffic Safety Resource Prosecutors:
  - Aaron Birst at aaron.birst@ndaco.org, 701-328-7342
  - Kristi Pettit Venhuizen at 701/780-9276

• For North Dakota road safety information including impaired driver facts sheets, issue briefs, and other education and outreach resources, visit the NDSU Rural Transportation Safety and Security Center (RTSSC) at: [http://www.ugpti.org/rtssc/resources/](http://www.ugpti.org/rtssc/resources/)

  The NDSU Upper Great Plains Transportation Institute at: [http://www.ugpti.org/resources/](http://www.ugpti.org/resources/)

• Other impaired-driving safety resources:
  - Insurance Institute for Highway Safety: [http://www.ihs.org/research/topics/alcohol_drugs.html](http://www.ihs.org/research/topics/alcohol_drugs.html)
Turtle Mountain Region Priority Strategy – Educate and Enforce Zero Tolerance Laws for Drivers under Age 21

Description: Turtle Mountain has a zero tolerance standard for anyone under the age of 21 operating a motor vehicle. Under North Dakota’s “Use/Lose Laws,” when minors measure a BAC of 0.02 or above, there is loss of driving privileges. The North Dakota Highway Patrol receives and distributes Enforcement of Underage Drinking Laws (EUDL) funds provided by the North Dakota Department of Human Services (federal Office of Juvenile Justice and Delinquency Prevention [OJJDP] funding). These funds are used by the Highway Patrol and dispersed to local law enforcement to facilitate underage drinking enforcement efforts across the state. The Highway Patrol participates with local law enforcement in multiagency efforts to stop underage drinking and driving using the following strategies to enforce Zero Tolerance Laws:

- Cops in Shops
- Shoulder Tap Operations
- Party Patrol Operations
- Compliance Checks
- Underage Alcohol-Related Fatality Investigations

In addition, Turtle Mountain enforcement participates in the national impaired driving prevention campaign, Driver Sober or Get Pulled Over, to ensure high visibility enforcement including North Dakota’s zero-tolerance law for those under age 21.

In addition to enforcement, research demonstrates the primary role of parents in shaping their children’s decision to not drink. To support parents’ healthy influence, North Dakota’s comprehensive Parents LEAD (Listen, Educate, Ask, Discuss) program is a primary resource for local traffic safety partners to engage parents to discuss the topic of underage drinking on an ongoing basis with their younger and adult children. Finally, OJJDP program outreach also provides information on social hosting, parental involvement, and consequences of underage drinking.

Getting Started

- Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as impaired driving, in the SHSP.

- Inquire about and support Tribal enforcement efforts to actively enforce laws and programs that fight underage drinking. For example, when an underage drinker is involved in a traffic crash, find out how the youths obtained the alcohol, then hold whoever gave or sold it to them accountable.

- The TSO may offer grant funds for law enforcement to conduct alcohol compliance checks and server training programs; other communities conduct server training as required through city or county ordinances including Dickinson, Fargo, Grand Forks and Williston.

- The North Dakota Department of Human Services (DHS) administers funds from the Federal Office of Juvenile Justice and Delinquency Prevention (OJJDP) which allowed state and local law enforcement to deter underage drinking through various enforcement strategies (compliance checks, shoulder taps, saturation, and party patrols). OJJDP program
outreach also provided information on social hosting, parental involvement, and consequences of underage drinking.

**Implementation Resources:**
- To contact the North Dakota Safety Council for community resources, contact: Terry Weaver, Traffic Safety Coordinator, TerryW@ndsc.org, 701-751-6106
- To contact local public health unit addressing alcohol use/impaired driving issues, see state listing located at: [http://www.ndhealth.gov/localhd/lphu-directory.pdf](http://www.ndhealth.gov/localhd/lphu-directory.pdf)

**Enforcement Resources:**
- For enforcement training and technical assistance in most promising practices for law enforcement operations to reduce underage drinking, see the Underage Drinking Enforcement Training Center at: [http://www.udetc.org/LawEnforcement.htm](http://www.udetc.org/LawEnforcement.htm)

