



Mississippi Department of Transportation Research Peer Exchange 2015

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16. Abstract From October 20 th to 22 nd , 2015, the Mississippi Department of Transportation, with the assistance of The University of Southern Mississippi, hosted a peer exchange focusing on best practices. The goal of the peer exchange was to develop actionable recommendations for: 1- Research project result implementation, 2- Strategic research plan and 3- Doing more with less. Representatives from four state DOTs (Maryland, Missouri, South Dakota and Montana), the Transportation Research Board (TRB), Federal Highway Administration (FHWA), and the University of Southern Mississippi (facilitator) participated in the peer exchange, which was held in Biloxi, Mississippi.					
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I. INTRODUCTION

I.1 - Preamble

From October 20th to 22nd 2015, the Mississippi Department of Transportation, with the assistance of The University of Southern Mississippi, hosted a research peer exchange focusing on research program management best practices. More specifically, the goal of the research peer exchange was to develop actionable recommendations for the following three focus areas:

- 1- Research project result implementation,
- 2- Strategic research plan and
- 3- Doing more with less.

Representatives from four state DOTs (Maryland, Missouri, South Dakota and Montana); the Transportation Research Board (TRB); Federal Highway Administration (FHWA); and the University of Southern Mississippi (facilitator) participated in the peer exchange, which was held in Biloxi, Mississippi.

This report documents the discussions, outcomes, and recommendations of the research peer exchange panel members. It includes brief summaries of each agency's research program, along with the agency's best practices and challenges in the three focus areas above. Key components and takeaways results from the sessions are presented for each participating agency.

I.2 - Peer Exchange Participants

The following agencies participated in the Mississippi Research Peer Exchange:

- 1- Maryland State Highway Administration - Hua Xiang
- 2- Missouri Department of Transportation - Jennifer Harper
- 3- South Dakota Department of Transportation - Daris Ormesher
- 4- Montana Department of Transportation - Susan Sillick (Chair)
- 5- Mississippi Department of Transportation - Cindy Smith, Bill Barstis, James Watkins, & James Williams
- 6- Federal Highway Administration - Randy Jansen & Clairborne Barwell
- 7- Transportation Research Board (TRB) - Lori Sundstrom
- 8- University of Southern Mississippi (Facilitator) - Tulio Sulbaran

Figure 1 shows the panel participants. Their contact information can be found in Appendix B.



(From left) Bill Barstis, Tulio Sulbaran, Susan Sillick, James Watkins, Cindy Smith, Daris Ormesher, Jennifer Harper, Lori Sundstrom, Claiborne Barnwell, James Williams, Randy Jansen and Hua Xiang

Figure 1 – MDOT Peer Exchange Participants

I.3 - Focus

Panel members were invited to the MDOT Research Peer Exchange because of their experience and interest in: 1- Research project result implementation, 2- Strategic research plan and 3- Doing more with less. The panelists discussed and reflected on the challenges, strengths, and opportunities of their programs. They were encouraged to freely share ideas and best practices that could be applied to strengthen the other DOTs. At the end of each session the panelists were asked to present their takeaway for their corresponding DOTs.

I.4 - Process

To prepare for the MDOT Research Peer Exchange, beginning in August, Tulio Sulbaran (from the University of Southern Mississippi) hosted a teleconference every two weeks with Cindy Smith, James Watkins, William Barstis and Kristi Cheek (from the Mississippi Department of Transportation) to address the logistical aspects of the meeting.

Beginning in September, every two weeks the participants received an e-mail from Tulio Sulbaran providing and requesting information related to the meeting logistics such as:

- 1- Flight information
- 2- Hotel Information
- 3- Agenda
- 4- Driving Directions
- 5- Dress Code

- 6- Meeting Preparation
- 7- Reimbursement
- 8- Contact information

I.5 - Peer Exchanges Mandate - 23 Code of Federal Regulations (CFR) 420 Sub-Part B

In accordance with 23 Code of Federal Regulations (CFR), Section 420, Subpart B, the Mississippi Department of Transportation Research Division hosted a research peer exchange in Biloxi, Mississippi, from October 20th till 22nd, 2015. According to the regulation the peer exchanges should be hosted at least once every five years. The peer exchange is a practical and effective tool to foster excellence in management of research programs. They provide an opportunity for participants to share best practices and management innovations through an open exchange of ideas, knowledge, and brainstorming. This peer exchange was 100% federally funded.

I.6 - Compliance Checklist – 23 Code of Federal Regulation (CFR) 420 Sub-Part B

Table 1 shows the Mississippi Department of Transportation (MDOT) Research Division compliance checklist for the requirements of the CFR section on research:

Table 1. Compliance Checklist

Item	Comply
RD&T program addressing transportation needs	✓
Encourage development and technology transfer	✓ and working on
Cooperation with other state DOTs and national efforts such as NCHRP and TRB	✓
Work program showing descriptions, time periods, and financial summaries (state/fed share, expenditures)	✓
Support and use of TRID database	✓
Procedures to determine effectiveness of management process, utilization of RD&T outputs and facilitation of peer exchanges	✓ and working on
Participation in other states' peer exchanges	✓
Documentation describing management and selection procedures (research manual and submission process document)	✓
Documentation of research studies through final reports	✓
Certification of compliance (sent to FHWA with work program)	✓
Periodic FHWA Division review of program	✓

I.7 - Improvements Implemented at MDOT since Last Peer Exchange in 2009

The following are improvements implemented by MDOT as a result of the 2009 exchange:

- 1- *Purchased and implemented library software* – this software is OCLC compliant.
- 2- *Changing from general solicitation to strategic research*— MDOT Research Division has challenged upper management to generate ideas for what areas need research rather than the general solicitation previously used. This will save everyone time (researchers and MDOT alike) and address the needs of the agency. Research personnel will work with technical experts on writing a research needs statement (RNSs) in advance.
- 3- *Task-oriented proposals* - The research proposals and contracts are more task oriented, which includes progress schedule Gantt chart, project progress chart, project cumulative gross expenditure graphs. These charts and graphs are submitted with each invoice.
- 4- *Expanded and improved proposal submission process*—MDOT extensively updated the proposal submission document and process to include materials lab and PI qualifications. Also, the proposal must now include graphs for time-vs-task and time-vs-expenditures. Further, the contract breakdown (overhead, labor, etc.) must be provided and match the proposal amount.
- 5- *More emphasis on implementation*—Proposals now require an implementation plan. Technical experts are also required to rate proposals, and implementation potential is one of the criteria.
- 6- *More in-depth proposal rating process*—Champions must rate proposals on several criteria and sign saying they are willing to commit to the project. Also, the champion's division head must approve his/her participation in the project.
- 7- *Marketing has improved*—MDOT received two high-value research awards from AASHTO-RAC. MDOT's Public Affairs Division helped with poster design and marketing. The State Research Engineer has also presented the research program to the Commission, and this has helped communication with them.
- 8- *Much better job of keeping state study documentation*—MDOT has a folder on the server for each study and require that paperwork be stored there. Commission orders, annual progress reports, invoices, and other documentation are captured within the work program database.
- 9- *Automated work program database*—This serves dual purposes of generating the work program document and presentation, and tracking research study activities.
- 10- *Proposals are now modeled after NCHRP format.*
- 11- *Quarterly Billing* - Most of our universities and consultants bill us on a quarterly basis.

- 12- *New requirement for technology transfer deliverables*—MDOT now requires a 2-page technical brief for every final report. Depending on the project, a presentation, webinar, or training may be required.
- 13- *Better job of funding diverse research topics* - MDOT performed more research in other areas of DOT (such as intermodal), not just pavement research.
- 14- *Workshop* - MDOT held a Research Workshop, which included universities, consultants, contractors, and MDOT staff.

Other improvements MDOT has implemented since the 2009 meeting, but were not necessarily a direct result of it are the following:

- 1- *More detailed outline of Research Division TAC member responsibilities*—MDOT has tasked the Research Division TAC member with more follow-up regarding project progress and implementation after the project is done.
- 2- *Updated consultant performance appraisal form with researcher appraisal form*—Previously Research Division used Consultant Service Unit's consultant appraisal form, but the two divisions worked together to create one more geared toward research PIs.
- 3- *Published updated and expanded Research Manual*—This was approved by FHWA in 2014, but will need updating again to reflect new solicitation process changes.
- 4- *Scanned documents into electronic form for library* – MDOT completed scanning the entire collection of documents, which is approximately 14,000 volumes.

Issues MDOT recognized as challenges/opportunities then and can still improve upon

- 1- *Implementation/performance measures database begun*—MDOT has a Microsoft Access database capturing projects since the late 1990s and have assigned implementation status and performance measures to projects. Also, MDOT reported some implementation numbers to MDOT's RAC for the first time in September 2015.
- 2- *Implementation efforts*—MDOT is talking more with champions after projects end to see if/how they implement the research results.
- 3- *Looking at implementation of national research efforts* such as pooled funds and NCHRP projects. Many NCHRP research results, for example, become AASHTO standards or guidelines.
- 4- *CFR Compliance Checklist*—For the FY16 work program, MDOT put together a list of requirements of the Code of Federal Regulations Section 420, which governs SP&R funds. MDOT is working on improvements to technology transfer and implementation.

