
May 31, 2022 | 1:00-3:00 PM | MDT Commission Room and Teams

RRC Members

Mack Long, MDT Director
Julie Brown, MDT Deputy Director
Dwane Kailey, Chief Operations Officer
Mike Bousliman, Information Services Division Administrator
Dustin Rouse, Highways and Engineering Division Administrator
Larry Flynn, Administration Division Administrator
Brad Marten, Motor Carrier Services Division, Administrator

Shane Mintz, Glendive District Administrator
Rob Stapley, Rail, Transit, and Planning Division Administrator
Jon Swartz, Maintenance Division Administrator
Bob Seliskar, FHWA
Matt Strizich, FHWA
David Kack, WTI Director

RRC Members Present: Dwane Kailey, Mike Bousliman, Dustin Rouse, Shane Mintz, Rob Stapley, Matt Strizich, and David Kack

Others Present: Rebecca Ridenour, Aaron Anderson, D.J. Berg, Stephanie Brandenberger, Stan Brelin, Vaneza Callejas, Karalyn Clouser, Andy Cullison, Chad DeAustin, Lisa Durbin, Robert Evans, Leah Fisher, Joe Hauck, Jeff Jackson, Oak Metcalf, Kaia Rosen, Bill Semmens, Matt Ulberg, Natalie Villwock-Witte, Deborah Wambach, and Mike Warren

Action items are in red.

Checking In on a Select Existing Pooled Fund

TPF-5(385): Pavement Structural Evaluation with Traffic Speed Deflection Devices (TSDDs)

DJ Berg, as the pooled fund technical representative for MDT, attended this meeting to present an overview of the pooled fund progress.

The TSDD Vendor collected approximately 200 miles of data in MT during the fall of 2021. That data has been delivered and they are in the process of evaluating it for use at MDT. The plan is to finish the literature review, do two more rounds of data collection and then move on to the full evaluation phase.

The goal is to collect in three distinct regions of Montana and to pick up different pavement types, geology, and functional classes. This will give them a firm data set to work from as they evaluate the future use of TSDD as a data stream for engineering and planning decisions.

MDT has been a partner in this study for the last year. Virginia DOT leads the study.

Questions: The two big benefits of safety and continuous measurements were discussed. DJ noted a greater data density. The availability for the equipment is very limited and expensive. The vendor provided the software and data set for processing.

Research Project Highlights

9890-784: A Feasibility Study of Road Culvert Bridge Deck Deicing Using Geothermal Energy

Jeff Jackson, as the project champion and technical panel chair, attended this meeting to present an overview of the project progress.

A literature review was conducted to evaluate the state-of-the-practice and recent advances in Ground Source Heat Pump (GSHP) systems with a focus on Montana climate/conditions. To understand MDT's perceptions and preferences about deicing/anti-icing measures, a survey was distributed. At Task 2, the research team conducted geotechnical soils testing, including thermal properties testing. They evaluated bio-cementation of soil to improve thermal properties, obtained typical concrete mix designs from MDT and cast cylinders for thermal properties (in addition to compression tests). They also set up an initial preliminary numerical model. Task 3 and 4 activities are ongoing and include performing advanced numerical modeling to model a scale sized bridge in the sub-zero lab at MSU.

Questions: A pump is requiring for electricity. The research will also look at culverts. Considerations for joining concrete was not considered at this time.

Pooled Funds Requests

TPF-5(447): Traffic Control Device Consortium

Stan Brelin as the pooled fund technical representative for MDT, attended this meeting to request a continuation on this pooled fund.

The program has produced research on signing, pavement markings, traffic control devices, etc. for inclusion into amendments and enhancements to the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD) expected to be published soon.

The commitment amount for this pooled fund study is \$10,000/year for three years (FFY 2023-2025). FHWA leads the study.

Dwane Kailey made a motion to continue with the pooled fund. Dustin Rouse seconded the motion. No discussion. All RRC members present voted in favor.

TPF-5(376): Northwest Passage (Phase 5)

Mike Warren, as the pooled fund technical representative for MDT, attended this meeting to request a continuation on this pooled fund.

The vision of the North/West Passage Corridor is to focus on developing effective methods for sharing, coordinating, and integrating traveler information and operational activities across state and provincial borders. Montana and the traveling public continue to benefit from participation in the pooled fund. The information we receive from the various research projects and the experiences of other states, helps MDT make the best decisions possible. Future projects will include analysis of winter performance measures and means of measurement, analysis of truck parking information management, analysis of weather messaging, and assessment of oversize/overweight movement.

The commitment amount for this pooled fund study is \$30,000/year for three years (FFY 2023-2025). Minnesota DOT leads the study.

