

# SOLUTIONS

## PROJECT HIGHLIGHTS

### Assessing the Effectiveness of Montana's Occupant Protection Programs

<http://www.mdt.mt.gov/research/projects/safety/occupant.shtml>

States invest extensively in occupant protection programs, however, the impact these programs have on improving seat belt compliance rates remains unclear. Quantitative evaluations of program effectiveness are critical to optimizing program impacts and are at the same time challenging. The purpose of this research project was to quantitatively evaluate the relationships between the Montana Department of Transportation's (MDT) occupant protection program activities and seat restraint usage across the state.

A cross-disciplinary research team worked in collaboration with MDT to evaluate four program activities:

- Office of Public Instruction driver education programs
- Selective Traffic Enforcement Programs (STEP)
- Buckle Up Montana (BUMT) coalitions
- Media campaigns

The team prepared data and constructed a statistical model that quantitatively compared seat belt usage at sites impacted by specific MDT programs to sites with no program activities. Data from multiple sources were used to conduct the quantitative analysis. Data from NHTSA's National Occupant Protection Usage Survey (NOPUS) provided a measure of seat belt compliance rates at sites throughout Montana for multiple years. MDT provided information on each of its occupant protection programs, which the research team translated into quantitative measures of program effort. Data from other sources (e.g., U.S. Census data; weather data; road type) were included to account for other factors likely associated with seat restraint use rates.



## RESEARCH PROGRAMS

*Winter/Spring 2015*

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Detecting program-specific effects was challenging using the NOPUS data.

The evaluation suggested that MDT's programs largely operate independently of one another. Buckle Up Montana program presence was associated with increased seat restraint use rates, especially in areas that were not in large media catchment areas. Selective Traffic Enforcement Programs showed a strong relationship with increased seat restraint use, but this relationship disappeared in models that included all occupant protection programs. Driver education program completion rates were not associated with increased seat belt use. There was no saturating effect of program impacts, except for media campaigns, where additional dollars led to improved occupant protection rates only to a point. Below is a summary of the project conclusions.

MDT programs contribute to a small increase in seat belt use rates, but their impacts are small relative to other factors. The factors with the largest effect on seat belt use rates in Montana are road type, population density, and income. Since none of these factors are under MDT's control, it would be easy to overlook the role that MDT's programs play. However, the effects associated with several MDT programs were significant, albeit relatively small. Buckle Up Montana coalition presence and media presence were both associated with increased seat restraint usage.

STEP may be highly effective, but its impacts are masked by the presence of other programs. Selective Traffic Enforcement Programs (STEP) were the most effective of the programs examined when analyzed in the absence of other MDT programs, but that impact

eroded when other programs were included in the model. This is likely a result of the data used, and may not reflect a true reduction of a STEP effect. The STEP activities showed similar impacts on seat belt use regardless of the population density or spatial jurisdiction in which they were allocated. In other words, STEP efforts in urban and rural jurisdictions access roughly the same number of vehicle passengers.

Media investment has initial benefits, but benefits decline when expenditures exceed \$12,000. A significant quadratic effect characterized the relationship between additional media investment and seat belt use when media was examined alone. This suggests that although initial media investments result in substantial gains in seat belt use, after a certain point, additional dollars no longer elicit the same benefit.

BUMT is highly effective, but BUMT and media are most beneficial when they operate separately. Buckle Up Montana Coalitions had the strongest effect of any MDT program analyzed, when all programs were considered in the same model.

This project produced direct estimates of program impacts on seat restraint usage in Montana. The findings provide an additional line of evidence supporting the general efficacy of MDT's occupant protection programs. To learn more about the project and recommendations to MDT regarding resource allocation to state occupant protection programs, visit the [research project website](#) for more information. If you have questions, please contact Kris Christensen ([krchristensen@mt.gov](mailto:krchristensen@mt.gov) or 406.444.6125)

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### **3M Reflective Ceramic Elements and Visimax Plus Elements for Added Retroreflectivity on Contrast Pavement Markings**

In an effort to add more visibility to an upcoming striping project on Missoula's Reserve Street, MDT elected to evaluate the effectiveness of 3M Ceramic Elements and Visimax Plus Elements when blended with conventional MDT Type II glass beads in use with bordered contrast pavement markings (a stripe with

a black outline and white center) on portland cement concrete pavement (PCCP).