**Education Outreach Resources**
- For underage drinking laws and resources for parents on how to start and continue the conversation about alcohol use with their children, see the North Dakota’s Parents LEAD (Listen, Educate, Ask, Discuss) program at: [http://www.parentslead.org/](http://www.parentslead.org/)
- For information on MADD’s underage drinking programs and information resources such as Power of Parents, Power of You(th), PowerTalk 21, and Why 21? see MADD’s underage drinking website at: [http://www.madd.org/underage-drinking/](http://www.madd.org/underage-drinking/)
  Additional information provided by Students Against Destructive Decisions or SADD at: [http://www.sadd.org/u21toolkit.htm](http://www.sadd.org/u21toolkit.htm)
- For North Dakota road safety information including facts sheets, issue briefs, and other education and outreach resources, visit the NDSU Rural Transportation Safety and Security Center (RTSSC) at: [http://www.ugpti.org/rtssc/resources/](http://www.ugpti.org/rtssc/resources/)
  The NDSU Upper Great Plains Transportation Institute at: [http://www.ugpti.org/resources/](http://www.ugpti.org/resources/)
Turtle Mountain Priority Strategy – Strengthen alcohol compliance of liquor-providing establishments.

**Description:** Liquor-providing establishments include bars, restaurants, and retail (convenience and liquor) stores. Strengthening the compliance of alcohol-related laws by these establishments includes advocating for responsible alcohol server and retailer training and compliance checks along with promoting judicial monitoring of “last place of drink” for bar-related DUI offenders and notifying establishments of their over-serving.

Responsible alcohol servers engage in alcohol sales policies and practices that prevent or discourage restaurant and bar patrons from drinking to excess, which can prevent patrons from driving while impaired. Likewise, responsible servers and retailers do not sell to underage people (NCHRP, 2005). Mandatory training programs can teach servers how to recognize the signs of intoxication and how to prevent intoxicated patrons from further drinking and from driving. With this knowledge, servers can refuse additional alcohol sales and assist with arranging alternative transportation. Training can also decrease the likelihood that alcohol will be sold to people under the legal drinking age. To achieve maximum effectiveness, employee training must be supported and promoted by management policies and programs such as limits on cheap drinks and other promotions, support for designated driver programs, strong commitment to server training, and strong support for servers who refuse alcohol to intoxicated patrons. Strong advocacy for training and associated policies will help to encourage management support for and compliance with responsible beverage service practices.

Tribal enforcement officers can conduct frequent compliance checks to reduce the likelihood that servers and retailers sell alcohol to underage people. To conduct a compliance check, officers watch as underage people attempt to purchase alcohol and cite the server or retailer for a violation if a sale is made (NHTSA, 2013). Because an effective compliance check program works primarily through deterrence, the goal is to increase the perception of being caught by sellers and purchasers (NHTSA, 2013). Strong and continued advocacy for compliance checks will help reduce the likelihood that underage people have access to alcohol and the potential to drive while impaired.

“Last place of drink” is a program in which tribal enforcement officers record the establishment (bar or restaurant) where a person involved in a DUI incident consumed their last alcoholic beverage prior to driving (Kringen, Mikkelson, Nesbitt). Review of this documentation can highlight alcohol-related trends including day of week, time, and particular establishments that have the highest frequencies of serving the last drink. With this information, officers can better focus their efforts in both educating and enforcing retailers about their violations and work with them to improve their serving practices. More responsible beverage service could reduce the potential for alcohol-related crashes on the reservation.

**Getting Started:**
- Contact the NDDOT Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as speeding and aggressive driving, in the SHSP.
- Explore tribal ordinances requiring all liquor establishment owners, managers, and servers complete a standardized responsible beverage service training course as a condition for an...
alcohol retailer obtaining and maintaining a license (or permit). Note: Several North Dakota cities mandate server training within city limits.

- Promote tribal enforcement and on-sale liquor establishments identified as having higher levels of customer drinking and driving incidents to develop and implement preventative action plans.
- Support tribal enforcement to strengthen compliance checks of alcohol retailers for sales to underage patrons.