Dwane Kailey made a motion to continue funding with \$30,000 for three years. Rob Stapley seconded the motion. No discussion. All RRC members present voted in favor.

TPF-5(486): Center for the Aging Infrastructure: Steel Bridge Research, Inspection, Training and Education...

Stephanie Brandenberger, as the potential technical representative to the pooled fund, attended this meeting to present this program for funding.

The funding for this program will be used in part to conduct a full scale, in-situ test of the stress redistribution and after fracture behavior of a 2-girder steel plate bridge subjected to loading consistent with the AASHTO Specifications for the Analysis and Identification of Fracture Critical Members and System Redundant Members. The value of this research to MDT is that by comparing the results of measured deflection, strains and overall behavior, the performance and safety of these types of bridges in-service can be better managed and investments for repairs and replacements made appropriately. The result could be less annual inspection costs and extended lifespan for the hundreds of these types of bridges in service across Montana.

The commitment amount for this pooled fund study is \$25,000/year for three years. Indiana DOT leads the study.

Dwane Kailey made a motion to fund with \$25,000 for the next three years (FFY 2023-2025). Dustin Rouse seconded the motion. No discussion. All RRC members present voted in favor.

2023 Project Ideas Stage 2 Forms

23-001 Significant Factors of Bridge Deterioration

Andy Cullison, as project champion, attended this meeting to request funding and move this project to the technical panel stage.

The proposed research is in response to the Federal Highway program's initiative to use state-based deterioration models to forecast bridge maintenance activity. To address this initiative and to improve these models, significant factors affecting bridge deterioration will be identified and evaluated to quantify their influence on bridge deterioration across the five transportation districts of Montana. The objective of the research is to increase the confidence of deterioration prediction models by applying weighted factors to reflect different environments, traffic characteristics, and bridge types in Montana. A potential path for accomplishing this objective is to align historical NBI component-level inspection condition data with historic precipitation, freeze-thaw cycles, and NWS or Snotel data. This research is a logical continuation of the Development of Deterioration Curves for Bridge Elements in Montana research that is currently underway and near completion. Specific factors anticipated to be significant to the deterioration of bridges in Montana may include, location-based environmental factors, type of steel reinforcement in concrete bridge decks, regional or historic construction practices, rehabilitation treatments, etc.

Discussion:

- Andy noted there will be a tiered approach, but no delay in entering data into BrM.

The total project budget is \$111,000. The estimated project period is 24 months.

23-002 Implementation of Electric Vehicle Charging Infrastructure

Joe Hauck, as project champion, attended this meeting to request funding and move this project to the technical panel stage.

Adoption of electric vehicles (EVs) is on the rise in the United States. Numerous automobile manufacturers have committed to bringing more EV models to the market over the next decade, including electric pick-up trucks. Additionally, improvements in battery technology, which have allowed for an increase in the range over which EVs may operate, and more competitive pricing are making EVs a more viable alternative for many Americans. With greater adoption, the demand for charging infrastructure is expected to increase. The recent National Electric Vehicle Infrastructure (NEVI) Formula Program has provided an opportunity for Montana to plan for EV charging corridors; however, the unique rural context of Montana has yet to be the focus of literature in this arena.

The proposed research project does not aim to duplicate efforts from the recent Montana Department of Environmental Quality (DEQ)/Montana Department of Transportation electric vehicle planning process. While some of the work may complement or build upon these efforts, this research effort will focus on understanding the experiences and economic benefits that small urban and rural communities have seen with implementing EV charging infrastructure.

Discussion:

- Dustin asked if DEQ is aware of MDT's interest in this project. He asked that DEQ be included on the technical panel (Dan Lloyd).
- Joe clarified that the objective of the project is developing an overall or big picture plan. To develop a broader planning tool that would benefit rural communities.
- Dwane mentioned that we should let our other rural neighbor states know about this project. This could be a potential/future pooled fund project.

The total project budget is \$166,500. The estimated project period is 12 months.

23-006 Use of Fiber-Reinforced Polymer (FRP) Composites for Bridge Repairs in Montana

Stephanie Brandenberger, as project champion, attended this meeting to request funding and move this project to the technical panel stage.

The aging and deteriorating transportation infrastructure requires proven, cost-effective, and efficient repair/strengthening methods, especially when replacement is not feasible due to economic and technical constraints. FRP repair methods are well suited to address this need. These methods have been successfully used by various DOTs across the country; however, research is needed to determine the most appropriate methods for Montana, and to ensure the successful implementation of these methods including the development of appropriate specifications for their use. This research will lead to more confidence in using FRP in bridge repairs in the state and will allow the state to capitalize on the inherent benefits of this material and related repair methods.