II. RESEARCH PROGRAM OF THE MISSISSIPPI DOT (MDOT)

II.1 - Overview

MDOT's Research Division has total budget of approximately \$2.2 million dollars with a current staff of 11 people. The Research Division is under the Operations area, and therefore it has a large operational responsibility. MDOT's Research Advisory Committee's role is to approve the research work program. The Research Division is in the process of modifying the project solicitation process. Upper management is now tasked with identifying the most pressing needs (high value research). Then an MDOT technical champion is assigned to the problem statements that might be funded. The number of research projects funded is limited by the amount of funds available. Each research project has a Technical Advisory Committee (TAC). This was the first year to capture the rate of implementation of the research projects.

II.2 - Project Solicitation and Selection

MDOT Research Division project solicitation is as follows:

- 1- Upper management generates ideas (Changing from general solicitation).
- 2- Write research needs statements (RNSs) in advance by research and technical champions.
- 3- Each project idea must have a technical champion.
- 4- Normally once a year, but can add studies during the year with MDOT-RAC approval.
- 5- Pooled fund solicitations sent out.
- 6- Depends on available funds.

MDOT Research Division project selection is done by the Research Advisory Committee (RAC) as follows:

- 1- Selects projects.
- 2- Approves annual work program based on ratings, funding, and importance to the agency and FHWA.
- 3- Pooled funds are evaluated by champions and approved by MDOT-RAC as part of the work program.

II.3 - Strengths

- 1- Well-outlined proposal and invoicing process
- 2- Work program generation and tracking database
- 3- Research Division TAC member responsibilities clearly outlined
- 4- Identification of technical champions up front
- 5- Champions must state if a project has implementation potential and specify what benefits he/she expects from study before MDOT will fund the study
- 6- Final report guidelines published
- 7- Work program database—now tracks which PIs are on time submitting QPRs, etc.
- 8- Implementation database in progress (helps with tracking which studies have been useful)
- 9- More tracking of implementation and new requirement for implementation deliverables

10- Better marketing

11- Strong upper management buy-in and support to research program

II.4 - Opportunities/Challenges

- 1- Front-end screening helps to some degree but cannot anticipate all problems
- 2- Sometimes useful results do not happen
- 3- Champion leaving or PI change during project
- 4- Shifting priorities
- 5- Lean staff
- 6- Operational duties other than research
- 7- Measuring implementation accurately

II.5 - Other Activities of the Research Division

The Research Division has many more responsibilities beyond research. Those other responsibilities include:

- 1- MDOT Library
- 2- Report distribution—TRID, RIP, NTL, MS Library Commission, etc.
- 3- Non-destructive testing (friction, FWD, profiler)
- 4- Pavement management (condition survey, PMS software, training, project recommendations)
- 5- Warranty data collection/reporting
- 6- Chair of Pipe/Culvert Subcommittee of Product Evaluation Committee
- 7- MDOT Product Evaluation Committee
- 8- Involved in asset management efforts
- 9- MDOT GIS Committee
- 10- MEPDG implementation
- 11- Operation of the bridge and pavement smoothness (PI & MRI) for new construction at the Department

III. PARTICIPANT TAKEAWAYS / SHAREABLE PRACTICES

III.1 - Maryland State Highway Administration

III.1.1 - Preamble

The Maryland State Highway Administration (SHA)'s Research Division has a budget of \$3.5 million per year with three full time positions. The Division manages SHA's state and national research programs including the annual Research Work Program and SHA's participation in Transportation Research Board (TRB) and National Cooperative Highway Research Program (NCHRP) activities. The Division also manages a number of university agreements in support of SHA's research and technical assistance activities.

Maryland SHA Research Division strengths include:

- 1- Effective team,
- 2- Excellent customer service (most frequent feedback received)
- 3- Support new ways of managing research program, such as SharePoint lists for tracking task orders and invoices, and customized workflows for information sharing

Maryland SHA Research Division challenges included:

- 1- Organizational changes impacting research function,
- 2- Increase responsibilities added to Division staff in other than research program area, and
- 3- Past state budget cuts made technical support sometimes difficult.

Maryland SHA implemented the following best practices for sharing research:

- 1- On-going updates/enhancements to the Research Division's Intranet site;
- 2- Post quarterly progress reports for all active projects on shared drives;
- 3- Post all final project reports on the Administration's Internet site; and
- 4- Set up a SharePoint list and maintain a customized workflow – when new information is posted, an automatic email is sent to the subject matter customer group.

III.1.2 - Research Project Result Implementation - Status

Maryland State Highway Administration implementation status is as follows:

- 1- Research are asked to provide implementation recommendations.
- 2- Maryland SHA evaluates implementation potential and decides if the project should or not be implemented.
- 3- Budget was set aside in the work program for the implementation of research products.

III.1.3 - Takeaways - Implementation

Maryland SHA takeaways include:

- 1- Require mid-project presentation
- 2- Aggregate reasons for not implementing the results of certain research projects
- 3- Require task reports in quarterly progress reports
- 4- Request implementation plan or implementation white paper.

III.1.4 - Strategic Planning - Status

Maryland SHA Research Division does not have strategic plan but it does have the vision to support the Maryland SHA's Business Plan and strategic goals.

III.1.5 - Takeaways - Strategic Plan

Maryland State Highway Administration takeaways include:

- 1- Consider doing a SWOT analysis for the Research Division.
- 2- The process of making strategic plan is more important than the document itself.
- 3- Carving out some time to improve the program.
- 4- Operationalize the strategic plan. It should easily guide the program not something that the program managers need to periodically dig out and try to update. "Fail to plan; plan to fail".
- 5- Revisit project selection criteria. Do they reflect the Division's strategic focuses? It is also a good way to increase the research program's visibility.

III.1.6 - Doing more with less - Status

The Maryland State Highway Administration is looking into:

- 1- A few years ago all final reports were scanned and assigned proper metadata. The PDF format reports were posted on-line which facilitate retrieval of information. In the past, all reports were archived in hard copy.
- 2- Trying to save time in training new employees by spending time in writing knowledge management documents and using standard template for routine e-mails.
- 3- Asking the universities to align their research initiative with Maryland State Highway Administration priorities

III.1.7 - Takeaways - Doing more with less

Maryland State Highway Administration takeaways include:

- 1- More "implementation projects" may be funded.
- 2- Broadening research to include the activities to push out research products
- 3- Encourage junior project managers to learn the system following the established procedure – may be more efficient
- 4- Identify what is high-value time spent, and what is low-value time spent.
- 5- Particular attention to the first several deliverables to ensure quality of written reports, and reiterate expectations.

III.2 - Missouri Department of Transportation

III.2.1 - Preamble

The Missouri Department of Transportation (MoDOT) research department has an overall budget of \$4,600,000, from which approximately \$2,000,000 is for research contracts. The research department is managed by a research staff of 3 people and 1 librarian (contract). The research staff has many responsibilities one of which is to manage the research projects. Most of the research projects are performed by University researchers. Several universities have basic agreements with MoDOT under which task order are added for each project. The project monitoring is done by a Technical Advisory Committee (TAC). TACs review quarterly reports that are required for all projects with mid project presentation. Unfortunately, lately MoDOT has challenges with very poorly written reports.

MoDOT Research Vision/Strategic Plan was revisited in 2014 with a strengths, weakness, opportunity, threats (SWOT) analysis. The strengths included:

- 1- Strong internal support,
- 2- Willingness to accommodate partner needs,
- 3- Leverage use of librarian expertise,
- 4- Strong relationship with local FHWA,
- 5- Better understanding of budget and budget process
- 6- Increased involvement with RAC.

The weaknesses/challenges included:

- 1- Only 4 staff 3 and 1 contract (librarian),
- 2- Additional layer between research and executive team,
- 3- Grants/programs taking away from Research time,
- 4- Disconnect with District activities.

The opportunities included:

- 1- Increase presence at district level,
- 2- Marketing and implementation of the projects,
- 3- Better internal communication, and
- 4- Increase publicity of the research projects.

Threats included:

- 1- Misperception about the Research Division,
- 2- Having to expend time with contractor at the field and
- 3- University Transportation Research Center's timelines do not align with MoDOT's project solicitation process timeline.

MoDOT Identified Key Functions & Strategies including:

- 1- On Time/On Budget
- 2- Build Relationships

- 3- Research Innovations/Implementable Research
- 4- New Products Process
- 5- Knowledge Management

III.2.2 - Research Project Result Implementation - Status

Missouri Department of Transportation (MoDOT) implementation status is as follows:

- 1- Performance measures have been done for 12 years in a centralized way and project implementation was one of the statewide performance measures at one time. Several years ago the number of statewide performance measures were reduced and this measure was removed. Each division and district have their own performance measures but research project implementation is not one of them.
- 2- Divisions are accountable to certain degree.
- 3- The researcher develops implementation recommendations for each project.
- 4- Standard forms are in place for: 1- Researchers and 2- Missouri DOT Research Division.

