

Emphasis Area: Roadway Departure & Intersections Related Crashes

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Co-Champion: Gabe Priebe, Traffic and Safety Engineering Bureau Chief, MDT

- Objectives:**
- Reduction of Roadway Departure Fatalities
 - Reduction of Roadway Departure Serious Injuries
 - Reduction of Intersection related Fatalities
 - Reduction of Intersection related Serious Injuries

Strategy 1: Reduce and mitigate roadway departure crashes through data driven problem identification and the use of best practices.

Purpose: Engineering countermeasures have proven to be very effective at reducing roadway departure crashes. In general, these treatments seek to prevent vehicles from leaving the roadway or to mitigate the impact of doing so. Countermeasures may be implemented in locations with a roadway departure crash history or where roadway departure risk factors are present. MDT's Roadway Departure Plan identifies roadways with a higher than normal crash rate and determines appropriate proven safety countermeasures to address the issues. Along with input from local and tribal jurisdictions MDT will continue to conduct analysis of locations identified as having safety issues and define potential infrastructure solutions. As research into proven best practices is ongoing, MDT will continue to research, identify, and implement technology and infrastructure safety improvements.

Opportunity for Action	Timeline	Status	Safety Partners	Reference	Resource	Measurement of Success
S1.1 Continue to Implement the Highway Safety Improvement Program (HSIP)	Annual. Ongoing	The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance. Annual HSIP projects include intersection, roadway departure, pedestrian related safety projects are currently under design and construction. Staff continues to complete field reviews. HSIP Program is on-going. Jan 2022: Identified numerous sites on non-MDT routes the past few years. Working w/ city, county, tribal entities for safety improvement projects	Patricia Burke/Gabe Priebe, Traffic & Safety Bureau (TSB), Highway Safety Improvement Program (HSIP) - Montana Department of Transportation (MDT)	HSIP FFY 2021	FHWA HSIP	Reduction in <u>crashes</u>, both number and severity.
S1.2 Continue to support and implement Roadway Departure Plan	Annual. Ongoing	Using Montana Specific Safety Performance Functions to focus on roadway departure crashes. This is based on non-junction related crashes and four crash types (roll over, fixed object, side-swipe opposite direction and head-on crashes). Roadway Departure Plan has been updated w/ recent crash data. Updated models are based on the recent 5 years of data and have undergone quality check process. Roadway Departure Plan updated in 2020. Plan is incorporated in HSIP program and also core MDT projects including rehabilitation, resurfacing and reconstruction projects	Patricia Burke, Safety Engineer, Highway Safety Improvement Program (HSIP) -MDT	MDT Roadway Departure Plan	FHWA Proven Safety Countermeasures	Reduction in number and severity of <u>roadway departure crashes</u>.
S1.3 Work Zone Technology to reduce conflicts, roadway departure and rear-end crashes	Ongoing	Work Zone Technology & Smart Signals are being integrated into work zones to reduce rear end crashes at traffic signals. Smart signals detect traffic and is tied to a cueing system. Smart arrow boards are being used to inform traveling public of lane closures.	Jeremy Wilde, Work Zone Safety			Incorporation of countermeasure and a standard operating procedure. Completed.

