

MEMORANDUM

To: RRC Members
Debbie Alke, Administrator/Aeronautics Division
D. John Blacker, Deputy Director
Mike Bousliman, Operations Manager
Monte N. Brown, Operations Manager/Business Process Solutions Unit
Jeffery M. Ebert, P.E./District Administrator-Butte
Larry Flynn, Administrator/Administration Division
Jennifer Jensen, Operations Manager
Dwane Kailey, Operations Manager
Jim Lynch, Director
Bob Seliskar/FHWA
Dennis Sheehy, Administrator/Motor Carrier Services Division
Jerry Stephens, P.E./WTI MSU
Jon Swartz, Administrator/Maintenance Division
Lynn Zanto, Administrator/Rail, Transit, and Planning Division

From: Susan C. Sillick, Manager
Research Programs

Date: February 11, 2010

Subject: 1/27/2010 RRC Meeting Notes

Action items are bolded.

RRC members present: Debbie Alke, John Blacker, Monte Brown, Larry Flynn, Dwane Kailey, Jim Lynch, Sue Sillick, Jerry Stephens, Jon Swartz, and Lynn Zanto.

Others present: Craig Abernathy, John Amestoy, Kent Barnes, Kris Christensen, Mike Dyrdaahl, Hal Fossum, Mark Goodman, Rich Jackson, Doug McBroom, Ray Mengel, Doug Moeller, Matt Strizich, Moriah Thunstrom, and Duane Williams.

1. 2010 Solicitation for Research Topics

Sue explained the process and informed the RRC and District Administrators (DAs) they would hear from the champions for each Research Topic Statement that had a champion and sponsor. After each presentation, the RRC and DAs would vote whether or not to move each Research Topic Statement forward to a technical panel for an in-depth review. Sue added that no funding was being approved at this time. Also, a SOW will be presented to the RRC for approval before an RFP is issued; the top scoring proposal resulting through the RFP process will be presented to the RRC for funding approval. Finally, for those projects not going through the RFP process, a SOW may be presented

to the RRC for approval and a proposal will be presented to the RRC for funding approval.

All SOW and/or proposal presentations to the RRC must include the business case for the project.

Jim Lynch informed Sue he would like to see all Research Topic Statements without a champion and/or sponsor. **Sue will compile a package for the Director.**

SUBJECT AREA	PROB NO.	PROBLEM TITLE	CHAMPION
Structures	10-002	Evaluation of a New Arch Bridge	Kent Barnes
Materials	10-005	Warm Mix Asphalt Paving for Montana Highway Construction: Test Section Construction and Monitoring	Geno Liva
Traffic	10-006	Developing a Virtual Test Bed for Design and Evaluation of Advance Signal Warnings	Duane Williams
Structures	10-007	An Advanced Life Extension Technology for MDT Reinforced Concrete Structures	Kent Barnes
Materials	10-008	Relative Operational Performance of Geosynthetics Used as Subgrade Stabilization	Rich Jackson
Structures	10-009	A Comparison of Predicted and Measured Prestress Losses	Kent Barnes
Hydraulics	10-013	Flood Frequency Analyses for Montana Based on Data through Water Year 2009	Mark Goodman
Planning	10-015	Evaluating Intercity Transit Services and Market Development Options	Doug McBroom
Planning	10-016	Assessing the Extent and Determinates of Induced Growth	Moriah Thunstrom
Planning	10-021	Livability Benchmarks for MDT and Partner Agencies	Doug McBroom

10-002: Evaluation of a New Arch Bridge Technology for Short Spans (Bridge-in-a-Backpack)

Kent Barnes championed this topic to investigate a new short span bridge system. This bridge system shows promise for rapid, cost effective solutions and may better address both the flood and environmental demands on many short bridges and culverts in need of replacement in Montana. Kent envisions two phases to this

research. Phase 1 would be a feasibility study, investigating the technology and processes to determine what type of sites in Montana are likely candidates for implementation. Phase 2, if recommended by phase 1, would be a demonstration project to implement and evaluate this technology.

Doug Moeller asked that the resource agencies be involved with this project. Kent indicated he envisions Environmental, Hydraulics, Bridge, and possibly Geotech for Phase 1 technical panel membership.

All voted in favor of moving this project forward to the technical panel stage.

10-005: Warm Mix Asphalt Paving for Montana Highway Construction: Test Section Construction and Monitoring

Matt Strizich championed this topic for three warm mix asphalt (WMA) demonstration projects. A synthesis project was recently completed indentifying WMA processes to consider in Montana. WMA is a “greener” product than the standard hot mix asphalt, using less energy with less emissions. Also, WMA is reported to be more compactable. Three upcoming projects will include WMA products; two of these projects will be let in February with one WMA treatment in each project. The third WMA asphalt project will consist of three WMA treatments and a control section. These projects will be monitored and performance evaluated.

