

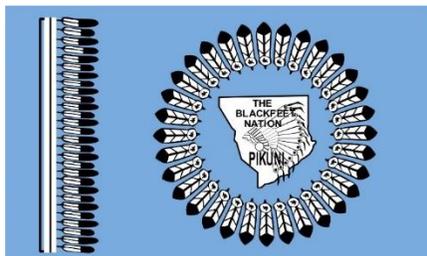
BLACKFEET NATION

2014 TRIBAL TRANSPORTATION

SAFETY PLAN

Developed thru the Blackfeet Tribal Transportation Department

Prepared by KLJ Engineering



EXECUTIVE SUMMARY

From 1996 to 2012, there were nearly 150 fatalities and over 1000 injuries in traffic crashes on the Blackfeet Indian Reservation. To combat these issues, a Tribal Transportation Safety Plan was developed in 2008. This plan identified a number of strategies to reduce these terrible events, including; establishing a safety committee, implementing a primary seat belt law and support for the Safe On All Roads (SOAR) Coordinator. Progress has been shown as overall crashes, injuries and deaths due to traffic crashes are down on the Blackfeet Reservation, but are still far too high.

In 2014 the Blackfeet Tribe undertook efforts to update this initial plan. This update culminated with a meeting where Tribal, state, federal and interested parties came together to review the existing data, ongoing safety efforts and to identify new or continuing strategies to improve transportation safety in Blackfeet communities. These strategies were prioritized around the 4E's of safety and included:

Education

- **Develop a “Healing from the Pain” Video**
- **Establish a “Sober Behind the Wheel” License Plate**
- **Develop a Young Drivers Education Program**
- **Participate in a Multi-Tribe Arrive Alive Campaign**

Enforcement

- **Implement an Electronic Crash Records System**
- **Provide Tribal Highway Safety Officer(s)**
- **Develop a Social Host/Responsible Server Program**
- **Increase Montana Highway Patrol Presence on the Reservation**
- **Develop a Cross Jurisdictional Agreement**
- **Develop an Enforcement Team for Livestock Removal**

Engineering

- **Continue Utilizing Road Safety Audits on BIA Routes**
- **Install Livestock Fencing**
- **Install Mile Markers on BIA Routes**

Other

- **Implement an ATV Ordinance on the Blackfeet Reservation**
- **Join the Northern Tribes DUI and Drug Task Force**

BACKGROUND

The Blackfeet Reservation encompasses one and a half million acres in northwest Montana and is bordered by Canada to the north and Glacier National Park to the west. The reservation is home to about 7,000 of the 15,560 enrolled tribal members. There are three branches of the Blackfeet peoples, the Northern Blackfeet or Siksika, the Blood and the Piegan or Pikuni.

While the main uses of the land in the area are for agriculture and ranching, with Glacier National Park bordering the reservation, nearly two million visitors travel thru or on portions of the reservation each year. With over 653 BIA and Tribal road miles, the safety of the tribal transportation system is an important factor for these visitors and residents.

A Tribal Transportation Safety Management Plan is a community based, multi-disciplinary approach to identify transportation safety issues and potential implementation strategies with the goal of improving transportation safety on Tribal Lands. The Federal Highway Administration describes them as:

“Tribal Transportation Safety Plans are a tool used to identify and address transportation risk factors that have a potential of leading to serious injury or death. Safety Plans also organize the efforts of a variety of entities to more effectively reduce risk and can cover multiple transportation modes (roads, maritime, trails, air travel, and others). Safety plans may lead to implementation of a project or program, renewed efforts in an existing program, or further study of a roadway section (using an engineering study or Road Safety Audit).

A Tribal Safety Plan should not be developed with a focus on any one funding source. Instead, a Tribal Safety Plan should demonstrate the safety concerns in a community and the strategies that will be explored to implement the plan. To the greatest extent possible, the concerns demonstrated by a safety plan should be selected based on incident history (data). Data allows funding entities to understand the needs and may even compel the funding of the community's needs. Safety Plans can provide a forum for utilizing data sets that are not otherwise considered by funding agencies such as public testimony when formal crash data does not exist”.

The benefits of developing safety plans has been well documented and include the opportunity to leverage resources, work toward a common goal, consider all road users and have reduced deaths and injuries in tribal and other communities.

In 2008 the Blackfeet Nation developed a Safety Management Plan to coordinate and focus the transportation safety efforts that were occurring on the Reservation and to identify additional strategies that if implemented, could reduce fatal and injury crashes. The plan was developed by a group of Tribal, state and federal safety professionals, and other interested parties from the Blackfeet community. This 2008 plan identified a number of existing programs, but highlighted the following ones:

- The Tribe, in association with the Montana Department of Transportation (MDT) has developed a Safe on all Roads (SOAR) program on the Blackfeet Reservation with a local coordinator.
- The Tribe has passed an ordinance banning domestic livestock from highway rights of way, or they will be removed by the tribe.
- A Medicine Wheel for family members that have lost family due to alcohol use is being dedicated this summer.
- All school bus drivers have been sent to Lewistown for the defensive driving class.
- The Tribe has implemented a Secondary Seatbelt Ordinance.
- MDT is completing maintenance reviews of all the state highways on the reservation.
- A grass roots group – “Concerned Citizens for Traffic Safety” has been formed on the reservation.

In addition to these ongoing activities the group also identified strategies that it was believed, if implemented, could assist in further reducing crashes. These included:

- Establish a Safety Committee
- Provide Education and Training Materials for Pedestrians
- Continue and Expand DUI and Seatbelt Campaigns
- Review the Advance Warning Signs for School Bus Stops
- Review the Crosswalk Locations in Browning
- Review the Access and Pedestrian Accommodations at the Tribal College
- Create PSA’s on Transportation Safety with Local High School Students
- Develop a Sober Behind the Wheel License Plate
- Develop an ATV Ordinance

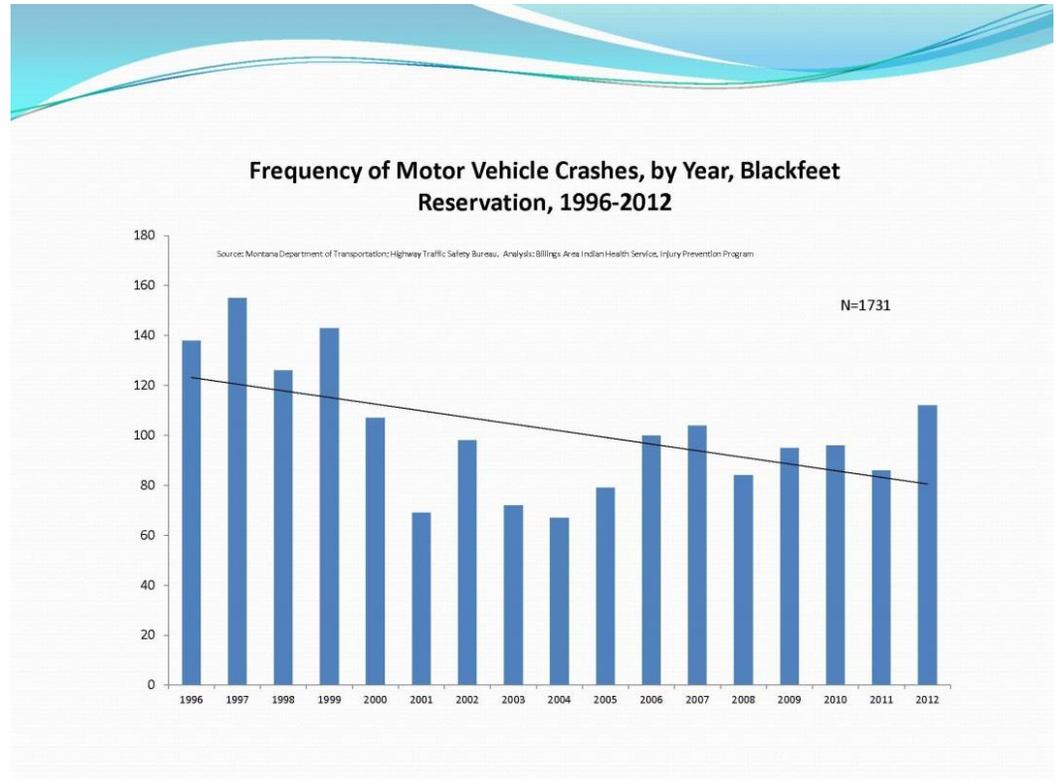
While this plan was a good start for the Blackfeet Tribe and current data shows that injuries and fatalities have been dropping since its implementation, the plan was not heavily data driven and was beginning to stagnate and an update was needed. To assist with this update, the Blackfeet Tribal Transportation Program applied to and received funding from the Tribal Transportation Program Safety Funding.

BLACKFEET RESERVATION DATA ANALYSIS

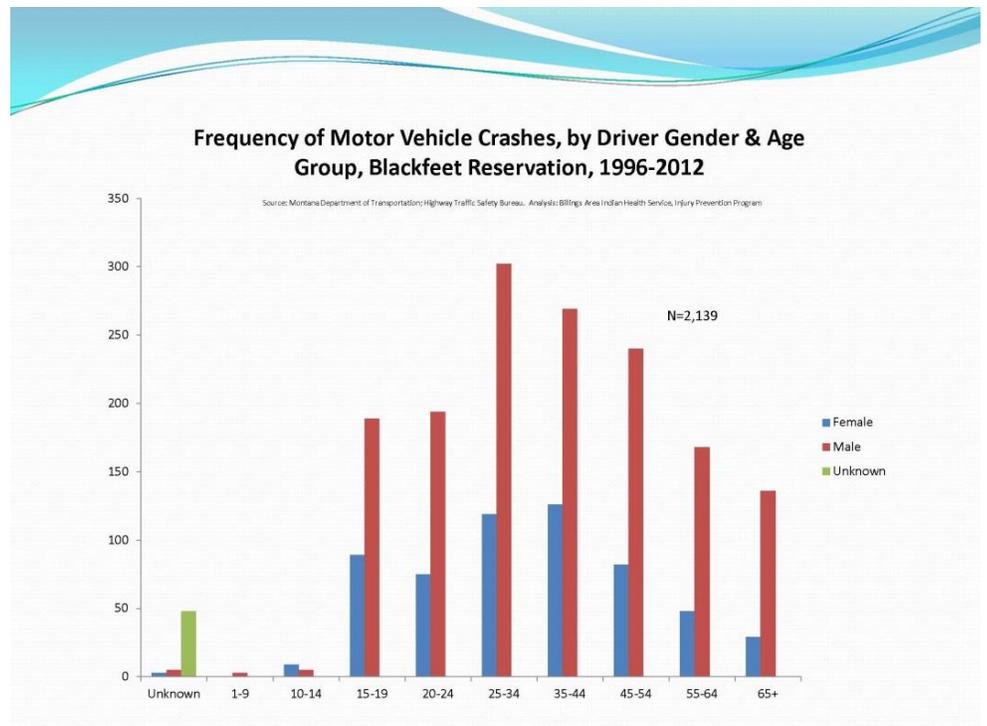
One of the important factors in the development of a Tribal Safety Plan is that available crash data is analyzed and utilized in the identification of issues and development of strategies. This data is also an important resource as tribes apply for federal and state safety funding, as many if not all of these request data to support the grant application. The 2008 plan used personal knowledge of where crashes were occurring, but had no statistical data. For the 2014 update, the Billings Area Indian Health Service Office did an extensive data mapping and analysis project of MDT crash data that has been utilized and is presented in summary form in this plan. One of the short comings of this analysis is that the data contained limited crash information for investigations by Tribal Police, however, the Montana Highway Patrol is called in for all major injury of fatal crashes on the reservation, so this data is more complete.

OVERALL CRASHES

From 1996 until 2012 there were over 1700 crashes on the Blackfeet Reservation according to the MDT data. The chart below shows that the overall trend is in a downward direction, but over the last few years has stabilized. The data also showed that overwhelmingly these crashes were single vehicle crashes that occurred during clear, daylight hours and on dry roadways.



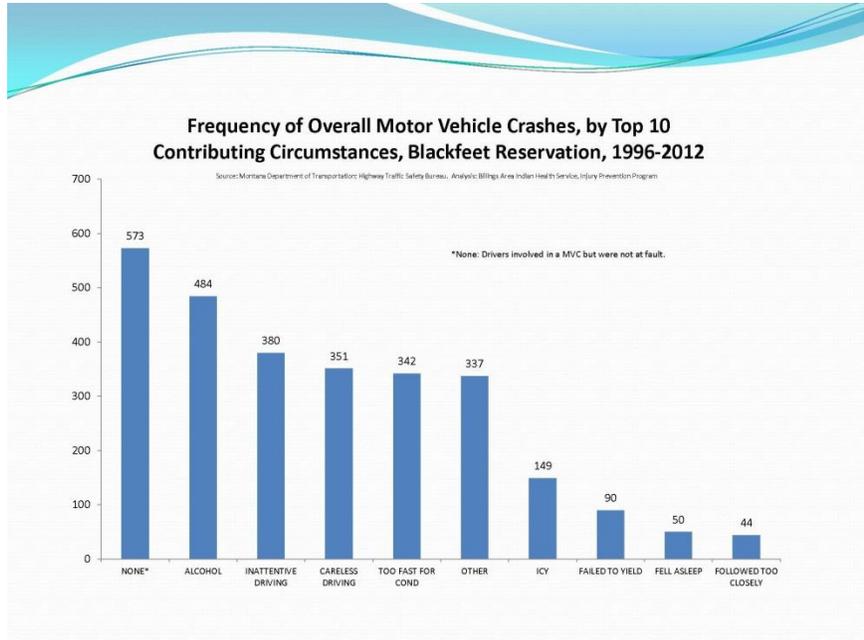
As has been seen in many tribal and non-tribal communities, male drivers are overwhelmingly involved in the crashes that are occurring on the Reservation. Historically, the largest proportion of these crashes are in the 15-44 year old age group, and while this is true for the Blackfeet data, the 45-54 year old age group is also significantly high. This may lead to education or training activities that would target this group as well, and not just younger drivers.



These crashes were all primarily the result of driver error or inattention with alcohol involvement and inattentive and careless driving as the predominant contributing circumstances. Speeding was also identified on a frequent basis. The large none category does not necessarily mean that there were not

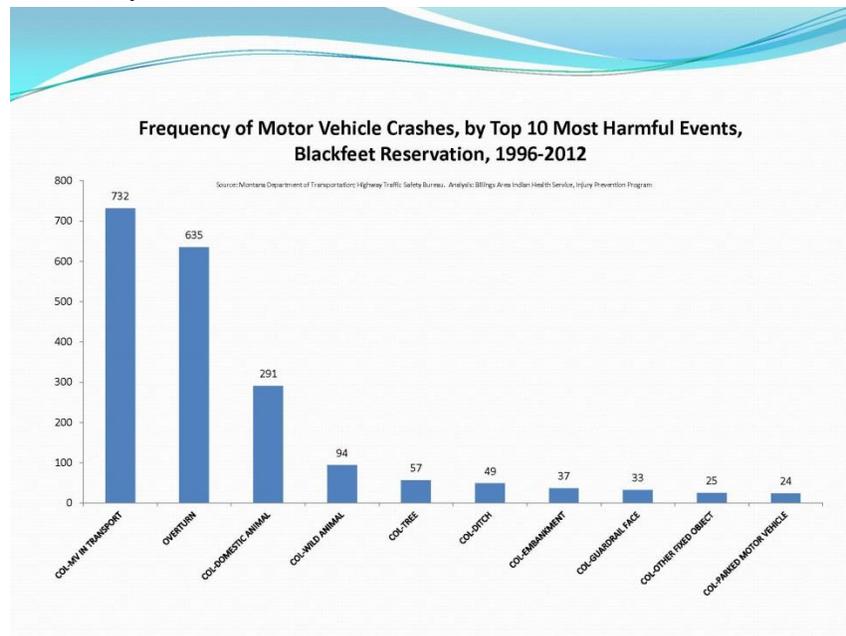
contributing circumstances, but that the officer did not code one on the crash report. While icy roads did show up in a fair number of crashes (149) it was the only roadway factor that was cited and no vehicle related issues were cited specifically enough times to show as an individual factor.