Discussion:

- Stephanie clarified that this project would follow same process as the UHPC project, with a phased implementation.

The total project budget is \$277,500. The estimated project period is 36 months.

23-007 Solar Energy Generation within MDT ROW

Aaron Anderson, as project champion, attended this meeting to request funding and move this project to the technical panel stage.

The Montana Department of Transportation (MDT) should develop a process for the installation of solar Photovoltaic (PV) projects in the highway right of way (ROW). The project would look at the utilization of GIS capabilities and evaluate the PV potential.

Discussion:

- There are multiple larger issues to be discussed (energy generation approach and 3rd party agreements) and MDT needs to decide what they are going to do with their ROW.
- RRC will want to think about the big picture approach prior to starting research. It was decided to wait to determine this prior to committing funds to this project.

The total project budget is \$110,000. The estimated project period is 24 months.

23-017 Drone-enabled Subgrade and Embankment Assessment

Bob Evans, as project champion, attended this meeting to request funding and move this project to the technical panel stage.

Drone-enabled platforms and sensors have sufficiently advanced that they can now provide useful information on geotechnical issues such as unstable soils in pavement subgrades and within embankment fills. This research would deploy multiple sensors to assess dispersive soils and frozen ground at regional and corridor scales for MDT managed roadways. The results from these multi-sensor field demonstrations will be integrated into a set of geospatial output products made available for project team and MDT use. Merged images (orthophotos) and digital elevation models will be produced for RGB imagery products. Merged multispectral, hyperspectral, and thermal imagery will also be produced. Image classification software, such as eCognition, will be used to create geospatial outputs that identify soil areas of interest (dispersive soils, frozen soils, other soil types) with precise location and area information. These results will be compared to existing and newly collected ground truth data to create error matrices that report on overall and soil type-specific accuracy. The results will be described in a final report with a focus on how the methods and results can be implemented by MDT on a practical basis, including recommendations for potential longer-term analysis.

The total project budget is \$222,000. The estimated project period is 12 months.

Research staff will proceed with forming technical panels for four of the five new MDT SPR-funded research projects. For the 23-007 Solar Energy Generation within MDT ROW, Rebecca will follow-up with RRC for next steps.

Project Concept Review

22-008 Aging Conditions for Hot Mix Asphalt Cracking Test (Proposal)

Oak Metcalf, as chair of the technical panel, attended this meeting to present this proposal, which is recommended by the project technical panel for funding.

He clarified that the submitter re-submitted a new proposal for a 58k budget increase, from the Stage 2 Form (topic statement) for field coring and traffic control tasks that they'd assumed MDT would be handling internally. The proposal reflects an adjustment in the previous FFY 2022 funding request, from \$75,000 to \$140,000.

Research staff will program the project and write and execute the contract.

22-013 Evaluate MDT Electrified Wildlife Deterrent Mats (SOW)

Bill S. and Deborah, as co-chairs of the technical panel, attended this meeting to present this SOW, which is recommended by the project technical panel for RFP.

They noted that the panel recommended purchasing the equipment as opposed to leasing the equipment. The SOW reflects an adjustment in the previous FFY 2022 funding request, from \$442,000 to \$405,000.

Research staff will program the project and work with Purchasing for the RFP.

UTC (University Transportation Center) Concept and Request

David Kack, from WTI, requested a UTC funding match of \$175,000/year of research SPR funds. The selection of the projects would happen collaboratively between WTI and MDT Research.

Dwane Kailey made a motion to reserve \$175,000 research funds to match WTI UTC funding effort projects. Dustin Rouse seconded the motion. All RRC members present voted in favor.

Budget

2023 FY LTAP (Local Technical Assistance Program) Proposal

Matt Ulberg, LTAP Director, was present to request SFY 2023 funding for LTAP. He stated that federal support to LTAP centers may increase for the following fiscal year. He mentioned that they have a few counties looking for free/scholarship classes and if funding increases next year, they may be able to offer this for a limited period. He also noted that they are increasing work with DOT research panels and federal highways evaluation teams. LTAP has about 215 customers in the state and provide technical assistance, safety trainings, and webinars to these customers. They did 24 technical assists that were substantial.

There are three yearly funding sources for LTAP. FHWA and legislated state gas tax funding, which are pass-thru funds of \$150,000 each. And lastly, MDT funding (SPR) at \$80,000.

The new workplan begins on July 1, 2022.

Dwane Kailey made a motion to fund LTAP with \$80,000 in SPR funds. Rob Stapley seconded the motion. No discussion. All RRC members present voted in favor of funding the work plan.

Rebecca will initiate programming and contracting LTAP.