III.2.3 - Takeaways - Implementation

MoDOT takeaways include:

- 1- Include Technical Advisory Committees (TACs) members from outside Missouri DOT (such as industry professionals).
- 2- Invoice research project based on tasks/deliverables.
- 3- Include as part of the RFP how is the researcher going to ensure quality.
- 4- Having the champion rate implementation potential of the research project upfront.
- 5- Put implementation on division heads performance evaluation.
- 6- Have task reports submitted throughout the project, so issues can be detected sooner.
- 7- Have a post-project implementation meeting with TAC and researcher. Then, require the researcher to submit report and formal implementation plan.

III.2.4 - Strategic Planning - Status

MoDOT does not have a formal strategic plan, but it has performed a SWOT analysis and has a Research Vision developed in 2014. The vision includes:

- 1- On Time/On Budget (Timeliness/Expenditure of Funds)
- 2- Build Relationships
- 3- Research Innovations / Implementable Research
- 4- New Product Process
- 5- Knowledge Management

III.2.5 - Takeaways - Strategic Plan

Missouri DOT takeaway include:

- 1- Revisit MoDOT research vision and add next steps/action items to the strategies.
- 2- Look at both long-term and short-term tasks.

III.2.6 - Doing more with less - Status

The Missouri Department of Transportation is looking into:

- 1- Running out of money for state match by 2018
- 2- Performing research mainly in maintenance activities
- 3- Have applied for AID grant (but they have 20% match) and SHRP2 grants
- 4- Getting to the point of “doing less with less”

III.2.7 - Takeaways - Doing more with less

Missouri DOT takeaway include:

- 1- At the project kickoff require table with tasks and due dates then that table goes into quarterly report.
- 2- ADA font requirement
- 3- Have researchers do 3-4 page summary “Text” then DOT puts into a template.
- 4- Have language in the contract/RFP about draft report requirements.
- 5- Looking into TRB report guidelines.
- 6- Have task reports due ahead of draft.

III.3 - Montana Department of Transportation

III.3.1 - Preamble

In the Montana Department of Transportation (MDT) Review Section is in the Engineering Division. The Research Division has four people including one librarian. The total budget of the MDT is \$2.5 million dollars. The average research project cost is between \$100-150K.

MDT uses the following guiding principles to identify research projects:

- 1- Target MDT Needs,
- 2- Department-Wide, including Multi/Inter-Modal,
- 3- Champion & Sponsor Required,
- 4- Direction Set by MDT’s Executive Management,
- 5- Strong Focus on Customer,
- 6- Focus on Applied, Implementable Research, Technology Transfer, Business Case,
- 7- Involve Stakeholders (Internal and External) to Facilitate Implementation,
- 8- Provide Necessary Resources,
- 9- Communication and
- 10- Continuous Process and Program Improvement

The main process for initiating research projects is as follows:

- 1- Annual Solicitation broadly distributed via a number of list serves,
- 2- Research Topic Statements due 4/30 of each year,
- 3- Champion (can be anyone in the department),

- 4- Sponsor, responsible for implementation (division and/or division administrator or higher),
- 5- Match research interests with MDT's research need, and
- 6- Other Ways to Initiate MDT Research Projects include: Small Projects, Partnering Projects and Administration High Priority Projects.

MDT Research Division strengths include:

- 1- Address Needs Department-Wide,
- 2- Communication,
- 3- Continuous Process & Program Improvement,
- 4- Documented Processes,
- 5- Effective,
- 6- Expect Products to Facilitate Implementation and Results to be Implemented;
- 7- Implementation of Results;
- 8- Flexibility/Flexible Processes,
- 9- Freedom to "Run" Program,
- 10- Great Staff,
- 11- Insist on Good work,
- 12- Library Catalog,
- 13- Management Support and Engagement/Integral component of Processes,
- 14- Objective "Third-Party" Reporting, and
- 15- Take as Much Burden Off Staff as Possible.

MDT Research Division challenges include:

- 1- Implementation Follow-Up;
- 2- Lack of a Strategic Plan/Direction- Prioritization Process;
- 3- Lack of a Research Program and Project Management System – Working on it;
- 4- Need to do more w/ Performance Measures;
- 5- Funding and
- 6- Time.

III.3.2 - Research Project Result Implementation - Status

Montana Department of Transportation (MDT) implementation status is as follows:

- 1- Implementation is very informal. But, the majority of the result from the research is implemented
- 2- Currently looking into formalizing the implementation process
- 3- Considering implementation from the beginning is key to a high rate of implementation
- 4- Includes implementation products in the contract

- 5- Research Technical Panel and researcher(s) meet to discuss each implementation recommendation in the final report. A decision is made as to how the department will handle each recommendation (e.g., implement fully, implement partially, not implement). This is documented in an implementation report that is drafted by the researcher(s) and is vetted by the sponsor.
- 6- Following up with the implementation is an area of great interest
- 7- Evaluating how pooled fund contribution is benefiting Montana DOT
- 8- Performance measures is an area of interest to Montana DOT.

III.3.3 - Takeaways - Implementation

MDT takeaways include:

- 1- Obtain implementation documents from other states
- 2- Obtain information from Maryland DOT on Knowledge and Project document management
- 3- Consider a formal customer satisfaction survey (in addition to each project exit survey)
- 4- Consider tracking what can't be implemented and lessons learned (in addition to what can be implemented)
- 5- Review various NCHRP implementation documents and share with staff
- 6- Investigate the possibility of using research implementation as an operational performance measure
- 7- Continue formalizing implementation and follow-up
- 8- Continue to work on performance measures

III.3.4 - Strategic Planning - Status

The Montana Department of Transportation does not have a strategic plan, nor does the Research Section. Some divisions have annual action plan. The Research Section is interested in obtaining the divisions' action plan to align the Research Section activities to support their action plan.

III.3.5 - Takeaways - Strategic Plan

MDT takeaways include:

- 1- Obtain and review division action plans. Identify areas where research can help.
- 2- Investigate strategic planning opportunities for research including a more strategic project prioritization and selection process.

III.3.6 - Doing more with less - Status

The Montana Department of Transportation is looking into:

1. Using federal funds where we can
2. Legislature guidance--However, Montana's legislature meets only every other year. Next time they will meet is in 2017.

3. MDT has applied for research grant in the past, but has not been a big part of the effort.
4. Efficiency can be increased, but at one point you do less with less.

III.3.7 - Takeaways - Doing more with less

Montana DOT takeaways include:

- 1- Review NCHRP document for use in Montana
- 2- Investigate ADA compliant fonts

III.4 - South Dakota Department of Transportation

III.4.1 - Preamble

The South Dakota Department of Transportation (SDDOT) division of planning and engineering oversees the Research Division. The total budget for the Research Division is approximately \$3 million dollars from which approximately \$2 million is used for research project contracts. The Research Division has 8 people. SDDOT Research Division's target/needs include:

- 1- Evaluate new materials/methods,
- 2- Develop design/analysis techniques,
- 3- Deploy innovative technology, and
- 4- Identify underlying causes of transportation problems.

The SDDOT Research Division defines research very broadly and involves stakeholders both internally and externally. The research solicitations include a list of objectives and tasks as well as a maximum budget allowed. The researcher presents a proposal following the solicitation guidelines, and the award is based on merit.

SDDOT Research Division projects include:

- 1- Infrastructure,
- 2- Policy,
- 3- Traffic and Operations, and
- 4- Environmental.

SDDOT Research Division research process includes:

- 1- Suggest research topic,
- 2- Select research topic,
- 3- Define project,
- 4- Authorize Request for Proposal (RFP),
- 5- Develop proposal/work plan,
- 6- Approve proposal/work plan,
- 7- Authorize Research Contract,
- 8- Perform research,
- 9- Direct research,
- 10- Evaluate research,
- 11- Recommend implementation, and

12- Decide implementation.

SDDOT Research Division strengths and challenges include:

- 1- Staffing,
- 2- Communication,
- 3- Good working relationship with other offices,
- 4- Identifying needed research,
- 5- Providing results,
- 6- Knowledge transfer, and
- 7- Completing Projects (Poor quality reports and timeliness).

III.4.2 - Research Project Result Implementation - Status

South Dakota Department of Transportation (SDDOT) implementation status is as follows:

- 1- The researcher has the latitude to provide any implementation recommendation that they consider appropriate.
- 2- Evaluation is done to determine if a formal implementation plan is required
- 3- Formal implementation plan template is in place for projects that require a formal implementation plan.
- 4- The formal implementation plan template includes: a- Version history, b- Implementation plan approval, c- Research Summary, d- Implementation Plan, e- Evaluation, and f- Key Terms.

III.4.3 - Takeaways - Implementation

The SDDOT takeaways include:

- 1- How is the researcher going to ensure a quality product – add to RFP
- 2- Put reports on Research Program and Project Management (RPPM) website.
- 3- Investigate negotiated 15% overhead rate.
- 4- Develop a check list for the first panel meeting with the researcher.
- 5- Annual reports on project spanning multiple years.

III.4.4 - Strategic Planning - Status

The SDDOT Research Division does not currently have a strategic plan. But, the Research Division is in the process of developing a strategic plan in support of the SDDOT strategic plan.

III.4.5 - Takeaways - Strategic Plan

SDDOT takeaways include:

- 1- Investigate how to officially recognize panel member for serving in TRB committees.
May be certificate or something placed in employee files.
- 2- Review MDOT, MoDOT and others strategic plan while developing SDDOT research strategic plan.