In contrast to the multiple contributing factors, the ten most harmful events can



essentially be reduced to three.

These would be collisions with another vehicle, single vehicle

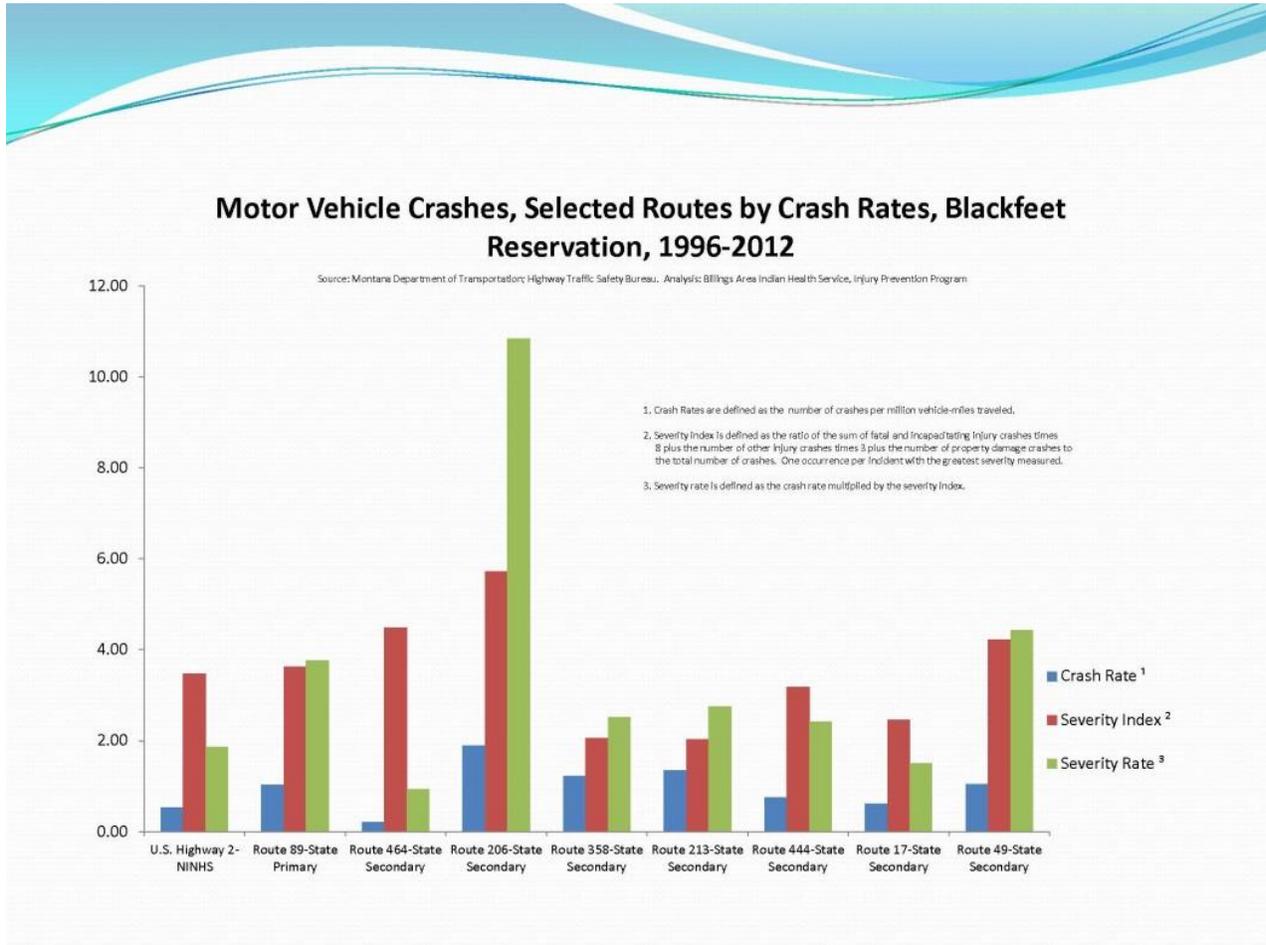


overturning crashes and collisions with an animal. If the domestic and wild animal crashes are combined, the total crashes would approach 400. Roadway and roadside crashes with fixed objects, roadway features and safety hardware do all show up in the data, but as can be seen below, these are significantly lower than these top three issues. Even though statistical data was not available when the 2008

plan was developed, it can be seen why the tribe at that time included the tribal ordinance to eliminate domestic livestock from roadways.

While the largest number of crashes are occurring on US 2 and US 89, the two main state highways that traverse the Blackfeet Reservation. This is not unexpected, as these routes carry significantly more traffic than the secondary roadways or BIA routes. By analyzing the data by crash and severity rates rather than just number, route 464, route 206 and route 49 all show severity characteristics that would indicate further review is needed. A map is included in

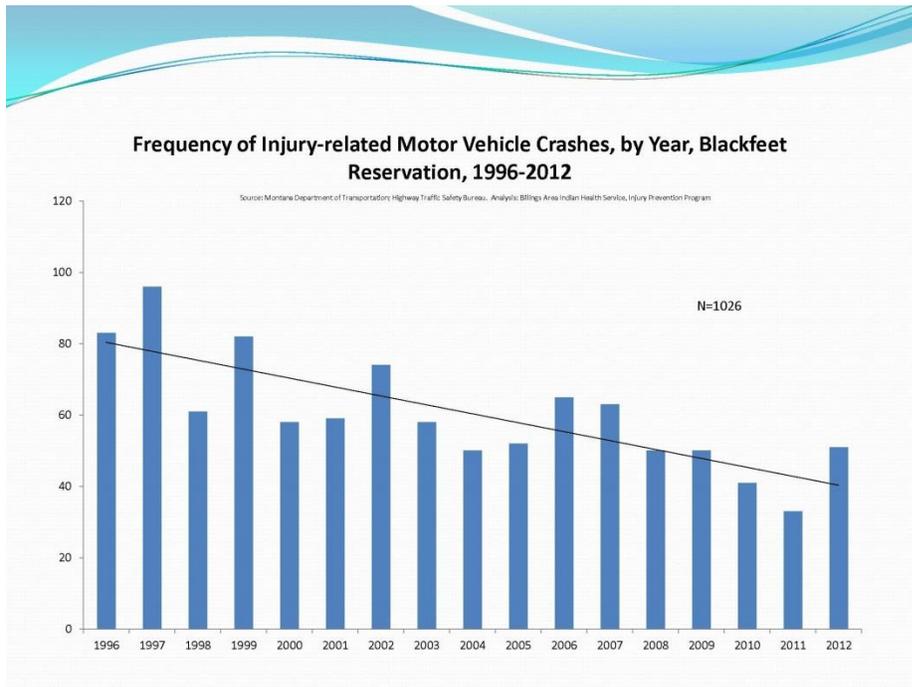
Attachment C that graphically shows a plotting of severe crashes on routes across the reservation.



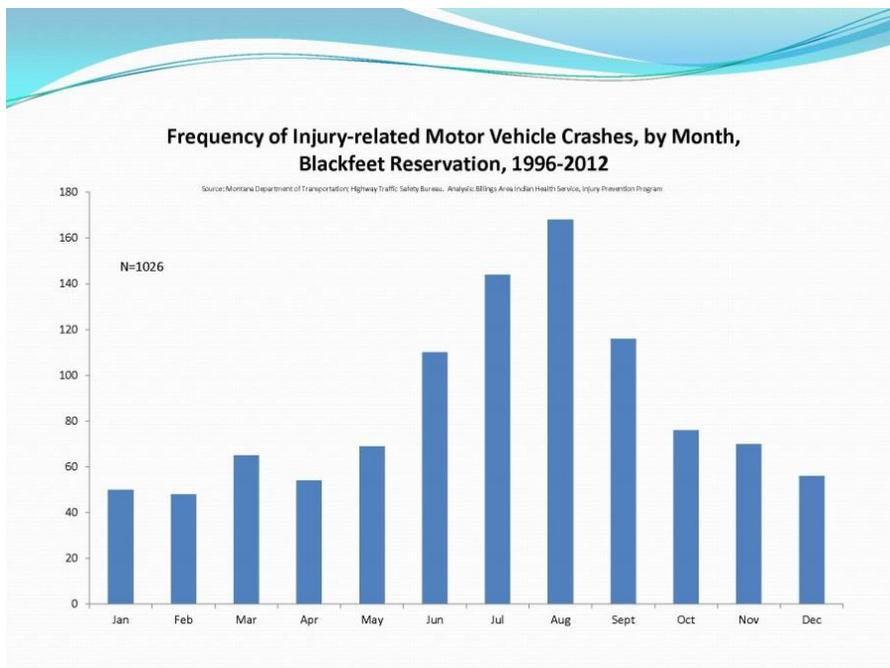
Route 464, commonly known as Duck Lake Road, shows a very high severity index, with a low severity rate. This would mean that while there are not a large number of crashes on this route as compared to the ADT, but the ones that are occurring are generally much more severe, resulting in fatalities and/or incapacitating injuries. Route 206 or Starr School Road and Route 49, Looking Glass Road both have an elevated severity rate and severity index. This is the result of the higher traffic volumes and the crashes frequently resulting in fatalities and/or injuries. This data was utilized during the development of the plan to identify routes that need or have had Road Safety Audits performed and to discuss engineering strategies.

INJURY CRASHES

As with the overall crashes, the general trend in the number of injuries had been in a downward



direction. It also has a steeper downward slope, meaning that currently injuries are going down at a faster pace. This could be due to a number of reasons, such as increased seat belt use, safety check points and the efforts of the SOAR Program. While this is a good trend, it still needs to be noted that in the analysis period from 1996 to 2012 there were still over



1000 injury crashes on the Reservation. This is a significant number considering the rural nature and relatively low population of the area. The data does not distinguish between tribal member or non-tribal member, so there is some effect of the amount of tourist traffic that occurs in the summer, and is shown in the month of year graph below.

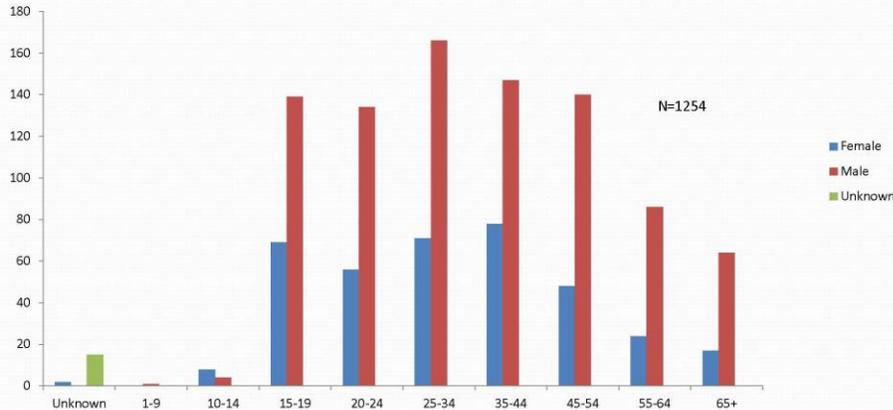
While the spike is not unexpected, the number of injuries that are occurring overall is still substantially high. Similar to

the overall crash data, the crashes are primarily single vehicle crashes occurring on dry pavement

with clear weather conditions. While the majority (750) are occurring during daylight conditions, the number occurring at night increases significantly over overall crashes, with 438. Also similar to the overall crash trends, the majority of the crashes are male drivers and the age of those injured continues to

Frequency of Injury-related Motor Vehicle Crashes, by Driver Gender & Age Group, Blackfeet Reservation, 1996-2012

Source: Montana Department of Transportation Highway Traffic Safety Bureau. Analysis: Billings Area Indian Health Services, Injury Prevention Program

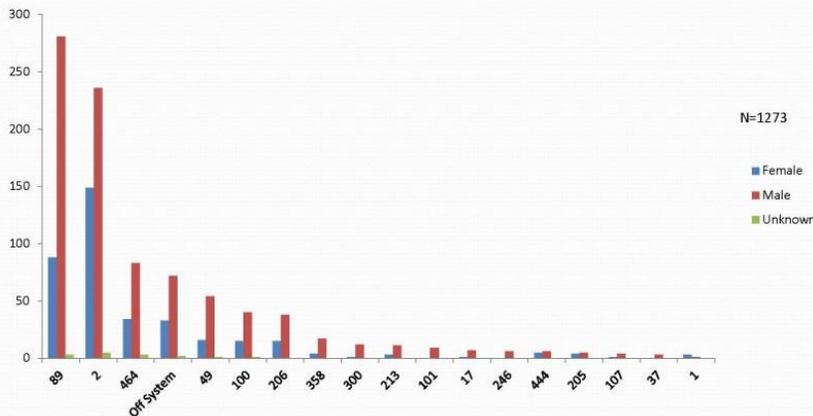


be those between 15 and 54. The trend for these closely matches overall crashes with the one minor exception that the younger ages 15-24 are slightly higher in proportion to the other age groups. This would indicate they are being injured at a slightly higher rate.

This could be due to lower seat belt use and higher speeds, but no definitive information was available.

Frequency of Injury-related Motor Vehicle Crashes, by Driver Gender & Location, Blackfeet Reservation, 1996-2012

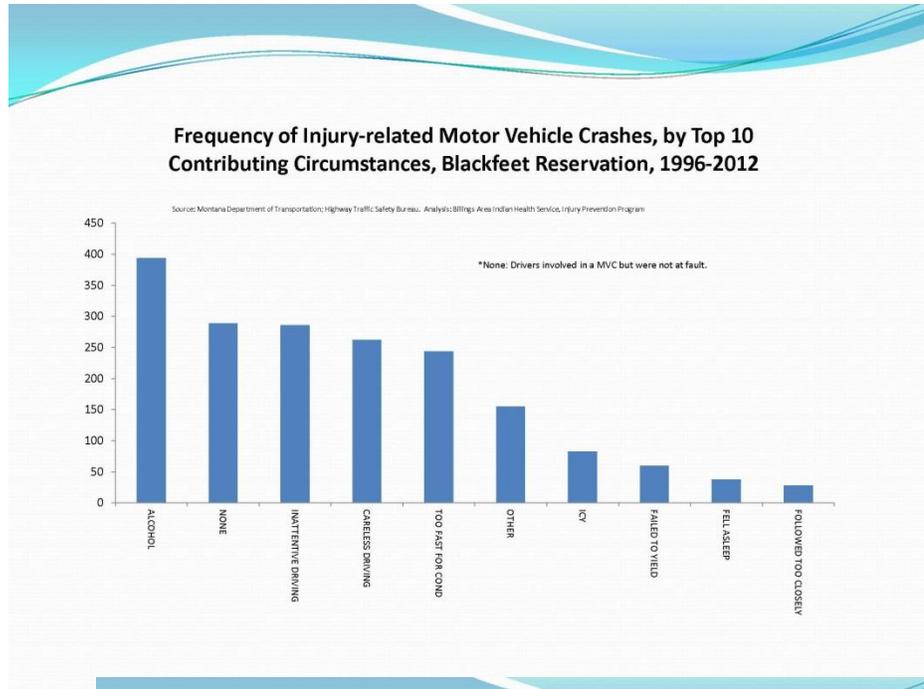
Source: Montana Department of Transportation Highway Traffic Safety Bureau. Analysis: Billings Area Indian Health Services, Injury Prevention Program



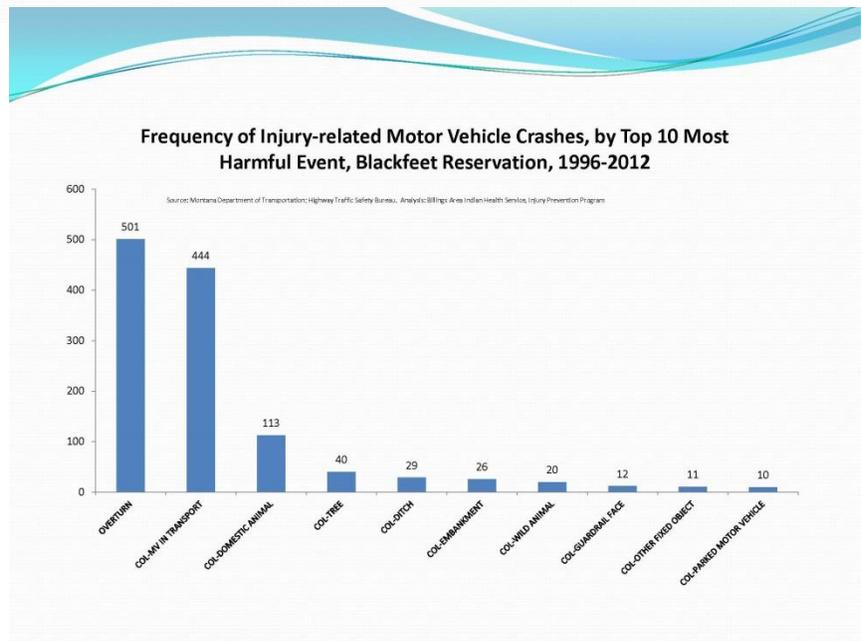
The map in Attachment C shows the locations of injuries by route, but as can be seen below, again the largest number of injuries are occurring on the state highway system, but Route

464 or Duck Lake Road, 49 – Looking Glass, and 206 – Starr School Road all show high injury

crashes. For the first time, Route 100, Heart Butte Road also was identified, having a high number of injuries. While these routes had elevated crash frequency, no specific spot locations were identified for improvement during the planning session.



