Alabama Department of Transportation, Arkansas Department of Transportation, & Kentucky Transportation Cabinet Research Peer Exchange Report

March 4-7, 2019

Prepared By:

ARDOT System Information and Research Division – Research Section

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Acknowledgements

The Arkansas Department of Transportation would like to take this section to thank all of the parties involved in making this peer exchange a success. From the massive organizational hurdles to the burden of travel, many difficult obstacles had to be overcome by each party in order to ensure ALDOT, ARDOT, and KYTC acquired the most valuable insight into how to make their research programs better. It could not be done, and would not be successful, without the utmost cooperation from the parties involved; because of that, we dedicate this section to most sincerely thank them.

List of Acronyms

ALDOT	Alabama Department of Transportation
ARA	Applied Research Associates, Inc.
ARDOT	Arkansas Department of Transportation
FY	Fiscal Year
HBCU	Historically Black Colleges and Universities
IDC	Indirect Costs
KTC	Kentucky Transportation Center
KYTC	Kentucky Transportation Cabinet
LADOTD	Louisiana Department of Transportation & Development
LTAP	Local Technical Assistance Program
MOU	Memorandum of Understanding
NCAT	National Center for Asphalt Technology
NCHRP	National Cooperative Highway Research Program
ODOT	Ohio Department of Transportation
PI	Principal Investigator
PM	Project Manager
QPR	Quarterly Progress Report
SAC	Study Advisory Committee
SPR	State Planning and Research
SPR2	State Planning and Research Part 2 Program
RAC	Research Advisory Council
RD&T	Research, Development, and Technology
RFP	Request for Proposals
ROI	Return on Investment
RPTS	Research Project Tracking System (Kentucky)
T2	Technology Transfer
TRB	Transportation Research Board
TRC	Transportation Research Committee (Arkansas)
VDOT	Virginia Department of Transportation

Introduction

In accordance with 23 CFR 420, the Arkansas Department of Transportation's (ARDOT) Research Section conducted a multistate peer exchange in Hot Springs, AR from March 4th through March 7th, 2019 along with representatives from the research, development, and technology (RD&T) programs of two other state departments of transportation (DOT): Alabama (ALDOT) and Kentucky (KYTC). Peer members from Virginia, Louisiana, and Ohio DOTs also attended the meeting. Jason Bittner of Applied Research Associates, Inc. (ARA) facilitated the peer exchange.

Objectives and Format

The objective of this peer exchange was to examine specific functions and processes of each of the participating DOT's RD&T programs and to evaluate these functions and processes based on the practices of the other participating DOTs, along with the expertise of the other invited participants. The processes and functions of interest for this peer exchange were broken down into four topics: Finances of Research Program/CFR 200/Alternative Funding for Research, Return on Investment for Research Projects, Tracking Research Implementation, and Research Program Performance Measures. From March 4th through March 6th, each state DOT was provided an opportunity to present their current states of practice regarding each topic. After each state DOT presented their state of practice, each state was provided a round-table brainstorming session to determine what lessons they had learned, their strengths and weaknesses regarding each topic, and the opportunities each DOT had for improvement in these areas. Jason Bittner, acting as facilitator of the discussion, emphasized the importance of story-telling to help participants internalize the massive amount of information being shared. The afternoon of March 6th was used to wrap-up any topic discussions and provide a summary of the critical items and takeaways. Summaries for what was discussed in each session were created and included in this report which was finalized and approved by the participants on March 7th.

Peer Exchange Participants

Back Row L to R: Cynthia Jones, Mike Fitch, Tyson Rupnow, Joe Crabtree, Chris Dailey, Parker Taylor. Middle Row L to R: Davin Webb, Jason Bittner, Bethany Stovall, Sydney Bryant, JD Borgeson, Karen McDaniels, Robin Russell. Front Row L to R: Jarrod Stanley, Clark Graves, Mike Weidman, Ron Johnson, Michelle Owens, Elisha Wright-Kehner.

- Michelle Owens, ALDOT
- Ron Johnson, ALDOT
- Jason Bittner, ARA
- Elisha Wright-Kehner, ARDOT
- Joe Crabtree, KTC
- Clark Graves, KTC
- Jarrod Stanley, KYTC
- Tyson Rupnow, LADOTD
- Cynthia Jones, ODOT
- Mike Fitch, VDOT

Summary of Participating Programs

Alabama

ADOT's mission is to provide a safe, efficient, and environmentally sound intermodal transportation system for all users. It is also to facilitate economic and social development through the efficient movement of people and goods and to facilitate

intermodal connections within Alabama. ALDOT must also demand excellence in transportation and be involved in promoting adequate funding to promote and maintain Alabama's transportation infrastructure.

The Research Section at ALDOT is responsible for administering the SPR2 of the State's Research Program. The program is part of the Bureau of Research and Development, which is responsible for administering both the Research area and Product Evaluation. All research is reviewed and approved by a Research Advisory Committee, headed by the R&D Bureau Chief. Members of the RAC also chair ALDOT's Project Advisory Committee. ALDOT conducts research through their research partners, which are currently: Auburn University, Alabama A&M University, NCAT, The University of Alabama, Tuskegee University, University of Alabama at Birmingham, University of Alabama in Huntsville, and University of South Alabama.

Arkansas

What is now known as the Arkansas Department of Transportation was created by Act 65 of 1929 which separated the then-named Arkansas Highway Department from the Department of State Lands, Highways, and Improvements. This act passed the responsibility of administering Arkansas's state highway system to the newly founded Department while also including responsibilities for coordinating public and private transportation activities and implementing a safe and efficient intermodal transportation system. The ARDOT Research Section, part of the Department's System Information and Research Division, has been operating as we know it since 1976 and administers the Department's SPR2 Program.

In 1976, following an extensive review, the Advisory Council and the Transportation Research Committee (TRC) were established. The Advisory Council, made up of educational institutions and industry representatives, provides guidance to the TRC in the selection of projects for funding. Since the reorganization, the formal process for getting a project underway has remained unchanged. The Department solicits Research Problem Statements annually from educational institutions within the State, from Advisory Council members, and from members of the public. Requests for Proposals (RFPs) are developed from the problem statements, and proposals are accepted from all universities. Each project is directed by a subcommittee (which is chaired by a member of the TRC and comprised of DOT employees), an FHWA representative, and a Research Section employee as a project manager. The subcommittee receives and reviews progress reports, reviews the work of the principal investigator, and stays involved in the project. Within six months of completion, the subcommittee, in conjunction with the principal investigator, develops the implementation plan for the project and prepares it for presentation to the Research Implementation Committee upon completion of the project.

