

Kansas Department of Transportation

**KDOT Research Peer Exchange
Final Report**

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STATE REPORTS

Kansas

The annual research budget for KDOT is \$5,092,000. The state provides \$1,902,000 and \$3,190,000 is provided through SPR funding. KDOT pays the fees for NCHRP, TRB and 25% of the SHRP-2 with SPR money. KDOT also uses SPR funding to support the LTAP at KU, Technology Transfer and NHI Training Courses, pooled funds, and employees' salaries. Almost 100% of KDOT's contract research is conducted by either Kansas State University or the University of Kansas. When Kansas is the lead state on a pooled fund, KDOT usually uses contract research with one of the universities to conduct the research. KDOT uses state funds to contract with the universities through the Kansas Transportation Research and New-Development Program (K-TRAN), and state funds are also used to contract with the universities to conduct ad-hoc research as the needs arise. KDOT tracks the Benefit to Cost ratio, B/C, on the K-TRAN program, but not on any of the other contract research; ad-hoc or pooled fund. The average K-TRAN contract over the last 4 years has been about \$65,000 with a 20 month duration. Since 1990 there have been over 293 projects completed under the K-TRAN program and over 159 products or 54% have been implemented. The B/C for the overall K-TRAN program is currently 8:1 and the B/C for the implemented projects is 15:1. KDOT uses a 3 year window to calculate the benefits of each research project. Many of the research employees in KDOT are technical experts in their field and serve the rest of the DOT in troubleshooting problems when they arise, working with contractors, and writing specifications. Much of the in house research done at KDOT is tied to field projects and test sections. These projects have longer durations than the contract research projects.

Utah

The annual research budget for UDOT is \$3,760,000. The state provides \$734,000 and \$2,326,000 is provided through SPR funding. Utah has other sources of matching funds up to \$700,000. Utah contributes \$875,000 to pooled funds. Approximately 92% of the remaining funding is spent on contract research and 8% is used for in house experimental features. Roughly 95% of the contract research is through Brigham Young, Utah State, and the University of Utah. The other 5% of the research is done with private companies. UDOT hires a former employee to conduct triennial benefit to cost ratios. A report is available that shows the B/C for the 41 projects conducted during the years 2006 to 2008 was 17:1. They are working on a report to calculate the B/C for 2009 through 2012. The average research contract in Utah is \$70,000 with a 24 month duration. UDOT uses the SPR funding to pay NCHRP, TRB and SHRP-2 dues.

Illinois

The annual research budget for IDOT is \$7,180,000. The state provides \$480,000 and the other \$6,700,000 comes from SPR money. IDOT uses the SPR funding to pay for contract research, pooled funds, and NCHRP, TRB and SHRP-2 dues. IDOT contracts with the University of Illinois at Urbana-Champaign, to have the Illinois Center for Transportation, ICT, to manage and administer IDOT's contract research program. The ICT provides a 25% match (tuition for graduate students, unrecovered overhead) for the SPR funds used to conduct the contract research. ICT receives little direct funding from the University of Illinois. The University of Illinois System (University of Illinois at Urbana-Champaign, University of Illinois at Chicago, and University of Illinois at Springfield) conducts 69% of the contract research. Non-UI System universities conduct 18% and consultants, agencies, and non-profits conduct the other 13% of the contract research. The average completed contract research project for IDOT was for \$175,312 and lasted 30 months. The average active contract research project is \$312,800 and has lasted 33 months. Illinois usually does not conduct Policy Research. IDOT requires that an implementation planning worksheet be filled out by the Technical Review Panel and the Principal Investigator for each project; initially at the beginning, and then again at the end of the project. IDOT is now requiring that implementation and benefit analysis language be included in all research project work plans. They have hired a consultant as a Research Implementation Engineer. IDOT developed an implementation tracking component in their research database that tracks implementation status as well as research outputs and outcomes. Illinois is hoping to learn Best Management Practices at this peer exchange to quantify the benefits of their research.

Minnesota

The annual research budget for MnDOT is \$10,857,000. The breakdown of funding sources are as follows: State funding \$3,284,000, SPR \$3,190,840, Local Road Research Board \$2,902,378, Cooperative Program for Transportation Research Studies \$363,000, Other \$1,117,087. MnDOT conducted approximately \$6,613,000 in contract research in FY 12 with \$4.4 M going to universities, \$1.6 M going to consultants and \$613,000 going to the MnDOT Materials Laboratory. The rest of the \$10,857,000 is spent on support federal programs; NCHRP, TRB Core Services, AASHTO technical programs, multi-state pool fund projects and research support contracts (staff salaries, marketing and communications, technology transfer activities, and maintain research data base (ARTS) and process documents. Universities received 67% of the contract research in FY 12. An overwhelming majority of this work is with the University of Minnesota. Consultants received 24% and the Materials Lab or MnRoad received 9% of the contract research in FY 12. MnDOT can contract with any university in the United States, and the university can subcontract up to 50% of the work. The consultants must be prequalified. In FY 12 the average contract was for \$135,142 and the average duration was 31 months. In FY 13 the average contract was for \$128,467 and the average duration was 27 months. MnDOT quantifies benefits on select research projects, but does not do it on a "program" basis. They use a 3 to 5 year window to quantify the benefits on selected projects. MnDOT pays for their contract research on "tasks" outlined in the proposal. The university, consultant, MnRoad, or Materials Laboratory do not get paid until the deliverables of each task are completed. MnDOT budgets \$1,000,000 each year to implement research results.