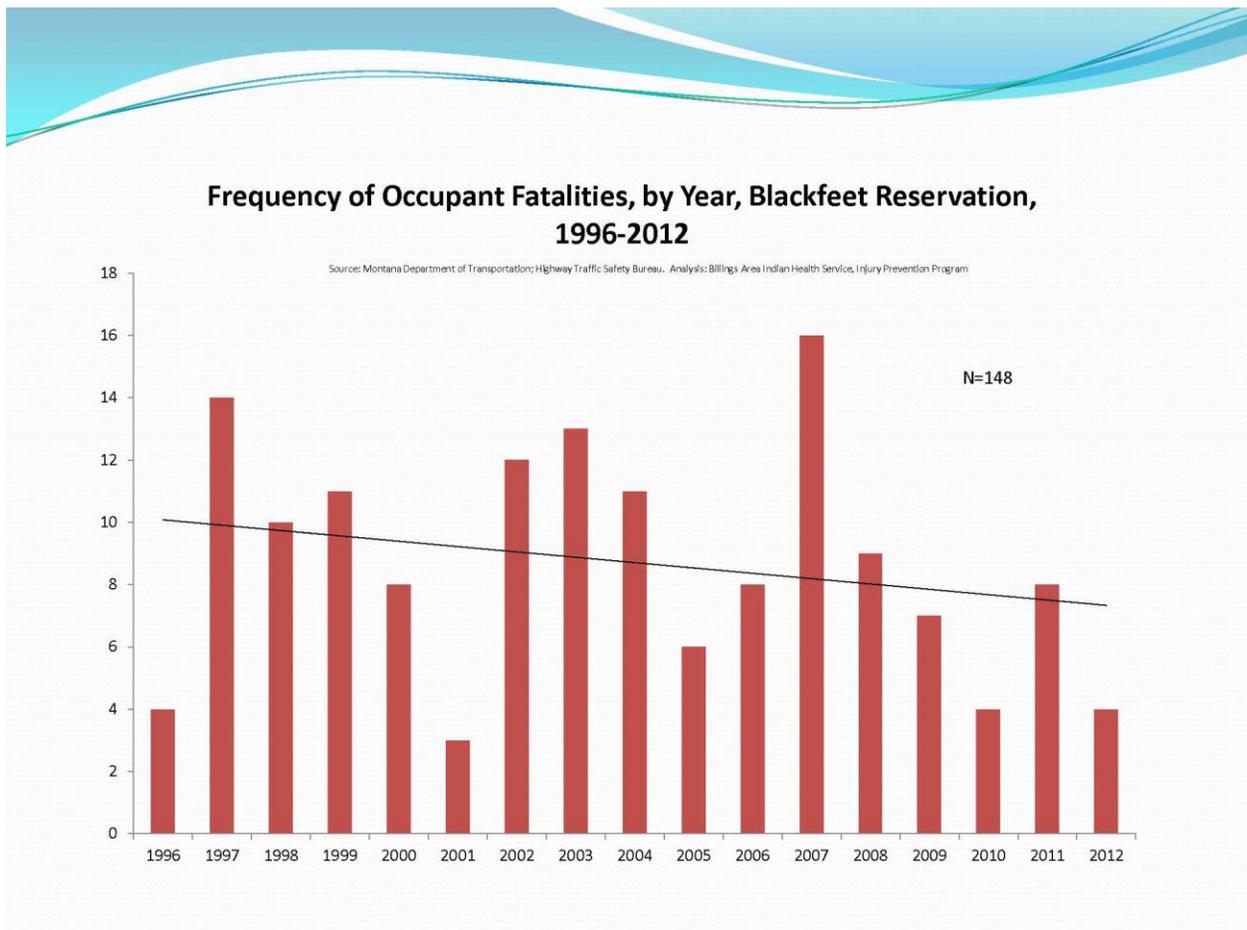
The contributing factors for injury crashes shows that alcohol involvement is a predominant issue, followed closely by inattentive driving, careless driving and speeding. These closely track with the circumstances for overall crashes.



While the top ten most harmful events remain essentially the same, crashes with another vehicle and overturning significantly outweigh all others. Domestic animals comes in third and caused 120 injuries, but it dropped off from overall crashes. While still much lower due to the top two events, roadside features such as embankments, ditches, trees, fences and highway signs were major causes of injuries.

FATAL CRASHES

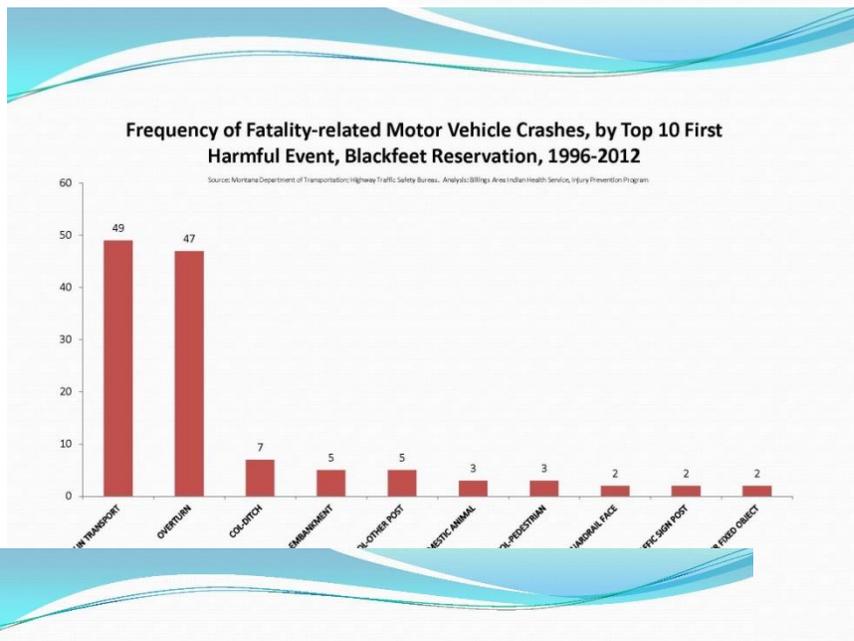
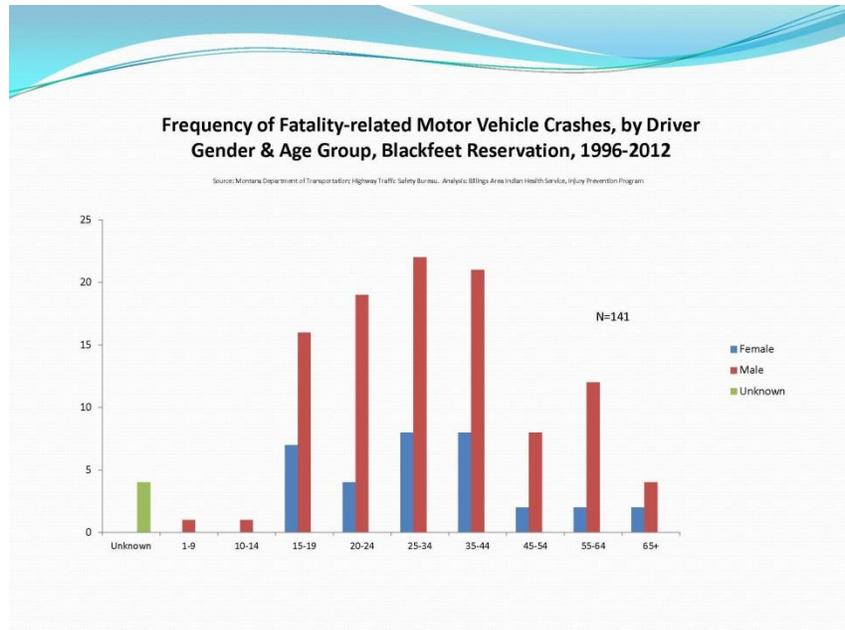
From 1996 to 2012 there were 148 fatalities on the Blackfeet Reservation. While the graph of the number by year shows a generally downward trend, this is still a very significant number with an average of nearly nine every year. The fatalities in 2013 have not yet been fully analyzed to the reservation level, however, we do know that there were 15 fatalities in Glacier County and 5 in Pondera County where the Blackfeet Reservation lies. So we do expect a peak similar to the one shown in 2007. While the number of fatalities can be highly variable the low numbers in 2009 thru 2012 are a source for optimism that the safety programs that have been implemented are having an effect.



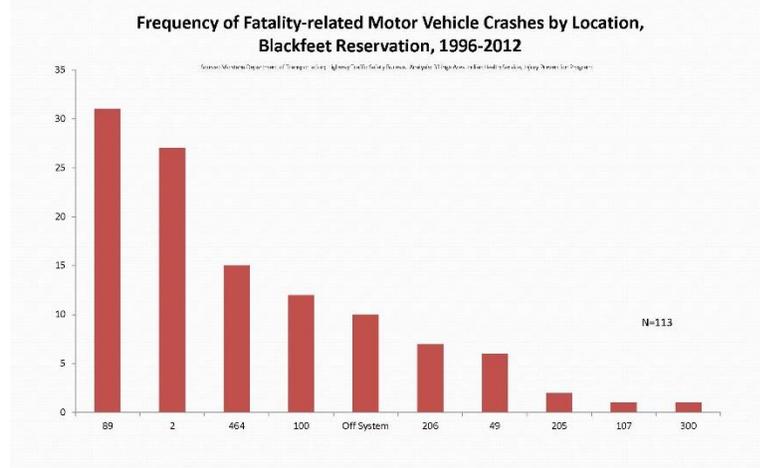
These fatal crashes continue to occur during clear and dry road conditions as the other crash types have been. Unlike the other crash types though, the fatal crashes are nearly evenly split between daytime and nighttime and there is a higher occurrence of crashes between Thursdays and Sundays. While all crash types have been higher in the summer months, this is especially true for the fatal crashes, with June through September being significantly higher than the other months.

As can be seen from the chart, similar trends for age and gender continue with the fatal crashes. It does show however, that the proportion of males has increased over the other crash types, making them even more disproportional. The 45-54 year old age group has shown a significant reduction, indicating that while they were shown to be involved in a lot of crashes, they are involved in few fatalities by comparison. The older drivers age 55-64 also show a significant increase here, indicating just the opposite, while not involved in a lot of crashes, when they are there is a higher probability of mortality.

The data for contributing circumstances, while not displayed here, shows no change from what was presented earlier, with



alcohol, distracted driving, careless driving and speeding being the major factors. While the first harmful event is also similar, collisions with another vehicle and single vehicle overturning crashes are the overwhelming cause of fatal crashes.



While US 89 and US 2 have the largest overall number of fatalities,

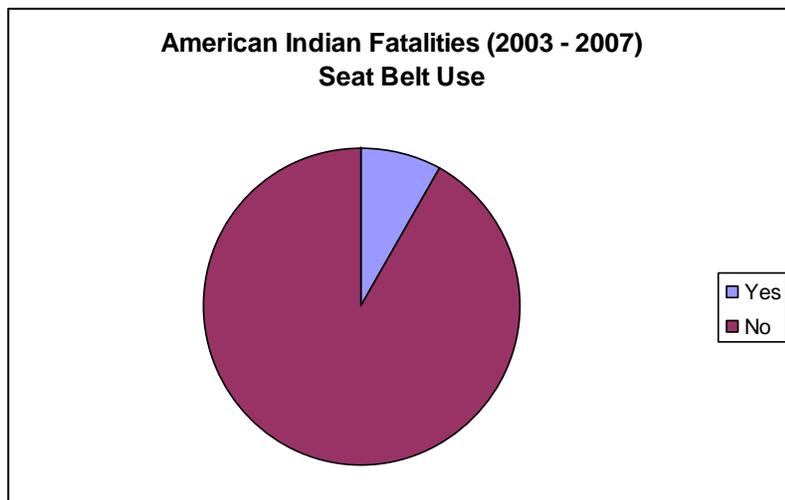
Routes 464, 100, 206 and 49, which were discussed before all have significant numbers, especially when one considers the much lower traffic volumes on these routes. Route 100, Heart Butte Road, in particular, stands out with the high number of fatalities that are occurring.

The full set of all the graphs from the data analysis is included in Attachment D which was compiled by the Billings Area Indian Health Service Office. The Blackfeet Tribe thanks them for their assistance with this effort.

SEAT BELT DATA

While complete seat belt usage data is not available, there are two sources that are included as an indication of the extent of seat belt use on the Blackfeet Reservation. The Blackfeet SOAR Coordinator has done seat belt surveys several times in Browning and found seat belt use to be approximately 10%. While the surveys did not necessarily follow accepted protocols, they do provide an idea of the number of drivers and passengers using restraints. MDT data for the period from 2003 to 2007 is shown in the chart. This data is for all Native American fatalities state wide and not just those on the seven reservations. Both of these sources indicate extremely

low restraint use and in particular, the use in fatal crashes is nearly non-existent.



2014 BLACKFEET TRIBAL

TRANSPORTATION SAFETY PLAN

The 2014 Blackfeet Safety Plan was developed using available data and the personal knowledge and expertise of the participants that attended the planning meeting. The group included state, federal and Tribal safety representatives from engineering, enforcement, education, emergency medical services and the school system. A complete list of participants is included in Attachment B.

The planning group reviewed the 2008 plan and crash data that was available and utilized it as a basis to develop a list of issues that are currently affecting transportation safety on the reservation. The group then identified the existing programs that currently exist on the reservation and identified additional strategies that need to be implemented to address these safety issues. The next three sections document these discussions and the outcomes.

ISSUES CAUSING CRASHES ON THE BLACKFEET RESERVATION

The crash data that was analyzed clearly shows a number of issues, many of which were identified in 2008 as well. These include:

- Alcohol involvement
- Inattentive driving
- Careless driving
- Speeding
- Domestic livestock on roadways
- Drivers 45 and under
- Single vehicle overturning crashes
- Collisions with other vehicles
- Lack of seatbelt use

In addition to these issues, the group identified a number of other issues based upon personal experience in dealing with transportation safety issues in the local communities. These included:

- Communication/Coordination among law enforcement agencies
- Montana Highway Patrol staffing
- Continued continuity of safety programs
- BIA route 1 crash rate
- Increase in crashes and fatalities around disbursement of settlement funds
- Need for better access to school and crossing of US 89
- Need for sidewalks from newly designed roundabout on US 89 into Browning
- Need for an approach to the rodeo grounds

EXISTING SAFETY PROGRAMS ON THE BLACKFEET RESERVATION

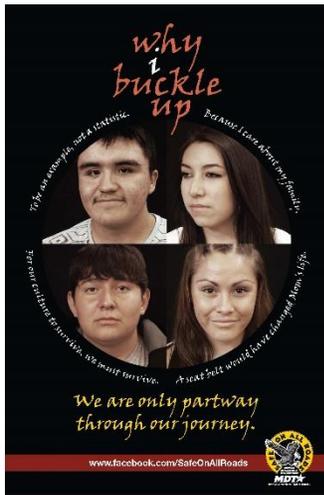
The Blackfeet Tribe has implemented or is working on a number of safety projects and programs to address transportation safety issues on the Reservation. The list is not all inclusive, but documents the programs that the group participating in the development of the safety plan were aware of.