Kentucky

The Kentucky Transportation Cabinet (KYTC) is an executive branch agency responsible for overseeing the development and preservation of a safe, efficient, multi-modal transportation system throughout the Commonwealth. KYTC manages more than 27,000 miles of highways, including roughly 20,500 miles of secondary roads, 3,600 miles of primary roads, and more than 1,400 miles of interstate and parkway. KYTC also provides direction for 230 licensed airports and heliports and oversees all motor vehicle and driver's licensure for more than three million drivers in the Commonwealth.

The Kentucky Transportation Center (KTC) at the University of Kentucky serves as the 'research arm' of the Kentucky Transportation Cabinet. The research program conducted by KTC began in 1981 when the Kentucky Department of Highways transferred its Division of Research to the University of Kentucky's College of Engineering. In 1988, the University of Kentucky combined the transportation research program with the federally-funded Local Technical Assistance Program (LTAP) to form what is today known as the Kentucky Transportation Center.

Topic 1: Finances of Research Programs

ALDOT - Finances

State of Practice

The Research Section at ALDOT averages 3.5 to 4 million dollars per fiscal year (FY). ALDOT Research currently supports NCHRP and TRB with one million dollars per year and participates in several pooled fund studies with the remainder for new research. A primary interest of the Research Section at ALDOT is how each state handles finances according to CFR 200.

Key Takeaways

The participating DOTs were impressed with Alabama's ability to retain budget carryover for each fiscal year and their "checkbook" style budget. The participating DOTs also praised ALDOT for utilizing a master contract for research projects which streamlines and standardizes project finance management; this is extremely beneficial due to the amount of potential research partners that ALDOT has at their disposal. ALDOT believes the technical quality of the final reports submitted is consistently of high quality, and they do not foresee a need to require technical editors as part of their contracts. Along with these strengths, the following takeaway items were discussed:

- ALDOT expressed interest in breaking down the budgets set forth in Letters of Direction by fiscal year to simplify accounting for annual reporting. Currently, ALDOT allocates funds to projects in full at the beginning of the project. Because of FHWA requirements, ALDOT is looking into how other states handle this aspect of project finance.
- ALDOT is interested in negotiating indirect costs (IDC) rates based on the vendor status of the universities with which ALDOT often contracts. Currently, ALDOT views universities as sub-recipients and pays cognizant agency IDC rates or rates established by the individual universities. After learning that other participating DOTs view universities as vendors instead of sub-recipients, ALDOT expressed interest in changing their manual to identify a standard IDC rate to be used on their projects.
- While ALDOT does not offer tuition to graduate students working on ALDOT funded research projects, they plan to evaluate the feasibility of paying tuition based on the results of a study brought up by Jason Bittner (i.e. that 60% of surveyed DOTs pay tuition of graduate students conducting their research projects).
- ALDOT is interested in a more formalized process of problem statement solicitation. Currently, the majority of project proposals are unsolicited; as a result, the majority of ALDOT's research contracts now go to only two university research partners in the state. They feel a more formalized process for submitting problem statements would open up the possibility of participation from some of the smaller parties interested.

ARDOT - Finances

State of Practice

For the 2019 FY, ARDOT's Research Section has approximately $6,500,000 in total program funding. NCHRP, Core Program, and other Pooled Fund studies account for around $850,000. SPR and State Matching funds go toward 43 Research Job Numbers. There are currently 24 continuing and new Transportation Research Committee (TRC) projects being funded. These are all either being conducted in-house by research staff (9 presently) or are contracted with an in-state university. The Technology Transfer/LTAP program costs around $302,000 annually. Of the remaining SPR funds, about half goes to TRC projects. The other half is used for other research projects/contracts, support services, project development, implementation, and other areas.

Key Takeaways

ARDOT's research program maintains an excellent relationship with their FHWA representative which manifests into numerable financial strengths. In addition, ARDOT's ability to negotiate lower IDC rates was praised by the participating DOTs. ARDOT's research staff in specific was considered a strength due both to its relative size and its inclusion of two employees dedicated solely to finance and implementation, respectively. Other ARDOT strengths included their policy to withhold 25% of total project funds until all deliverables have been accepted for that project and their ability to cancel projects due to deadlines not being met. ARDOT is currently transitioning to electronic contracting (i.e. Doc Express) which other participating DOTs consider to be a valuable change. Along with these strengths, the following takeaway items were discussed:

- ARDOT explained that being invoiced on time from their research contractors is a major financial issue resulting in extraneous budgeting problems. An appealing solution for ARDOT is to begin including language in future contracts that require invoices to be submitted within 90 days following the end of each quarter.
- ARDOT expressed interest in beginning to provide training to Offices of Sponsored Programs personnel involved with ARDOT contracts. It would also be beneficial to have specific individuals in this program to be responsible for administering the programs that relate to ARDOT.
- Based on the success of ODOT's task-order contracting, ARDOT will evaluate the feasibility of including task based deliverables in their contracts.
- Due to a continually more stringent travel budget, ARDOT has been evaluating ways to adjust travel policies. A viable suggestion brought forth by LADOTD is to limit travel reimbursement for contract research PIs to the days before, of, and after a presentation of their ARDOT research project.
- Due to declining technical quality in submitted final reports, ARDOT will begin to require a technical review as part of the Project Manager's review process.

KYTC - Finances

State of Practice

Kentucky Transportation Cabinet's annual SPR budget is approximately $5 million. Approximately $1 million is allocated to NCHRP dues ($760K) and pooled-fund studies. The remaining $4 million includes $3.75 million of 80/20 federal/state funds

and $260K of 100% state funds for the administration of the program. In addition to the SPR program, KYTC contracts with KTC for additional projects and tasks funded from non-SPR sources. These projects and tasks typically total between $2 and $4 million per year.

