

# SOLUTIONS



## RESEARCH PROGRAMS

*Spring/Summer 2021*

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## PROJECT HIGHLIGHTS

### Testing Wildlife Friendly Fence Modifications to Manage Wildlife and Livestock Movements

[https://www.mdt.mt.gov/research/projects/env/wildlife\\_fence\\_mods.shtml](https://www.mdt.mt.gov/research/projects/env/wildlife_fence_mods.shtml)

Fences along roadways serve as safety measures to protect humans from vehicular collisions with wildlife and livestock (i.e., all cattle) by containing livestock in appropriate pastures. However, fencing can reduce overall landscape connectivity for wildlife and ecological processes. Historically, many in the ranching community have believed wildlife friendly fence designs to be ineffective in holding livestock. This research measured the effectiveness of wildlife friendly fence designs and fence modifications in allowing continued movement of wildlife while keeping livestock in appropriate pastures. The results of this research provide scientifically defensible recommendations that can be used to inform State and Federal Wildlife and Land Management Agencies, Departments of Transportation, and the public at large of the effectiveness of more holistic multi-species 'wildlife friendly' fence designs, and mitigation techniques.



A bottom wire height of 18" proved to be the optimum bottom wire height above the ground for improving or accounting for passage by pronghorn while keeping livestock within the intended pasture. A strand of smooth wire set at 18", or the use of clips or carabiners to modify the bottom wire height of an existing fence up to 18" above the ground was proven to be the most effective. The research found that increased bottom-wire heights allowed deer species to crawl underneath fence and was the preferred crossing decision by does, and in particular, does with fawns. The present usage of a goat-bar, i.e., PVC pipe, on the bottom wire to improve passage was documented to be ineffective and created a negative behavioral response by pronghorn. Finally, the research found that modifications which increased fence visibility (i.e., sage-grouse reflectors and PVC pipe on the top wire) did not impede crossing success and had no substantial unintended consequences on the crossing behavior of pronghorn, mule deer, or white-tailed deer, ultimately leading to a plausible multi-species wildlife friendly fence design.

For more information, visit the [project website](#) or contact the research office (406-444-6338).



## Guidance for Evaluating Traffic Safety Culture Strategies

<https://www.mdt.mt.gov/research/projects/trafficsafety-strategies.shtml>

Traffic safety culture can be defined as the beliefs shared by a group of road users or stakeholders that influence their behaviors that impact traffic safety. This definition of culture establishes a relationship between beliefs and behaviors. Many of our beliefs come from the culture of the groups we belong to such as family, school, workplace, or community. Specifically, when individuals have certain beliefs, they are more likely to engage in certain behaviors.



For example, if people believe that it is safe to have hands-free cell phone conversations while driving, they are more likely to engage in this risky driving behavior.

To reduce the number of traffic crashes and resulting injuries and fatalities, traffic safety agencies are developing and implementing new intervention strategies aimed at changing traffic safety culture. However, efforts to systematically evaluate these new programs are not advancing as rapidly as the strategies

themselves. Barriers to evaluating traffic safety culture strategies include a lack of suitable evaluation design and/or a lack of agreement about the design elements of an evaluation appropriate for these strategies. Understanding how a traffic safety culture strategy leads to improving traffic safety is important when designing an evaluation. Such evaluations need to include evidence not only about changes in behavior, but also changes in beliefs that support those behaviors and the outcomes that result from those behaviors.

Reaching zero traffic-related deaths and serious injuries will require new thinking – including evaluative thinking. Evaluative thinking is a problem-solving approach to designing, selecting, and allocating resources for traffic safety strategies. It seeks credible evidence to provide answers about the effectiveness and sustainability of traffic safety strategies.

Traffic safety culture strategies focus on changing beliefs that influence behaviors related to traffic safety. For such strategies to become more widely used, we need more evidence that they are effective and more knowledge about how to implement them effectively. Traffic safety practitioners can use process, outcome, and impact evaluations to grow evidence and knowledge.