- The Tribal Law Enforcement continues to set up safety check points in an effort to remove impaired drivers from the road and to identify vehicle safety issues. These safety check points are being used as a key safety strategy around community events such as Pow Wow's, rodeos and prom.
- The Montana DOT is reconstructing US 89 and will be installing a roundabout at the intersection with US 2 and sidewalks and crosswalks in the area.



- The school district has installed strobe lights on the school buses to increase visibility. School bus stop locations have also been reviewed to identify any locations where advance warning signs would be appropriate.

- The Safe On All Roads (SOAR) program is still active on the Reservation and has recently completed posters using the local basketball team as part of a “Buckle Up” campaign.



- The Tribal Transportation Department has had Road Safety Audits (RSA's) conducted on routes where they have had safety concerns. These have been done on BIA Route #1 from Browning to Heart Butte, BIA Route #8 – Starr School Road. A copy is included in Attachment D.
- Turnouts on US 2 between Browning and East Glacier to accommodate trucks during inclement weather have been funded by the State of Montana.
- The Blackfeet Transportation Department has applied for and received TTP Safety funding to complete a multi route safety improvement project that includes signing and striping of BIA routes.
- The Blackfeet Tribe received TTP Safety funding to implement a Motor Carrier Safety Program to address the potential increase in large truck traffic associated with oil drilling on the front range of the Rockies.
- The Blackfeet Tribe has implemented a Primary Seat Belt Law on the Reservation.

The main goal of the Blackfeet Tribal Safety Plan, is to use a multi-disciplinary approach to identify safety strategies for implementation that can address the safety issues that were identified. The strategies are intended to be implemented over the next several years and when appropriate, possible safety funding sources have been identified. The strategies were developed as a comprehensive approach to safety, including engineering, enforcement, education and emergency management opportunities.

Education Strategies



- **Develop a “Healing from the Pain of Alcohol in our Community” Video**

Many different videos have been developed, particularly for youth that attempt to change driver behavior in various areas such as drinking and driving, seat belt use or distracted driving. This effort would take a different approach and use local members of the Blackfeet community who have lost family or friends to traffic crashes to discuss how their

lives have changed and the struggles that continue. The video would be used with youth groups particularly to allow them to understand that traffic fatalities have effects much broader than just the victim. It is also hoped that being part of the video may allow some healing to those struggling with the loss of loved ones.

Strategy Champion: Blackfeet Tribal SOAR Coordinator

Funding Opportunity: 2014 TTP Safety Funding. If unsuccessful, the project could be submitted in subsequent years or also could be eligible for National Highway Traffic Safety Administration (NHTSA) 402 funds thru the BIA Indian Highway Safety Program (IHSP).

- **Develop a “Sober Behind the Wheel” License Plate for Montana**

This strategy was also identified in the Tribe’s 2008 Safety Plan. The State of Montana has a large number of specialty license plates and this effort would create one specifically to recognize those that have committed to not drinking and driving. Specialty plates also require an additional fee and this could create an opportunity for these funds going to support the Northern Plains DUI Task Force and some of their activities. The design of the license plate and promotion of it could be led by this task force and be developed in 2014. If the Northern Plains DUI Task Force is not interested in taking on this effort then the Blackfeet Tribe could apply separately and develop a plate independently. This effort would require coordination with the Montana Motor Vehicle Department.

Strategy Champion: MDT SOAR Coordinator, Blackfeet SOAR and Northern Plains DUI Task Force.

Funding Opportunity: None required

- **Establish a Youth Drivers Education Program**

During the development of the Blackfeet Tribal Safety Plan, there was considerable discussion about driver education programs for younger drivers. These programs have

changed over the years from one that was provided thru the school systems to one where participants are required to pay for the classes and behind the wheel training. This has resulted in many youth in the community not taking classes due to the inability to pay for this service. In an effort to improve this program, a number of strategies were identified:

- Submit a topic to have research conducted on the effect of driver education on crash rates for youth in Tribal communities. There has been research in the past of the effects of driver education programs in general, but many Tribal youth and those in rural communities, have challenges that differ from those nationwide.

Strategy Champion: TRB Tribal Safety Issues Subcommittee Chairman

Funding Opportunity: TRB Research Funds

- Require completion of a driver's education program as a graduation requirement for the Browning School System. In order for this to be possible, the program would have to be funded so that there was no cost to the students to ensure that it does not result in causing a reduction in graduation rates. Coordination will need to occur with the Montana Office of Public Instruction and the Browning Schools to see if this is possible and funding will need to be secured to offset the cost of the program.

Strategy Champion: Tribal SOAR Coordinator, MDT SOAR Coordinator and KLJ

Funding Opportunity: MT OPI Funds and/or thru a grant application to TTP Safety Funds and BIA IHSP Funds

- **Participate in a Multi-Tribe Arrive Alive Program**



Several Tribes have expressed an interest in acquiring and using a distracted driving simulator that could be used with youth in the Tribal communities. This system allows participants to use the simulator to experience what situations such as texting and driving or driving while impaired feel like from a driver's perspective. Sessions could be set up or the equipment could be purchased and used jointly by Tribes across

Montana at community events and school activities. Groups such as Unite at: <http://arrivealivetour.com/unite/> have the necessary equipment and expertise. The

Blackfeet Tribe and MDT SOAR Program will take the lead in researching this opportunity and applying for safety funds. The expected cost of this system is approximately \$10,000.00.

Strategy Champion: Tribal SOAR Coordinator(s) and MDT SOAR Coordinator

Funding Opportunity: TTP Safety Funding or BIA IHSP Funding

Enforcement Strategies



- **Implement an Electronic Crash Records System**

As was discussed in the data section of this plan, the statistical data that is presented relies almost solely upon crash data from the State of Montana and includes very minimal Blackfeet crash data. One of the main reasons for this is that the Tribal Law Enforcement currently do not have an electronic records system

in place that is capable of sharing all or partial data. There are a number of crash records systems available, but the Montana Highway Patrol has recently implemented a new system that includes a web based interface for city, county and tribal governments. Many Tribes have started using electronic crash record systems and the many of the most successful implementation have been where the program and form used are supported by the state DOT and they are able to provide training and support. The Blackfeet Law Enforcement should work with MHP to review the system and hardware and software requirements for tribal implementation.

Strategy Champions: Blackfeet Law Enforcement and MHP

Funding Opportunities: MHP has indicated there is no cost for use of the system and training, if hardware or other costs are identified, TTP Safety Funding or BIA IHSP Funds should be applied for.

- **Provide a Tribal Highway Safety Officer**

Currently the Tribe does not have any officers dedicated to highway safety enforcement. With the limited staffing and the demands on time that criminal activities require, highway safety enforcement by necessity becomes a lower priority. In the past, the tribe had Highway Safety Officers whose positions were funded thru the BIA Indian Highway Safety Program. To elevate the level of highway safety enforcement, Tribal Law Enforcement should pursue obtaining at least one and possibly two highway safety enforcement officers.

Strategy Champion: Blackfeet Law Enforcement

Funding Opportunity: BIA Indian Highway Safety Program

- **Establish a Social Host and Responsible Server Program**



One of the issues that continually is associated with drinking and driving crashes is the serving of alcohol to underage patrons and to those that are obviously intoxicated. This is especially important on the Blackfeet Reservation where both the fatalities have a high involvement of young drivers and alcohol. To combat these problems, a Tribal Ordinance should be developed to allow Tribal Law Enforcement to establish a program to inspect and cite both businesses and social events that fail to follow acceptable protocol in serving of alcoholic beverages. Other Tribes should be solicited to identify existing ordinances that could be used as a model.

Strategy Champion: Blackfeet Law Enforcement

Funding Opportunity: None Required

- **Increase MHP Law Enforcement Presence**



Many law enforcement and other government agencies are struggling with staffing levels and the ability to provide minimal, let alone desired services. The Montana Highway Patrol is no exception. Currently they only have one office stationed in Cut Bank who is responsible for the entire reservation and surrounding area. With the high number of injuries and fatalities in the area, there is a

strong need and desire for additional officers in the area. MHP has a Special Transportation Enforcement Team (STET) that is used to address areas with high crash frequency. With the high number of fatalities and injuries in Tribal communities, a similar team could be developed for enforcement on reservations. It is recognized that this would require legislative action, but currently with a Blackfeet Tribal Member serving in the State Legislature, it may be a timely opportunity to advance a bill to provide for additional MHP Officers.

Strategy Champion: Lea Whitford, State Legislator

Funding Opportunity: State Funds

- **Develop and Utilize a Cross Jurisdictional Agreement**

With the staffing challenges faced by all enforcement agencies, many tribes, states and local jurisdictions have entered into cross jurisdictional agreements to expand their enforcement abilities. In the past the Blackfeet Tribe had a cross jurisdictional agreement in place, but it has since lapsed. The positive benefits of such an agreement should be presented to the Tribal Council and determine whether they are open to such an opportunity. It may be desirable to invite tribal council and/or tribal law enforcement from other Montana Reservations where cross jurisdictional agreements are in place to discuss the benefits and some of the challenges that they have experienced.

Strategy Champion: Blackfeet Law Enforcement

Funding Opportunity: None required

- **Develop an Enforcement Team for Livestock Removal**

While the Blackfeet Tribe has had a livestock ordinance in place for many years that allows for stray animals to be removed from highway rights of way, enforcement had been a continual problem. The main issue with the enforcement had been the lack of manpower and funding for any program to monitor, remove, house and auction animals. The increased fencing has improved the safety in some areas, there continues to be vast areas of open range with little to no control of animal movements. The Blackfeet Tribe will develop a proposal and apply for funding to establish a removal team with the goal being a direct, measureable reduction in vehicle crashes with livestock on the reservation.

Strategy Champion: Blackfeet Transportation Department

Funding Opportunity: TTPSF, BIA IHSP

Engineering Strategies

- **Continue Utilizing Road Safety Audits on BIA Routes**



Road Safety Audits (RSA's) have been an important tool for many Tribes and one that the Blackfeet Transportation Department have utilized for several years. They have used the RSA's as an opportunity to bring outside traffic and safety expertise onto the reservation to help in assessing the safety concerns of routes where there are high numbers or crashes or where they have specific concerns. Using

these RSA's, the transportation program has scheduled maintenance activities that were identified that could improve safety, such as mowing and clearing trees that inhibit sight distance, as well as, developed safety projects to install highway signing, lighting, striping and guardrail in various locations. The most recent RSA is attached in attachment D for reference, but this program should be continued and additional routes having RSA's performed. The results of these RSA's can then continue to be used to schedule maintenance crews and activities and develop TTP Safety projects that can be incorporated into the Tribal TIP for countermeasure implementation.

Strategy Champion: Blackfeet Tribal Transportation Department

Funding Opportunity: TTP Safety Funds or utilize Crow Tribe RSA Coordinator

- **Install Livestock Fencing**



With over 300 livestock crashes since 1996, the Blackfeet Tribe has taken a number of actions to try and reduce these. There has been an ordinance in place for several years that allows the tribal government to remove loose livestock from highway rights of way and hold them at the fairground facility. If the landowner wishes to get their livestock back, they have to pay a fee that recoups the cost for collection,

hauling, holding and feeding of the animals. They have also worked with the BIA and

MDT to install livestock fencing in areas where concentrations of livestock crashes are occurring. In reviewing the current crash data and using personal experience, additional fencing is needed on US 89 from the junction of 464 to Babb, Montana.

Strategy Champion: Blackfeet Transportation Department and Montana Department of Transportation

Funding Opportunity: TTP Safety Funding, TTP Construction Funding or MDT Funding

- **Install Mile Markers on BIA Routes**

In plotting out the crash information for the mapping that is included in Attachment C, many crash locations were poorly located and took considerable effort to determine where on the roadway where these actually occurred. One of the main reasons for this is that the BIA road system does not currently include any mile marker locations. This also makes it more difficult for EMS and Tribal Enforcement when responding to calls along the roadways to determine the location of an incident. To remedy this, the Tribe should install mile markers on BIA roadways, with an emphasis on those routes with high crash frequencies such as BIA 8 and BIA 1.

Strategy Champion: Blackfeet Tribal Transportation Department

Funding Opportunity: TTP Safety Funding or TTP Construction Funds

Emergency Service Strategies



No Emergency Service strategies were prioritized for implementation

Other Strategies

- **Implement an ATV Ordinance**



implementation.

The 2008 Blackfeet Tribal Safety Plan identified the need for an ATV ordinance that would require helmets for youth and more responsible operation. A draft ordinance was initiated, but was never completed or approved by the Tribal Council. This ordinance should be reviewed, updated and completed and carried forward for final approval and

Strategy Champion: Blackfeet Tribal Transportation Department

Funding Opportunity: None Required

- **Join the Northern Tribes DUI and Drug Task Force**

The Tribes across the high line in Montana, including Fort Belknap, Fort Peck and Rocky Boys are forming a multi-tribe DUI and Drug Task Force to combat the high levels of impaired driving crashes and deaths that are occurring on all the reservations in the area. The Blackfeet Tribe, with their high number of fatalities and high rate of impaired driving, needs to join and become an active member of this group. Historically, enforcement agencies have been one of the main partners in these groups and while they continue to play an important role, several other Blackfeet Tribal partners including transportation, EMS, SOAR and Indian Health Service should consider actively participating.

Strategy Champions: Blackfeet Enforcement, Blackfeet Tribal Transportation Department, Blackfeet EMS, Indian Health Service and Blackfeet SOAR Coordinator.

Funding Opportunity: Funding for the Task Force could come from the “Sober Behind the Wheel” license plat that was discussed earlier. Depending on specific activities the task force chooses to pursue, TTP Safety Funds, BIA IHSP Funding or MDT NHTSA Funding may be applicable.