<p>Strategy 2: Reduce and mitigate speed-related roadway departure/intersection crashes</p>	<p>Purpose: Driving the speed limits is the responsibility of the vehicle operator. While roads are designed, constructed, and maintained with safety in mind, drivers routinely exceed the posted speed limits and drive too fast for conditions. The faster a vehicle is traveling when it crashes, the greater the risk of severe injury for the occupants. Speed limits are set by state statute and monitored and enforced by law enforcement to improve speed limit compliance. Challenges to enforcing the speed limits include vast distances of open road, limited manpower and funding for law enforcement, and Legislative statute that forbids the use of automated enforcement. Countermeasures for mitigating speed-related roadway departures and intersection crashes include geometric alignment changes and use of other roadway safety features.</p>
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Opportunity for Action	Timeline	Status	Safety Partners	Reference	Resource	Measurement of Success
<p>S2.1 Continued implementation of Speed Enforcement Campaigns</p>	<p>Annual. Ongoing</p>	<p>In addition to focusing on impaired drivers and unrestrained vehicle occupants the STEP campaigns also focus on drivers exceeding the posted speeding and other risky driving factors. MCS and MHP coordinate Ticketing Aggressive Cars and Trucks (TACT) enforcement specials to deter unsafe driving behaviors by passenger vehicle (PV) and commercial motor vehicle (CMV) drivers when they interact to share the road.</p>	<p>Chad Newman, Law Enforcement Liaison, State Highway Traffic Safety Section (SHTSS) -MDT; Eric Belford, Motor Carrier Services (MCS)-MDT & Captain Conner Smith, Montana Highway Patrol (MHP)</p>	<p>CVSP FFY 2018-2020, HSP FFY 2021</p>	<p>Federal Motor Carriers Safety Administration (FMCSA), NHTSA Countermeasures That Work (CMW)</p>	<p>Output Measure: Implement STEP program. Outcome Measure: Reduction in speed related citations.</p>
<p>S2.2 Continue to support and implement Intersection Safety Plan</p>	<p>Annual. Ongoing</p>	<p>Using Montana Specific Safety Performance Functions to focus on intersection related crashes in both rural and urban environments. Systematic or spot improvements safety projects have been added. Consultant is reviewing problem intersections for recommendations. A Term Consultant is assisting to analyze several intersections for safety improvements</p>	<p>Patricia Burke, Safety Engineer, HSIP-MDT</p>	<p>FHWA Proven Safety Countermeasures</p>	<p>FHWA Proven Safety Countermeasures</p>	<p>Reduction in number and severity of <u>intersection-related crashes.</u></p>
<p>S2.3 Continue to implement and consider speed management methodologies appropriate for Montana.</p>	<p>Annual. Ongoing.</p>	<p>State statute. Speed limits are posted only after a traffic and safety engineering study has been conducted and (where applicable) approved by the Transportation Commission. Before setting limits, Engineering traffic investigator considers: the length and width of roadway, the roadway type and condition, the location of access roads & intersections, existing traffic control, sight distance, crash history, and traffic speed studies. Speed investigations continue. Traffic Operations staff continue to implement and consider speed management methodologies appropriate for Montana.</p>	<p>Stan Brelin & Gabe Priebe, Traffic Engineer, Traffic & Safety Bureau-MDT</p>	<p>MT Traffic Engineering Manual (TEM), Institute for Setting Speeds (ITE)</p>	<p>MT Traffic Engineering Manual (TEM), Institute for Setting Speeds (ITE)</p>	<p>Reduction of speed related crashes on roadways.</p>

<p>Strategy 3: Reduce roadway departure and intersection crashes through <u>traffic safety education</u></p>	<p>Purpose: Education and awareness campaigns are a critical in reducing roadway departure and intersection related crashes. Public awareness and knowledge of safe driving practices can help prevent unsafe driving reaction and behavior. Drivers should be encouraged to refresh their knowledge and skills as new technological and safety improvement becomes available. Most people only learn about these new elements when they encounter them on the roadway. Public education and awareness inform people on how to navigate standard and innovate roadway infrastructure and safety improvements</p>
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<p>S3.1 AARP Driver Skills Training refresher course covers current rules of the road and defensive driving techniques.</p>	<p>Annual. Ongoing</p>	<p>The AARP Smart Driver™ course, offered by AARP Driver Safety, is the nation's first and largest refresher course designed specifically for drivers age 50 and older. Courses are offered in either a traditional classroom setting or through an interactive online course that may be taken from your home computer at pace of the participant. Course focuses on how to operate a vehicle safely in today's challenging driving and includes managing and accommodating common age-related changes in vision, hearing and reaction time. AARP Driver Safety, https://www.aarp.org/auto/driver-safety/</p>	<p>Carl Peil, AARP Driver Instructor</p>	<p>AARP</p>	<p>AARP Driver Safety</p>	<p>Number of classes / participants:</p>