III.4.6 - Doing more with less - Status

SDDOT is looking into:

1. Training people in Intelligent Transportation Systems
2. Trying to pass responsibility to other divisions
3. Still support pavement management system
4. Implementation of research results to some degree double the work of the Research Division
5. Concerned about doing more with less

III.4.7 - Takeaways - Doing more with less

The SDDOT takeaways include:

- 1- Spend more time up front (kickoff meeting) to discuss due dates and final report quality.
- 2- Evaluate projects to have researchers provide task write-ups for review.

III.5 - Mississippi Department of Transportation (MDOT)

III.5.1 - Research Project Result Implementation - Status

MDOT implementation includes the following:

- 1- MDOT has a database that includes state research studies from 2000 forward.
- 2- An implementation plan is now required for each project from the researcher (modeled after NCHRP).
- 3- The Southeast Transportation Consortium pooled fund is doing a study on how to quantify research impact.
- 4- MDOT has an implementation rate of approximately 70% including lessons learned, implementation planned, and projects fully implemented.
- 5- MDOT has a number of performance measures.
- 6- Struggling with how to measure implementation.
- 7- Trying to quantify implementation of NCHRP projects.
- 8- Looking into pooled funds back until 2005 to see which one we have implemented.

III.5.2 - Takeaways - Implementation

MDOT takeaways include:

- 1- Investigate implementation plan template.
- 2- Think about keeping the Technical Advisory Committee (TAC) together after project has ended to track implementation.
- 3- Budget implementation/technology transfer plans and activities into proposal tasks.
- 4- Develop a post-project check list.
- 5- Continue to work on performance measures and quantifying benefits.
- 6- For projects with barriers to implement, check later to see if barriers got removed.
- 7- Investigate getting an implementation engineer.
- 8- Think about requiring PIs to put an editing/proofreading task into proposals.

- 9- Put documents onto RPPM website.

III.5.3 - Strategic Planning - Status

MDOT performed a SWOT analysis and has a draft strategic plan with the following goals/objectives:

- 1- Higher rate of state study implementation: Our current implementation rate for 80/20 state studies is approximately 70%. In five years, we would like to be at 80%.
- 2- Rate of implementation of national research efforts: In two years' time, we would like to include national research such as NCHRP studies and pooled funds in our implementation report.
- 3- Improvements to in-house applications: In two years' time, we would like to have the database tracking program improved in the following ways:
 - a. Have a module for PIs to enter their quarterly progress reports (QPRs) on line.
 - b. Improved forms and interfaces for in-house staff to use.
- 4- Quantification of research benefits: We would like to have more uniform ways to quantify study benefits.
- 5- Nationally recognized high-value research--We would like to win another AASHTO RAC "Sweet 16" high-value research project award in the next 2 years.
- 6- Marketing of research: We would like to improve the marketing of research results, both nationally and in-state.

III.5.4 - Takeaways - Strategic Plan

MDOT takeaways include:

- 1- Organize goals and actions items into administrative/management and operational.
- 2- Change strategies into more specific action items with names and the frames. Put these items under each goal/objective.
- 3- Tie draft plan to MDOT's focus areas and tell how each goal supports these areas.
- 4- If necessary, add explanation of changes, such as economic organizational, or political, that affect the strategic plan.
- 5- Do more marketing and showcasing of research, even when MDOT is not winning an award such as the AASHTO RAC High-Value "Sweet 16."

III.5.5 - Doing more with Less – Status

The Mississippi Department of Transportation is looking into:

- 1- Knowing what other DOTs are doing to find more money
- 2- Increasing knowledge/expertise on program/project management as a way to make people more efficient
- 3- Dedicating more time to research activities. Currently, 90% of the Research Division effort is dedicated to operational activities.

III.5.6 - Takeaways - Doing More With Less

MDOT takeaways include:

- 1- Look into knowledge management for research managers.
- 2- Think about proposal and final report templates
- 3- Have a checklist of important project milestone dates at each kick-off meeting.

III.6 - Transportation Research Board

III.6.1 - Preamble

The Transportation Research Board's (TRB) strategic plan was updated in 2014 and it includes a significant emphasis on the implementation of research results and an appropriate role for TRB in encouraging awareness and facilitating implementation of research results. TRB is finalizing a Strategic Communications Plan which will guide all TRB Divisions and programs – including the National Cooperative Highway Research Program (NCHRP) – in the assessment and improvement of their messaging and the communication vehicles used. The AASHTO Standing on Research (SCOR) – which governs NCHRP – also has a Strategic Plan. One of the elements focuses on understanding which NCHRP research is being used, and what the impacts of implementation are. In March 2015, SCOR allocated \$2.0 million to enhance the dissemination of NCHRP research results and to fund some level of implementation support activities.

NCHRP is working with a task force of state DOTs to develop this program. Beginning with RFPs issued in 2015, NCHRP is requiring an additional deliverable for all research projects: a technical memorandum describing potential avenues of implementation, including specific actions that could be taken and suggesting organizations or entities that could take those actions.

The TRB Executive Committee identified three research priority areas: 1- Resiliency, 2- Disruptive Technology, and 3- Public Health. In March 2015 SCOR identified 3 strategic research areas: 1—Resiliency, 2—Disruptive Technology, and 3—Freight, and this was noted in the current call for NCHRP problem statements. TRB library services are available for free to the state DOTs and can supplement state agency resources for finding information, including conducting literature reviews that could help state DOTs determine if research has already addressed the topic of a proposed problem statement.

III.6.2 - Research Project Result Implementation - Status

TRB does not implement projects, but it is commonly asked by the states about project results implementation.

III.6.3 - Takeaways - Implementation

Transportation Research Board takeaway include:

- 1- Provide information on the benefit to state DOTs of having their staff participating on NCHRP project oversight panels. This information may help staff to receive travel approvals.

- 2- Supporting implementation should strengthen the connection of NCHRP to the state DOTs and ensure that NCHRP is producing useful and relevant research for the state DOTs.

III.6.4 - Strategic Planning - Status

The SCOR Strategic Plan is action-oriented, which is consistent with general trends in strategic planning in the private sector. While strategic plans should be aspirational, they increasingly also serve as a 1-3 year work plan. The relevancy and usefulness of a hybrid strategic/action-oriented plan is increased if work units and even individuals are assigned responsibility for accomplishing actions by particular dates. This can provide a means to track performance. Tying each task to the organizational objectives/goals demonstrate how they relate to the larger agency mission.

III.6.5 - Takeaways - Strategic Plan

Transportation Research Board takeaway include:

- 1- Letting each state Department of Transportation know who from their state is serving on NCHRP panels – sometime between September and the TRB Annual Meeting.

III.6.6 - Doing more with less - Status

NCHRP staff have found:

- 1- It can be very hard to take the time to do things now that will save you time in the future
- 2- Efficiency is achieved by establishing routine ways to accomplish repetitive administrative tasks – using templates, etc. so that the time needed to process work is minimized.
- 3- Expect to spend more time on some projects than on others. Now and then you will have to make extra effort to get a project back on track.
- 4- Start a project by visiting the contractor's office to review mutual expectations and requirements.
- 5- Pay close attention to the first few deliverables to correct issues and reinforce performance expectations as needed so that contractor understands what is expected. Hopefully this gets the contractor off to a strong start and prevents future performance problems.

APPENDIX A - AGENDA

MDOT Research Peer Exchange

October 2015

Monday, October 19:

- Flight to Biloxi/Gulfport Airport
- Eat on your own
- USM/MDOT team will pick-up participants at the Gulfport/Biloxi Airport and take to hotel

Tuesday, October 20

7:00-8:00 Breakfast

8:00-8:15 Welcome and Introductions
USM – Tulio
MDOT – James / Cindy

8:15-8:30 Brief discussion of focus areas, expectations, and plans
MDOT – Cindy

8:30-9:00 Session T1 - Presentation of MDOT's research program
MDOT – Cindy / Bill

9:00-10:15 Session T2 - Agency presentations (TRB, Montana, South Dakota, Maryland,
Missouri)
Participants

10:15-10:30 Morning Networking Break

10:30-12:00 Session T3 - Implementation Discussion - Part 1 of 2
Participants - Group Discussion Free Flow
(What is working, what is not working, recommendation)

12:00-1:00 Lunch

1:00-3:00 Session T4 - Implementation Discussion – Part 2 of 2
Participants - Group Discussion Free Flow
(What is working, what is not working, recommendation)

3:00-3:30 Afternoon Networking Break

3:30-4:00 Session T5 - Report Preparation on Implementation (Takeaway)
USM – Tulio

5:30 Meet at the Lobby for Dinner

Wednesday, October 21

7:00-8:00 Breakfast

8:00-9:30 Session W1 - Strategic Research Plan - Part 1 of 2
Participants - Group Discussion Free Flow
(What is working, what is not working, recommendations)

9:30-10:00 Morning Networking Break

10:00-11:15 Session W2 - Strategic Research Plan - Part 2 of 2
Participants - Group Discussion Free Flow
(What is working, what is not working, recommendations)11:15-12:00 Session W3 - Report Preparation – Strategic Research Plan (Takeaway)
USM - Tulio