ATTACHMENT A

Blackfeet Tribal Safety Plan 2014

Agenda

- 10:00 a.m. Welcome and Introductions
- 10:15 a.m. Background and Overview
Discussion of Tribal Safety Plans, including need for
Review of 2008 Blackfeet Safety Plan
Presentation of Crash and Safety Data
Questions and Discussion of Data
- 11:00 a.m. Blackfeet Tribe existing safety approaches (this is any practice the Tribe is utilizing to address transportation safety i.e. education to public, crash reporting/processes, EMS or engineering projects)
- 11:30 a.m. Development of Activities for updated Blackfeet Tribal Transportation Safety Plan:
Identification/Discussion of Safety issues and concerns
Safety approaches to include
Safety approaches to develop
Integration with other safety plans
- 12:00 Lunch (provided)
- 1:00 p.m. Finalize Development of Safety Activities to include in Plan
Sort by 4E's
Identification of Implementation Steps
Identification of Champions for Specific Elements
Identification of Potential Funding Sources
- 2:15 p.m. Break
- 2:30 p.m. Questions/Discussion of Process or other Items
- 3:00 p.m. Wrap up and/or Site Visit to any Locations

ATTACHMENT B

BLACKFEET TRIBAL TRANSPORTATION SAFETY PLAN

PARTICIPANTS

February 26, 2014

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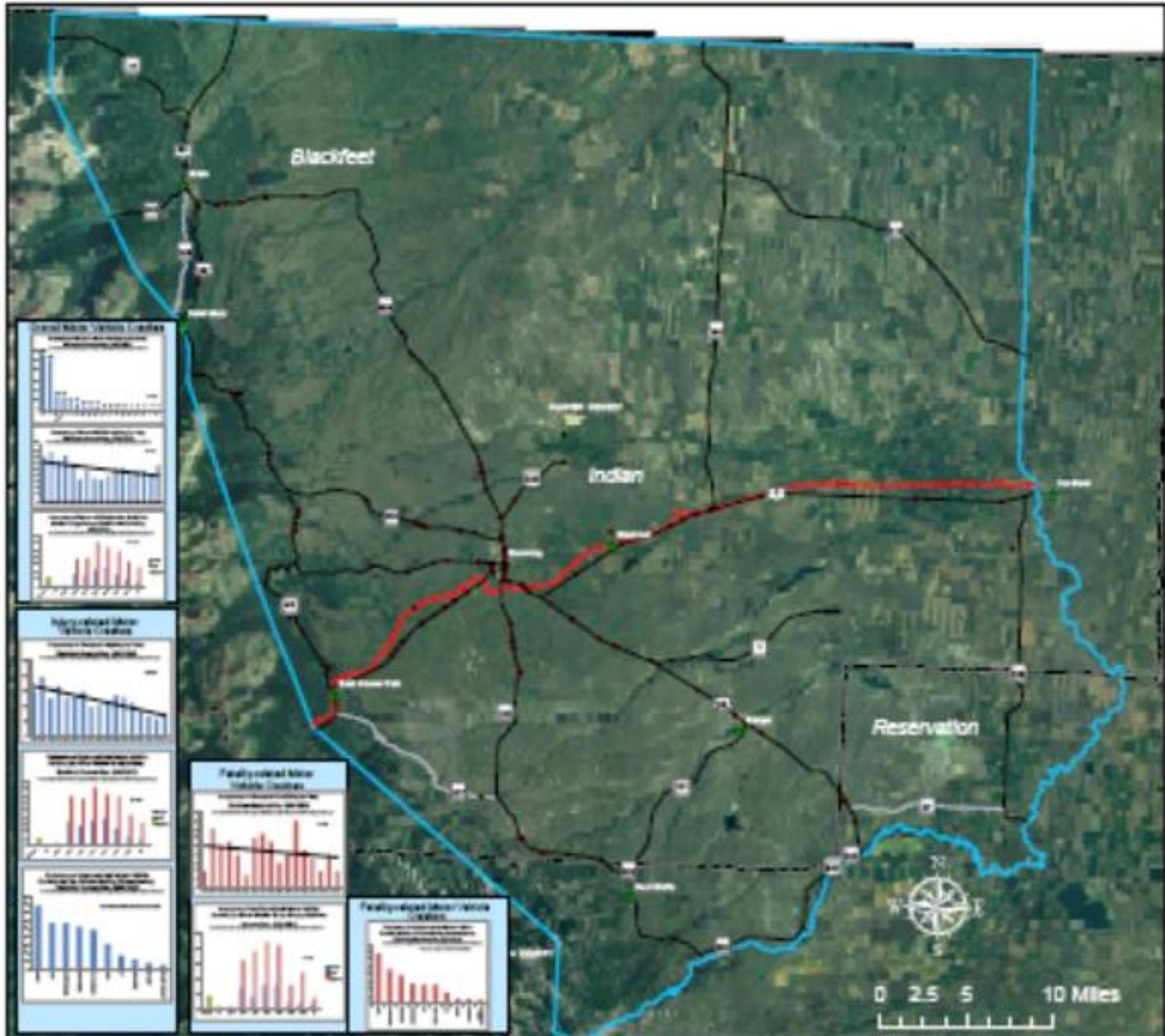
ATTACHMENT C

MAP 1 OF FATAL CRASH LOCATIONS



The Blackfeet Tribe Motor Vehicle Crash Site Identification Project 1996-2012

Fatality-related Motor Vehicle Crashes

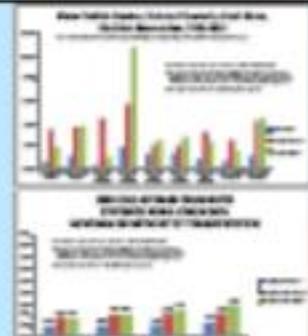


The map was created by Dany Martens, MPH, Epidemiologist/Health Specialist, Blaine Area Indian Health Service, 2014

Legend

- + Fatality-related MVC
- ★ Towns
- US Highway 2
- US Highway 93
- Major Roads
- Stream
- Railroad
- Blackfeet Reservation
- County Boundary

The Blackfeet Tribe Motor Vehicle Crash Site Identification Project map is comprised of motor vehicle crashes (MVCs) resulting in injury, death, or property damage. Data was collected from the Montana Department of Transportation's Highway Traffic Safety Bureau for years 1996-2012. The overall goal of the project is to identify MVC cluster sites, trends, and to prevent MVC injuries and fatalities for those transporting within the boundaries of the Blackfeet reservation.

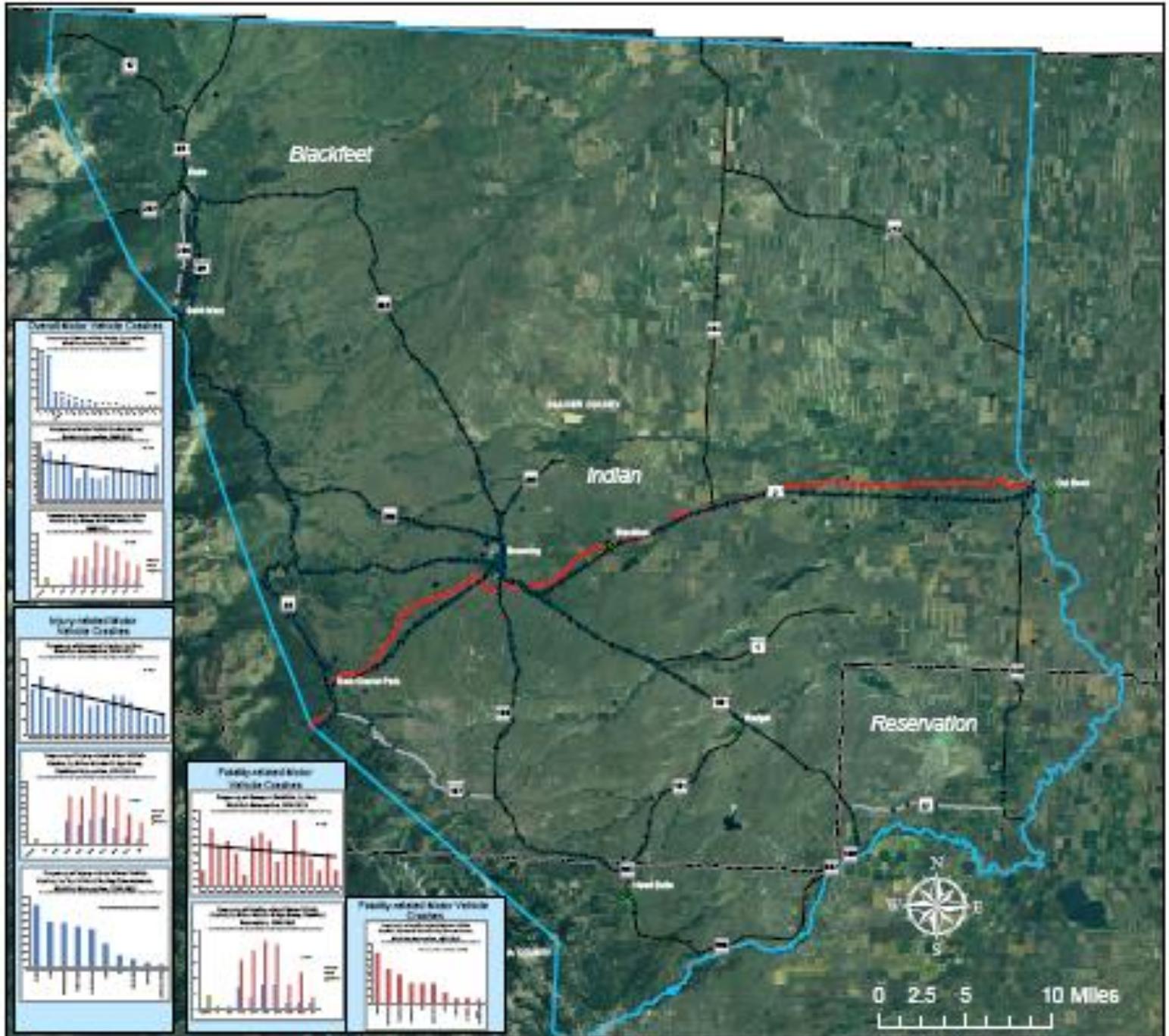


MAP 2 OF INJURY CRASH LOCATIONS



The Blackfoot Tribe Motor Vehicle Crash Site Identification Project 1996-2012

Injury-related Motor Vehicle Crashes



This map was created by Darryl Mitchell, MPH, Environmental Health Specialist, Billings Area Indian Health Service, 2014

Legend

- Injury-related MVC
- ☆ Towns
- US Highway 2
- US Highway 88
- Major Roads
- Gravel
- Railroad
- Blackfoot Reservation
- County Boundary

The Blackfoot Tribe Motor Vehicle Crash Site Identification Project map is comprised of motor vehicle crashes (MVCs) resulting in injury, death, or property damage. Data was collected from the Montana Department of Transportation's Highway Traffic Safety Bureau for years 1996-2012. The overall goal of the project is to identify MVC cluster sites, trends, and to prevent MVC injuries and fatalities for those transporting within the boundaries of the Blackfoot reservation.

Motor Vehicle Crashes Resulting in Fatalities

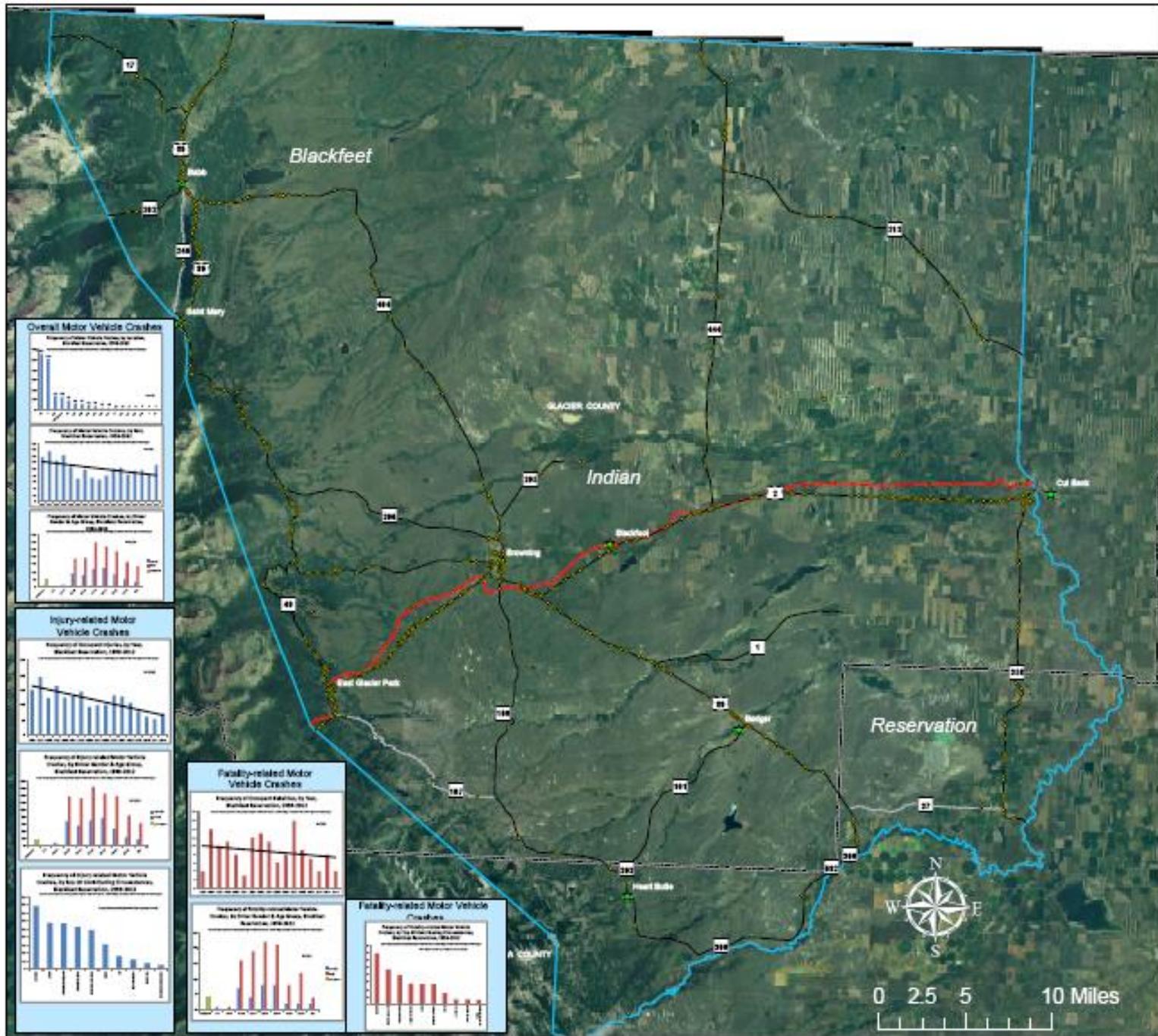
Injury-related Motor Vehicle Crashes

**MAP 3 OF PROPERTY DAMAGE CRASH
LOCATIONS**



The Blackfoot Tribe Motor Vehicle Crash Site Identification Project 1996-2012

Property Damage Motor Vehicle Crashes

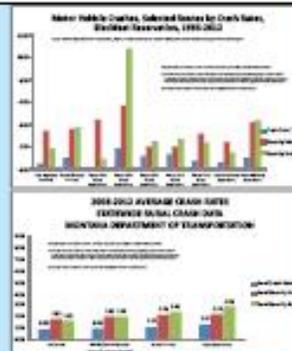


This map was created by Darcy Merchant, MPH, Environmental Health Specialist, Billings Area Indian Health Service, 2014.

Legend

- ◆ Property Damage MVC
- ☆ Towns
- US Highway 2
- US Highway 89
- Major Roads
- Gravel
- Railroad
- Blackfoot Reservation
- County Boundary

The Blackfoot Tribe Motor Vehicle Crash Site Identification Project map is comprised of motor vehicle crashes (MVCs) resulting in injury, death, or property damage. Data was collected from the Montana Department of Transportation's Highway Traffic Safety Bureau for years 1996-2012. The overall goal of the project is to identify MVC cluster sites, trends, and to prevent MVC injuries and fatalities for those transporting within the boundaries of the Blackfoot reservation.



ATTACHMENT D

ROAD SAFETY AUDIT OF BIA ROUTE 1 AND BIA ROUTE 8

Bureau of Indian Affairs

Blackfeet Reservation

Road Safety Audit

Prepared by:



In partnership with the Federal Highway Administration

Technical Assistance Provided by:



RSA PROCESS

The RSA on the Blackfeet Reservation was the product of an application from BIA staff to the Federal Highway Administration (FHWA) as part of an Advance Implementation of RSAs on Tribal and Federal Lands program. The Blackfeet Reservation RSA was performed over the course of a two day period on June 13-14, 2013 with the assistance of FHWA consultants from Vanasse Hangen Brustlin, Inc. (VHB).

On Thursday, June 13th, the entire RSA team reviewed available crash data and identified several specific locations and corridors of interest based on collision records along with BIA, Tribal, and emergency service input. The RSA team travelled to these locations and corridors over the course of two days (June 13th and 14th) including a night review on June 13th. A field review of each of the locations and corridors was conducted with members of the RSA team providing input on typical safety issues, contributing factors, past and planned modifications, and key considerations related to design, maintenance, and operation of the roadways. After the field visits, the RSA team reconvened to discuss examples of existing positive features, to prioritize the comprehensive list of safety issues, to establish priorities for developing countermeasures, and to discuss a list of preliminary countermeasure options.

RSA TEAM

Attendees

The RSA team included staff from BIA, the Blackfeet Reservation, MDT, and FHWA RSA facilitators. Individuals from the Blackfeet Reservation, BIA, and James Wilson, the RSA Coordinator, assisted in assembling the RSA team and assisting with logistics. There were a total of eighteen team members that included:

BIA Rocky Mountain Region Staff

- Gerald Gilbert

Tribal Members

- Don White – Blackfeet Transportation
- Randi Parsons – Blackfeet Transportation
- Joleen Weatherwax – Blackfeet EMS
- Nora Kennedy – Blackfeet TERO
- Toni Grant – Blackfeet Transportation
- Graig Gilham – Blackfeet Transportation
- Robert Kennerly – Blackfeet Transit
- Stewart Horn – Blackfeet Transit
- Donald Trombley – Blackfeet Transit
- Frederick D. Makes Cold Weather – Blackfeet Transit
- James Wilson – Crow Tribal Transportation and RSA Coordinator.
- Thomas Little Owl – Crow Tribal Transportation

Montana Department of Transportation

- James A. Combs

Montana Highway Patrol

- Robert R. Bender

Federal Highway Administration Program Staff and Consulting Team

- Paul Harker – FHWA Montana Division
- Daniel Nabors – VHB, Inc.
- Elissa Goughnour – VHB, Inc.