S3.2 Sustain and continue to provide Share the Road and No-Zone training focusing on operating around large vehicles	Annual. Ongoing	Training focuses on the importance of operating passenger vehicles safely around large vehicles. Motor Carriers Services (MCS) will continue to work with the Office of Public Instruction (OPI), Motor Carriers of Montana (MCM) and carriers throughout Montana to line up trainers and equipment as needed.	Eric Belford, MCS-MDT, Michael W. Gehl Safety Coordinator, Motor Carriers of Montana (MCM) & Office of Public Instruction (OPI),	CVSP FFY 2018-2020	FMCSA	Number of trainings/ classes:
S3.3 Continue to sustain and support the implementation of MT D.R.I.V.E skills training	Annual. Ongoing	All types of drivers attend the summer workshops: school bus drivers; ambulance and fire truck drivers; state, federal and municipal employees; heavy truck and transit bus drivers; driver ed teachers, individuals, and teens (Teen Week in July). More than 16,000 drivers have taken the workshop since 1979. Teachers can earn one college credit from MSUN when they take the workshop, stay an extra day to student teach, and write a paper.	Dwight Nelson, Traffic Education Director	OPI	Administrative Rules of Montana (ARM) 10.13.401-410	Number of students eligible/enrolled:
S3.4 Continue to sustain and support implementation of the OPI Teen Drivers Education. Expand awareness and importance of driver's education for novice drivers and requirement for parental participation.	Annual. Ongoing	The Montana Traffic Education Curriculum Guide meets the standards, benchmarks & performance standards for state-approved teen driver education. Structured learning & guided practice are needed for students to acquire & demonstrate legal & safe driving skills, habits, and responsibilities. Teen drivers must complete an approved Montana driver's education & training program to obtain a driver's license before age 16.	Dwight Nelson, Traffic Education Director	OPI		Number of successful participants:
S3.5 Montana Motorcycle Rider Safety (MMRS) Training	Annual. Ongoing	Classroom and driving range safety education to learn and enhance motorcycle operator skills and importance of using motorcycle safety equipment; and applying operator skills to enhance abilities and improve defensive driving strategies. 2020 classes were canceled due to COVID. 2021 classes planned & numbers will be available after the training season. Locations: *Basic Rider Course (BRC): Bozeman 5 courses, Great Falls 4 courses, Helena 3 courses, Kalispell 7 courses, Missoula 9 courses, Sidney 3 courses.*BRC2: a course; *Advanced Riders Course (ARC): Helena 1 course & Missoula 1 course.	Jim Morrow, Montana Motorcycle Rider Safety(MMRS) - MSU Northern, Sheila Cozzie State Highway Traffic Safety Section (SHTSS)-MDT	HSP FFY 2021	Motorcycle Safety Foundation (MSF)	Successful Participants:
S3.6 Continue to promote Operation Lifesaver (OLS)- RR safety program	Annual. Ongoing	Develop MT Operation Lifesaver website to enhance public awareness and promote safety around rail road crossings to reduce highway-rail crossing collisions, deaths and injuries. Outreach activities typically include: Annual outreach events/presentations (including high school assemblies, drivers education, and business meetings). *2021: OLS is working to fill the vacant coordinator position. September 20-24, Rail Safety Week promoted by CHSP partners, MDT homepage, and social media to stakeholders.	John Althof, RR Safety-MDT / Montana Operation Lifesaver (OLS)		Operation Lifesaver Rail Safety Education	Outreach & Educational events:
S3.7 Continue to provide and enhance traffic safety information for bicyclist and pedestrians and other non-motorized transportation system users.	Ongoing	Support and provide traffic safety education materials and resources to enhance safety awareness and Montana statute for non-motorized transportation system users with consideration of age and if appropriate skill levels. State Bicycle /Pedestrian Coordinator conducted outreach and safety materials for all ages (Head Start- Seniors) to include PSAs and social media.	Bicycle & Pedestrian Coordinator, Multimodal Bureau-MDT		Tran Plan MT	Program implementation.
Strategy 4: Reduce and mitigate intersection crashes through data-driven problem identification and the use of best practices		Purpose: MDT's intersection safety plan will use analytical techniques addressing intersection safety in a proactive manner to identify intersection types where specific crash patterns exist or where severe crashes are more likely to occur based on infrastructure characteristics and define potential solutions. MDT will continue to work with all roadway jurisdictions using input on safety issues to identify specific locations where improvements may be needed, conduct analysis, and define and implement solutions.				
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S4.1 Implement the Railway-Highway Crossings (Section 130) Program. Section 130 program funds are eligible for projects at all public crossings including roadways, bicycle and pedestrian paths.	Annual. Ongoing	This program provides funds for the elimination of hazards at railway-highway crossings. 50% of a State's apportionment under 23 USC 130(e) is dedicated for the installation of protective devices at crossings. The remainder of the fund's apportionment can be used for any hazard elimination project, including protective devices. MDT continues to implement the Railway-Highway Crossing program on an annual basis.	John Althof, RR Highway Safety, TSB-MDT		FHWA-Railway-Highway Crossings (Section 130) Program, 23 USC 130	Implementation of annual program.
S4.2 Continue to implement and enhance proven countermeasures such as, but not limited to improving sight distance at intersections and availability of gaps in traffic and assist drivers in judging gaps; access management; traffic signalization, control, operational, and other infrastructure improvements for all transportation system users.	Annual. Ongoing	The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance. * 2021: Working with Operations on various sites to address identified safety issues.	Patricia Burke, Safety Engineer, HSIP-MDT	HSIP FY 2021	FHWA- Highway Safety Improvement Program	Implementation of annual program in identified safety issues.