**Implementation Resources:**
- For a standardized curriculum for server training programs used by Safe Communities and law enforcement, contact the NDDOT Traffic Safety Office (701) 328-4692.
- For a sample presentation for responsible beverage service prepared by the Minnesota Department of Public Safety, Office of Alcohol and Gambling Enforcement Division, see: [https://dps.mn.gov/pages/Results.aspx?k=responsible%20beverage%20service%20training](https://dps.mn.gov/pages/Results.aspx?k=responsible%20beverage%20service%20training)
- For information about on-line responsible beverage service training and certification, see: [http://www.suresellnow.com/](http://www.suresellnow.com/)
- For descriptions of alcohol control policies to reduce youth access to alcohol from both social and commercial sources as well as links to resources including the *Alcohol Compliance Check Manual*, see: [http://www.aep.umn.edu/index.php/aep-tools/underage-access](http://www.aep.umn.edu/index.php/aep-tools/underage-access)
- For information on implementing a “last place of drink” program, contact Minnesota Department of Public Safety Alcohol and Gambling Enforcement Division: Brian Kringen, brian.kringen@state.mn.us

### 5.4.5 Speed and Aggressive Driving

**Turtle Mountain Priority Strategy** – Identify high-risk speed locations/corridors and conduct targeted enhanced, high-visibility speed enforcement.

**Description:** Identifying problem locations that have a high rate of speeding-related crashes are at the heart of an effective speed enforcement program. Enforcement and the associated public outreach efforts are most successful when deployed at specific locations or corridors and times when speeding is most likely to occur. Strengthened analysis of the following sources of data and information provides the focus needed for more effective, targeted enforcement and public outreach to reduce speed-related severe crashes:

1. Current and historical crash records and citation data
2. Engineering traffic and speed data
3. Law enforcement experience
4. Tribal council and member input

See Section 5.4.4 priority strategy, *Expand the use of high-visibility DUI enforcement saturation patrols including sobriety checkpoints*, for a full description of high-visibility/highly publicized enforcement campaigns.
North Dakota law enforcement agencies (state, county, city, and tribal) participate in the state’s cooperative enforcement programs to reduce speeding-related fatalities and incapacitating injuries by stepped up enforcement of aggressive drivers of cars and trucks primarily in oil-production-impacted counties. For aggressive driving enforcement, officers focus on drivers who commit a combination of moving traffic violations such as speeding, following too closely, and/or running red lights that endanger other persons or property.

**Getting Started:**
- Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as speed and aggressive driving, in the SHSP.
- Contact Tribal transportation engineering staff for assistance with analyzing crashes and traffic data to identify locations with speed and aggressive driving-related crash involvement for high-visibility enforcement.

Experience in other states suggests that rural road segments or corridors that have a higher density of road departure crashes have also been found to have a higher density for speed/aggressive driving and other behavioral-related crashes. Therefore, for suggested locations for enhanced enforcement, see tribal-specific priority locations for rural road segments at risk for lane departure in this report’s Chapter 4 Appendix. (Note: HSIP flex funds may be used for overtime enforcement at at-risk locations for lane departure.)

**Note on at-risk lane departure infrastructure safety strategies:** To reduce lane departure severe crashes on rural paved roads, the Turtle Mountain may be deploying infrastructure safety improvements (e.g., centerline rumble strips, edge line rumble strips, adding or widening edge lines, high visibility pavement markings) at select at-risk corridors. To maximize the expected safety benefit of the road improvements, integrating increased enforcement presence at targeted at-risk locations and timeframes will reduce risky driver behaviors through strengthening the public’s perceived risk of being stopped.

- Tribal law enforcement, together with tribal behavioral safety and traffic engineering staff, attend Tribal Council and community leadership meetings to speak on the importance of enforcing the speed limits and reducing aggressive driving and the importance of enforcement and engineering safety strategies working together to save lives on Tribal roads.
- Collaborate with highway patrol, local law enforcement, community health officials, and local traffic safety stakeholders to use NDDOT Traffic Safety Office speed campaign materials to conduct community outreach on the speed enforcement campaign.

**Implementation Resources:**
- For crash data and analysis to focus speed enforcement efforts, which may include the development of electronic pin maps of speed-related crash locations, contact the NDDOT Traffic Safety Office (TSO) at (701) 328-4692.
- To learn about local traffic safety enforcement initiatives and enforcement grant opportunities, contact the TSO and the state’s Law Enforcement Liaison at (701) 328-4692. Enforcement grant application information for overtime speed enforcement can be found at: https://www.dot.nd.gov/divisions/safety/trafficsafety.htm
• See Section 5.5, Traffic Safety Office Supporting Resources.