12:00-1:00 Lunch

1:00-3:00 Session W4 - Doing More with Less - Part 1 of 2
Participants - Group Discussion Free Flow
(What is working, what is not working, recommendations)

3:00-3:30 Afternoon Networking Break

3:30-4:00 Session W5 - Doing More with Less - Part 2 of 2
Participants - Group Discussion Free Flow
(What is working, what is not working, recommendations)4:00-4:30 Session W6 - Report Preparation – Doing more with less (Takeaway)
USM – Tulio

5:30 Meet at the Lobby for Dinner

Thursday, October 22

7:00-8:00 Breakfast

8:00-9:25 Session TH1- Review and Finalize Report
USM – Tulio9:25-9:30 Session TH1- Administrative Wrap-up/Closing (reimbursements, paper work,
etc.)
USM – Tulio9:30 Drive to the Airport
USM/MDOT Team will take participants to Airport

11:00 Leave from Biloxi/Gulfport Airport

APPENDIX B - PARTICIPANTS

MDOT Research Peer Exchange

October 2015

From Mississippi

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APPENDIX C - CODE OF FEDERAL REGULATION (CFR) – PART 420

SUBCHAPTER E—PLANNING AND RESEARCH

PART 420—PLANNING AND RESEARCH PROGRAM ADMINISTRATION

Subpart A—Administration of FHWA Planning and Research Funds

- Sec.
- 420.101 What is the purpose of this part?
- 420.103 How does the FHWA define the terms used in this part?
- 420.105 What is the FHWA's policy on use of FHWA planning and research funds?
- 420.107 What is the minimum required expenditure of State planning and research funds for research development and technology transfer?
- 420.109 What are the requirements for distribution of metropolitan planning funds?
- 420.111 What are the documentation requirements for use of FHWA planning and research funds?
- 420.113 What costs are eligible?
- 420.115 What are the FHWA approval and authorization requirements?
- 420.117 What are the program monitoring and reporting requirements?
- 420.119 What are the fiscal requirements?
- 420.121 What other requirements apply to the administration of FHWA planning and research funds?

Subpart B—Research, Development, and Technology Transfer Program Management

- 420.201 What is the purpose of this subpart?
- 420.203 How does the FHWA define the terms used in this subpart?
- 420.205 What is the FHWA's policy for research, development, and technology transfer funding?
- 420.207 What are the requirements for research, development, and technology transfer work programs?
- 420.209 What are the conditions for approval?

AUTHORITY: 23 U.S.C. 103(b)(6), 104(f), 115, 120, 133(b), 134(n), 303(g), 505, and 315; and 49 CFR 1.48(b).

SOURCE: 67 FR 47271, July 18, 2002, unless otherwise noted.

Subpart A—Administration of FHWA Planning and Research Funds

§ 420.101 What is the purpose of this part?

This part prescribes the Federal Highway Administration (FHWA) policies and procedures for the administration of activities undertaken by State departments of transportation (State DOTs) and their subrecipients, including metropolitan planning organizations (MPOs), with FHWA planning and research funds. Subpart A identifies the administrative requirements that apply to use of FHWA planning and research funds both for planning and for research, development, and technology transfer (RD&T) activities. Subpart B describes the policies and procedures that relate to the approval and authorization of RD&T work programs. The requirements in this part supplement those in 49 CFR part 18, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments and 49 CFR part 19, Uniform Administrative Requirements for Grants and Cooperative Agreements with Institutions of Higher Education, Hospitals and Other Non-Profit Organizations.

§ 420.103 How does the FHWA define the terms used in this part?

Unless otherwise specified in this part, the definitions in 23 U.S.C. 101(a) are applicable to this part. As used in this part:

FHWA planning and research funds include:

(1) State planning and research (SPR) funds (the two percent set aside of funds apportioned or allocated to a State DOT for activities authorized under 23 U.S.C. 505);

(2) Metropolitan planning (PL) funds (the one percent of funds authorized under 23 U.S.C. 104(f) to carry out the provisions of 23 U.S.C. 134);

(3) National highway system (NHS) funds authorized under 23 U.S.C. 104(b)(1) used for transportation planning in accordance with 23 U.S.C. 134

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and 135, highway research and planning in accordance with 23 U.S.C. 505, highway-related technology transfer activities, or development and establishment of management systems under 23 U.S.C. 303;

(4) Surface transportation program (STP) funds authorized under 23 U.S.C. 104(b)(3) used for highway and transit research and development and technology transfer programs, surface transportation planning programs, or development and establishment of management systems under 23 U.S.C. 303; and

(5) Minimum guarantee (MG) funds authorized under 23 U.S.C. 505 used for transportation planning and research, development and technology transfer activities that are eligible under title 23, U.S.C.

Grant agreement means a legal instrument reflecting a relationship between an awarding agency and a recipient or subrecipient when the principal purpose of the relationship is to transfer a thing of value to the recipient or subrecipient to carry out a public purpose of support or stimulation authorized by a law instead of acquiring (by purchase, lease, or barter) property or services for the direct benefit or use of the awarding agency.

Metropolitan planning area means the geographic area in which the metropolitan transportation planning process required by 23 U.S.C. 134 and 49 U.S.C. 5303–5305 must be carried out.

Metropolitan planning organization (MPO) means the forum for cooperative transportation decisionmaking for a metropolitan planning area.

National Cooperative Highway Research Program (NCHRP) means the cooperative RD&T program directed toward solving problems of national or regional significance identified by State DOTs and the FHWA, and administered by the Transportation Research Board, National Academy of Sciences.

Procurement contract means a legal instrument reflecting a relationship between an awarding agency and a recipient or subrecipient when the principal purpose of the instrument is to acquire (by purchase, lease, or barter) property or services for the direct benefit or use of the awarding agency.

State Department of Transportation (State DOT) means that department, commission, board, or official of any State charged by its laws with the responsibility for highway construction.

Transportation management area (TMA) means an urbanized area with a population over 200,000 (as determined by the latest decennial census) and designated by the Secretary of Transportation or other area when TMA designation is requested by the Governor and the MPO (or affected local officials), and officially designated by the Secretary of Transportation.

Transportation pooled fund study means a planning, research, development, or technology transfer activity administered by the FHWA, a lead State DOT, or other organization that is supported by two or more participants and that addresses an issue of significant or widespread interest related to highway, public, or intermodal transportation. A transportation pooled fund study is intended to address a new area or provide information that will complement or advance previous investigations of the subject matter.

Work program means a periodic statement of proposed work, covering no less than one year, and estimated costs that documents eligible activities to be undertaken by State DOTs and/or their subrecipients with FHWA planning and research funds.

§ 420.105 What is the FHWA's policy on use of FHWA planning and research funds?

(a) If the FHWA determines that planning activities of national significance, identified in paragraph (b) of this section, and the requirements of 23 U.S.C. 134, 135, 303, and 505 are being adequately addressed, the FHWA will allow State DOTs and MPOs:

(1) Maximum possible flexibility in the use of FHWA planning and research funds to meet highway and local public transportation planning and RD&T needs at the national, State, and local levels while ensuring legal use of such funds and avoiding unnecessary duplication of efforts; and

(2) To determine which eligible planning and RD&T activities they desire

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to support with FHWA planning and research funds and at what funding level.

(b) The State DOTs must provide data that support the FHWA's responsibilities to the Congress and to the public. These data include, but are not limited to, information required for: preparing proposed legislation and reports to the Congress; evaluating the extent, performance, condition, and use of the Nation's transportation systems; analyzing existing and proposed Federal-aid funding methods and levels and the assignment of user cost responsibility; maintaining a critical information base on fuel availability, use, and revenues generated; and calculating apportionment factors.

(c) The policy in paragraph (a) of this section does not remove the FHWA's responsibility and authority to determine which activities are eligible for funding. Activities proposed to be funded with FHWA planning and research funds by the State DOTs and their sub-recipients shall be documented and submitted for FHWA approval and authorization as prescribed in §§420.111 and 420.113. (The information collection requirements in paragraph (b) of §420.105 have been approved by the Office of Management and Budget (OMB) under control numbers 2125-0028 and 2125-0032.)

§420.107 What is the minimum required expenditure of State planning and research funds for research development and technology transfer?

(a) A State DOT must expend no less than 25 percent of its annual SPR funds on RD&T activities relating to highway, public transportation, and intermodal transportation systems in accordance with the provisions of 23 U.S.C. 505(b), unless a State DOT certifies, and the FHWA accepts the State DOT's certification, that total expenditures by the State DOT during the fiscal year for transportation planning under 23 U.S.C. 134 and 135 will exceed 75 percent of the amount apportioned for the fiscal year.

(b) Prior to submitting a request for an exception to the 25 percent requirement, the State DOT must ensure that:

(1) The additional planning activities are essential, and there are no other reasonable options available for fund-

ing these planning activities (including the use of NHS, STP, MG, or FTA State planning and research funds (49 U.S.C. 5313(b)) or by deferment of lower priority planning activities);

(2) The planning activities have a higher priority than RD&T activities in the overall needs of the State DOT for a given fiscal year; and

(3) The total level of effort by the State DOT in RD&T (using both Federal and State funds) is adequate.

