Organizational Results

Annual Report

Fiscal Year 2010

Building Momentum

Organizational Results
Annual Report – Fiscal Year 2010

July 1, 2009 – June 30, 2010

Missouri Department of Transportation
PO Box 270
Jefferson City, Missouri 65102

Building Momentum

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BUILDING MOMENTUM …

What can you do in five years? Pay off a car? Send your kid to college? How about change an organization's culture? Over the past five years that's what Organizational Results has attempted to do. By placing business process experts and research professionals in one unit, MoDOT set out to change how the organization completed its work and measured its progress. So, what do we have to show for five years' effort?

Consider the following list of accomplishments:

- A performance management system that has cascaded to all levels of the organization and gained national recognition,
- A best practices system that has been benchmarked by numerous other agencies,
- A practical approach to research projects that has delivered results to impact daily operations,
- A centralized evaluation process for new products that is faster and more convenient for MoDOT employees and product vendors,
- An annual statewide innovations competition,
- A partnering meeting process that has tapped outside organizations to solve some our most pressing problems, and
- More than 50 chartered teams that have improved processes throughout MoDOT.

It's an impressive list, but not one that OR can claim by itself. These accomplishments weren't completed in a vacuum. It took thousands of hours of collaborative work from field technicians to executive staff within MoDOT and other public and private organizations. In fact, the cooperation and teamwork we've realized the past five years may be our number one accomplishment to date.

More importantly, we're not ready to rest on our laurels. We understand our work will never be truly finished. We will always be pursuing new ways for MoDOT to push its performance to the next level and get things done better, faster and cheaper.

Our 2010 annual report documents another list of accomplishments that stands as building blocks toward the next generation of organizational development and performance at MoDOT.

Respectfully submitted,

Mara Campbell
Organizational Results Director

ORGANIZATIONAL SUPPORT

We seek to provide MoDOT with the tools and expert consultation to drive performance excellence.

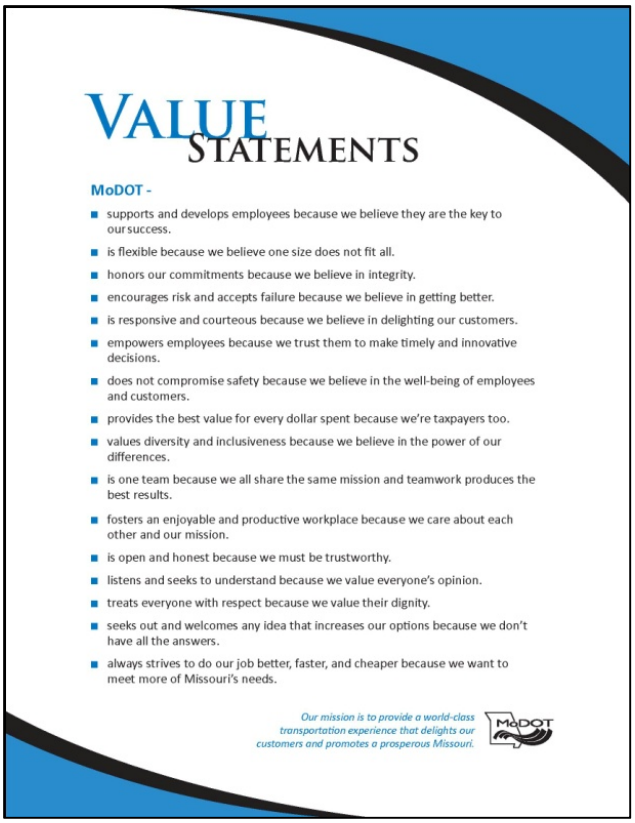
- Performance analysis and consultation
- Performance measurement development
- Quality systems and tools development
- Process team facilitation

Strategic Documents Revisited

Much like a roadmap, organizations need foundational documents to guide activities from long-range planning to daily business decisions. At MoDOT, those are the Value Statements and the Tangible Results. This past year, Organizational Results worked with department managers to revisit these two organizational documents.

The Value Statements and Tangible Results were first established in late 2004. The Value Statements are brief sentences describing how department employees will interact with each other and the public. The Tangible Results are key deliverables that MoDOT customers expect as the agency pursues its mission.

During January 2010, Organizational Results hosted five focus groups to review both documents with managers from the districts and Central Office. The review involved determining if the documents still accurately reflect MoDOT's business and whether additions or edits were needed. The input from the manager focus groups was combined, condensed and clarified before being presented to department executives.