• For speed-related crash data by County, see: 2013 North Dakota Crash Summary see: http://www.dot.nd.gov/divisions/safety/docs/crash-summary.pdf

• For a successful model of data-driven traffic enforcement, see Washington State’s Target Zero Team project where planners use GIS mapping software to guide Target Zero patrols to where crashes were occurring and which roads led to high-collision areas at: http://www.wsp.wa.gov/targetzero/targetzero.htm#tzt

• For guidance on data-driven speed enforcement, see:
  NHTSA’s Speed Enforcement Program Guidelines at: http://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa09028/resources/Speed%20Enforcement%20Program%20Guidelines.pdf#page=1

• For guidance on law enforcement on planning and publicizing local speed saturation patrols and successful case examples, see NHTSA’s Guidelines for Developing a Municipal Speed Enforcement Program at: http://www.nhtsa.dot.gov/people/injury/enforce/program.htm

• For a summary of successful aggressive driving enforcement programs deployed at the local and state-level across the country, see NHTSA’s Aggressive Driving Enforcement: Strategies for Implementing Best Practices at: http://www.nhtsa.gov/people/injury/enforce/aggressdrivers/agenforce/

• Other speed-related safety resources:
  Insurance Institute for Highway Safety: http://www.iihs.org/iihs/topics/t/speed/topicoverview

• For North Dakota road safety information including speed facts sheets, issue briefs, and other education and outreach resources, visit the NDSU Rural Transportation Safety and Security Center (RTSSC) at: http://www.ugpti.org/rtssc/resources/
  The NDSU Upper Great Plains Transportation Institute at: http://www.ugpti.org/resources/

Turtle Mountain Priority Strategy – Explore pilot implementation of Tribal police automated speed enforcement in high-risk areas coupled with public education and outreach.

Description: To encourage compliance with posted speed limits and improve the efficiency and effectiveness of enforcing them, automated speed enforcement can be deployed simultaneously at multiple locations across the reservation. The devices are ideally located on high-speed roads
where speeding is a known issue and on roads where traditional traffic stops are difficult or dangerous. Automated speed enforcement is a tool that helps to maximize limited available tribal traffic safety enforcement resources on the reservation. Because the devices can operate 24 hours a day / 7 days a week, they enable BIA and/or tribal police to have a greater impact on improving traffic safety without increasing personnel or operating costs.

These devices, known as speed cameras or photo radar, record a vehicle’s speed using radar or some other type of speed measuring instrumentation. When the vehicle speed exceeds a threshold limit set by tribal staff and/or law enforcement (such as 10 miles per hour 10 mph over the posted speed limit), the camera takes a photograph of the vehicle license plate (NHTSA, 2013). The photograph and recorded data about speed, time, and date are electronically sent to tribal law enforcement personnel. Speeding citations can then be automatically issued to the vehicle owner (it is difficult to identify the driver from the photograph and, therefore, less effective to issue citations to the driver).

Studies conducted in the United States indicate that speed cameras are proven effective in reducing vehicle travel speeds (TRB, 2009). The cameras’ presence strengthens the public’s perception that if driving above a speed limit threshold, a speed citation will be issued. Studies suggest that a successful introduction of automated speed enforcement promotes public support (TRB, 2009). Therefore, it is suggested that tribal engineering and enforcement staff, explore pilot implementation of speed camera located where the public perceives speeding to be of greater concern, such as school crossings, work zones, and neighborhoods. Strong public education and outreach on the public safety benefits is critical for successful tribal community adoption of automated speed enforcement cameras.

**Getting Started:**

- Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as speeding and aggressive driving, in the SHSP.

- Tribal law enforcement and traffic safety engineering staff collaborate with NDDOT Traffic Operations Section to explore suggested pilot speed camera project locations from a traffic crash history perspective. Contact NDDOT Traffic Operations Section, Shawn Kuntz, (701) 328-2673.

- Tribal law enforcement, together with tribal behavioral safety and traffic engineering staff, attend Tribal Council and community leadership meetings to educate about the community safety benefits and to develop support for automated speed enforcement and the pilot application of the technology in high-risk tribal areas.

- Tribal law enforcement and traffic safety engineering staff to meet with tribal court personnel to promote understanding of automated speed technology, the pilot demonstration locations, and to promote the willingness to prosecute violators and the court’s upholding of charges and conviction of violators.

**Implementation Resources:**

- For supporting crash data and analysis to focus automated enforcement efforts, contact the NDDOT Traffic Safety Office (TSO) at (701) 328-4692.
• Work with NDDOT staff regarding specific design features of the system. Contact NDDOT Traffic Operations Section, Shawn Kuntz, (701) 328-2673.