Potential Partners not in Attendance

Future RSAs on the Blackfeet Reservation and within the BIA Rocky Mountain Region might benefit from including law enforcement personnel (Tribal and county), county transportation officials, and Indian Health Service officials.

RSA SITE LOCATIONS

The RSA team identified two corridors for detailed assessment during the RSA on the Blackfeet Reservation; Heart Butte Road (BIA 1), and Starr School Road (BIA 8), as shown in [Figure 1](#).

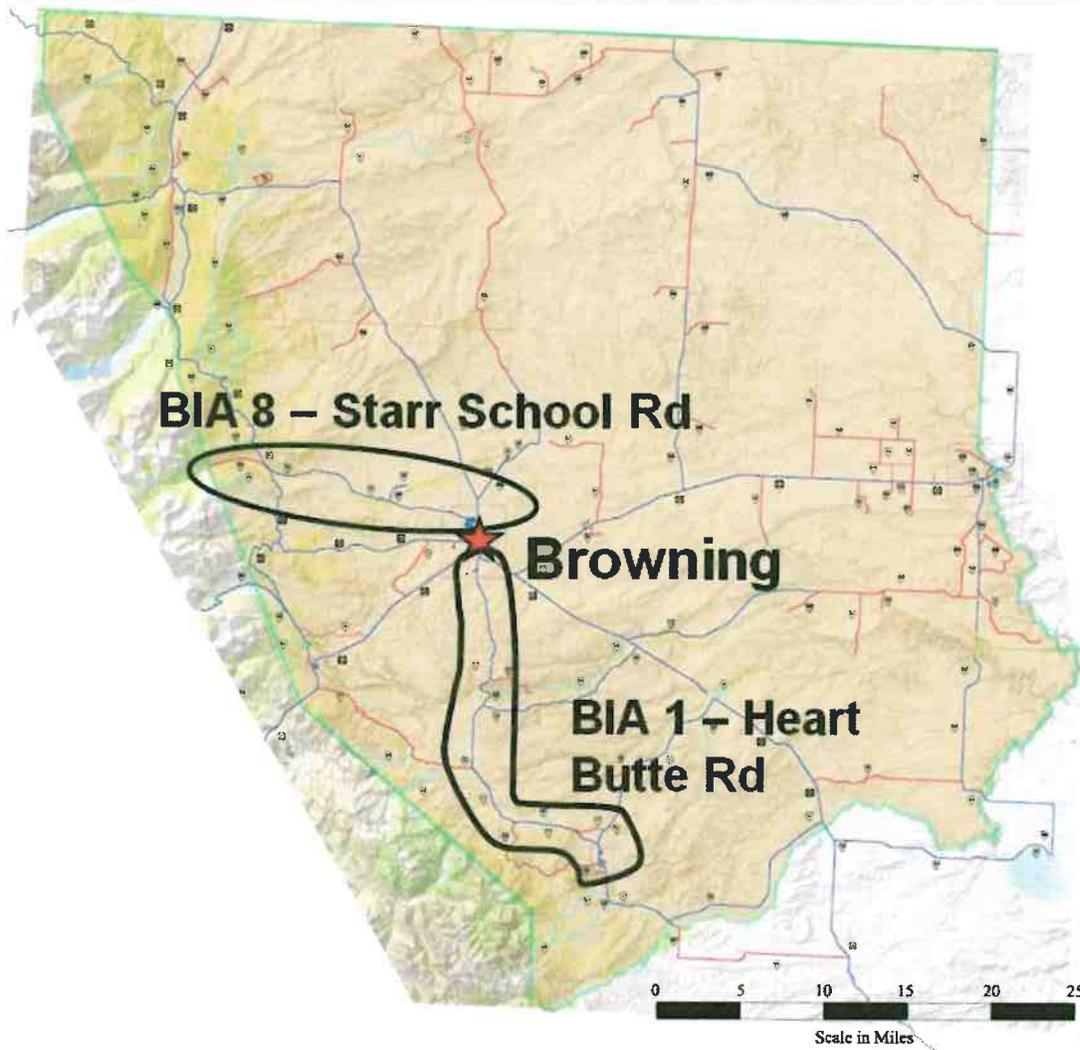


Figure 1. RSA Study Location.

Geometric and Traffic Conditions

There was a wide variety of geometric conditions throughout the study area. The following is a description of each of the roads, which can be located on the map shown on [Figure 1](#) ~~Figure 1~~:

- Heart Butte Road (BIA 1) – an approximately 24-foot wide, paved two-lane road with varying shoulder widths. Most of the road is rural in nature except for the southern portion of the study area near Heart Butte. The portion of the road near Heart Butte is suburban in nature with residential and commercial developments.
- Starr School Road (BIA 8) – an approximately 24-foot wide, paved two-lane road with varying shoulder widths. The eastern portion of the road is suburban with residential and commercial developments and has sidewalks on either side of the roadway. The remainder of the roadway is rural in nature.

The speed limit on the majority of Starr School Road is 70 MPH except for the residential portion to the east, which has a speed limit of 35 MPH. The speed limit on Duck Creek, in the vicinity of the intersection with Starr School Road, is 40 mph starting south of the intersection and continuing to the northern entrance to the gas station, 50 mph for about 0.2 miles, and then 70 mph (60 mph for trucks) continuing from that point north. Starting at the north for Heart Butte Road, at the intersection with Route 2/89, the speed limit is XX mph for about 1.8 miles. From there, the speed limit is 70 mph (60 mph for trucks) until Badger Creek Road, located north of Heart Butte. At the intersection of Heart Butte Road and Badger Creek Road, the speed limit reduces to 50 mph for approximately 1.2 miles. From that location, at the center of Heart Butte, heading south, the speed limit reduces to 35 mph. A diagram of the speed limits found throughout the study area can be found in Figure 2.

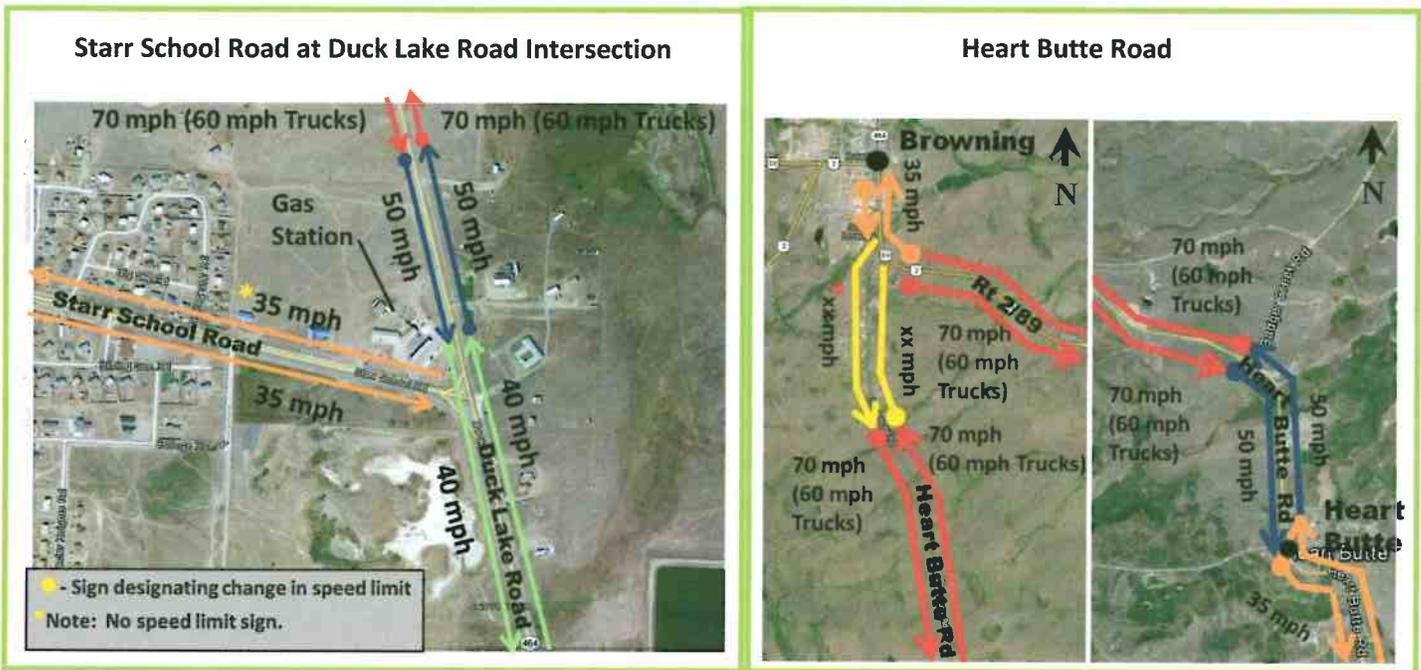


Figure 2. Speed limits on Starr School Road and Heart Butte Road.

Crash History

The crash data were provided by the Montana Highway Patrol (MHP) and Blackfeet Emergency Services. This data consists of crashes to which each agency responded; as such, data may include overlapping crashes if both agencies responded to the same crash, however, some crashes may be unique.

The reservation-wide crashes recorded by MHP between January 1, 2008 and June 6, 2013 are shown in [Figure 3](#)~~Figure 3~~. A closer view of the crashes on Starr School Road and Heart Butte Road are shown in [Figure 4](#)~~Figure 4~~ and [Figure 5](#)~~Figure 5~~, respectively.

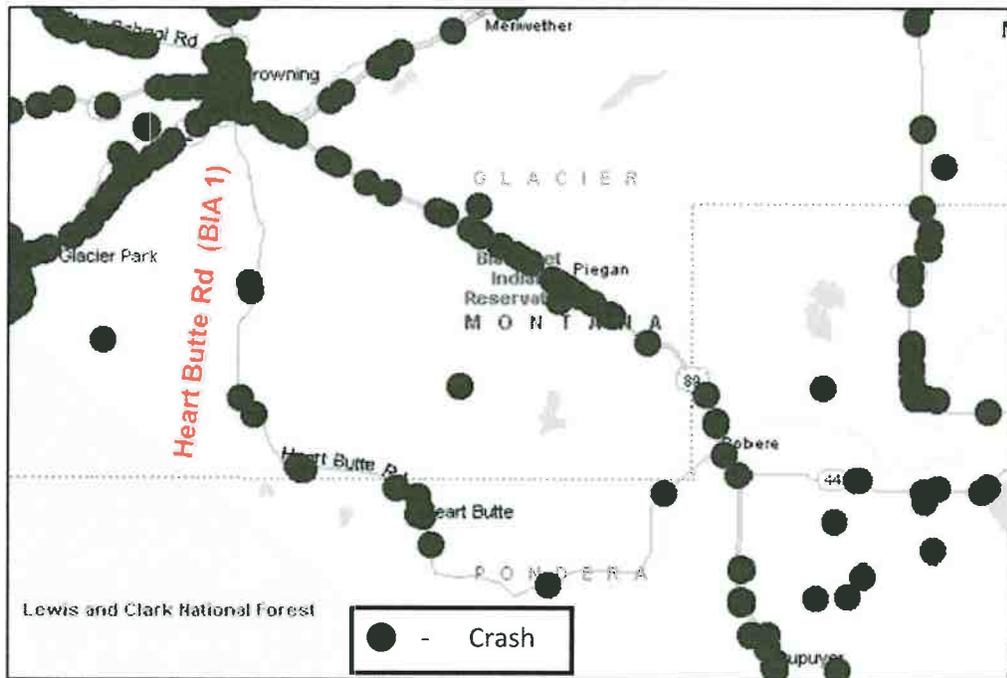


Figure 5. MHP Heart Butte Road Crashes from January, 2008 to June, 2013.

Between 2010 and 2012, MHP responded to 13 crashes on Starr School and Heart Butte Roads. The crashes per year on each of those roadways are shown in [Table 1](#).

Table 1. MHP Crashes by Year and Road from 2010-2012.

Year	Starr School Road Crashes	Heart Butte Road Crashes
2010	2	1
2011	2	1
2012	3	4

The reservation-wide crashes recorded by Blackfeet Tribal EMS between October, 1996 and January, 1998 are shown in [Figure 6](#), and the crashes between October, 1996 and January, 2011 are shown in [Figure 7](#). The pin maps from Tribal EMS only include those crashes that involved Tribal EMS response.

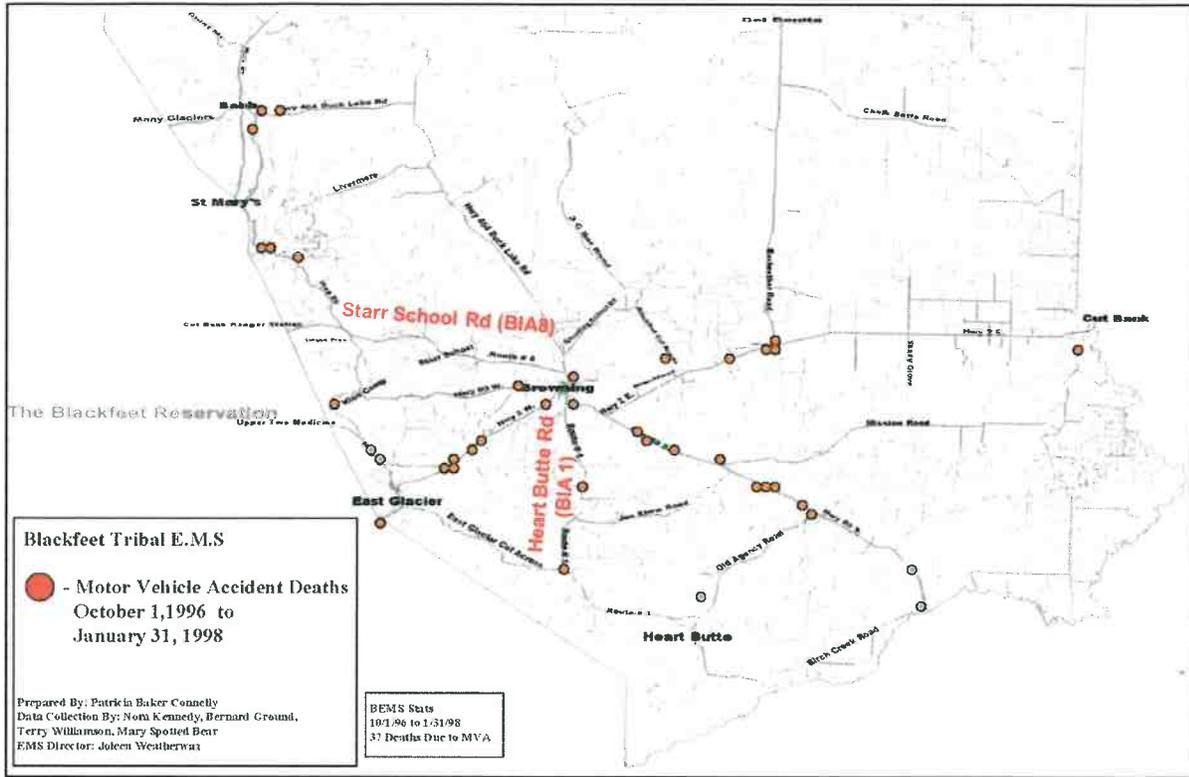


Figure 6. Tribal EMS Blackfoot Reservation Crashes from October, 1996 to January, 1998.