(c) If the State DOT chooses to pursue an exception, it must send the request, along with supporting justification, to the FHWA Division Administrator for action by the FHWA Associate Administrator for Research, Development, and Technology. The Associate Administrator's decision will be based upon the following considerations:

(1) Whether the State DOT has a process for identifying RD&T needs and for implementing a viable RD&T program.

(2) Whether the State DOT is contributing to cooperative RD&T programs or activities, such as the National Cooperative Highway Research Program, the Transportation Research Board, and transportation pooled fund studies.

(3) Whether the State DOT is using SPR funds for technology transfer and for transit or intermodal research and development to help meet the 25 percent minimum requirement.

(4) Whether the State DOT can demonstrate that it will meet the requirement or substantially increase its RD&T expenditures over a multi-year period, if an exception is granted for the fiscal year.

(5) Whether Federal funds needed for planning exceed the 75 percent limit for the fiscal year and whether any unused planning funds are available from previous fiscal years.

(d) If the FHWA Associate Administrator for Research, Development, and Technology approves the State DOT's request for an exception, the exception is valid only for that fiscal year's funds. A new request must be submitted and approved for subsequent fiscal year funds.

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§ 420.109 What are the requirements for distribution of metropolitan planning funds?

(a) The State DOTs shall make all PL funds authorized by 23 U.S.C. 104(f) available to the MPOs in accordance with a formula developed by the State DOT, in consultation with the MPOs, and approved by the FHWA Division Administrator. The formula may allow for a portion of the PL funds to be used by the State DOT, or other agency agreed to by the State DOT and the MPOs, for activities that benefit all MPOs in the State, but State DOTs shall not use any PL funds for grant or subgrant administration. The formula may also provide for a portion of the funds to be made available for discretionary grants to MPOs to supplement their annual amount received under the distribution formula.

(b) In developing the formula for distributing PL funds, the State DOT shall consider population, status of planning, attainment of air quality standards, metropolitan area transportation needs, and other factors necessary to provide for an appropriate distribution of funds to carry out the requirements of 23 U.S.C. 134 and other applicable requirements of Federal law.

(c) The State DOTs shall inform the MPOs and the FHWA Division Office of the amounts allocated to each MPO as soon as possible after PL funds have been apportioned by the FHWA to the State DOTs.

(d) If the State DOT, in a State receiving the minimum apportionment of PL funds under the provisions of 23 U.S.C. 104(f)(2), determines that the share of funds to be allocated to any MPO results in the MPO receiving more funds than necessary to carry out the provisions of 23 U.S.C. 134, the State DOT may, after considering the views of the affected MPO(s) and with the approval of the FHWA Division Administrator, use those funds for transportation planning outside of metropolitan planning areas.

(e) In accordance with the provisions of 23 U.S.C. 134(n), any PL funds not needed for carrying out the metropolitan planning provisions of 23 U.S.C. 134 in any State may be made available by the MPO(s) to the State DOT for funding statewide planning activities under

23 U.S.C. 135, subject to approval by the FHWA Division Administrator.

(f) Any State PL fund distribution formula that does not meet the requirements of paragraphs (a) and (b) of this section shall be brought into conformance with those requirements before distribution on any new apportionment of PL funds.

§ 420.111 What are the documentation requirements for use of FHWA planning and research funds?

(a) Proposed use of FHWA planning and research funds must be documented by the State DOTs and subrecipients in a work program, or other document that describes the work to be accomplished, that is acceptable to the FHWA Division Administrator. Statewide, metropolitan, other transportation planning activities, and transportation RD&T activities may be documented in separate programs, paired in various combinations, or brought together as a single work program. The expenditure of PL funds for transportation planning outside of metropolitan planning areas under § 420.109(d) may be included in the work program for statewide transportation planning activities or in a separate work program submitted by the State DOT.

(b)(1) A work program(s) for transportation planning activities must include a description of work to be accomplished and cost estimates by activity or task. In addition, each work program must include a summary that shows:

- (i) Federal share by type of fund;
- (ii) Matching rate by type of fund;
- (iii) State and/or local matching share; and
- (iv) Other State or local funds.

(2) Additional information on metropolitan planning area work programs is contained in 23 CFR part 450. Additional information on RD&T work program content and format is contained in subpart B of this part.

(c) In areas not designated as TMAs, a simplified statement of work that describes who will perform the work and the work that will be accomplished using Federal funds may be used in lieu of a work program. If a simplified statement of work is used, it may be

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submitted separately or as part of the Statewide planning work program.

(d) The State DOTs that use separate Federal-aid projects in accordance with paragraph (a) of this section must submit an overall summary that identifies the amounts and sources of FHWA planning and research funds available, matching funds, and the amounts budgeted for each activity (e.g., statewide planning, RD&T, each metropolitan area, contributions to NCHRP and transportation pooled fund studies, etc.).

(e) The State DOTs and MPOs also are encouraged to include cost estimates for transportation planning, research, development, and technology transfer related activities funded with other Federal or State and/or local funds; particularly for producing the FHWA-required data specified in paragraph (b) of § 420.105, for planning for other transportation modes, and for air quality planning activities in areas designated as non-attainment for transportation-related pollutants in their work programs. The MPOs in TMAs must include such information in their work programs. (The information collection requirements in §§ 420.111 have been approved by the OMB and assigned control numbers 2125-0039 for States and 2132-0529 for MPOs.)

§ 420.113 What costs are eligible?

(a) Costs will be eligible for FHWA participation provided that the costs:

(1) Are for work performed for activities eligible under the section of title 23, U.S.C., applicable to the class of funds used for the activities;

(2) Are verifiable from the State DOT's or the subrecipient's records;

(3) Are necessary and reasonable for proper and efficient accomplishment of project objectives and meet the other criteria for allowable costs in the applicable cost principles cited in 49 CFR 18.22;

(4) Are included in the approved budget, or amendment thereto; and

(5) Were not incurred prior to FHWA authorization.

(b) Indirect costs of State DOTs and their subrecipients are allowable if supported by a cost allocation plan and indirect cost proposal prepared, sub-

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mitted (if required), and approved by the cognizant or oversight agency in accordance with the OMB requirements applicable to the State DOT or subrecipient specified in 49 CFR 18.22(b).

§ 420.115 What are the FHWA approval and authorization requirements?

(a) The State DOT and its subrecipients must obtain approval and authorization to proceed prior to beginning work on activities to be undertaken with FHWA planning and research funds. Such approvals and authorizations should be based on final work programs or other documents that describe the work to be performed. The State DOT and its subrecipients also must obtain prior approval for budget and programmatic changes as specified in 49 CFR 18.30 or 49 CFR 19.25 and for those items of allowable costs which require approval in accordance with the cost principles specified in 49 CFR 18.22(b) applicable to the entity expending the funds.

(b) Authorization to proceed with the FHWA funded work in whole or in part is a contractual obligation of the Federal government pursuant to 23 U.S.C. 106 and requires that appropriate funds be available for the full Federal share of the cost of work authorized. Those State DOTs that do not have sufficient FHWA planning and research funds or obligation authority available to obligate the full Federal share of a work program or project may utilize the advance construction provisions of 23 U.S.C. 115(a) in accordance with the requirements of 23 CFR part 630, subpart G. The State DOTs that do not meet the advance construction provisions, or do not wish to utilize them, may request authorization to proceed with that portion of the work for which FHWA planning and research funds are available. In the latter case, authorization to proceed may be given for either selected work activities or for a portion of the program period, but such authorization does not constitute a commitment by the FHWA to fund the remaining portion of the work if additional funds do become available.

(c) A project agreement must be executed by the State DOT and the FHWA Division Office for each statewide transportation planning, metropolitan

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planning area, or RD&T work program, individual activity or study, or any combination administered as a single Federal-aid project. The project agreement may be executed concurrent with or after authorization has been given by the FHWA Division Administrator to proceed with the work in whole or in part. In the event that the project agreement is executed for only part of the work, the project agreement must be amended when authorization is given to proceed with additional work.

(The information collection requirements in §420.115(c) have been approved by the OMB and assigned control numbers 2125-0529)

§420.117 What are the program monitoring and reporting requirements?

(a) In accordance with 49 CFR 18.40, the State DOT shall monitor all activities performed by its staff or by sub-recipients with FHWA planning and research funds to assure that the work is being managed and performed satisfactorily and that time schedules are being met.

(b)(1) The State DOT must submit performance and expenditure reports, including a report from each sub-recipient, that contain as a minimum:

- (i) Comparison of actual performance with established goals;
 - (ii) Progress in meeting schedules;
 - (iii) Status of expenditures in a format compatible with the work program, including a comparison of budgeted (approved) amounts and actual costs incurred;
 - (iv) Cost overruns or underruns;
 - (v) Approved work program revisions; and
 - (vi) Other pertinent supporting data.
- (2) Additional information on reporting requirements for individual RD&T studies is contained in subpart B of this part.

(c) Reports required by paragraph (b) of this section shall be annual unless more frequent reporting is determined to be necessary by the FHWA Division Administrator. The FHWA may not require more frequent than quarterly reporting unless the criteria in 49 CFR 18.12 or 49 CFR 19.14 are met. Reports are due 90 days after the end of the reporting period for annual and final reports and no later than 30 days after

the end of the reporting period for other reports.