• See Section 5.5, Traffic Safety Office Supporting Resources.


• Other speed-related safety resources:
  - Insurance Institute for Highway Safety: http://www.iihs.org/iihs/topics/t/speed/topicoverview

• For North Dakota road safety information including speed facts sheets, issue briefs, and other education and outreach resources, visit the NDSU Rural Transportation Safety and Security Center (RTSSC) at: http://www.ugpti.org/rtssc/resources/
  - The NDSU Upper Great Plains Transportation Institute at: http://www.ugpti.org/resources/

5.4.6 Young Drivers

Turtle Mountain Priority Strategy - Encourage tribal driver education providers (local schools and private providers) to require a parent education component

Description: Effective parental monitoring of teen driving can go a long way in helping to keep novice drivers safe on the roadway. Programs offering teen driver safety materials together with facilitated guidance help parents make the important connection between teen driving restrictions and teen driving risks. Without a required parent component for teen driver education, parents lack awareness of graduated driver license (GDL) safety provisions, don’t fully recognize teen driving risks, are often anxious to be relieved from shuttling their teens, may be reluctant to invest the necessary time to instruct and supervise their teen’s driving, and often believe their teen is the exception and is a good and safe driver. Incorporating a parent education component into driver education programs is demonstrating promising results in overcoming these parent challenges and more effectively engaging parents.

Key components of a good parent education program include:

• Discusses risks for novice teen drivers
• Explains how and why GDL works to address the driving risks for young drivers
• Reviews the critical role parents play in teaching, supporting, and managing their novice drivers
- Explains the importance of and provides an opportunity to try out a parent/teen driving agreement
- Delivery by trained, educated facilitators
- Emphasizes parents and teens working together for safety

**Getting Started:**

- Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as young drivers, in the SHSP.

- With local law enforcement and driver educators, Tribal Council and community leadership meetings to promote the tribal initiative to incorporate parent education into driver education programs to more fully engage parents and reduce severe young driver crashes.

- Post information on teen driving laws on tribal school websites or request school resource officer to send information to parents highlighting driving risks for teens and existing North Dakota teen driver laws.

- Consider linking parent-teen participation in a teen-driving program to school parking privileges.

**Implementation Resources:**

- See Section 5.5, Traffic Safety Office Supporting Resources.

- For educational materials for parents of teen drivers including guidelines to ensure teen drivers are educated on safe driving practices as well as *The North Dakota Parent Guide to Teen Driving* and the *Parent Teen Driver Agreement*, see the Teen Drivers & Parents section of the NDDOT website: [http://www.dot.nd.gov/divisions/safety/teens-parents.htm](http://www.dot.nd.gov/divisions/safety/teens-parents.htm)

- For a free mobile app for parents and teens to automatically track and log their supervised driving and includes tracking night driving, type of roads traveled and weather conditions, see: [http://www.roadreadyapp.com/](http://www.roadreadyapp.com/)


- The Minnesota Office of Traffic Safety developed, *Point of Impact: Teen Driver Safety Parent Awareness Program*, as a community-based class for parents and their soon-to-be teen drivers. The Point of Impact Leader’s Guide is a resource for implementing the class. The Point of Impact video is an important component of the program. A PowerPoint presentation and other information are available by contacting Gordy Pehrson at gordy.pehrson@state.mn.us.


For age-specific information and resources for parents on how to start and continue the conversation about alcohol use with their children, see the North Dakota’s Parents LEAD program (Listen, Educate, Ask, Discuss).  [http://www.parentslead.org/](http://www.parentslead.org/)

For PowerPoint presentations, parent/teen activities and other tools to be adopted for driver education providers, see Teendriversource: Research Put into Action.  [www.teendriversource.org](http://www.teendriversource.org)

For information on Teen Driving Parents/Alive at 25 that includes a 1-hour parent, 4-hour teen driving program including a comprehensive publication, Teen Driver; A Family Guide to Teen Safe Driving.  [http://www.nsc.org/products_training/Products/MotorVehicleSafety/Pages/TeenDriving.aspx](http://www.nsc.org/products_training/Products/MotorVehicleSafety/Pages/TeenDriving.aspx)