These elements are claimed to provide increased retro-reflectivity during wet conditions allowing for the striping to be recessed, which may increase



durability with snow plow use. The increased retro-reflectivity during wet conditions is also being evaluated to determine their effectiveness as safety treatments.

The products to be tested are as follows:

- 3M Elements wet-reflective microcrystalline dual-optic beads (2.4 reflective-index) with high

efficiency pigments are reported to provide optimal reflectivity for pavement markings under wet conditions. The 3M system combines standard glass beads with ceramic elements to maintain optimal visibility in wet and dry conditions, as described by the manufacturer.

- The Visimax elements are composed of a Visibead Core coated with a proprietary coating and bonded to thousands of high index beads to form an outer shell. Visimax Plus is a blend of Visimax and Type 4 (large) beads which is used to supplement standard glass beads to maintain optimal visibility in dry and wet conditions.

This project will be constructed in summer 2015, and will be monitored for performance annually for a minimum period of five years following that. Updates will be posted to the [project page](#). For additional information, contact Craig Abernathy (406.444.6269 or [cabernathy@mt.gov](mailto:cabernathy@mt.gov)).

### Evaluation of the Break-Out Square Post Breakaway Coupler

The Break-out Square (BOS) Post Breakaway Coupler is currently being evaluated through the MDT Experimental Projects Program.

Upon vehicle impact, the coupler, a 360° sacrificial shear section connected to a wedge anchor base, is

designed to break flush with the grade, with no damage to the square tube post or anchor. The purpose of which is to offer quick return of the sign to service without the use of any special tools.





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Once the sign is hit, the sacrificial coupler snaps the anchor base level with the surface with no protruding metal. The undamaged sign is then fitted with a new coupler and reinserted into the wedge base.



Since the original installation in 2012, several units have been struck and performed as advertised, with the signs being re-installed in about 10 minutes.

So far fourteen BOS units have been placed within the City of Billings. Since the units are much cheaper to purchase than the current slip-base models, and easier and quicker to initially install and to replace, MDT plans to install more of the BOS units in the future.

Evaluation updates will be added to the [project page](#). For additional information, contact Craig Abernathy ([cabernathy@mt.gov](mailto:cabernathy@mt.gov) or 406.444.6269).

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## LIBRARY CORNER

### How to Find New Research Reports

At the rate new research reports are published, it can be a challenge to keep up with the information. State transportation agencies such as the Montana Department of Transportation (MDT) have technologies to help readers stay up-to-date as new reports are published.

For MDT's Research and Experimental projects, we offer the following to stay informed about our research information:

- We have web pages that list all active and completed [Research](#) and [Experimental](#) projects. The projects are organized by categories, in order to facilitate easier access.
- We have [email listservs](#) set up for new Research and Experimental final reports, as well as project

solicitations, requests for proposals, and this Research newsletter. All that is required is your email address to receive notifications.

- We now have an [RSS feed](#), which allows subscribers to receive updates of any new content added to all MDT Research pages, including Experimental, Research, and Newsletters. RSS stands for "Rich Site Summary". It's a way to receive alerts via your email, web browser, or feed service, about new content available. The MDT Research RSS feed provides a means to learn about content beyond project final reports, including meeting notes, presentations, annual reports, project summary reports and more; see [these instructions](#) to learn more about how to subscribe to the feed using Microsoft Outlook





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or Internet Explorer. If you have a different web browser or email service, please contact your IT department for more information on how to subscribe. Once subscribed, when the title of the folder in your email or web browser is in bold font, that means new content is available.

- We offer [an interactive map](#), which shows approximately where projects are being conducted and have been conducted in the past. This is a visual way to learn more about our projects.