(d) Events that have significant impact on the work must be reported as soon as they become known. The types of events or conditions that require reporting include: problems, delays, or adverse conditions that will materially affect the ability to attain program objectives. This disclosure must be accompanied by a statement of the action taken, or contemplated, and any Federal assistance needed to resolve the situation.

(e) Suitable reports that document the results of activities performed with FHWA planning and research funds must be prepared by the State DOT or subrecipient and submitted for approval by the FHWA Division Administrator prior to publication. The FHWA Division Administrator may waive this requirement for prior approval. The FHWA's approval of reports constitutes acceptance of such reports as evidence of work performed but does not imply endorsement of a report's findings or recommendations. Reports prepared for FHWA-funded work must include appropriate credit references and disclaimer statements. (The information collection requirements in §420.117 have been approved by the OMB and assigned control numbers 2125-0039 for States and 2132-0529 for MPOs.)

§420.119 What are the fiscal requirements?

(a) The maximum rate of Federal participation for FHWA planning and research funds shall be as prescribed in title 23, U.S.C., for the specific class of funds used (*i.e.*, SPR, PL, NHS, STP, or MG) except as specified in paragraph (d) of this section. The provisions of 49 CFR 18.24 or 49 CFR 19.23 are applicable to any necessary matching of FHWA planning and research funds.

(b) The value of third party in-kind contributions may be accepted as the match for FHWA planning and research funds, in accordance with the provisions of 49 CFR 18.24(a)(2) or 49 CFR 19.23(a) and may be on either a total planning work program basis or for specific line items or projects. The use of third party in-kind contributions must be identified in the original work program/scope of work and the grant/

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subgrant agreement, or amendments thereto. The use of third-party in-kind contributions must be approved in advance by the FHWA Division Administrator and may not be made retroactive prior to approval of the work program/scope of work or an amendment thereto. The State DOT or subrecipient is responsible for ensuring that the following additional criteria are met:

(1) The third party performing the work agrees to allow the value of the work to be used as the match;

(2) The cost of the third party work is not paid for by other Federal funds or used as a match for other federally funded grants/subgrants;

(3) The work performed by the third party is an eligible transportation planning or RD&T related activity that benefits the federally funded work;

(4) The third party costs (*i.e.*, salaries, fringe benefits, etc.) are allowable under the applicable Office of Management and Budget (OMB) cost principles (*i.e.*, OMB Circular A-21, A-87, or A-122);¹

(5) The third party work is performed during the period to which the matching requirement applies;

(6) The third party in-kind contributions are verifiable from the records of the State DOT or subrecipient and these records show how the value placed on third party in-kind contributions was derived; and

(7) If the total amount of third party expenditures at the end of the program period is not sufficient to match the total expenditure of Federal funds by the recipient/subrecipient, the recipient/subrecipient will need to make up any shortfall with its own funds.

(c) In accordance with the provisions of 23 U.S.C. 120(j), toll revenues that are generated and used by public, quasi-public, and private agencies to build, improve, or maintain highways, bridges, or tunnels that serve the public purpose of interstate commerce may be used as a credit for the non-Federal share of an FHWA planning and research funded project.

¹ OMB Circulars are available on the Internet at <http://www.whitehouse.gov/omb/circulars/index.html>.

(d) In accordance with 23 U.S.C. 505(c) or 23 U.S.C. 104(f)(3), the requirement for matching SPR or PL funds may be waived if the FHWA determines the interests of the Federal-aid highway program would be best served. Waiver of the matching requirement is intended to encourage State DOTs and/or MPOs to pool SPR and/or PL funds to address national or regional high priority planning or RD&T problems that would benefit multiple States and/or MPOs. Requests for waiver of matching requirements must be submitted to the FHWA headquarters office for approval by the Associate Administrator for Planning and Environment (for planning activities) or the Associate Administrator for Research, Development, and Technology (for RD&T activities). The matching requirement may not be waived for NHS, STP, or MG funds.

(e) NHS, STP, or MG funds used for eligible planning and RD&T purposes must be identified separately from SPR or PL funds in the work program(s) and must be administered and accounted for separately for fiscal purposes. In accordance with the statewide and metropolitan planning process requirements for fiscally constrained transportation improvement program (TIPs) planning or RD&T activities funded with NHS, STP, or MG funds must be included in the Statewide and/or metropolitan TIP(s) unless the State DOT and MPO (for a metropolitan area) agree that they may be excluded from the TIP.

(f) Payment shall be made in accordance with the provisions of 49 CFR 18.21 or 49 CFR 19.22.

§ 420.121 What other requirements apply to the administration of FHWA planning and research funds?

(a) *Audits.* Audits of the State DOTs and their subrecipients shall be performed in accordance with OMB Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations.² Audits of for-profit contractors are to be performed in accordance with State DOT or subrecipient contract administration procedures.

² See footnote 1.

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(b) *Copyrights.* The State DOTs and their subrecipients may copyright any books, publications, or other copyrightable materials developed in the course of the FHWA planning and research funded project. The FHWA reserves a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use, the work for Government purposes.

(c) *Disadvantaged business enterprises.* The State DOTs must administer the transportation planning and RD&T program(s) consistent with their overall efforts to implement section 1001(b) of the Transportation Equity Act for the 21st Century (Pub. L. 105-178) and 49 CFR part 26 regarding disadvantaged business enterprises.

(d) *Drug free workplace.* In accordance with the provisions of 49 CFR part 29, subpart F, State DOTs must certify to the FHWA that they will provide a drug free workplace. This requirement may be satisfied through the annual certification for the Federal-aid highway program.

(e) *Equipment.* Acquisition, use, and disposition of equipment purchased with FHWA planning and research funds by the State DOTs must be in accordance with 49 CFR 18.32(b). Local government subrecipients of State DOTs must follow the procedures specified by the State DOT. Universities, hospitals, and other non-profit organizations must follow the procedures in 49 CFR 19.34.

(f) *Financial management systems.* The financial management systems of the State DOTs and their local government subrecipients must be in accordance with the provisions of 49 CFR 18.20(a). The financial management systems of universities, hospitals, and other non-profit organizations must be in accordance with 49 CFR 19.21.

(g) *Lobbying.* The provisions of 49 CFR part 20 regarding restrictions on influencing certain Federal activities are applicable to all tiers of recipients of FHWA planning and research funds.

(h) *Nondiscrimination.* The non-discrimination provisions of 23 CFR parts 200 and 230 and 49 CFR part 21, with respect to Title VI of the Civil Rights Act of 1964 and the Civil Rights Restoration Act of 1987, apply to all

programs and activities of recipients, subrecipients, and contractors receiving FHWA planning and research funds whether or not those programs or activities are federally funded.

(i) *Patents.* The State DOTs and their subrecipients are subject to the provisions of 37 CFR part 401 governing patents and inventions and must include or cite the standard patent rights clause at 37 CFR 401.14, except for §401.14(g), in all subgrants or contracts. In addition, State DOTs and their subrecipients must include the following clause, suitably modified to identify the parties, in all subgrants or contracts, regardless of tier, for experimental, developmental or research work: "The subgrantee or contractor will retain all rights provided for the State in this clause, and the State will not, as part of the consideration for awarding the subgrant or contract, obtain rights in the subgrantee's or contractor's subject inventions."

(j) *Procurement.* Procedures for the procurement of property and services with FHWA planning and research funds by the State DOTs must be in accordance with 49 CFR 18.36(a) and (i) and, if applicable, 18.36(t). Local government subrecipients of State DOTs must follow the procedures specified by the State DOT. Universities, hospitals, and other non-profit organizations must follow the procedures in 49 CFR 19.40 through 19.48. The State DOTs and their subrecipients must not use FHWA funds for procurements from persons (as defined in 49 CFR 29.105) who have been debarred or suspended in accordance with the provisions of 49 CFR part 29, subparts A through E.

(k) *Program income.* Program income, as defined in 49 CFR 18.25(b) or 49 CFR 19.24, must be shown and deducted from total expenditures to determine the Federal share to be reimbursed, unless the FHWA Division Administrator has given prior approval to use the program income to perform additional eligible work or as the non-Federal match.

(l) *Record retention.* Recordkeeping and retention requirements must be in accordance with 49 CFR 18.42 or 49 CFR 19.53.

(m) *Subgrants to local governments.* The State DOTs and subrecipients are

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responsible for administering FHWA planning and research funds passed through to MPOs and local governments, for ensuring that such funds are expended for eligible activities, and for ensuring that the funds are administered in accordance with this part, 49 CFR part 18, Uniform Administrative Requirements for Grants and Agreements to State and Local Governments, and applicable OMB cost principles. The State DOTs shall follow State laws and procedures when awarding and administering subgrants to MPOs and local governments and must ensure that the requirements of 49 CFR 18.37(a) have been satisfied.

(n) *Subgrants to universities, hospitals, and other non-profit organizations.* The State DOTs and subrecipients are responsible for ensuring that FHWA planning and research funds passed through to universities, hospitals, and other non-profit organizations are expended for eligible activities and for ensuring that the funds are administered in accordance with this part, 49 CFR part 19, Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations, and applicable OMB cost principles.