Missouri

The annual research budget for MoDOT is \$5,400,000. The state provides \$800,000 and the other \$4,600,000 comes from SPR. MoDOT uses the SPR funding to pay for contract research, pooled funds, and NCHRP, TRB and SHRP-2 dues. The Missouri contract research core budget is \$2,016,908. There are 28 projects under contract with universities and 8 projects under contract with private industry. MoDOT can contract with out of state universities and has agreements with UM-Columbia, Missouri University of Science and Technology, UMKC, UM-St. Louis, and Iowa State. MoDOT calculates the “value” of research (savings to the DOT) on a project by project basis, and often reports the value as number of crashes reduced and do not associate a cost to the number of crashes. MoDOT implemented 72% of the projects completed in 2008.

Louisiana

The Louisiana DOTD has a very unique research center. The Louisiana Transportation Research Center (LTRC) is a cooperative research, technology transfer and training center jointly administered by the LADOTD and LSU. The research section of the LTRC has 44 employees, 26 are DOTD personnel and 18 are LSU personnel. Many of the LSU employees are post-doc students that rotate every 2 to 4 years. The research budget is \$8,819,000. The state provides \$1,923,000 and \$6,335,000 comes from SPR. An additional \$564,000 of research funding comes from other sources. LaDOTD uses SPR funds to pay NCHRP, TRB and SHRP-2 dues. The LTRC contract research budget is \$6,319,000 with 90% of that amount going to five universities in Louisiana and 10% going to private contractors. All these figures include the LSU staff and work done at LSU. LaDOTD contributes \$490,000 annually to pooled funds. Many of the research employees in LaDOTD are technical experts in their field and serve the rest of the DOT in providing technical assistance, working with contractors, and writing specifications. Much of the in house research done at LaDOTD is tied to field projects and test sections. These projects have longer durations than the contract research projects. The LTRC implements 70% of their completed research projects, and uses a 5 year period to determine the benefits of certain projects.

General

Many of the attending states have other duties assigned to their Research sections, or Research is part of another section. Some are part of a Materials section while others are associated with Planning. Some of the states conduct routine testing within the Research section, such as FWD, skid data collection, and laboratory testing.

All of the attending states have implementation plans, but most of the states begin working on the implementation plans from the beginning of the project. Most of the states separate out projects that they know will not have implementation plans and label them as such from the beginning. These are projects where the product will be knowledge, or information to be gained, policy research, or research where the product will be training. These projects are not included

in Benefit Cost Ratio calculations. At least three of the states do not do this type of soft side or policy research. These three states require quantifiable benefits before the research is approved.

Most of the states have committees that oversee the Research Projects instead of a single project monitor. They require quarterly or semi-annual meetings and reviews. Missouri's Research Administrator decides which projects to fund and forwards the program to the Chief Engineer. The other states have committees or groups that determine which projects to fund. Some of the states have the Principle Investigator assist in the B/C calculation. More than one of the states will not accept proposals unless the PI has a champion in the DOT for that proposal. Two states hire consultants to calculate their benefits or act as Implementation Engineer for their project.

Some of the states keep money in their budgets to allow for cost overruns and extensions. Most of the states allow time extensions also. Three of the states pay tuition as part of their contract research with the universities, either directly or indirectly. The other three states do not pay tuition.

SENIOR MANAGEMENT CLOSEOUT

The members of the peer exchange team were joined by Jerry Younger, Deputy Secretary and State Transportation Engineer for KDOT and Norbert Munoz, Assistant Division Administrator for FHWA. Each state was asked to review what they thought the other states did well and make suggestions on what the other states should improve upon. They also were asked to mention anything they may like to implement in their state as a result of the peer exchange. Each state was also asked to forward all the documents that they discussed during the peer exchange to Susan Barker so Susan can include them on the CD that she will be providing each participant.

Minnesota

Linda mentioned that she likes what Kansas does in having the Technology Transfer Engineer meet with each Project Monitor to help calculate the B/C and submit the Implementation Plan. She believes the triennial benefit model for calculating the B/C is a good, conservative, approach that is realistic and practical. Linda likes the implementation worksheets that both Illinois and Kansas uses and the contract language for the university master agreements. She thought that the fact that Utah uses a former Research manager to report their B/C was a good idea and was appreciative of the project management check list that Utah uses. Linda thinks that Missouri and Louisiana do an excellent job at marketing their research outcomes and implementation results to stakeholders.