Key Takeaways

The biggest overall strength for KYTC is its relationship with KTC and the University of Kentucky. This relationship makes invoicing simple, as all the ongoing SPR projects can be itemized in a single invoice. This relationship also provides for ease of negotiation, as the two operate under a master contract with a relatively low IDC rate and no IDC for the LTAP program. KTC works closely with the university's administrative departments (sponsored projects and research financial services) and provides training as needed for those on the administrative staff who are assigned to handle KYTC contracts. With these strengths, the following takeaway was identified:

- Currently, KYTC does not provide much incentive for PIs to produce final reports and close out projects, particularly if the results of projects have already been delivered and implemented. This results in a backlog of projects that are lacking only the final reports. KYTC will develop a process to get the final reports completed in order to reduce the backlog of incomplete projects; they will also develop incentives for PIs to produce final reports in the future.

Key Takeaways from Other Participants - Finances

LADOTD

- Having no IDC for LTAP would be an immense benefit. It would enable LADOTD to get more out of the program for the funds available.
- Doc Express would be a big time saver for LADOTD. Currently, LADOTD has a mix of paper and electronic contracts. Louisiana's FHWA Division Office requires electronic documents for signature, while internal DOTD accounting requires ink signatures.
- ALDOT's program budget being kept like a checkbook would be a big benefit as LADOTD does not typically have carryover from year to year.
- The 25% retainage policy that ARDOT employs would give the DOTD more "teeth" for obtaining deliverables from research projects.
- In order to better coordinate invoicing and reporting, LADOTD will consider moving to quarterly reporting/invoicing from monthly.

ODOT

- Currently, ODOT pays cognizant agency IDC rates on their research projects; they would like to evaluate the reason behind this decision and begin negotiating lower IDC rates where applicable.

VDOT

- The use of Doc Express appears to be potentially beneficial for VDOT as they currently handle all external research contracts by way of hard copy.

Topic 2: Return on Investment from Research Projects

ALDOT – Return on Investment

State of Practice

At the current time, the ALDOT Research Program does not have any return on investment (ROI) determination for their projects.

Key Takeaways

While ALDOT's Research Program acknowledges that a means of analyzing ROI is needed, the "blank-slate" nature of their ROI policy allows them to fine tune a method that most suits their needs. The following are key takeaway items discussed during the peer exchange:

- ALDOT expressed interest in incorporating ROI analysis into their project contracts using in-house staff and/or university staff that are independent of any given project.
- Based on ARDOT's spreadsheet for tracking ROI, ALDOT is interested in utilizing a standardized form to evaluate ROI for when projects approach completion.

ARDOT - Return on Investment

State of Practice

The Research Section at ARDOT approaches ROI from a few different angles from the very beginning of the process until the project is complete and implementation begins.

- An ROI section is included on ARDOT's official Problem Statement form; therefore, potential Principal Investigators are keeping ROI in mind while developing their problem statements.
- After a problem statement advances through the TRC's official process and becomes a contract, the project manager for that particular project completes the Summary of Estimated Savings document.
- The Summary of Estimated Savings document supplies ARDOT's leaders with a monetary amount of estimated potential savings along with details that explain the development of those figures.
- All TRC projects require a cost-benefit analysis at the time of their completion.

Key Takeaways

While the ARDOT leadership cares about ROI, the Research Section does not let ROI influence project selection. ARDOT had the following takeaways as it relates to ROI:

- ARDOT believes its relationships with the professors that conduct research projects could be stronger. Based on LADOTD's practice, ARDOT will begin to set up meetings with new professors that will be involved in research projects.

- In order to increase the marketing of their research projects, ARDOT will look into the several suggestions set forth by the other states including a six-minute research project presentation at the TRC conference for each completed or ongoing project and a "research roadshow" that will travel to different districts in order to inform field personnel about completed and ongoing research and increase their cooperation.
- ARDOT will develop definitions to segregate the different types of ROI as well as create a matrix to display the different types of ROI.

KYTC - Return on Investment

State of Practice

KYTC and KTC have not implemented a program that reviews or uses ROI as a metric.

Key Takeaways

As there has been no pressure from upper management to monitor ROI on projects, KYTC fears standardizing ROI into projects will threaten the amount of exploratory research they currently conduct. Despite this, KYTC and KTC have the following takeaway:

- As a measure of good housekeeping, KYTC would like to develop a simple process to show ROI of applicable projects in order to defend the relevance of their program if necessary.

Key Takeaways from Other Participants – Return on Investment

LADOTD

There were no specific takeaways mentioned by LADOTD on this topic.

ODOT

- It is important to be deliberate about the amount of time and effort allocated to ROI; consider the ROI of the effort of capturing ROI.

VDOT

While there were no specific takeaways for VDOT, they made the point that ROIs are only accurate if they exclusively consider the implementable aspects of the projects. Employing an ROI metric for all projects would require the monetization of other benefits derived from some projects such as increased safety, regulatory compliance, decreased travel time, etc.

Topic 3: Tracking Research Implementation

ALDOT – Tracking Implementation

State of Practice

The Research Section at ALDOT includes implementation plans within their research proposals.

Key Takeaways

The participating DOTs agreed that having implementation statements within Alabama's project proposals emphasizes the importance of implementation from the beginning of a project. In addition, it is seen as a benefit having a Bureau Chief that champions the majority of research projects, along with purpose-driven project committees. It was also noted that PIs working with ALDOT research will sometimes stay involved in the implementation of projects once projects are complete as they are often able to develop future work related to the project. Alabama highlighted the following takeaways:

- Currently, ALDOT does not have any formal system for tracking implementation due to lack of staffing. Adding a staff member to be responsible specifically for tracking implementation would enable an opportunity to do so.
- ALDOT already requires that projects have implementation plans within the project proposals; ALDOT believes an implementation assessment, similar to the one set forth by KTC, would be a cost effective addition to their project proposal process.
- Though ALDOT doesn't currently dedicate funds to tracking implementation, they intend to evaluate the feasibility of doing so.
- ALDOT plans to evaluate projects completed in the last several years to determine the amount of their projects that are currently being implemented. This evaluation will serve to create a baseline for new implementation requirements.
- As a means to increase marketing, ALDOT will evaluate the feasibility of circulating a newsletter in order to display their work and facilitate cooperation from a broader range of entities.
- ALDOT expressed a desire to set up an annual "kickoff" meeting with all project PIs and contractors involved in projects for that FY.