Other states' transportation agencies also publish research and offer various ways to learn about their new reports. This [web page](#) has a listing of some agencies' publications subscriptions, allowing you to stay current with their new research reports and information. It will soon be updated with even more states' subscription information.

Another way to stay current is to take advantage of the RSS feature of [Transportation Research Board's TRID Database](#). This database contains over a million records of transportation research, including states' research reports and active research projects.

To find research from a particular state transportation agency, you can type in the name of the agency in the search field - for example, "Montana Department of Transportation".

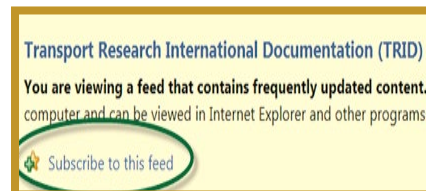
Below that, from the drop down menu, select "Agencies", and then Submit.

The results retrieved will be in reverse chronological order, and again, you can see published final reports and active projects. The search may also retrieve results generally related to that particular state; that is, that state may have been included in a larger study of multiple states. This [recorded webinar](#) offers more information about searching TRID.

You can then click on the RSS feed icon directly above the search results, towards the left. This will take you to the feed subscription page. The contents of the feed and the alerts you'll receive are related to your search of the particular state agency's research.



Click Subscribe to this feed to add it to your web browser or follow [these directions](#) to add the feed to Outlook. The RSS feed subscription procedure and the way the feed works is the same as the MDT Research RSS feed.





It will then send you notifications any time new information is published related to that search; so anytime that agency adds new projects, publications, or information related to that state is published, you'll receive an alert. This same process can be used to continually receive updated information on topical searches as well.

These are just a few technologies available to allow users to stay current with transportation research information. To learn more, contact Katy Callon ([kcallon@mt.gov](mailto:kcallon@mt.gov) or 406.444.0871).

## DID YOU KNOW?

### MyTRB

The Transportation Research Board (TRB) has recently released a new self-service portal called MyTRB, which is designed to allow all state DOT employees to maintain their own contact information and profile, order print versions of publications, and become "friends" of TRB standing committees. Friends of committees generally receive news and information from the committee, and also form one of the groups from which new members of the committee are chosen. For state DOT employees who are already active in TRB, the MyTRB portal provides other committee-centric services as well.

### Initial Log-In

To access the MyTRB portal, go to [TRB's homepage](#). In the top right hand corner, click on the MyTRB link.



You'll then be directed to the log-in page. If it's your first time logging in, click on "New User Signup".

You'll be asked to enter your email address. Please use your official email address. This will help to avoid confusion, as benefits and access to certain features are keyed, in part, off your email. Then, click "Submit".

You will receive an email in about 5 minutes that will contain a URL to a new page that will allow you to create a password to access your existing information in MyTRB.

If you believe the profile TRB has on file for you may be linked to an old e-mail address to which



you no longer have access, please contact the MyTRB help desk with both the old and new e-mail addresses. Wait for a response from the help desk before attempting to log in.

**After You Log In**

Once in MyTRB, please take a moment to ensure that your profile is up-to-date. Navigation within MyTRB is controlled by the links that appear in the gray bar below the burgundy TRB header on the website. To view

your existing profile, hover over My Account and then click on “Edit Profile.”

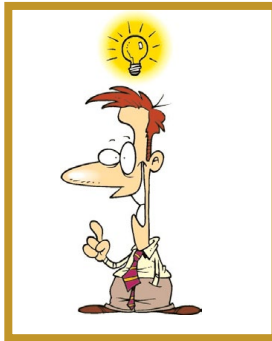
**Subsequent Log-Ins**

For subsequent log-ins, you can bookmark the [MyTRB](#) page or click on the “MyTRB” link in the top black bar on TRB’s main website.

If you have any questions, please contact the MyTRB help desk ([MyTRB@nas.edu](mailto:MyTRB@nas.edu) or 202.334.1738).

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**MDT Solicitation for Research Project Ideas**



We need your ideas by April 30, 2015!