For evaluations to be useful, they must use quality data and make appropriate comparisons. Stakeholders should be involved in developing an evaluation. After developing a clear description of the strategy, quality data and appropriate comparisons can be identified for use in the evaluation. Once evaluation results are gathered and analyzed, stakeholders should make meaning of the results, accumulate wisdom (i.e., lessons learned), and identify opportunities to apply the knowledge in the

For additional information, visit the [project website](#) or contact the Research Office (406.444.6338).



## **LIBRARY CORNER**

### **National Library Week 2021**

<http://www.mdt.mt.gov/research/unique/services.shtml>

The theme of National Library Week 2021 was *Welcome to Your Library*. This theme highlights the idea that libraries extend far beyond the four walls of a building, and that everyone is welcome to use their services.



During the pandemic, libraries have been going above and beyond to adapt to our changing environment by expanding our resources to continue to meet the needs of our users. Whether people visit in person or virtually, libraries offer opportunities for everyone to explore ideas and become their best selves through access to technology, multimedia content, and educational programs.

The Montana Department of Transportation library is no different. This library is a resource of its agency, but it is also part of a much larger community. At its most local level the library works with MDT staff to answer questions, solve problems, and provide research services. The MDT Library participates in the Montana Shared Catalog with the State Library. This means we have an impact on the greater library community allowing us to serve customers throughout the state of Montana.

Of course, this doesn't even touch our national reach. The Interlibrary loan program assists other transportation, academic, and even public libraries around the nation. Similarly, our integration with the Transportation Research Board, and the [AASHTO Research Advisory Committee \(RAC\)](#) keeps the Montana Department of Transportation connected to the latest research in the field while keeping other agencies aware of the important work we do here.

The research reports generated at the Montana Department of Transportation are sent on to the [National Transportation Library \(NTL\)](#) for greater distribution through their Rosa-P Database. These have an international reach. We also build [LibGuides](#) for the [National Transportation Knowledge Networks \(NTKN\)](#) to keep the flow of information in developing areas of research current for anyone who needs it.

For such a small library our community is vast, and that is something of which to be proud. This year at the Montana Department of Transportation Research Library our local adaptation of National Library Week took the form of a virtual event featuring games, customer appreciation, and education for the MDT staff.

We launched an online library scavenger hunt that took MDT staff through databases, the library catalog, and our various library subscriptions on a wild chase for educational clues to win the game.

During this week, the library also offered virtual training in a variety of topics. Staff learned how to use valuable tools like Overdrive business ebooks and audio books. Participants also learned how to access and use the [TRID database](#), the [Rosa P repository of the National Transportation Library](#), and our own [internal library catalog](#). During these training sessions the librarian helped employees learn to take advantage of research assistance and how to locate books for our agency professional development programs.

Library customer appreciation week is always an exciting opportunity to showcase our collection, provide online training, and raise awareness of the value and impact of research in our community, a community that starts locally but has a reach that is far larger than meets the eye.

For additional information, please contact Bobbi deMontigny ([bodemontigny@mt.gov](mailto:bodemontigny@mt.gov), 406.444.0871).



## SOLUTIONS

Spring/Summer 2021

MONTANA DEPARTMENT OF TRANSPORTATION  
RESEARCH PROGRAMS

### DID YOU KNOW?

#### New Research Projects and Pooled Fund Participation for the 2022 Federal Fiscal Year (FFY)

<https://www.mdt.mt.gov/research/unique/solicit.shtml>



Did you know that the Montana Department of Transportation (MDT) solicits for research ideas annually? Although research ideas can be submitted at any time by anyone, the Research Section formally solicits for research ideas beginning in February, for which Stage 1: Research Ideas are due March 31st. In March and early April, champions are identified, literature searches are conducted, and the champions determine which projects will move forward to Stage 2.

Research ideas without champions do not move forward. Stage 2: Research Topic Statements are due April 30th. Between May and August, based on available funds, the MDT high-level Research Review Committee (RRC) and District Administrators determine which projects resulting from this annual solicitation, pooled funds, and other partnering projects will move forward. These projects along with the continuing projects make up the next year's work plan. The new projects selected for the 2022 FFY include four new research projects and participation in two new pooled fund projects.