ARDOT - Tracking Implementation

State of Practice

Tracking implementation provides the Research Section with proof to upper management that their investments are providing a good return as well as creates champions for future research. Starting with the problem statement, and continuing through the life of the project, the Research Section's goal is to ensure that the PI understands the commitment it has to seeing a fully implementable outcome.

Key Takeaways

As implementation is extremely important to ARDOT, they have assigned a dedicated staff member to be responsible for ensuring and tracking implementation. Implementation is tracked for three years after the end of the project, while most states do not track implementation for that amount of time after a project is completed. Some research projects have strong champions on their subcommittees, which tends to lead to the most implementable research. Along with these strengths, ARDOT received the following takeaways:

- ARDOT, after the suggestion from KTC, will look into defining the different types of implementation efforts in order to more efficiently direct funds and determine the success of the project.
- ARDOT currently lacks specificity in accountability within the implementation reports. Accountability for implementation would be stronger if assigned to individuals in each step of the process.
- ARDOT will look into ways to educate and motivate subcommittee chairs and members in regard to their responsibilities in order to increase participation within subcommittees. An annual "kickoff" meeting with all PIs and subcommittee chairs for the projects of that FY is one possibility ARDOT is considering based on the suggestion from KTC.
- Preliminary implementation assessment being due at the beginning of the project, as suggested by KTC, will emphasize the importance of implementation from the projects' starts.
- Based on LADOTD's suggestions, ARDOT will look into ways of incorporating implementation into a larger technology transfer program.

KYTC - Tracking Implementation

State of Practice

KYTC and KTC have established a process that requires a preliminary implementation assessment to be completed at the beginning of each SPR project. Each PI and Study Advisory Committee (SAC) Chair work together to determine:

- How each project will be implemented,
- The anticipated impacts of that implementation,
- The potential challenges to implementation.

The implementation assessment is prepared concurrently with the project's work plan and is due 60 days after the project start date. Over the course of the project, the preliminary implementation assessment is developed into a more extensive and complete implementation plan. The implementation plan must be completed and approved before the final report is approved for publication.

KYTC has also funded an effort at KTC to review all projects completed in the past few years, identify which project findings have been implemented, classify the types of implementation, and assign a value to each implementation (where applicable). This effort will also recommend a process for ongoing, systematic tracking of implementation.

Key Takeaways

KTC's preliminary implementation assessment was seen as a huge strength. Participating DOTs were especially interested in the way this assessment broke down different types of implementation to more accurately define the degree to which each project can be implemented. Along with these strengths, the following takeaway items were discussed:

- KYTC will identify and commit the resources necessary to complete the current implementation tracking effort and to put into place an ongoing tracking process.

Key Takeaways from Other Participants – Tracking Implementation

LADOTD

- LADOTD will reconsider their current definition of a successful research project considering more indicators besides the degree to which a project is implementable.

ODOT

- ODOT Project Managers track implementation and may recommend an implementation project to bridge the research into agency implementation.

VDOT

- VDOT would like to develop a list of implementation types to help quantify actual implementation based on KTC's implementation assessment.
- Based on ARDOT's practice, VDOT will consider expanding its current implementation tracking system to a 3-year tracking process in order to get a more complete picture of the extent of current implementation.

Topic 4: Research Program Performance Measures

ALDOT – Performance Measures

State of Practice

At the current time, ALDOT has no formal performance measure policies in place.

Key Takeaways

While the research section at ALDOT has no formal method of tracking performance measures, QPRs provide an indirect metric of performance. PIs are incentivized by the competition surrounding the many research contractors in Alabama; this, coupled with ALDOT's good relationship with university staffs, has precluded any desire to formally track performance. Participating DOTs felt that the "blank slate" nature of ALDOT's system of measuring performance is beneficial, as ALDOT can tailor performance measure tracking to better fit the needs of the current system. The following are a few takeaways that ALDOT discussed:

- ALDOT already informally tracks leading indicators for performance measures, but they would like to create a method of tracking both leading and lagging indicators and focus on closing out projects that may be open due to such issues.
- ALDOT would like to maintain a focus on collecting performance measure data that has a useful or implementable purpose (rather than collecting data without a specific goal in mind).

ARDOT - Performance Measures

State of Practice

Arkansas's Research Program began developing a list of performance measures for the program which includes: completion of projects on schedule, completion within projected budget, reduction in scope changes, satisfaction with project results, and dispersion of funding. The Research Section has begun to focus on ways to improve its outreach to other states by way of publications, coordinated surveys, circulated library materials, and conference presentations at their yearly research conference. Currently, the LTAP Program is looking at ways to improve by evaluating the Department's classes for local agencies with regard to instructors, attendance, necessity of classes, and skills obtained during those classes.

Key Takeaways

ARDOT is in the process of developing a standard method of measuring performance. Part of the development process is determining the desired function of the performance measures and where they will be applicable. Performance measures will be built from project management, financing, reporting, implementation, and return on investment metrics. ARDOT plans to streamline project tracking. ARDOT's takeaways for this subject are as follows:

- While ARDOT has begun the process of developing performance measure metrics, they believe the areas of applicability of the performance measures are still to be better determined.
- In order to streamline performance tracking, ARDOT is interested in a research project tracking system.
- ARDOT will look at training all employees in relation to performance measures.

KYTC - Performance Measures

State of Practice

Kentucky's SPR program began developing a list of performance measures for the program which includes timely completion of projects; adherence to schedule and budget; ensuring project implementation; exposure on a national scale.

In addition to developing this list of performance measures, the management team has developed significant initiatives to enable these measures to be implemented. These initiatives that KTC and KYTC developed include:

- Web-based research project tracking system.
- Standardized QPRs for each SPR project produced directly from the Research Project Tracking System (RPTS).
- Centralized review of all QPRs.
- Centralized verification that each project has a "final" QPR when it is completed.
- Formalized process for the review and approval of project work plans and implementation assessments.
- Centralized storage and tracking of all project work plans and implementation assessments.
- Implementation initiative to put systems and processes in place for the ongoing tracking of the implementation for SPR projects.