Dwane Kailey mentioned WMA might help with compactability issues for long hauls.

Monte Brown asked if a cost comparison will be conducted. Ray Mengel indicated in District 4 there will be a hot mix asphalt project adjacent to the WMA project likely with the same contractor for cost comparison purposes. It was noted that cost will be a part of the evaluation; however, when first trying a new technology, costs are often inflated due to risk and it may not be a fair comparison with the first projects.

All voted in favor of moving this project forward to the technical panel stage.

10-006: Developing a Virtual Test Bed for Design and Evaluation of Advance Signal Warnings

Duane Williams championed this topic to study driver reactions to advanced signal warning devises. The intent is to improve advanced signal warning design and function based on driver responses to them. It is anticipated this research will take place in a controlled driver simulator/visualization environment.

It was mentioned that a good literature review should be conducted as a part of this project.

All voted in favor of moving this project forward to the technical panel stage.

10-007: An Advanced Life Extension Technology for MDT Reinforced Concrete Structures

Kent Barnes championed this topic statement to investigate an enhanced electrochemical chloride extraction (ECE) method to reduce the corrosion of reinforcing steel in bridge decks. Kent indicated we've tried cathodic protection (CP), which was not terribly successful. Montana structures require more frequent repair and maintenance to address chloride ingress. The enhanced ECE involves electrically introducing beneficial chemicals, such as corrosion inhibitors and positively charged pozzolanic particles, in addition to ECE. The research will begin with a laboratory phase to determine the feasibility of combining ECE with cation injection. If feasible, a field method will be developed, along with a field demonstration evaluation.

Jim Lynch indicated there is quite a bit of information on ECE. Kent added that the enhanced ECE is a newer technology than ECE.

Jim voted against moving this project forward to the technical panel stage. All others voted for. This project will move forward to the technical panel stage.

10-008: Relative Operational Performance of Geosynthetics Used as Subgrade Stabilization

Rich Jackson championed this topic to investigate the use of geosynthetics for subgrade stabilization. A recently completed research project, which MDT partially funded, indicated the performance of test sections, at least in part, depended on the tensile strength of the geosynthetic in the cross-machine direction. In addition, geosynthetics substantially stabilized the weak subgrade. This research would further characterize geosynthetic performance in subgrade stabilization. It is anticipated that the results of this research will allow improvements in MDT's specification for geosynthetic subgrade stabilization and, therefore, allow MDT to take better advantage of competitive bidding. Rich admitted this is an ambitious project; however, we need more data to open up our specification, which currently only allows one material.

Rich mentioned WYDOT is interested in partially funding this project.

Jim Lynch said that there is a ton of research out there from geosynthetic manufacturers and questioned why we need to conduct more research. He said the technical panel needs to come back to the RRC with detailed objectives and a clear plan to achieve real results.

All voted in favor of moving this project forward to the technical panel stage.

10-009: A Comparison of Predicted and Measured Prestress Losses

Kent Barnes championed this topic to verify the prestress losses predicted in the 2007 AASHTO LRFD Bridge Specifications. This is especially important because MDT is changing beam shapes with longer spans and increased level of prestress. The results of this work will include recommendations for improving prestress loss and deflection calculations, thereby improving cost-effectiveness of beams.

Jim Lynch asked if the manufacturers were already determining prestress losses. Kent indicated if we have a better understanding of what is going on, we can improve our specifications.

John Blacker indicated he is struggling with the need for validation. John voted against moving this project forward to the technical panel stage. All others voted for. This project will move forward to the technical panel stage.

10-013: Flood Frequency Analyses for Montana Based on Data through Water Year 2009

Mark Goodman championed this topic to update 10 years of Montana flood frequency and magnitude data. Magnitudes of peak flows over various intervals will be determined for about 660 gauging stations in Montana. In addition, we will have 10 years of data for 18 new stations. Analysis and prediction methods will be evaluated to reduce errors. This data is used routinely to determine bridge and culvert openings, scour in road grade elevation, determining levels of service, and in damage claims. Mark indicated MDT and USGS are long-term collaborators in collecting and analyzing this data. Finally Mark indicated USGS, DNRC, MDT, and possibly others will join together to fund this project.

John Blacker asked who owns the stations. Mark indicated USGS owns them; however, MDT provides funding to help maintain the stations.

Jim Lynch asked why MDT was slated to contribute more funding than USGS. Jim, John, and Dwane indicated all partners should come together to better balance the funding levels.