The Montana Department of Transportation (MDT) conducts research to discover, develop, or extend knowledge needed to operate, maintain and improve the statewide multimodal transportation system. Specific goals

include: evaluation and advancement of new technologies, materials and methods; development of design and analysis techniques; and study of current transportation challenges. Every year,

Research staff solicits for new research topics. Topics can be submitted at any time; however, they are due by April 30th of each year and may only be considered once a year during our annual solicitation. New topics are chosen by MDT’s Research Review Committee in May of each year and proceed to technical panels, which determine if a research need exists and the most effective and efficient manner in which to conduct the research. Visit the [Research solicitation page](#) for further information and solicitation topic statement forms. Information on various past and current research projects can be found on the [Research projects page](#). For more information, contact Sue Sillick ([ssillick@mt.gov](mailto:ssillick@mt.gov) or 406.444.7693).

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**MDT Research and Library Customer Appreciation Day**

On April 15th, we held a celebratory open house as way to say thank you to our customers and to share information with staff about the services provided through the Research and Library programs. This event was held in conjunction with the American Library Association’s National Library Week. The theme this year was “Unlimited Possibilities @ Your Library”.





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About 50 MDT staff were able to attend. We had games, door prizes, and snacks, and showcased our research and experimental projects, publications, and library materials. It was a great opportunity to talk more with staff about what we offer. We also distributed brochures, fliers, and MDT Library bookmarks.

We want to say thank you to those who attended and to all of our customers. We greatly appreciate your support and hope to see you at next year's event!

### CALENDAR OF EVENTS

#### April

- National Library Week 4/12-18/15
- MDT Research & Library Customer Appreciation Event - 4/15/15
- MDT RRC Meeting 4/28/14
- MDT Research Topic Statements Due 4/30/15

#### May

- AASHTO Spring Meeting 5/13-15/15
- MDT RRC Meeting - 5/29/15
- SHRP2 Round 6 Implementation Assistance Application Process Opens - 5/29/15

#### June

- TCRP Problem Statements Due - 6/15/15
- MDT RRC Meeting- 6/25/15

#### July

- AASHTO RAC Meeting - 7/27-30/15

- MDT RRC Meeting - 7/23/15

#### August

- MDT RRC Meeting - 8/26/15

#### September

- NCHRP Highway IDEA Proposals Due - 9/1/15
- ACRP Synthesis Topics Due- 9/18/15
- ACRP Legal Studies Topics Due - 9/18/15
- MDT RRC Meeting - 9/29/15
- NCHRP Legal Studies Topics Due - 9/30/15
- TCRP Legal Studies Topics Due - 9/30/15



### NEW RESEARCH REPORTS

[Assessing the Effectiveness of Montana's Occupant Protection Programs](#)

A listing of all past and current projects can be found at [http://www.mdt.mt.gov/research/projects/sub\\_listing.shtm](http://www.mdt.mt.gov/research/projects/sub_listing.shtm).





## **NEW EXPERIMENTAL REPORTS**

[Kwik Bond PPC 1121 Polyester Polymer Concrete \(PPC\) Overlay - 2014 Construction Report](#)

[Geosynthetic Reinforced Soil \(GRS\) - Integrated Bridge System \(IBS\) Technology - 2014 Annual Report](#)

A listing of all past and current projects can be found at  
[http://www.mdt.mt.gov/research/projects/exp\\_sub\\_listing.shtml](http://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**

Sue Sillick – Research Programs Manager  
406.444.7693  
[ssillick@mt.gov](mailto:ssillick@mt.gov)

Kris Christensen – Research Projects Manager  
406.444.6125  
[krchristensen@mt.gov](mailto:krchristensen@mt.gov)

Craig Abernathy – Experimental Projects Manager  
406.444.6269  
[cabernathy@mt.gov](mailto:cabernathy@mt.gov)

Katy Callon – Librarian  
406.444.0871  
[kcallon@mt.gov](mailto:kcallon@mt.gov)

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