For information on Parents are the Key and free downloadable resources that can be customized.  [www.cdcgov/ParentsAreTheKey/](http://www.cdcgov/ParentsAreTheKey/)

Other young driver-related safety resources:


Insurance Institute for Highway Safety:  [http://www.ilhs.org/ilhs/topics/t/speed/topicoverview](http://www.ilhs.org/ilhs/topics/t/speed/topicoverview)

For North Dakota road safety information including speed facts sheets, issue briefs, and other education and outreach resources, visit the NDSU Rural Transportation Safety and Security Center (RTSSC) at:  [http://www.ugpti.org/rtssc/resources/](http://www.ugpti.org/rtssc/resources/)

The NDSU Upper Great Plains Transportation Institute at:  [http://www.ugpti.org/resources/](http://www.ugpti.org/resources/)

**Turtle Mountain Priority Strategy – Promote safe teen driving outreach.**

**Description:** In addition to following traditional rules for operating and navigating vehicles on roadways, safe teen driving includes complying with driver behavior norms such as being
Outreach to teen drivers and passengers is necessary to educate them about transportation safety issues and their potential consequences, and to encourage compliance with safe driving practices. Several materials, messages, and campaigns have been developed at a national level for use in teen outreach. However, to be effective, these materials need to be modified so the outreach effort is relevant to the Turtle Mountain culture.

Considerations for Tribal traffic safety outreach activities include: (1) culturally appropriate media activities, including news releases, news conferences, live radio and television remotes, television and radio interviews, etc., (2) culturally appropriate internet marketing activities, including blogging, postings to social networking websites like Facebook, email blasts, etc., and (3) other culturally appropriate public awareness activities, such as partnerships with local entities pertinent to the target populations including businesses, sports venues, health and social services programs, community and faith-based organizations, and other locally identified venues that would appropriately advance the campaign messages.

Outreach can be conducted by stakeholders associated with these activities, law enforcement, school administrators, and parents/family members. Successful teen driving outreach necessarily includes outreach to parents and adult family members so they understand the critical role they can play in their teen’s safe driving practices. When parents/family members set, monitor and enforce safe driving practices, teens are less likely to crash or violate the law. Teens are more likely to drive safely if they have involved parents/family members that set high expectations and continue to educate and encourage their safe driving practices.

“Code for the Road” is a traffic safety campaign developed by the state of North Dakota. The campaign encourages drivers to police themselves about following the rules of the road and engaging in safe driver behaviors. To provide additional emphasis to teen drivers, high school activity ads, posters, web banners, and fact sheets were created to convey the message. Also, national materials (such as billboards, posters, and brochures) can be tailored to the Turtle Mountain culture by using local leaders or community members and local artistry to deliver the safety messages. Community members have the knowledge to develop materials that will connect with their teens.

Getting Started:
- Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as speeding and aggressive driving, in the SHSP.
- Establish a committee of tribal teen safety stakeholders for the purpose of modifying national and state teen driver outreach materials to be culturally relevant.

Implementation Resources:
- Contact other tribes that have implemented transportation safety programs for young drivers, such as the Turtle Mountain Sioux Tribe and the Rosebud Sioux Tribe.
• For North Dakota’s traffic safety education campaign, *Code for the Road*, providing extensive resources for safety stakeholders to help cultivate a stronger traffic safety culture, see: [http://www.ndcodefortheroad.org/about/](http://www.ndcodefortheroad.org/about/)

• For a proven, peer-to-peer outreach program, *Teens in the Driver Seat*, addresses risky driving behaviors of teens and relies on teens developing and delivering traffic safety messaging to their peers, see: [http://www.t-driver.com/](http://www.t-driver.com/)

• For information about parental involvement in preventing teen substance abuse and impaired driving in North Dakota, see [http://www.parentslead.org/](http://www.parentslead.org/)


• For information about teen driving and resources from the National Highway Traffic Safety Administration, see [http://www.nhtsa.gov/Teen-Drivers](http://www.nhtsa.gov/Teen-Drivers)

### 5.4.7 Unbelted Occupants

**Turtle Mountain Priority Strategy** – *Conduct highly publicized enforcement campaigns to maximize Tribal restraint use.*

**Description:** See Section 5.4.5 for a description of high-visibility/highly publicized enforcement campaigns.

North Dakota law enforcement agencies (state, county, city, and tribal) participate in the state’s *Click It or Ticket* mobilization program to boost seat belt use and reduce highway fatalities through stepped up enforcement of unrestrained occupants. The mobilization is supported by national and local paid advertising and earned media campaigns aimed at raising awareness before the enforcement saturation. North Dakota conducts four annual *Click It or Ticket* campaigns—including participation in the national campaign in May around the Memorial Day holiday. North Dakota has increased its focus on nighttime seat belt use because fewer motorists buckle up at night resulting in a greater number of nighttime severe-injury crashes.