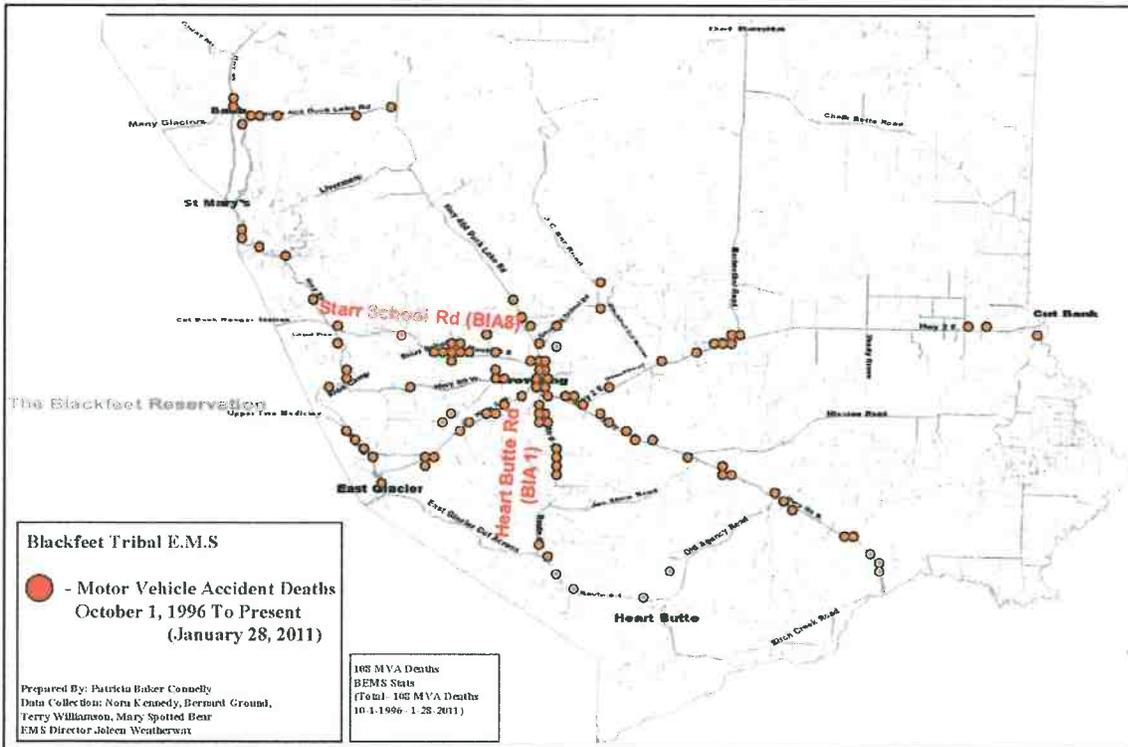


Figure 7. Tribal EMS Blackfoot Reservation Crashes from October, 2006 to January, 2011.

A closer view of the crashes recorded by Tribal EMS on Starr School Road and Heart Butte Road are shown in [Figure 8](#).

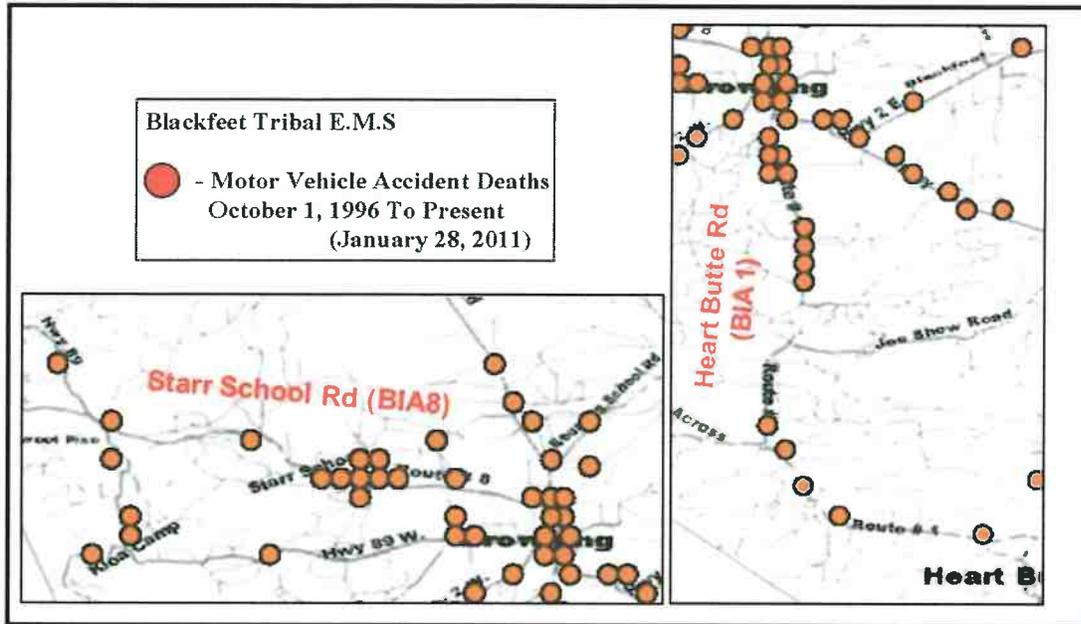


Figure 8. Tribal EMS Crashes on Starr School and Heart Butte Roads from October, 2006 to January, 2011.

ASSESSMENT FINDINGS

Positive Features

The RSA process recognizes that effective context-sensitive safety practices and treatments are often found in the RSA study area. The BIA Rocky Mountain Region and MDT have designed and implemented a variety of safety treatments suited to the cultural, physical, and operational character of the study area. Some of the features include:

- Use of enhanced safety features through recent projects – There have been many recent improvements in the study area, particularly on Starr School Road. Some of the improvements include the addition of wider shoulders, and sidewalks and street lighting on the eastern portion of the road. Also, there were a cluster of crashes around the bridge crossing Cut Bank Creek. The creek is a popular swimming area and there is a fresh water source where people come to fill up containers of water. Improvements were made in the vicinity of the bridge, including a parking area to reduce the number of vehicles parking on the road and the bridge, bridge improvements, and the construction of a shoulder and rumble strips. Those crashes may have occurred prior to these improvements. The Tribe and BIA should review the detailed crash data and continue reviewing the future crash data to ensure that is the case.
- Reflective delineators used throughout the study area including entrances to private drives.
- Vegetation was maintained.

- Use of centerline and fog line – The entire study area had a centerline and a fog line. These pavement markings provide critical lane and roadway guidance to drivers, particularly in rural areas that lack street lights.
- Good roadway condition - The paved roads lacked potholes and the pavement was generally in good condition, particularly on Starr School Road.
- Guardrail was present on many sections that appeared to warrant guardrail.
- Chevrons were used on some horizontal curves. Chevrons are a form of curve warning signage and that helps to assist motorists in navigating the curve.

RSA Team Prioritization of Issues

After completing the RSA field review, the RSA team reconvened to discuss the range of issues suggested by the available crash data and field observations. All RSA team members were asked to identify issue types and provide examples of the issue. After the issues were identified, the RSA team prioritized the set of issues. The following is a summary nine prioritized factors that contribute to the risk or severity of a crash:

1. Horizontal curve design and delineation.
2. Conflicts at intersections.
3. Vehicle speed.
4. Road stabilization.
5. Environmental conditions (wind, flooding, ice, snow).
6. Roadside conditions (lack of recovery area).
7. Pavement markings and delineation.
8. Animal management.
9. Detailed crash data.

Detailed Issues and Countermeasure Summary

The following section summarizes specific issues observed and discussed by the RSA team and discusses potential countermeasures to address these issues. Included in this summary is a discussion of crash modification factors related to the countermeasures.

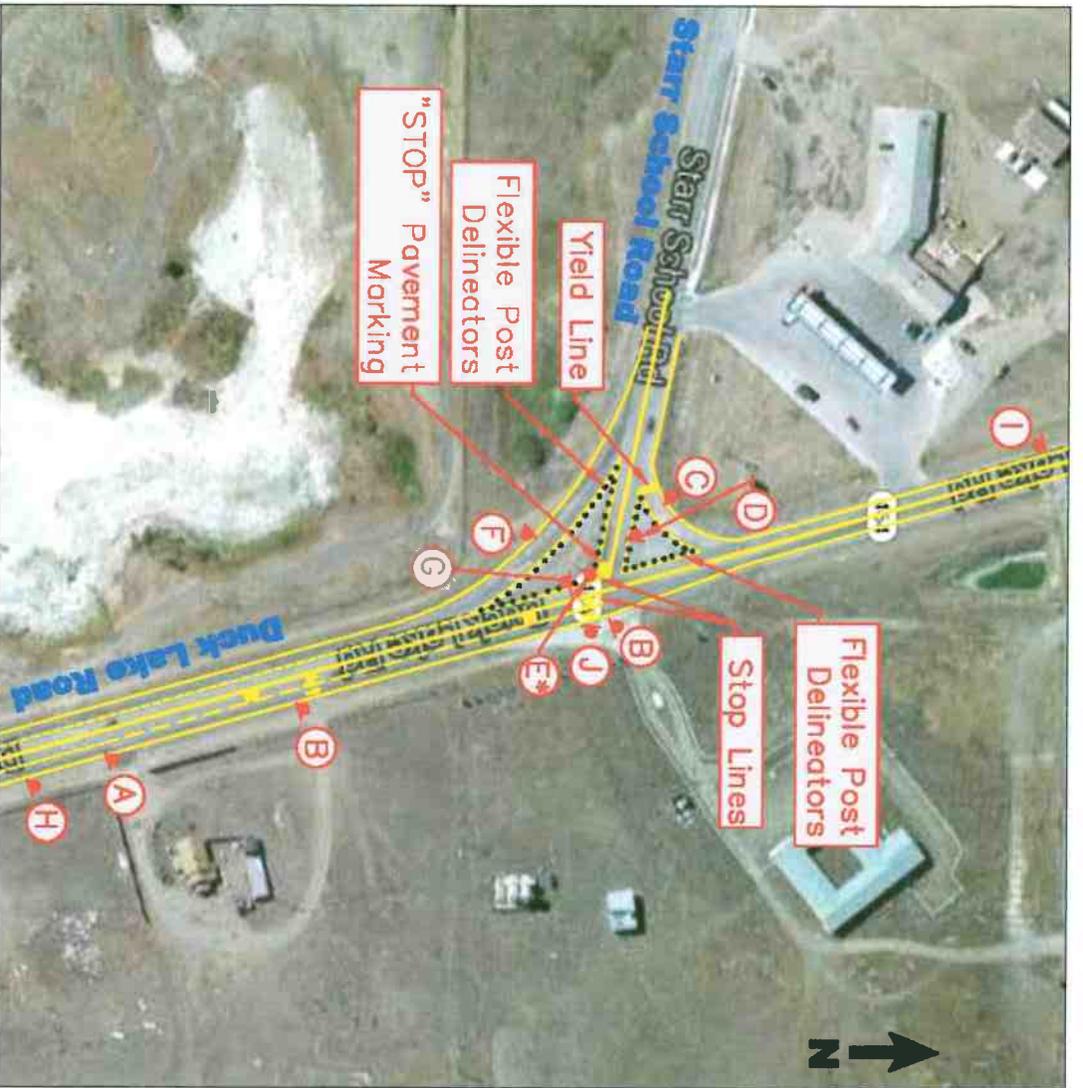
Issue 1: Horizontal curve design and delineation

Specific Safety Concern	Suggested Improvements	Example of Issue
<p>Tribal EMS indicated that many of the crashes have occurred along curves. The MHP and Tribal EMS pin maps also indicated that many crashes occurred at curves.</p> <ul style="list-style-type: none"> • Lack of curve delineation/warning. <p>Many of the curves had no curve delineation or warning signage. With the rural nature of the roadway, and high speeds, drivers may have difficulty recognizing and navigating the curves.</p> <ul style="list-style-type: none"> • Some of the curves appear to be lacking adequate superlevation. <p>Superelevation helps drivers to stay on the roadway when they are driving through curved sections of the roadway. Some of the curves appeared to be lacking proper superlevation.</p>	<p>Implement a systemic approach to evaluate and implement improvements including the use of a ball bank test in coordination with crash data. Use the results of the test and crash data to determine where to implement suggestions.</p> <p>Short Range –</p> <ul style="list-style-type: none"> • Check superlevation and take appropriate intermediate and long range actions. • Consider using the following signs and delineators: <p>Advance curve warning signs (MUTCD, W1-1) placed in advance of the curve so drivers have time to prepare and slow down.</p> <p>Curve warning signs (MUTCD, W1-6 or W1-8) placed at the curve to guide drivers around the curve. Chevrons in locations with higher traffic volumes and speeds, and arrows on lower volume, lower speed roads.</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin: 0 10px;">or</div>  </div> <p><small>Curve warning signs. Source: FHWA MUTCD, W1-6 & W1-8</small></p> <p>Reflective delineators placed along the curve to guide drivers through the curve during dark conditions.</p> <p>Sign placement guidance can be found in section 2C.07 of the MUTCD and an example is provided in Appendix C.</p> <p><i>Note: Overuse of signs can affect adherence. Pilot sign application at high crash locations, or in locations with planned construction or maintenance projects.</i></p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 10px;"> <p><small>Reflective Delineator</small></p> </div> </div>	 <p>Curve on Heart Butte Road that appears to be lacking adequate superlevation.</p>  <p>Combinations of horizontal and vertical curves on Heart Butte Road can limit sight distance and may be difficult to navigate at high speeds.</p>

Specific Safety Concern	Suggested Improvements	Example of Issue
<ul style="list-style-type: none"> • Narrow or lack of shoulder on many curves. <p>Many curves had narrow or no shoulders. Without shoulders, drivers may off-track through the curve by driving along either edge of the roadway. Off-tracking can lead to a wearing away next to the roadway, possibly creating a drop-off over time, and can also deteriorate the pavement.</p> <ul style="list-style-type: none"> • Lack of guardrail or incompatible guardrail <p>Some curves had steep drop-offs that appeared to warrant use of guardrail. Other curves had barriers, such as the cable barrier shown to the right, that were not compatible with conditions present.</p>	<p>Intermediate Range –</p> <ul style="list-style-type: none"> • Considering adding guardrail on sections of roadway on portions of roadway with steep, non-recoverable slopes. As guardrails can lead to a more severe crash, consider installing short-range measures first and observe effectiveness. • Add paved shoulders at curves to provide drivers with additional space to navigate the curve, to provide pavement stabilization, and to prevent the creation of drop-offs from off-tracking vehicles. <p>Long Range -</p> <ul style="list-style-type: none"> • On curves with inadequate superlevation, reconstruct or correct the superlevation. 	 <p>Heart Butte Road curve located approximately 2 miles north of Joe Show Road intersection. The guardrail in this section is not compatible with conditions. According to FHWA¹, cable barriers should only be used on flat or moderately sloped terrain. The deflection of cable barrier is too large for the steep drop off. Standard guardrail may be better suited for the conditions present.</p>

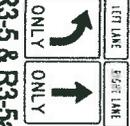
¹ Federal Highway Administration. Cable Barriers: Design Standard and Placement Conditions. Available: http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/crmeasures/cable_barriers/

Specific Safety Concern	Suggested Improvements	Example of Issue
<ul style="list-style-type: none"> • At the intersection of Starr School Road and Duck Lake Road, signage and pavement markings may cause driver confusion. The current pavement markings and signage create confusing about lane usage and which drivers have priority or which drivers should yield. • Lighting There are lights along Duck Lake Road but they are not currently in use. There is confusion between MDT and the Tribe about ownership/operation of the lights. • Speed There is a large speed differential on Duck Lake Road, in the vicinity of the intersection with Starr School Road, as non-turning vehicles traveling at high speeds and vehicles turning onto, or out of Starr School Road are traveling at much slower speeds. This speed differential makes it difficult for vehicles on Starr School Road to determine an acceptable gap to pull onto Duck Lake Road. The high speeds can also increase the severity of crashes that may occur. 	<p>Short Range –</p> <ul style="list-style-type: none"> • Review existing signage and placement and add/remove/relocate signs as necessary to ensure that they are properly placed and provide adequate guidance to drivers. <p>See Figure 9 for an example of possible intersection delineation, signage, and pavement markings.</p> <p>Intermediate Range –</p> <ul style="list-style-type: none"> • Ensure lighting is adequate for traffic conditions. Work with MDT to determine ownership/operation of lighting. 	 <p>Southbound view of Duck Lake Road (Route 464) from intersection with Starr School Road.</p>  <p>Conflicting signs on Starr School Road, approaching intersection with Duck Lake Road.</p>



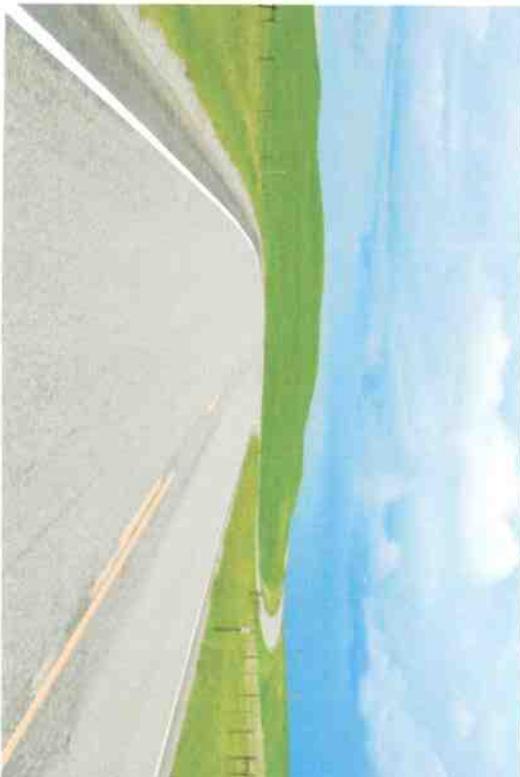
LEGEND

- Flexible Post Mounted Delineators
- Sign Location

 R1-1  W4-1  R1-2	 W2-2L & W16-8P  W1-7
 R3-5 & R3-5a  W4-3	 W4-6  W4-3
 R3-7  W4-6	 W4-6  W4-3
 R1-1  W4-1  R1-2	 W2-2L & W16-8P  W1-7

*Consider use of oversized sign.