Strategy 5: Continue to improve the accuracy, completeness, integration, timeliness, uniformity, collection, and accessibility of safety (fatality and serious injury, traffic, and roadway) data used in traffic safety analysis

Purpose: The key to achieving the long-term vision of zero fatalities and zero serious injuries is to focus resources on the most significant problems. Accurate, complete, uniform, and timely data can be used to access appropriate countermeasures. The ability to collect and integrate all city, county, tribal, and state crash data by jurisdictional law enforcement would allow a more accurate picture of road crashes and contributing roadway factors. Ability to access data by all entities is necessary for infrastructure safety improvement and safety program funding opportunities.

Opportunity for Action	Timeline	Status	Safety Partners	Reference	Resource	Measurement of Success
S5.1 Enhance and upgrade MDT's Safety Information Management System (SIMS) crash database. Continue to identify, analyze and track HSIP projects that reduce the number of fatal and serious injuries.	Ongoing. 5+ Years.	Working through the process of upgrading MDT's current crash database. This includes coordination with MDT-ISD and MHP. Tentative Completion date, mid-2022.	MHP, Patricia Burke, Safety Engineer, HSIP-MDT, Informations Services Division (ISD)-MDT	HSIP FFY 2021	Safety - MDT	Update MDT's Safety Information Management System (SIMS) crash database.
S5.2 Create crash database dashboards for groups including CHSP, Planning Division, etc. This could include other agencies such as MHP (focusing enforcement efforts) and DPHHS (focusing educational efforts).	1-2 Years	Preliminary discussions on creating dashboards. Dashboard development early 2021. New crash data base will include set up of crash factor related and fatality dash boards to align with safety programs. In dashboard development stage.	Patricia Burke, Safety Engineer, HSIP-MDT, Informations Services Division (ISD)-MDT	Confirm HSIP FFY 2021	Safety - MDT	Develop & rollout of crash data dashboards to provide consistent data for all stakeholders and partners.

Strategy 6: Support and increase enforcement of proper road use behaviors by all road users (motorized and nonmotorized) identified through crash data.