Key Takeaways

KYTC strengths included the web-based performance tracking system at the university level. With this tracking system, they are able to track the percentage of money spent, percentage of time elapsed, and percentage of work completed within projects. The system allows for easier data compiling in order to produce clear and consistent quarterly progress reports for all projects. The system also produces a program-wide executive summary of all progress reports. Along with these strengths, the following takeaway items were discussed:

- While KTC has the RPTS, KYTC is interested in developing a KYTC-centric website to provide info post-report, to post KYTC's performance measures, etc.
- Though KTC has developed a list of performance measures, they will consider expanding the current list to include more proactive leading indicators.
- Time constraints have restricted KTC to currently enter only SPR projects into the RPTS. KTC plans to prioritize updating their RPTS to include all non-SPR projects.
- KYTC and KTC are interested in working together to include performance measures for LTAP into the program-wide performance measures.
- Based on the example set forth by ODOT's utilization of the HBCU organization, KTC will look into sponsoring university students to attend national conferences.

- Based on LADOTD's process of annually surveying PIs in order to gather information for their performance measures, KYTC and KTC will look into using a similar procedure to gather national exposure and visibility data.

Key Takeaways from Other Participants – Performance Measures

LADOTD

There were no specific takeaways mentioned by LADOTD on this topic.

ODOT

- Based on the discussion, ODOT will review their performance metrics currently in use.

VDOT

- In order to streamline performance tracking, VDOT is interested in a research project tracking system similar to that set forth by KTC.
- Based on the KTC's practice, VDOT will look into conducting surveys with research customers to determine their levels of satisfaction.

Conclusions

ALDOT – Conclusion

A summary of ALDOT's main areas of interest are as follows:

- Breaking down the budgets set forth in Letters of Direction by fiscal year to simplify accounting for annual reporting.
- Holding a retainer to incentivize PIs to finish final reports.
- Negotiating IDC with universities and contractors.
- Arranging a kickoff meeting with PIs and project committees to set expectations and build relations.
- Developing an implementation assessment to be populated at beginning and end of projects.
- Developing a method for tracking implementation at the end of projects.
- Analyzing ROI on select projects to establish a baseline for future analysis.

ARDOT - Conclusion

A summary of ARDOT's main areas of interest are as follows:

- Developing a streamlined research project tracking system.
- Developing better strategies for marketing research projects and processes.
- Considering methods to increase training for university and research staff in order to emphasize responsibilities and expectations regarding research projects.

KYTC - Conclusion

A summary of KYTC's main areas of interest are as follows:

- Continuing the implementation tracking study (currently underway) in order to establish an implementation tracking baseline and a sustainable ongoing process.
- Adding non-SPR projects to the RPTS.
- Conducting an annual survey of PIs to gather data on national exposure, contributions, and visibility for KYTC's performance measures.
- Using the data gathered from the annual survey to evaluate the level of exposure KTC's research is receiving on a national level.
- Developing a KYTC-centric website for research program. Website would ideally include information on implementation procedures and performance measures.

Other Participants - Conclusions

LADOTD

A summary of LADOTD's main areas of interest are as follows:

- Implementing Doc Express for more efficient contracting.
- Increasing retainer for final project delivery to 25%.
- Negotiating the ability to waive IDC for LTAP.
- Developing a research "speed dating" event.
- Revising definition of success to consider factors other than sole implementability.
- Changing invoicing requirements to quarterly instead of monthly.

ODOT

A summary of ODOT's main areas of interest are as follows:

- Reviewing and revising current performance measures.
- Reviewing the reason ODOT pays full cognizant IDC rates and potentially negotiating lower rates with research contractors.
- Reinforcing the review of task-based deliverables to streamline final report development.
- Being strategic with ROI responsibilities, the extent of which scales with available resources
- Reviewing the Kentucky research project tracking system to compare with ODOT's current system.
- Considering technology transfer as a leading indicator and implementation as a lagging indicator for performance management. Also considering if or how T2 activities support better implementation results.

VDOT

A summary of VDOT's main areas of interest are as follows:

- As vastly different as each research program is in respect to funding, staffing, and other factors, the challenges each program faces are incredibly similar.
- Increasing focus on leading indicators in future performance measures.
- Transitioning to Doc Express for contracting.
- Including task-based progress reporting and executive summaries with visual aids in QPRs.
- Surveying VDOT research customers to determine their level of satisfaction.

Jason Bittner of ARA

Mr. Bittner provided a number of observations to help provide context on the areas of performance measures, ROI, program administration, and implementation tracking. The following items summarize key items:

- A useful tool for developing research staffing skill sets and generally improving programs is the recently complete NCHRP Synthesis 20-05/Topic 49-07.
- Research program managers can benefit by engaging their university researchers to discuss IDC.

- There are general impacts of research; not every research activity is going to return a dollar amount. Thus, it is applicable to consider a holistic view of research without solely focusing on monetary benefits to understand program level assessments.
- Utilizing performance measures and other forms of tracking help with program quality improvement. There is a cost associated with not implementing performance measures; every day that performance measures aren't implemented, there is a loss. The cost of compliance (including staffing and workload) must be considered.
- Tracking students that have worked on research projects after graduating is a beneficial measure of research program performance. This however, remains very difficult to accomplish.

Appendix A: Agenda

PEER EXCHANGE AGENDA

March 4-7, 2019

Hot Springs, Arkansas

Sunday – March 3, 2019

Shuttle from Airport if needed.

5:00–7:00 Meet/Greet @ Hot Springs Hotel Suite

Monday – March 4, 2019

Topic 1 - Finances of Research Program/ CFR 200/Discuss Alternative Funding for Research

6:30–8:30 Breakfast at the hotel on your own

8:30–9:00 Introductions - Everyone

9:00–9:30 Peer Exchange General Overview – Jason Bittner

9:30–10:00 Topic 1 – ALDOT "How you do it"

10:00–10:30 Topic 1 – ARDOT "How you do it"

10:30–11:00 Topic 1 – KYTC "How you do it"

11:00–1:00 Lunch

1:00–4:30 Topic 1 – Brainstorming

a.) Lessons Learned
b.) Strengths and Weaknesses each Program
c.) Opportunities for Improvement

6:00 Group Dinner

Tuesday – March 5, 2019

Topic 2 – Return of Investment for Research Projects

Topic 3 – Tracking Research Implementation

6:30–8:00 Breakfast at the hotel on your own

8:00–9:30 Topic 2 – Each State gives a "How they do it"