Figure 9. Example Delineation, Signage, and Pavement Markings for the Duck Lake Road and Starr School Road Intersection.

Specific Safety Concern	Suggested Improvements	Example of Issue
<ul style="list-style-type: none"> • The speed limit may not be compatible with the roadway geometry in certain locations. <p>Speed limits on both Starr School Road and Heart Butte Road reach 70 mph (see Figure 2 for speed limit details). At those speeds, drivers may have difficulty navigating through certain geometric features, such as sharp curves or intersections.</p> <ul style="list-style-type: none"> • The RSA team expressed concerns over drivers traveling at high speeds. <p>The RSA team noted that many drivers travel at speeds that appear to be too fast for conditions, particularly during dark conditions or during inclement weather.</p>	<p>Short Range –</p> <ul style="list-style-type: none"> • Increased enforcement of speed limits, particularly in areas with specific geometric considerations (e.g., horizontal curves, intersections) and high crash locations. • Additional warning signs (e.g., intersection and curve warning signs) to alert motorists of roadway conditions/features. In a systemic manner, evaluate signage at curves and intersections. Additional warning signs may alert motorists to roadway conditions, allowing them time to slow down. <p>Intermediate Range –</p> <ul style="list-style-type: none"> • Investigate reduced speed zones in those areas with specific geometric considerations (e.g., horizontal curves, intersections) and high crash locations. • Educational campaign targeting speeding. 	 <p>Horizontal and vertical curves on Heart Butte Road.</p>

Issue 4: Road stabilization

Specific Safety Concern	Suggested Improvements	Example of Issue
<ul style="list-style-type: none"> • In some locations the road is sloughing away and side slopes are destabilized. <p>Some of these locations require continual maintenance and repair. The destabilized roadway also presents dips in the roadway that drivers may not expect or be prepared for.</p>	<ul style="list-style-type: none"> • Short Range – Install object markers at locations where destabilization is the most pronounced. • Intermediate Range – Improve the guardrail in those sections. See Issue 1: <u>Horizontal curve design and delineation</u>, <u>Horizontal curve design and delineation</u> for additional guardrail discussion and explanation. • Long Range – <ul style="list-style-type: none"> • Reconstruct the curve north of Joe Show Road to ensure proper roadway stabilization. • Investigate measures to improve the structural integrity of the road. 	 <p>Curve on Heart Butte Road, approximately 2 miles north of the intersection with Joe Show Road. The side slope is sloughing away, destabilizing the roadway.</p>

Specific Safety Concern	Suggested Improvements	Example of Issue
<ul style="list-style-type: none"> • Environmental conditions (e.g., wind, flooding, ice, and snow). <p>The reservation is subject to extreme weather conditions which affect which improvements can be used and how maintenance operations are conducted. For example, winds are so strong that they can shear off screws holding signs in place. Those strong wind gusts can also affect a driver's ability to navigate the roadway.</p>	<p>Short Range –</p> <ul style="list-style-type: none"> • Add warning signs in specific locations that are consistently affected by specific environmental conditions (e.g. floods frequently) or where crashes related to environmental factors are present. 	 <p>Snow removal in Browning. The Blackfeet Reservation experiences extreme weather conditions including strong winds, flooding, ice and snow. These affect how roadway maintenance is conducted, the ability of drivers to navigate roadway, and the ability of emergency services to reach vehicles in distress. (Source: Glacier Reporter 2011).</p>

Issue 6: Roadside conditions

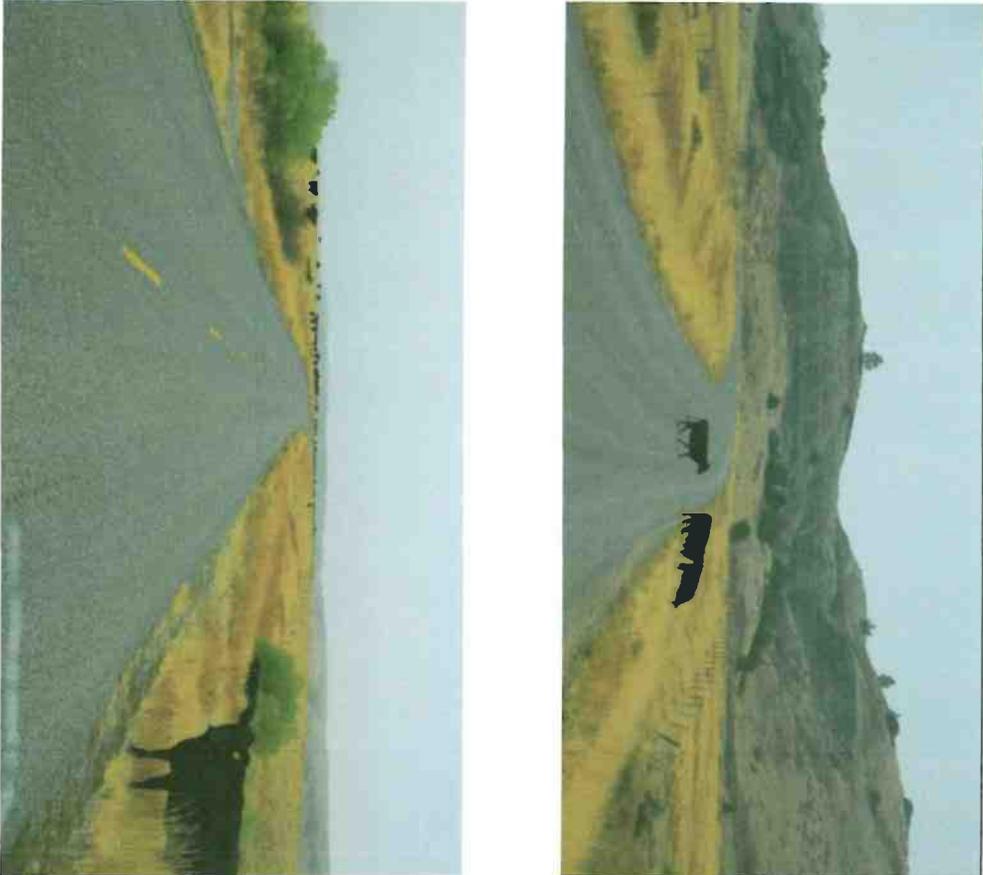
Specific Safety Concern	Suggested Improvements	Example of Issue
<ul style="list-style-type: none"> • Sections of the roadway had a lack of recovery area and steep drop-offs. <p>These roadside conditions prevent drivers from recovering if the vehicle leaves the roadway.</p>	<ul style="list-style-type: none"> • Consider installing/upgrading guardrail in locations with steep drop-offs. As guardrails can lead to a more severe crash, consider installing short-range measures first and observe effectiveness. <p>Intermediate Range –</p> <ul style="list-style-type: none"> • Consider adding shoulders, particularly at curves. 	 <p>Heart Butte Road overpass. The guardrail in this section is not compatible with conditions. According to FHWA², cable barriers should only be used on flat or moderately sloped terrain. The deflection of cable barrier is too large for the steep drop off. Standard guardrail may be better suited for the conditions present.</p>  <p>Curve on Heart Butte Road, approximately 2 miles north of the intersection with Joe Show Road. The curve has extremely steep side slopes.</p>

² Federal Highway Administration. Cable Barriers: Design Standard and Placement Conditions. Available: http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/ctrmeasures/cable_barriers/

Issue 7: Pavement markings and delineation

Specific Safety Concern	Suggested Improvements	Example of Issue
<p>Pavement markings and delineation (e.g., reflectors alongside the road) help to define the roadway and provide positive guidance to drivers. In the study area:</p> <ul style="list-style-type: none"> • Centerline pavement markings on Heart Butte were less visible in locations, particularly during dark conditions. • Pavement markings were overlapping in locations resulting in multiple centerlines. <p>Pavement markings should be clearly marked and visible during both light and dark conditions to help provide positive guidance to drivers. This is especially important with the steep roadside conditions and curves found throughout the study area.</p>	<p>Short Range –</p> <ul style="list-style-type: none"> • Reapply centerline and edgeline pavement markings. • Conduct a more thorough crash analysis to determine how many crashes involve single vehicle run-off-the-road crashes. Based on the data, edgeline rumble strips may be a possible improvement. • Adjust/add delineators for consistent spacing. Consistent spacing aids drivers in judging distance and identifying roadway geometry. • Consider double posting delineators, particularly in curved sections or portions of the road with a high crash rate. 	 <p>Pavement markings on Heart Butte Road applied in an inconsistent manner resulting in multiple center lane lines.</p>

Specific Safety Concern	Suggested Improvements	Example of Issue
<ul style="list-style-type: none"> • Inconsistent delineator spacing. <p>Similar to pavement markings, delineators should be consistently spaced to ensure that they provide consistent positive guidance for drivers – particularly on curves. This is of particular importance as most of the study area did not have street lights making nighttime delineation even more crucial.</p>		

Specific Safety Concern	Suggested Improvements	Example of Issue
<ul style="list-style-type: none"> • Animals along the roadway. <p>The reservation has an open range policy and so both wild and domestic animals can regularly be found on the roadway.</p> <p>Due to the open range, it is difficult to manage the presence of animals in the roadway. Some of the animals, such as the cattle shown to the right, are dark and are nearly impossible to see in dark conditions.</p>	<ul style="list-style-type: none"> • Consider the use of additional warning signs, such as the non-vehicular warning sign (MUTCD W11-4) shown below, may serve as a reminder for drivers to be alert.  <p>Non-vehicular warning sign. (Source: FHWA, W11-4)</p> <ul style="list-style-type: none"> • Work with property owners to mitigate animal crossings (e.g., repairing damaged fences or closing any gaps in fence). 	 <p>Open range examples of cattle on Montana Reservation roads.</p>

Crash Modification Factors

A crash modification factor (CMF) is a multiplicative factor, based on documented safety research studies, used to compute the expected number of crashes after implementing a given countermeasure at a specific site. CMFs provide some indication of the potential benefit, or lack thereof, associated with specific countermeasures.

FHWA compiles CMF data from published safety studies in the CMF Clearinghouse (<http://www.cmfclearinghouse.org/index.cfm>) to help practitioners select the most effective safety treatments. While CMF data is not available for all potential countermeasures, the CMF Clearinghouse provides a useful and consolidated source of data to help engineers, planners, and project owners make informed decisions. The following table summarizes CMFs related to some of the countermeasure suggestions in the previous section.

Table 2. Crash Modification Factor (CMF) Summary.

Countermeasure	CMF (% Change in Crash Incidence)	Other Information
Install guardrail	0.53-0.93 (7-47% reduction)	Applies to run off the road crash types. Area type undefined.
Add advanced curve warning sign	0.7-0.92 (8-30% reduction)	Applies to all crash types. Area type undefined.
Add chevron signs on horizontal curves	0.75-0.96 (4-25% reduction)	Applies to the following crash types in rural areas: non-intersection, head-on, run-off-the-road, sideswipe, nighttime, and head-on.
Remove or relocate fixed objects outside of clear zone	0.62 (38% reduction)	Applies all crash types on all area types.
Install edgeline rumble strips	0.61-0.67 (33 – 39% reduction)	Applies to fatal, serious injury, and minor injury crash types on 2-lane, undivided rural area roads (only used studies with 4-5 star ratings)

The crash modification factors included in the previous table indicate that just about all of the countermeasures reviewed have been demonstrated to positively affect roadway safety in locations where studies were performed. According to the CMF data, installing guardrail is the most effective countermeasure included in this summary, with a possible 47 percent reduction in crashes. Some of the systemic countermeasures identified for curves, such as the chevron or advance curve warning signs, have the potential to reduce crashes by four to 30 percent.

CONCLUSIONS

The BIA Rocky Mountain Region RSA team conducted an RSA on the Blackfeet Reservation, focusing on Starr School Road and Heart Butte Road. The RSA team identified and ranked eight issues; curve delineation and warning, intersections, speed, road stabilization, environmental conditions, roadside conditions, pavement markings and delineation, animal management, detailed crash data.

Input from Tribal EMS and the mapped crashes indicate that many crash clusters are located at curves. Also, according to Tribal EMS, many of the crashes were single vehicle run-off-the-road and alcohol was a significant factor. There were some locations, such as the bridge over Cut Bank Creek on Starr School Road, that experienced a high crash frequency but improvements were made. It is not clear what affect those improvements had on the crash rate. It is important to access crash records and details for a more thorough analysis, both to understand some of the contributing crash factors, but also to analyze the effectiveness of improvements.

With the large size of the reservation, the similarity in crash locations, and funding limitations, the BIA may experience the greatest benefit through implementation of low-cost countermeasures that can be applied in a systemic manner. Systemic countermeasures include a wide array of strategies, including, but not limited to, design treatments at numerous locations with common safety issues or educational campaigns targeted at vulnerable users. Based on the mapped crash locations identifying crash clusters at curves, and the field review noting deficiencies in curve signage and delineation, the BIA may want to consider implementing systemic signage and delineation improvements at curves throughout the reservation. As shown in the CMF table, some of these measures have the potential to reduce crashes by four to 30 percent.

In response to this RSA, the BIA should complete the chart located in Appendix D of this report to indicate all of the recommendations, action to be taken, a cost estimate, and the responsible party.

Finally, as the roads on the Blackfeet Reservation are owned and maintained by a variety of entities, the BIA and Tribe should continue working with the State and other partners to identify and address safety concerns in a cohesive and deliberate manner.

EPILOGUE

Two days after the RSA concluded, on June 16, 2013, there was a crash within the RSA study area resulting in five fatalities.³ The driver, who died in the crash, was a 28-year old male. The remaining four fatalities included three women and one man ranging in age from 17 to 24 years old.

The crash occurred just after midnight on Starr School Road, approximately a mile and a half east of the intersection with U.S. Highway 89. According to the MHP, the vehicle was traveling east on Starr School road at a speed that was well above the night-time speed limit of 65 miles per hour. The driver was distracted, drifted right and over-corrected, eventually rolling over several times. There were seven vehicle occupants, none of which were wearing seat belts. MHP determined speed to be a factor and it is unknown if alcohol contributed to the crash although alcohol was found at the crash site.

³ KRTV News (June 16, 2013). Five people dead in crash near Browning. Available: <http://www.krtv.com/news/five-people-dead-in-crash-near-browning/#>