Missouri

Bill likes the table that KDOT uses to track unit costs for safety and that Susan distributed. He also suggested that KDOT start their implementation procedures earlier in the project life and involve the university principle investigator. This will take a while for everyone to get used to because it is a change in culture. Bill also liked Utah's check list for contract research that Cameron distributed to the participants.

Illinois

Amy stated that Illinois has used the KDOT K-TRAN report KSU-03-9 Guidelines for Estimating Triennial Benefits of K-TRAN Research Projects as a guide to developing their own B/C procedures. She compared the use of technical advisory committees (TAC) to oversee the contract research versus the single project monitor. The panel brings all interested parties to the table during the project, including contractors, but there are some efficiencies with using the single project monitor. Illinois has hired a consultant to facilitate the implementations of research projects, but as of this date, that person has not started their duties. Amy liked the fact that Louisiana tracks the implementation of their projects over a 5 year period and their communication of the value of their research. She also thought that the fact that Minnesota pays for their contract research based on deliverables and not on time spent on the project was very interesting. Amy also liked the fact that Utah announces a final closeout meeting for each of their projects so anyone interested in the research can attend. She was interested in the fact that Missouri calculates the value of research on a few chosen projects instead of a B/C.

Louisiana

Mark also thought Minnesota's use of task oriented invoices was a good idea and likes the fact that Minnesota also requires technical memorandums at the completion of each task so there are no surprises at the end of the research project. He likes the way that Utah uses You Tube to market their research results. Mark thinks the fact that KDOT does not pay indirect costs on contract research with the universities is interesting. (Explanation: All contract research with the universities in Kansas that is not pooled fund is done with state money. The universities are state agencies and one state agency cannot charge another state agency indirect costs. Indirect costs are paid to the universities when SPR money is used.) Mark suggested that KDOT do more marketing of research results. This marketing should not be technical, but can be in the form of a simple fact sheet.

Utah

Cameron also like the fact that Susan Barker meets with the project monitor at the end of each project and assists in the implementation plan and the calculation of the B/C. Utah does that too. He likes the way Minnesota does task based contracts and the way Illinois keeps the TAC involved throughout the implementation of the research. Cameron likes the way that Louisiana bases their problem statements on need and implementation possibilities. Cameron added that the contractors in Utah have experienced some 'big research' projects, like moving bridges into place, and are always eager to see what might come next.

Kansas

Kansas will investigate incorporating the implementation of the project from the beginning and involving the university principle investigator in the implementation plan and calculation of the B/C. They will also increase their efforts in marketing completed projects. Rod was interested in the fact that many of the states have agreements with their universities to limit their indirect cost on projects with SPR money. Some of the states only allow 10% to 25% indirect costs on university projects funded through SPR. Kansas pays no indirect costs on contracts funded with state money, but pays 48% on pooled fund projects funded with SPR money. Kansas will also

investigate using SPR funds to contract universities to conduct research that are not pooled fund related. Every other state at the peer exchange does that.

	Kansas	Illinois	Minnesota	Utah	Louisiana	Missouri
State Research Dollars	\$1,900,000	\$480,000	\$3,284,000	\$734,000	\$1,923,000	\$800,000
SPR Part 2	\$3,190,000	\$6,700,000	\$3,190,000	\$2,326,000	\$6,335,000	\$4,600,000
Other Funding		\$1,700,000 ICT Match	\$4,386,000 (Local Road & others)	Up to \$700,000	\$564,000	
Total	\$5,090,000	\$8,880,000	\$10,860,000	\$3,760,000	\$8,819,000	\$5,400,000
Contract Research	\$800,000 K-TRAN Up to \$600,000 Ad-Hoc	\$6,680,000	\$6,613,000	92%	\$6,319,000* \$1,977,000**	\$2,016,908
University Research	Nearly 100%	87%	67%	95%	\$5,622,000* \$1,462,000**	78%
Percent in House Research	35%	Very Little	9%	8%	64% * 28% **	Zero
% Private Contract	Very little	13%	24%	5%	10% * 26% **	22%
Average Contract Duration	20 months	30 months	29 months	2 years	18 months	18 months
Average Contract Costs	\$65,000	\$175,000 - \$300,000	\$128,467	\$70,000	\$150,000	\$75,000
Number of People in Research	23 All employees are involved in either the Contract Research or the In House Research.	IDOT 14.5, Contract Research 2.5, ITC manages & admin contract research 10 to 15 (not FTE)	10.5	7	44 * 26 **	3 + 1 Contract Librarian
Transportation Pooled Fund	\$700,000	\$400,000	\$706,000	\$875,000	\$490,000	\$464,000
Benefit Cost Ratios	8:1 KTRAN Program. 15:1 for Implemented KTRAN projects.	Working on a method to quantify Research benefits.	Quantifies benefits on a select project basis.	17:1 for years 2006-2008 12:1 for 1995-1997	Quantifies benefits on a select project basis.	Quantifies benefits on a select project basis.

*w/ LSU Staff

** w/o LSU Staff