For FFY 2022, the following new projects were moved forward to the Technical Panel stage:

- ★ Aging Conditions for Hot Mix Asphalt Cracking Test
- ★ Development of P-Y Curves for analysis of Laterally Loaded Piles in Montana
- ★ Evaluate MDT Electrified Wildlife Deterrent Mats
- ★ Organization and Analysis of Measurement While Drilling (WMD) Data

For FFY 2022, participation in the following new pooled fund projects was approved.

- ★ Building Information Modeling (BIM) for Infrastructure
- ★ Pavement Structural Evaluation with Traffic Speed Deflection Devices (TSDDs)

Contact Susan Sillick ([ssillick@mt.gov](mailto:ssillick@mt.gov), 406.444.7693) for more information.



## New Faces in Research

<http://www.mdt.mt.gov/research/our-staff.shtml>

Please welcome our new Experimental Projects Manager.



Chad is originally from southwest Minnesota. He made the move to Missoula in 2017 from Fargo, ND and joined MDT in February of 2018 as a part of the Missoula District

Materials Lab where he spent the last three years.

Chad officially joined the Research Section on June 7th. Most of his free time is spent hunting, fishing and exploring with Lexy (his soon to be wife, September 2021) and their chocolate lab, Cedar.

Katie Kuipers is our intern for the summer.



Katie grew up in Oakes, ND and moved to Bismarck, ND after graduating from the University of Nebraska-Lincoln with a Bachelor of Arts in history. For the past year and a half, she worked as a Library Assistant for Bismarck Public Schools, moving from an elementary school to two high schools in February where

she assisted students and staff with locating materials, and developed new programming for the libraries.

She enjoys travel, nonfiction books, and going for a run outside. She looks forward to exploring Montana this summer. If you have any suggestions on what to see or do, please reach out and let her know!

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## CALENDAR OF EVENTS

### July

- AASHTO RAC Summer Meeting - 7/13 - 7/15
- BTSCR Panel Nominations Due - 7/17
- RRC Meeting - 7/29

### August

- RRC Meeting - 8/31

### September

- NCHRP IDEA Proposals Due - 9/1
- ACRP Synthesis Problem Statements Due - 9/15
- Rail Safety IDEA Proposals Due - 9/15
- ACRP Panel Nominations Due - 9/17
- RRC Meeting - 9/30

### October

### November

- NCHRP Problem Statements Due - 11/1
- RRC Meeting - 11/5
- MDT Preconstruction Conference - 11/30-12/1

### December

- RRC Meeting - 12/17



For additional information, please see: <https://rppm.org/events/>.



## **NEW RESEARCH PROJECTS**

[Numerical Modeling of the Test Pit for Falling Weight Deflectometer Calibration](#)

[Resources and Tools to Reduce Multi-Risk Driving Behaviors](#)

[A Review of Methods to Change Beliefs](#)

## **NEW RESEARCH REPORTS**

[Feasibility of Non-Proprietary Ultra-High Performance Concrete \(UHPC\) for Use in Highway Bridges in Montana Phase II](#)

[Guidance for Evaluating Traffic Safety Culture Strategies](#)

[Large-Scale Laboratory Testing of Geosynthetics in Roadway Applications](#)

[MDT Research Annual Reports](#)

[Testing Wildlife-Friendly Fencing Modifications to Manage Wildlife and Livestock Movements](#)

A listing of all past and current research projects can be found at

[http://www.mdt.mt.gov/research/projects/sub\\_listing.shtml](http://www.mdt.mt.gov/research/projects/sub_listing.shtml)

## **NEW EXPERIMENTAL PROJECTS**

[Trail creek structures/Ultra-High Performance Concrete \(UHPC\)](#)

## **NEW EXPERIMENTAL REPORTS**

[High Friction Surface Treatments \(HFSTs\)](#)

A listing of all past and current experimental projects can be found at

[https://www.mdt.mt.gov/research/projects/exp\\_sub\\_listing.shtml](https://www.mdt.mt.gov/research/projects/exp_sub_listing.shtml)



## REMINDER

Information on research services and products, such as research and experimental project processes and reports and technology transfer services, can be found on the Research web site at [www.mdt.mt.gov/research](http://www.mdt.mt.gov/research).

MDT's library collection can be searched through the [library catalog](#). The catalog and other information resources are available through the [MDT Library web site](#).

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## CONTACT US

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