9:30–11:30 Topic 2 – Brainstorming

11:30–1:00 Lunch

1:00–4:30 Topic 3 – Each State gives a "How they do it"

6:00 Group Dinner

Wednesday – March 6, 2019

Topic 4 – Research Program Performance Measures

6:30–8:00 Breakfast at the hotel on your own

8:00–9:30 Topic 4 - Each State gives a "How they do it"

9:30–11:30 Topic 4 – Brainstorming

11:30–1:00 Lunch

1:00–4:00 Topics Wrap Up and Rabbit Hole Clean Up

4:00–5:00 Summary of Critical Items/Takeaways

6:00 Group Dinner with TRC Chair and System Information & Research

Division Office

Thursday – March 7, 2019

6:30–8:00 Breakfast at the hotel on your own

8:00–10:00 Finalize Team Report Brief

10:00–11:00 Final Approval from Team

11:00–12:30 Lunch

12:30 Return to Little Rock and travel home

Appendix B: Read Ahead Material Topic 1

Peer Exchange Topic 1 – Finances of Research Program

Summary

March 4, 2019

ALDOT Summary:

Our Program averages 3.5 to 4 million dollars per fiscal year. We support NCHRP and TRB with one million per year and participate in several pooled funds with the remainder for new research.

ARDOT Summary:

ARDOT's Part 2 Work Program financial summary for the 2019 Fiscal Year:

- $6,500,000 total program funding.
  - $3,500,000 SPR Funds.
  - $850,000 Previously Programmed funds.
    - $593,000 NCHRP Contribution
    - $118,000 Core Program
    - $110,000 AASHTO TSP
    - $27,000 to other Pooled Fund
  - $888,000 State Matching for SPR.
  - $1,180,000 100% State Program.

For 2019, the Part II Budget was $4,440,055 (SPR plus state matching funds). ARDOT allocated those funds in the following way over 43 Job Numbers:

- 18 General/Other Projects Job Numbers
  - $2,208,055 is allocated to job numbers for general office administration, support services, project development, implementation, etc.
  - This portion is also used for on-going research projects that are not done through our Transportation Research Committee (TRC) process.
  - This portion also funds contracted short-term research projects
- 19 Continuing Projects
  - $1,390,000 allocated to continuing TRC research projects.
  - TRC Projects are the contracted and in-house research projects the Research.
  - Of these 19 projects, 11 are contracted out with universities and 8 are being conducted in-house using Research staff.
- 5 New TRC Projects
  - $540,000 allocated for new TRC Research Projects.
  - The research solicitation process occurs every year.

    - The number of new projects is dependent on anticipated funding availability. Five new projects were started in FY19 (4 contracted and 1 in-house) and for FY20 we anticipate beginning 3 new TRC projects (2 contracted and 1 in-house).
- Technology Transfer Program/LTAP
    - $302,000 FY19 Budget.

The $1,180,000 in 100% State Funded programs was allocated to:

- $225,000 to Administration.
- Remaining allocated to various job numbers for other administrative or research related activities including funding for short-term, limited scope research conducted through contract.
- Due to regulations, we are limited to what we can charge to these job numbers and must be cautious when paying for something using these 100% state funds.

Areas of interest/Finance-related topics our Research Section is exploring:

- TRC Contracted Research Projects claims process.
    - We pay using expense-reimbursable, not invoice based, claims.
        - Based on claims paid in FY18, this saved $37,000 (comparing originally billed amounts on claims versus what we ultimately paid to the universities after review and removal of expenses that were not allowed according to the project's contract or our Research Manual).
    - The process to transition to online submission of claims, contracts, and other relevant documents has begun.
        - We have begun to utilize Doc Express, and plan to use this for virtually all submittals related to our Research projects in the future.
- Allocating more funding towards consultant research utilizing non-university consultants to increase the variety/competition/scope of the research we fund.

KTC Summary:

KYTC's SPR research budget is $5 million/year with the following breakdown:

- $4 million with KTC for the annual SPR Program ($3,750,000 Federal (including State Match) and $260,000 State funds for the Administration of the program).
    - These $4 million cover:
        - $3.14 million for new and existing SPR Projects
        - $36,500 for equipment
        - $300,000 for Unforeseen Investigations
        - $130,00 for Implementation Initiatives
        - $90,00 for Cabinet Representation and Program Outreach
        - $50,000 for Long Term Monitoring
- Other Expenditures for SPR program are:
    - $760,000 for NCHRP
    - $275,000 for Pooled Fund Studies

In addition to the Federal SPR Program, the Cabinet also contracts with KTC for an estimated $2 - 4 million dollars per year for additional tasks that are deemed necessary such as:

- Research for Potential Cabinet Policy Change

- Research for Potential Legislative Change
- Training via LTAP
- Field Exploration for Bridges and Pavements (LiDAR, Pipe Inspections, GPR, NDE for Bridges)
- Technical Support to Cabinet Divisions and Offices
- Federal Grant Research for Federal Motor Carriers and KYTC's Vehicle Regulation Department (DMV, Driver Licensing and Motor Carriers)
- LTAP (Safety Circuit Rider)

These tasks are financed with either state or federal dollars but are charged to:

- Grants
- Construction Projects
- Design Projects
- Office or Division Overhead funds

Appendix C: Read Ahead Material Topic 2

Peer Exchange Topic 2 – Return on Investment

Summary

March 5, 2019

ALDOT Summary:

We do not have a ROI determination for our projects, and do not have performance measures policies in place.

ARDOT Summary:

In the research section at ARDOT there is one main method used to evaluate the return on investment for research projects, which is cost-benefit analysis. All projects require a cost-benefit analysis at the time of their completion. However, there are also proactive measures incorporated into the research process to ensure there is a return on investment for all projects. For the FY20 problem statement solicitation process, all problem statement forms had a required return on investment section. This ensures that submitters are considering return on investment from the very beginning of the process. It also helps those who are required to review and approve the problem statements have an idea of tangible benefits of the research.

In addition to the return on investment section on problems statement forms, there is also a Summary of Estimated Savings document required for all TRC projects. The document is completed by the Project Manager and is presented to the Deputy Director & Chief Operating Officer, Deputy Director & Chief Engineer, and the Assistant Chief Engineer of Planning at the signing of the contract; this allows Research to present some of the Department's leaders with a monetary amount of estimated potential savings, along with details that explain the development of those numbers.