Purpose: A primary way to change driver behavior is through enforcement of safe driving. The goal of issuing citations and fines to those who violate statutes and exhibit risky behavior is to change behavior. Data analysis and input from law enforcement is invaluable in identifying locations where enforcement and/or safety improvements are needed. Those locations may also be reviewed for infrastructure and facility upgrades to increase safety for enforcement and other emergency responders.

Opportunity for Action	Timeline	Status	Safety Partners	Reference	Resource	Measurement of Success
S6.1 Continue to conduct and implement Operation Safe Driver campaigns.	Annual. Ongoing.	CMV enforcement activities within corridors where data indicated there are a high number of crashes involving vehicles involved in international commerce. Dec 2020: COVID has cut enforcement activities. Contacts limited to those only necessary. Random specials are being conducted.	Eric Belford, MCS & MHP	CVSP FFY 2018-2020	Federal Motor Carriers Safety Administration (FMCSA)	Implementation of Annual Campaigns.
S6.2 Continue to support the Montana Highway Patrol (MHP) high visibility enforcement to reduce roadway departure and intersection related crashes due to risky driving behaviors.	Annual. Ongoing.	Crash maps to assist enforcement in identifying enforcement corridor or crash clusters to focus on risky driving behaviors to reduce roadway departures.	Mark Keeffe, SHTSS-MDT & MHP			Annual maps.

Strategy 7: Explore and implement best practices for reducing roadway departure, including distracted and fatigued driving, in addition to other behavioral factors.

Purpose: Behavior change may result from enforcement, education, or a response to infrastructure. For example, distracted or fatigued driving can be addressed through rumble strips that alert a driver (who might be talking on a cell phone or falling asleep) that they are leaving the travel lane; law enforcement could stop a vehicle for careless driving upon noting erratic movement on the roadway; or an education campaign might convince a driver that it is just not worth the risk to answer a call while driving or that they should pull over to rest when overly fatigued. New technology and research are continually emerging to address behavioral issues. With this strategy, Montana will continue to monitor safety literature to evaluate emerging safety improvements strategies with a proven safety benefit and consider implementation, as appropriate.