All voted in favor of moving this project forward to the technical panel stage.

10-015: Evaluating Intercity Transit Services and Market Development Options

Doug McBroom championed this research topic to conduct a needs assessment and develop marketing materials for intercity transit providers. MDT is required to spend at least 15% of the 5311 Federal Transit Administration (FTA) funds (about \$1 M annually) on intercity transit. However, ridership and revenues are decreasing; some routes have been dropped; and providers report revenues do not cover the local match required by FTA. It is anticipated that Phase 1 of this research would synthesize

intercity transit programs in Montana and the surrounding states, determine intercity transit needs in Montana, identify barriers and challenges to providing intercity transit in Montana, and document and develop strategies to improve intercity transit in Montana. Phase 2, if warranted by Phase 1, would involve the development of guidance for local providers of intercity transit in Montana.

All voted in favor of moving this project forward to the technical panel stage.

10-016: Assessing the Extent and Determinates of Induced Growth

Moriah Thunstrom championed this topic to assist MDT in evaluating growth induced as a result of construction projects. MDT is required to assess potential direct, indirect, and cumulative effects of construction projects to satisfy the requirements of NEPA and MEPA. Direct impacts are fairly easy to determine; however, indirect impacts are not and the requirements state these impacts must be assessed for “reasonably foreseeable” conditions. Moriah envisions this research in a phased approach. Phase 1 would involve a synthesis related to case law and best practices. The second phase, if warranted based on Phase 1, would involve after-the-fact assessment of development surrounding one or more construction projects. Finally, Phase 3 would involve use of the results of Phases 1 and 2 to develop practical refinements to current analysis methods for Montana. The result would be a streamlined, systematic, consistent, and legally defensible approach to determining potential indirect effects of MDT construction projects.

Jim Lynch asked if there were enough projects with these kinds of difficulties to warrant a research project.

Jim voted against moving this project forward to the technical panel stage. All others voted for. This project will move forward to the technical panel stage.

10-021: Livability Benchmarks for MDT and Partner Agencies

Doug McBroom championed this topic to assess “livability” conditions in Montana by defining terms, identifying goals and developing benchmarks outcome-based measures against which MDT can evaluate specific and aggregate progress with regards to “livability”. Doug envisions two phases for this research. Phase 1 would involve a synthesis of livability initiatives, terms, and practices; and an evaluation as to whether MDT meets the current practices. Phase 2 would be completed if the National Highway Bill contains livability initiatives or benchmarks. This phase would involve identifying key objectives, measures, and metrics; and policy and program gaps.

Jim Lynch doesn't want higher livability standards for Montana as compared to more populated areas. Lynn Zanto said there shouldn't be a single definition of livability. Also, Jim wants input regarding technical panel membership; we should include all partners, such as: FTA, FHWA, and FAA.

Dwane Kailey asked if Planning was looking for livability criteria or a process to determine livability. Lynn Zanto responded we are looking for a process.

All voted in favor of moving this project forward to the technical panel stage.

Sue told the RRC she would send an e-mail requesting technical panel member input for each of the above research topics moved forward to the technical panel stage.

Research staff will proceed in forming technical panels for all projects approved above.

2. **Budget Report:** Attached

Larry Flynn asked if the RRC members, who are MDT employees, can charge their time attending RRC meetings to a project. Sue said she has an annual project set-up for MDT staff to charge to when they are conducting Research work, such as coring, traffic control, and preparing for and attending meetings. **Sue said she didn't see any issues, but she would contact Bob Seliskar/FHWA to verify.**

Larry also asked about the nearly \$700,000 current estimated unobligated federal funds. Sue said the unobligated federal funds used to be in the millions and she is slowly spending it down so that at some point, the incoming funds equals, or nearly so, the outgoing funds. For a number of years now, Research expenditures have exceeded the federal research apportionment plus the state match, resulting in a continuing decrease in unobligated SPR funding.

3. **Research Project – current listing:** Attached

No discussion.

4. **Reports:** Available Upon Request

- a. **2009 Summer Transportation Institute** – Final Report
- b. **Automatic Crash Notification: Assessing Montana's Motor Vehicle Crash and Related Injury Data Infrastructure**- Progress Report- October 2009
- c. **Bozeman Pass Wildlife Monitoring** – Progress Reports –November and December 2009
- d. **Ground Penetrating Radar: Phase 1 (08.013)** – Final Report
- e. **Keep Encouraging Young Drive Safety (KEYS) Pilot Study: Increasing Parental Involvement in Teenage Driving Through Driver Education (08.015)** – Final Report
- f. **Montana US 93 South Wildlife Crossings Research (04.016)** – Progress Report – October 2009
- g. **Steep Cut Slope Composting: Field Trials and Evaluation (05.010)** – Progress Report – September 2009

No discussion.