KTC Summary:

KYTC and KTC have not implemented a program that reviews, or uses, Return on Investment as a metric.

Appendix D: Read Ahead Material Topic 3

Peer Exchange Topic 3 – Tracking Research Implementation

Summary

March 5, 2019

ALDOT Summary:

Currently our implementation plans are included in our research proposals.

ARDOT Summary:

By tracking the implementation results of our research projects, we can show whether a project was successful or not. This can be very valuable in our efforts to provide quantitative evidence that a research result benefited the Department either by monetary savings, a reduction in man-hours or the approval of a new product. This is another tool to increase the upper management buy-in for the Research Section and increased support from project champions.

Research Implementation starts with the Problem Statement (PS) submittal, ARDOT requires the PS submitter to prepare a "Form of Research Implementation and Return on Investment". ARDOT has also put an emphasis on implementation in our initial project kick off meeting, this insures that the Principal Investigator knows what our expectations are from the very beginning instead of waiting until the project is nearing completion or completed before determining how to implement the results.

ARDOT Management has recently given authority to cancel projects at the discretion of the subcommittee and the Staff Research Engineer; if they determine that the PI is not following the scope of the project, completing tasks on time, or is not providing implementable results the project can be terminated. This will help ensure that ARDOT meets its implementation goals and reduce the number of projects that are completed without any implementable results.

With ARDOT's new Implementation Database, we will now be able to track:

- Was Implementation successful;
- What was implemented, i.e. manual or guide of best practices, software, new procedure, or a new product;
- What was the Return on Investment (ROI);
- Was there a reduction in Man-hours;
- Were we able to improve safety or lower the crash rate?

By tracking these critical topics, we can better show the value of research and create support from within the department for the research program.

KTC Summary:

About 2 years ago, KYTC and KTC began the process of requiring an implementation assessment to be completed for each SPR project. This "begin with the end in mind" document allows each Principal Investigator (PI) and Study Advisory Committee Chair (SAC) to describe the type(s) of implementation expected for each project, the anticipated impacts of that implementation, and potential challenges or roadblocks. The implementation assessment is prepared concurrently with the project workplan and is due 60 days after the project start date. We have compiled the results for implementation of projects for the last 3 years, but both KYTC and KTC are interested in any tools or programs that other DOTs are using to track research implementation.

Appendix E: Read Ahead Material Topic 4

Peer Exchange Topic 4 – Research Program Performance Measures

Summary

March 6, 2019

ALDOT Summary:

At the current time, ALDOT has no performance measure policies in place.

ARDOT Summary:

- Percentage of research projects completed on time.
    a. Time from project start date to approval of final report
    b. Quarterly Reports are required
    c. Renewals required each fiscal year
- Percentage of projects completed on budget.
    a. Extension of project
    b. Additional funds required
- Percentage of change of scope of projects.
    a. Subcommittee involvement to review scope and implementation to lessen the need for scope changes.
- Level of satisfaction of subcommittee with project results.
    a. Implementable results
    b. Percentage of findings that is implementable.
    c. Return of investment or Benefit/cost ratio of implementable findings.
- Number of LTAP classes and attendees
    a. LTAP - Percentage of classes vs skills obtained for local agencies.
    b. LTAP - Percentage of instructor invoices paid on time.
- Number of staff publications.
    a. Research Staff reports that are published.
- Number of invitations to present at conferences.
    a. Research Staff
    b. Principal Investigators
    c. DOTs - FHWA
- SPR Part II funding distribution by percent.
    a. Pooled Fund Studies
    b. Research Projects
    c. Distribution of funds obligated for research studies by general topical area.
- Library materials circulated.
- Number of surveys coordinated.

KTC Summary:

This topic is of great interest to Kentucky. In late 2014, the management team for Kentucky's SPR program began developing a list of performance measures for the program. An initial brainstorming list of potential performance measures was developed, which was then refined into a shorter list of critical performance measures. Here is the resulting list:

Timely Completion of Projects

- Average time from project start date to delivery of project results
- Average time from project start date to approval of final report

Adherence to Schedule and Budget

- Percentage of projects completed on-time (per work plan)
- Percentage of projects requiring revision to work plan for schedule extension
- Percentage of projects requiring revision to work plan to add funds

Implementation

- Percentage of projects resulting in documented implementation
- Estimated benefits of documented implementation

National Contributions/Visibility/Exposure

- Number of KYTC research projects selected for national "High-Value Research" publications
- Number of papers selected for presentation and/or publication by TRB
- Number of papers selected for publication in other peer-reviewed journals
- Number of presentations of KYTC research at regional, national, or international conferences

In addition to developing the list of performance measures, the management team has undertaken significant initiatives to enable these measures to be implemented. These initiatives include:

- Development of a web-based Research Project Tracking System
- Development of standardized quarterly progress reports (QPRs) for each SPR project, produced from the RPTS.
- Centralized review of all QPRs
- Centralized verification that each project has a "final" QPR when it is completed.
- Formalized process for the review and approval of project work plans and implementation assessments
- Centralized storage and tracking of all project work plans and implementation assessments
- Creation and funding of an implementation initiative to put systems and processes in place for the ongoing tracking of the implementation of SPR projects.

With these systems and processes in place, we are gaining the ability to begin establishing baselines for some of our performance measures. The true value of the systems and processes will be realized once we have been doing this for a few years and we can examine trends over time. That will allow us identify negative trends, implement corrective measures, and assess the impacts of changes that we have made.

Appendix F: 2019 Research Peer Exchange Final Team Briefing

2019 Research Peer Exchange

Alabama Department of Transportation

Arkansas Department of Transportation

Kentucky Transportation Cabinet

Participating Members

- Jason Bittner, ARA
- Michelle Owens, ALDOT
- Ron Johnson, ALDOT
- Elisha Wright-Kehner, ARDOT
  - ARDOT Support Staff
- Jarred Stanley, KTC
- Joe Crabtree, University of Kentucky
- Clark Graves, University of Kentucky
- Cynthia Jones, ODOT
- Mike Fitch, VDOT
- Tyson Rupnow, LADOTD

Objectives

- Examine the specified topics within each Research Program:
  - Finances of Research Programs,
  - Return on Investment,
  - Tracking Implementation, and
  - Research Program Performance Measures.
- Have each participant take home at least one takeaway for implementation in their program.
- Sharing of stories that would resonate and provide continuous improvement.