Opportunity for Action	Timeline	Status	Safety Partners	Reference	Resource	Measurement of Success
S7.1 Conduct low volume rural roads research project to prioritize and identify areas of need.	Two year project	Develop a methodology for identifying and prioritizing locations on low volume local roads in Montana at the network level deserving of Highway Safety Improvement Projects. Research project includes methodology, risk factors, and roadway features. Low volume rural roads research project completed December 2021.	Gabe Priebe, Traffic & Safety Engineering (TS)	Research- MDT	Research-MDT	Completion of research project and implementation of finds, if appropriate. ☐
S7.2 Research effectiveness of highway safety public education at Montana Motor Vehicle Division and Vehicle Registration Stations by streaming safety videos.	In progress.	Based on the need to educate Montanans about highway safety, the consequences of risky driving behaviors (such as texting while driving, driving while impaired or distracted, driving unbuckled); and the benefits of proven innovative road safety countermeasures (such as roundabouts and rumble strips installed by public transportation agencies) a research project has been undertaken. The highway safety public education research project is underway with the Montana Motor Vehicle Division and Vehicle Registration Stations to stream safety videos for customers waiting 5+ minutes. The video sequence and approval of use is being confirmed. Long-term vision is to use on MDT site. The project will include a survey to measure whether viewing the videos makes a difference in driver behavior. Consider implementation of research findings, if appropriate. Deployment is anticipated for summer 2021. Experienced COVID-19 delays.	Gabe Priebe, Traffic & Safety Engineering (TS), Motor Vehicle Division-Dept of Justice (MVD-DOJ) and other traffic safety partners	Research- MDT	Research-MDT	Effectiveness of Highway Safety Public Education at DMV and Vehicle Registration Offices:
S7.3 Proposed: Research safety evaluation of sinusoidal centerline rumble strips.	Long term. In progress.	Previous studies show a quieter centerline rumble strip (CLRS) option is the sinusoidal centerline rumble strip (SCLRS). Currently there are no studies to quantify the crash reduction effects of the SCLRS. This project will investigate the effectiveness of SCLRS in lowering the number of observed crashes. This project is in progress and is expected to be a long-term project as sufficient data is necessary to evaluate the effectiveness of SCLRS. *2021: Sinusoidal centerline rumble strips were installed in the Missoula District summer 2021. Research underway.	Gabe Priebe, Traffic & Safety Engineering (TS)-MDT	Research- MDT	Research-MDT	Evaluation of sinusoidal centerline rumble strips.
S7.4 Implement findings of New/Novel Signs Study to Support Infrastructure Based Motorcycle Crash Countermeasures Project	Reviewed by end of 2022.	Develop a prioritized list of highway sign alternatives that can serve as effective motorcycle crash countermeasures. Objective is to determine and/or develop various new/novel highway sign alternatives, conduct comprehension and legibility testing of these highway signs, and develop a prioritized list of highway sign alternatives that can serve as effective motorcycle crash countermeasures. Research Project completed. Unknown if MDT will review final report & implement finding, if appropriate.	FHWA	FHWA	FHWA	Review final report & implement finding, if appropriate.
S7.5 Continue to track and consider implementation of advances in automated vehicle and roadway technologies. As automated vehicle technology advances and is deployed, transportation policy and planning will be critical. Approaches to fully address the needs of the traveling public, businesses, and freight operators will need to be adapted.	Ongoing.	As automated driving systems developers continue to improve their systems, laboratory and track-testing are validated with controlled testing on public roads. Vehicle-to-vehicle (V2V) communication's ability to wirelessly exchange information about the speed and position of surrounding vehicles can help to avoid crashes, ease traffic congestion, and improve the travel environment. Advanced driver assistance technologies depend on an array of electronics, sensors, and computer systems. In advancing these features and exploring the safety benefits of these new vehicle technologies, NHTSA is also focused on strong cybersecurity to ensure these systems work as intended and are built to mitigate safety risks.	Chad Newman, SHTSS-MDT & Gabe Priebe, Traffic & Safety Engineering, & Eric Belford, Motor Carrier Services-MDT	NHTSA	NHTSA, Research-MDT, FHWA, FMCSA, among others	Provide updates as they become available.
S7.6 Continue to support awareness of community cell phone ordinances with safety partners	Ongoing.	Electronic hand held device / texting while driving ordinances have been effective in reducing driver distractions. Ordinance language & fines vary and often include exception for emergency responders or road maintenance and construction. *Shelby enacted a cell phone ordinance Dec 3, 2020, becoming the 15th community in Montana to do so. https://www.mdt.mt.gov/visionzero/docs/CELL-PHONE-BAN-MAP.PDF recent activities in Shelby involve installing ordinance signage. Pam requested map update Jan 2021.	Safety Stakeholders		NHTSA	Continue to support and document communities that implement cell phone ordinances.

<p>S7.7 Proposed research effective wildlife fences through better functioning barriers at access roads and jump-outs. Wildlife fences in combination with wildlife crossing structures are the most effective measure to improve human safety through reducing collisions with large mammals, and to provide safe crossing opportunities for wildlife.</p>	<p>Proposed</p>	<p>Study to investigate barrier types to keep species with paws out of the fenced road corridor at access roads. Research to select sites with very low traffic volume & interested landowners first, before increasing complexities with higher volume public roads. Initial focus is on very low volume access roads and single land owners, and relatively low-cost barriers. Barriers at higher volume access roads or barriers on the main highway at fence-ends, likely will require more complex and more expensive measures. Initial focus on low volume access roads has the potential to result in the greatest benefits at the lowest costs. Existing gates and existing wildlife guards can be left in place; as an integral part of the "treatment" (e.g. for existing wildlife guards) or they could be left open during the testing of the alternative barriers (e.g. for existing gates).</p>	<p>Environmental-MDT, Confederated Salish & Kootenai Tribes and other traffic safety partners</p>	<p>Research- MDT</p>	<p>Research-MDT</p>	<p>Implement research findings, if appropriate.</p>
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