**Getting Started:**

• Contact the Traffic Safety Office (TSO) to participate in the SHSP process as a stakeholder in the implementation of strategies identified for priority safety emphasis areas, such as unbelted crashes, in the SHSP.

• Contact Tribal transportation engineering staff for assistance with analyzing crashes and traffic data to identify locations with unbelted occupant-speed related crash involvement for high-visibility enforcement.

• Tribal law enforcement, together with tribal behavioral safety and traffic engineering staff, attend Tribal Council and community leadership meetings to educate about the community safety benefits and to strengthen support for tribal seat belt enforcement and the issuing of citations for lack of belt use.

• Collaborate with tribal enforcement, community health officials, and local traffic safety stakeholders to use TSO seat belt use campaign materials to conduct community outreach on the enforcement campaign.
Implementation Resources:

- For crash data and analysis to focus seat belt enforcement efforts, contact the NDDOT Traffic Safety Office (TSO) at (701) 328-4692.

- To learn about local traffic safety enforcement initiatives, secondary enforcement strategies, and enforcement grant opportunities, contact the TSO and the state’s Law Enforcement Liaison at (701) 328-4692. Enforcement grant application information for overtime belt enforcement can be found at: [https://www.dot.nd.gov/divisions/safety/trafficsafety.htm](https://www.dot.nd.gov/divisions/safety/trafficsafety.htm)

- See Section 5.5, Traffic Safety Office Supporting Resources.

- For statewide belt use mobilizations, the TSO distributes media outreach materials to local enforcement agencies which may include: press releases, talking points, camera-ready artwork and posters, belt-use fact sheets, a print public service announcement (PSA), and live-read radio PSAs. *(Note: TSO to assemble available information resources.)*

- For information on strategies and recommendations for effective enforcement of secondary belt use:
  
  How States Achieve High Seat Belt Use Rates  


- For guidance on planning and publicizing belt-use saturation patrols:
  
  NHTSA 2014 national seat belt enforcement *Products for Enforcement Action Kit (PEAK)* to help enforcement rally officers and alert the public to prepare for maximum high-visibility seat belt enforcement during the day and also at night.  
  [http://www.trafficsafetymarketing.gov/CIOT-PEAK](http://www.trafficsafetymarketing.gov/CIOT-PEAK)


  For the above and other belt enforcement and information outreach resources:  
• For North Dakota road safety information including facts sheets, issue briefs, and other education and outreach resources, visit the North Dakota State University (NDSU) Rural Transportation Safety and Security Center (RTSSC) at:
  http://www.ugpti.org/rtssc/resources/

  The NDSU Upper Great Plains Transportation Institute at:
  http://www.ugpti.org/resources/

• Other seat-belt safety resources:
  Center for Disease Control and Prevention seat belt briefing:
  http://www.cdc.gov/motorvehiclesafety/seatbeltbrief/

  Governor’s Highway Safety Administration:

  The NDSU Upper Great Plains Transportation Institute at:
  http://www.ugpti.org/resources/

5.4.8 Cross-Cutting Safety Strategy

Turtle Mountain Priority Strategy – Tribal Enforcement Use of Traffic and Criminal Software (TraCS)

Description: The analysis of timely, complete, and accurate tribal crash data provides the ability of tribal traffic safety enforcement, engineering, road maintenance, and driver behavior professionals to more accurately and clearly identify severe crash patterns and safety issues. Equipped with crash data-driven problem identification, tribal traffic safety team members can more effectively: 1) identify safety strategies having the greatest potential to reduce severe crashes, 2) focus limited resources on priority safety investments, and 3) better determine effective strategy implementation plans to achieve the expected safety impact—reduced fatalities and severe injuries on reservation roadways.