Topic 1: Finances of Research Program

- Finance of an SPR Program
- Program Management of an SPR Program

- Break down budget set forth in Letters of Direction by fiscal year to simplify accounting for annual reporting.
- Negotiate IDC rates based on vendor status of Universities.
- Evaluate feasibility of paying tuition of graduate students on research projects.
- Evaluate project solicitation process to facilitate participation from smaller universities and research contractors.

- Include language in contract for invoices to be submitted within the following quarter.
- Provide training to Research and Sponsored Programs personnel involved with ARDOT contracts.
- Evaluate feasibility of task-order contracts.
- Limit travel reimbursement for contract research PIs to the days before, of, and after a presentation.
- Require technical review as part of Project Manager's review process.

- Finish out projects held up by incomplete final reports.
- Look into ways to incentivize producing final report.

Peer Members Takeaways

- LADOTD
  - Evaluate feasibility of implementing Doc Express.
  - Evaluate ways to negotiate lower IDC rates.
    - No IDC for LTAP programs.
  - Include stipulation in projects to withhold 25% total contract cost until all deliverables are accepted.
  - Evaluate ways to retain carryover.
- ODOT
  - Evaluate the reason behind a cognizant IDC rates, and begin negotiating lower rates where applicable.
- VDOT
  - Evaluate the use of Doc Express.

Topic 2: Return on Investment from Projects
Topic 3: Tracking Research Implementation

- ROI of a SPR Program
  - Looking at the process of determining ROI of a program.
- Tracking implementation for a Research Program
  - Looking at implementation through out the life of the project.
  - The overall impacts of implementation.

- Feasibility of Implementation staff.
- Implementation tracking forms.
- Add ROI and/or B/C in proposal.
- Set aside funds for general implementation.
- Look at utilizing universities to calculate ROI.
- Kickoff meeting with all PIs at an Annual Event.

- Take the opportunity to meet new professors to create relationships early.
- Definitions of ROI and Implementation.
- Accountability of implementation reports.
- 6 minute "swamp tank" presentation at TRC.
- Research roadshow.
- Kickoff meeting with PIs and Chairs to clarify expectations of both parties.
- Matrix to show different types of ROI.
- Preliminary implementation assessment due at the beginning of the project.

- Cabinet will start a matrix view of ROI.
- Kentucky will set aside funds to follow through with implementation tracking.

Peer Members

- LADOTD
  - Revisit and revise what success of a project means to LADOTD vs implementation
- ODOT
  - Increase discipline of getting task deliverables in and reviewed during the life of the project.
- VDOT
  - Develop list of implementation types to help quantify actual implementation effort based on UK's implementation assessment.
  - Expand the implementation tracking to three years.

Topic 4: Research Program Performance Measures

- General research performance indicators.

- Create a method for performance measure tracking for leading and lagging indicators.
- Maintain a focus on collecting performance measure data that is useful or implementable.

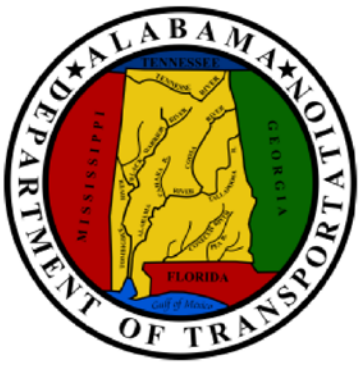
- Insuring that the endstate of performance measures is defined.
- Consider improvements to research project tracking system.
- Training for employees in relation to performance measures.

- Publish performance measures on website.
- Follow-up on non-SPR projects in tracking system.
- Leading vs. lagging performance measures.
- Question of including LTAP performance measures.
- Improve annual reporting to FHWA.
- Look into program to sponsor minorities students to attend national conferences.
- Annual report from PI's to track performance measures.

Peer Members

- LADOTD
  - Look into moving invoicing from monthly to quarterly.
- ODOT
  - Reviewing performance metrics that are currently in use. Are all the criteria being used the most useful for measuring performance?
- VDOT
  - Conduct surveys with research customers to determine their level of satisfaction.

Conclusions



- Break down budgets set in LoD by fiscal year.
- Hold a retainer to incentivize PIs to finish final reports.
- Negotiate IDC with universities and contractors.
- Kickoff meeting with PIs and project committee members to clarify expectations and build relations.
- Implementation questionnaire at beginning of projects.
- Tracking implementation of projects once completed.
- Analyze the ROI on select projects to gain a baseline.

- Develop a streamlined project tracking process.
- Marketing of Research at different levels.
- Training – increase for all individuals that have any involvement in the research program.

KENTUCKY TRANSPORTATION CABINET

- Make sure to continue tracking implementation on an ongoing basis.
- The Cabinet wants to create a website that includes performance measures.
- Include non-SPR program into the tracking system.
- Improve the Annual Report.
- Easily collect national exposure and prominence of their program.

DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

- Doc Express could be very beneficial to contracting of research projects.
- Look into increasing project retainer to 25%.
- Look into Indirect Cost rates and possibility of having no IDCs on LTAP contracts.
- Research "speed dating" meeting between DOTD staff and researchers could be beneficial.
- Look into finding successes from research projects not just implementation of the projects.
- Look into the possibility of moving to quarterly invoices from monthly.

- Review paying full IDC. Is it a requirement of the department or just the way things have always been done?
- Increase discipline of receiving deliverables.
- Being thoughtful of measuring ROI. Since they don't have a person for only that task, it must be sustainable and doable.
- Document Technology Transfer activities (leading indicator) and implementation (lagging indicator).
- Reviewing performance metrics that are in use. For example, if contract fully executed within 90 days of signing.

- As vastly different as each research program is in respect to funding, staffing, and other factors, the challenges each program faces are incredibly similar.
- Increase focus on "leading" indicators in future performance measures.
- Look into the possibility of transitioning to Doc Express for contracting.
- Look into including task-based progress reporting and executive summaries with visual aids in QPRs.
- Survey VDOT research customers to determine their level of satisfaction.

Steps Forward

- Approve Report
- Publish Report
  - Present at RAC.
- Collect Lessons Learned no later than March 21, 2019.