(o) *Suspension and debarment.* (1) The State DOTs and their subrecipients shall not award grants or cooperative agreements to entities who are debarred or suspended, or otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549 of February 18, 1986 (3 CFR, 1986 Comp., p. 189); and

(2) The State DOTs and their subrecipients shall comply with the provisions of 49 CFR part 29, subparts A through E, for procurements from persons (as defined in 49 CFR 29.105) who have been debarred or suspended.

(p) *Supplies.* Acquisition and disposition of supplies acquired by the State DOTs and their subrecipients with FHWA planning and research funds must be in accordance with 49 CFR 18.33 or 49 CFR 19.35.

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Subpart B—Research, Development and Technology Transfer Program Management

§ 420.201 What is the purpose of this subpart?

The purpose of this subpart is to prescribe requirements for research, development, and technology transfer (RD&T) activities, programs, and studies undertaken by State DOTs and their subrecipients with FHWA planning and research funds.

§ 420.203 How does the FHWA define the terms used in this subpart?

Unless otherwise specified in this part, the definitions in 23 U.S.C. 101(a) and subpart A of this part, are applicable to this subpart. As used in this subpart:

Applied research means the study of phenomena to gain knowledge or understanding necessary for determining the means by which a recognized need may be met; the primary purpose of this kind of research is to answer a question or solve a problem.

Basic research means the study of phenomena, and of observable facts, without specific applications towards processes or products in mind; the primary purpose of this kind of research is to increase knowledge.

Development means the systematic use of the knowledge or understanding gained from research, directed toward the production of useful materials, devices, systems or methods, including design and development of prototypes and processes.

Final report means a report documenting a completed RD&T study or activity.

Intermodal RD&T means research, development, and technology transfer activities involving more than one mode of transportation, including transfer facilities between modes.

Peer exchange means a periodic review of a State DOT's RD&T program, or portion thereof, by representatives of other State DOT's, for the purpose of exchange of information or best practices. The State DOT may also invite the participation of the FHWA, and other Federal, State, regional or local

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transportation agencies, the Transportation Research Board, academic institutions, foundations or private firms that support transportation research, development or technology transfer activities.

RD&T activity means a basic or applied research project or study, development or technology transfer activity.

Research means a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research can be basic or applied.

Technology transfer means those activities that lead to the adoption of a new technique or product by users and involves dissemination, demonstration, training, and other activities that lead to eventual innovation.

Transportation Research Information Services (TRIS) means the database produced and maintained by the Transportation Research Board and available online through the National Transportation Library. TRIS includes bibliographic records and abstracts of ongoing and completed RD&T activities. TRIS Online also includes links to the full text of public-domain documents.

§ 420.205 What is the FHWA's policy for research, development, and technology transfer funding?

(a) It is the FHWA's policy to administer the RD&T program activities utilizing FHWA planning and research funds consistent with the policy specified in § 420.105 and the following general principles in paragraphs (b) through (g) of this section.

(b) The State DOTs must provide information necessary for peer exchanges.

(c) The State DOTs are encouraged to develop, establish, and implement an RD&T program, funded with Federal and State DOT resources that anticipates and addresses transportation concerns before they become critical problems. Further, the State DOTs are encouraged to include in this program development and technology transfer programs to share the results of their own research efforts and promote the use of new technology.

(d) To promote effective use of available resources, the State DOTs are en-

couraged to cooperate with other State DOTs, the FHWA, and other appropriate agencies to achieve RD&T objectives established at the national level and to develop a technology transfer program to promote and use those results. This includes contributing to cooperative RD&T programs such as the NCHRP, the TRB, and transportation pooled fund studies as a means of addressing national and regional issues and as a means of leveraging funds.

(e) The State DOTs will be allowed the authority and flexibility to manage and direct their RD&T activities as presented in their work programs, and to initiate RD&T activities supported by FHWA planning and research funds, subject to the limitation of Federal funds and to compliance with program conditions set forth in subpart A of this part and § 420.207.

(f) The State DOTs will have primary responsibility for managing RD&T activities supported with FHWA planning and research funds carried out by other State agencies and organizations and for ensuring that such funds are expended for purposes consistent with this subpart.

(g) Each State DOT must develop, establish, and implement a management process that ensures effective use of available FHWA planning and research funds for RD&T activities on a statewide basis. Each State DOT is permitted to tailor its management process to meet State or local needs; however, the process must comply with the minimum requirements and conditions of this subpart.

(h) The State DOTs are encouraged to make effective use of the FHWA Division, Resource Center, and Headquarters office expertise in developing and carrying out their RD&T activities. Participation of the FHWA on advisory panels and in program exchange meetings is encouraged.

§ 420.207 What are the requirements for research, development, and technology transfer work programs?

(a) The State DOT's RD&T work program must, as a minimum, consist of a description of RD&T activities to be accomplished during the program period, estimated costs for each eligible

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activity, and a description of any cooperative activities including the State DOT's participation in any transportation pooled fund studies and the NCHRP. The State DOT's work program should include a list of the major items with a cost estimate for each item. The work program should also include any study funded under a previous work program until a final report has been completed for the study.

(b) The State DOT's RD&T work program must include financial summaries showing the funding levels and share (Federal, State, and other sources) for RD&T activities for the program year. State DOTs are encouraged to include any activity funded 100 percent with State or other funds for information purposes.

(c) Approval and authorization procedures in § 420.115 are applicable to the State DOT's RD&T work program.

§ 420.209 What are the conditions for approval?

(a) As a condition for approval of FHWA planning and research funds for RD&T activities, a State DOT must develop, establish, and implement a management process that identifies and results in implementation of RD&T activities expected to address high priority transportation issues. The management process must include:

(1) An interactive process for identification and prioritization of RD&T activities for inclusion in an RD&T work program;

(2) Use of all FHWA planning and research funds set aside for RD&T activities, either internally or for participation in transportation pooled fund studies or other cooperative RD&T programs, to the maximum extent possible;

(3) Procedures for tracking program activities, schedules, accomplishments, and fiscal commitments;

(4) Support and use of the TRIS database for program development, reporting of active RD&T activities, and input of the final report information;

(5) Procedures to determine the effectiveness of the State DOT's management process in implementing the RD&T program, to determine the utilization of the State DOT's RD&T outputs, and to facilitate peer exchanges

of its RD&T Program on a periodic basis;

(6) Procedures for documenting RD&T activities through the preparation of final reports. As a minimum, the documentation must include the data collected, analyses performed, conclusions, and recommendations. The State DOT must actively implement appropriate research findings and should document benefits; and

(7) Participation in peer exchanges of its RD&T management process and of other State DOTs' programs on a periodic basis. To assist peer exchange teams in conducting an effective exchange, the State DOT must provide to them the information and documentation required to be collected and maintained under this subpart. Travel and other costs associated with the State DOT's peer exchange may be identified as a line item in the State DOT's work program and will be eligible for 100 percent Federal funding. The peer exchange team must prepare a written report of the exchange.

(b) Documentation that describes the State DOT's management process and the procedures for selecting and implementing RD&T activities must be developed by the State DOT and submitted to the FHWA Division office for approval. Significant changes in the management process also must be submitted by the State DOT to the FHWA for approval. The State DOT must make the documentation available, as necessary, to facilitate peer exchanges.

(c) The State DOT must include a certification that it is in full compliance with the requirements of this subpart in each RD&T work program. If the State DOT is unable to certify full compliance, the FHWA Division Administrator may grant conditional approval of the State DOT's work program. A conditional approval must cite those areas of the State DOT's management process that are deficient and require that the deficiencies be corrected within 6 months of conditional approval. The certification must consist of a statement signed by the Administrator, or an official designated by the Administrator, of the State DOT certifying as follows: "I (name of certifying official), (position title), of the State (Commonwealth) of _____, do hereby

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certify that the State (Commonwealth) is in compliance with all requirements of 23 U.S.C. 505 and its implementing regulations with respect to the research, development, and technology transfer program, and contemplate no changes in statutes, regulations, or administrative procedures which would affect such compliance.”

(d) The FHWA Division Administrator shall periodically review the State DOT's management process to determine if the State is in compliance with the requirements of this subpart. If the Division Administrator determines that a State DOT is not complying with the requirements of this subpart, or is not performing in accordance with its RD&T management process, the FHWA Division Administrator shall issue a written notice of proposed determination of noncompliance to the State DOT. The notice will set forth the reasons for the proposed determination and inform the State DOT that it may reply in writing within 30 calendar days from the date of the notice. The State DOT's reply should address the deficiencies cited in the notice and provide documentation as necessary. If the State DOT and the Division Administrator cannot resolve the differences set forth in the determination of nonconformity, the State DOT may appeal to the Federal Highway Administrator whose action shall constitute the final decision of the FHWA. An adverse decision shall result in immediate withdrawal of approval of FHWA planning and research funds for the State DOT's RD&T activities until the State DOT is in full compliance.

(The information collection requirements in § 420.209 have been approved by the OMB and assigned control number 2125-0039)

PART 450—PLANNING ASSISTANCE AND STANDARDS

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