5. **Contract Extensions:** None

6. **Proposals:**

a. **Accelerated Bridge Construction (ABC): Decision-Making and Economic Modeling Tool** – Pooled-Fund Study

Kent Barnes championed participation in this pooled-fund study. The goal is to produce a spreadsheet type tool that can be used to evaluate the economic benefits of ABC considering such factors as congestion, traffic control, user costs, and other factors. Kent feels this tool will be useful to MDT and wants to “buy” a seat at the table to ensure the results are applicable to Montana. Kent is recommending a one-time contribution of \$10,000.

Sue indicated the budget for this project has been added to the proposed expenditures in the budget sheets.

Dwane Kailey made a motion to support this pooled-fund study with a one-time contribution of \$10,000. Monte Brown seconded the motion and all present voted in favor. The motion passed.

b. **Ground Penetrating Radar (GPR) Phase II** (08.013)

John Amestoy presented this proposal on behalf of the technical panel, which recommends this proposal for funding at a total cost of \$277,112. Sue indicated the budget for this project has been added to the proposed expenditures in the budget sheets.

MDT currently employs GPR in pavement management. The purpose of this proposed research is to determine if MDT’s GPR program can be expanded beyond its current use to further aid in the determination of reconstruction and rehabilitation treatments. In order to do this, it is necessary to determine the level of accuracy required to achieve significant benefit, the ability of MDT’s GPR program to achieve this level of accuracy, and the requirements to achieve this accuracy. A Phase 1 concluded that there are a number of areas where it is feasible and desirable to expand the MDT GPR program.

John Amestoy indicated that if we can get a better handle of what is in place, MDT can make better decisions on milling and other treatments with the potential to save money and time.

Dwane Kailey indicated GPR has the potential to determine quality and types of pavement layers, including the identification of stripping. He also indicated that some states are using GPR for final project coring. Dwane would like to see a cost comparison of GPR versus coring.

John Blacker said that even after we have all of the data through both nondestructive and destructive testing, it is still difficult to arrive at a consensus regarding treatment.

Dwane also asked why the proposal includes NCE as a sub to do coring and auguring. Craig Abernathy indicated it would be a logistical nightmare for MDT core drill to meet the needs of this project along with all of the standard construction project workload. Craig also indicated that uniformity in the destructive testing is ensured by having NCE conduct all of the coring and auguring.

Dwane Kailey motioned to approve this proposal as presented. Doug Moeller seconded the motion and all present voted in favor. The motion passed.

7. Implementation/Technology Transfer: None

8. Discuss RRC Composition

Dwane Kailey indicated he would like to keep the RRC membership as it is. He said the current membership provides a good cross-section of the Department to better discuss MDT research needs.

Debbie Alke indicated she would like the opportunity to attend, but sometimes feels as if she has more pressing needs elsewhere.

John Blacker verified with Sue that a majority of members is not needed for a quorum. Sue indicated this is true; whoever is present has the authority to take action, with a simple majority vote of those RRC members present. He also said that if attendance becomes an issue, it may become mandatory. John indicated research has an opportunity to make a large impact on MDT.

Dwane asked Sue to verify that either Jim Lynch or John Blacker is available to attend each meeting.

E-mail ballots continue to be an acceptable way of conducting business for items that require immediate attention. When an item arises for an e-mail ballot, Sue will discuss with John Blacker to make sure management is aware of the issue. Sue will also do a better job of explaining the background for all e-mail ballot issues.

Finally, the business case needs to be made for all projects presented to the RRC.

9. Department/Division Hot Topics – RRC Members Roundtable Discussion

None.

cc: Craig Abernathy/Research Programs w/attachments
Kent M. Barnes, P.E./Bridge Bureau
Kevin Christensen/Highways and Engineering Division
Kris Christensen/Research Programs w/attachments
Tim Conway, P.E./Consultant Design Bureau
Lisa Durbin/Construction Administration-Bureau
Mike Dyrdaahl/Highways and Engineering Division
Paul R. Ferry, P.E./Highways Bureau
Paul Jagoda, P.E./Construction Engineering Bureau
Michael P. Johnson/District Administrator-Great Falls
Tom Martin, P.E./Environmental Services Bureau
Ray Mengel/District Administrator-Glendive
Doug Moeller/District Administrator-Missoula
Suzy Price/Contract Plans Bureau
Timothy W. Reardon/Legal Services
Stefan Streeter, P.E. /District Administrator-Billings
Matt Strizich, P.E./Materials Bureau
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