A reliable and complete tribal crash database begins with data collected from crash reports at the time of the incident when a crash involves fatalities, injuries, or at least $1,000 in property damage. More often, this crash information is collect by tribal enforcement officers, but depending on tribal procedures, may also be collected by emergency response personnel such as fire or ambulance staff.

A single and standardized, easy-to-use, in-the-field electronic reporting system is the best means for crash data collection and provides a mechanism for important crash data sharing, based on established Memorandum of Understandings, for more complete analysis of critical crash patterns and trends within Turtle Mountain, across the state of North Dakota, and other tribal communities in North Dakota and in the nation.

The NDDOT, together with the National Highway Transportation Safety Administration (NHTSA) and the Federal Highway Administration (FHWA), supports through grant funds, the installation of Traffic and Criminal Software or TraCS through and provides technical assistance and training to local agency and tribal law enforcement to effectively deploy TraCS for in-the-field incident reporting.
Getting Started:
- Contact the NDDOT Traffic Safety Office for further information on TraCS and the available tribal support for TraCS installation, training and on-going technical assistance.

- Explore creating a Memorandum Of Agreement (MOA) on crash reporting among Turtle Mountain and the State of North Dakota DOT and the Highway Patrol to exchange crash data between the tribe and the state to improve highway safety.

- Strengthen training for law enforcement officers on tribal lands on crash reporting including its role in traffic crash problem identification and the determination and implementation of safety strategies.

Implementation Resources:
- See Section 5.5, Traffic Safety Office Supporting Resources.

- For an overview of crash reporting and data sharing challenges and recommendations, see Improving Crash Reporting Study of Crash Reporting Practice on Nine Indian Reservations at: http://www.ttap.mtu.edu/library/ImprovingCrashReportingStudyofCrashReportingPractice-NineIndianRes.pdf

- For information offering guidance for state agencies and tribal leaders on effective crash Reporting, see NCHRP Report 788: Guide for Effective Tribal Crash Reporting, at: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_788.pdf

5.5 Traffic Safety Office Supporting Resources

Unless otherwise indicated, for technical assistance and supporting resources contact the NDDOT Traffic Safety Office (TSO) at (701) 328-4692.

5.5.1 TSO Grant Program Application Process

The TSO solicits grant applications from eligible state, local, and tribal agencies and for-profit and non-profit organizations that address North Dakota’s problem solution plans or PSPs. PSPs reflect the state’s greatest opportunities for behavioral safety improvement. Grant applications are due June 30th of each year and are evaluated based on: (1) response to identified problems, (2) proposed evidenced-based strategy, (3) clear objectives, (4) comprehensive evaluation plans, and (5) cost-effective budgets. Selected projects are included in TSO’s Highway Safety Plan and once approved by NHTSA, grant contracts are generally effective October 1 through September 30th.

5.5.2 Technical Assistance

County Outreach Program

The TSO, in cooperation with the North Dakota Association of Counties, offers a county-based Traffic Safety Outreach program to provide advocacy and community mobilization, media support, public outreach, and training to address seat belt use, impaired driving, speeding, and distracted driving at the county level. County participants include county employees, county officials, law enforcement, transportation engineering, public health, schools, businesses, nonprofit agencies, media, and other entities.
5.5.3 Traffic Records/Crash Data

Traffic and Criminal Software or TraCS

The quality of traffic safety problem identification and decision-making regarding effective safety strategies and their implementation is based on the quality and timeliness of crash data.

To assist law enforcement in providing timely, complete, and accurate crash reports, the NDDOT Traffic Safety Office (TSO) supports the installation of Traffic and Criminal Software or TraCS and provides technical assistance and training to local agency and tribal law enforcement to effectively deploy TraCS for in-the-field incident reporting.

Local and tribal enforcement agencies are strongly encouraged to utilize the convenience of TraCS for the electronic submission of crash reports to the NDDOT. Key benefits to participating agencies and tribes are the reduced officer time and effort required for duplicate entry into local and state crash databases, reduced need for data entry resources and administrative support, as well as improving the overall quality and timeliness of the crash report.

Annual Crash Summary

The NDDOT annually publishes the Crash Summary to identify and describe the annual crash data and historical crash trends in North Dakota including the description of factors contributing to the occurrence of traffic crashes and the resulting injuries and fatalities. The Crash Summary is a valuable reference resource for local agencies and their safety partners for problem identification, safety strategy planning, targeted strategy implementation, program evaluation, and media inquiries, and is located at:
References