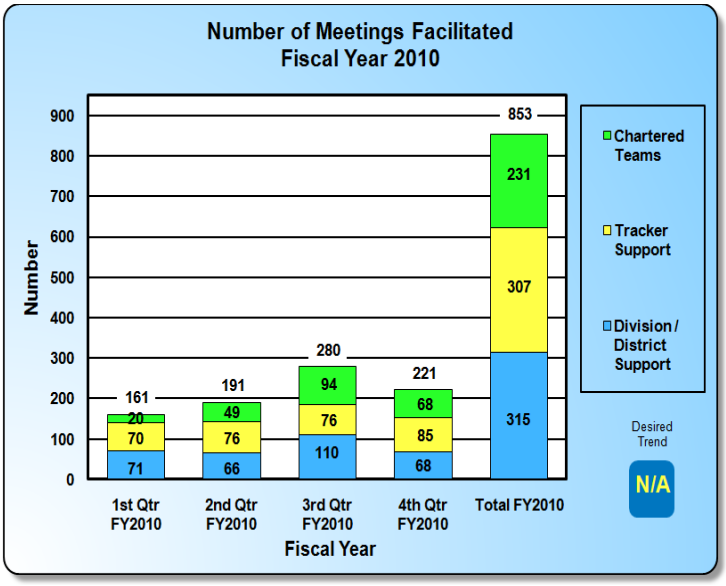


The Tangible Results were reduced from 18 to 17. However, nothing was lost because two roadside-related results were combined into Accommodating Roadsides. Two communications results were shortened to Outstanding Customer Service and Proactive Transportation Information. Also, the word "socially" was added to Environmentally Responsible to reflect customer expectations in that area. While not changing as much, the Value Statements did get a minor facelift. Each of the statements was taken from the future tense to the present tense to better express "living" the values.

A draft of each revised document was prepared and shared with department employees for comments. An electronic comment mailbox served as an online employee focus group. Overall, employee comments about the revised documents were positive. Senior managers adopted revisions to both documents at their May meeting. Community Relations has prepared a variety of sizes and formats for employees to post in work areas.

Teams Focus on Key Operational Areas

With tightening budgets on the horizon, more than ever this past year department managers turned to Organizational Results to help them improve processes, policies and programs in key operational areas. Organizational Results facilitators conducted a total of 231 meetings with district and division employees on topics ranging from energy usage at department facilities to improving how bridge plans are developed. This was on top of more than 600 meetings to support performance management and Tracker production with division managers. Overall, this past year Organizational Results facilitators have logged more than 850 meetings. That's a lot of flipcharts and post-it notes!



Team Facilitation Projects

FY 2010

- Pavement Marking
- Bridge Plans Production
- Sign Inventory Management
- Fleet Purchasing Process
- Diversity Education
- Project Delivery Challenge
- Realty Asset Management
- Diverging Diamond Interchange
- Signals & Highway Lighting Utilities Analysis
- Facilities Utilities Analysis
- Blurring Boundaries in System Operations
- Blurring Boundaries in Program Delivery
- Manchester Interchange Peer Review
- TMS Customization (Phase 1)
- Highway Safety Voucher Process

Performance Incentives End on High Note

On June 2, 2010, Interim Director Kevin Keith recommended to the Missouri Highways and Transportation Commission that Performance Plus be eliminated as of June 30, 2010, the end of the fiscal year and the conclusion of the last measurement period for the program. The elimination includes both of the Performance Plus incentives, Construction Cost Savings and Project Scoping and Estimating. Eligible employees received their final payouts for the program on August 31, 2010.

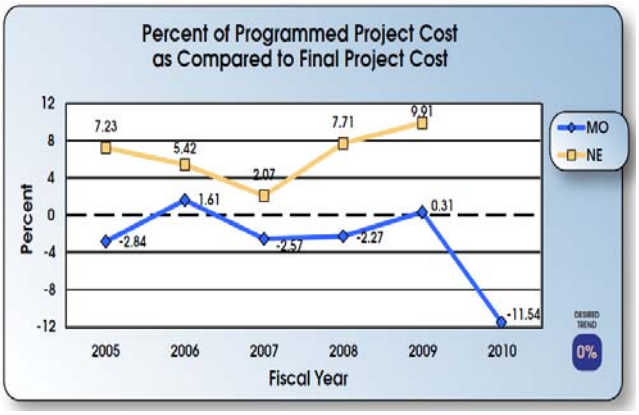
The primary factor resulting in this difficult decision was quite simply, the program has run its course and accomplished what was originally intended. Launched in 2006, Performance Plus was designed as an incentive and tool to help change the culture of MoDOT to one of a Practical Design philosophy and Radical Cost Control and to reward eligible construction and design employees for above and beyond performance in scoping, estimating and bringing projects in on budget.

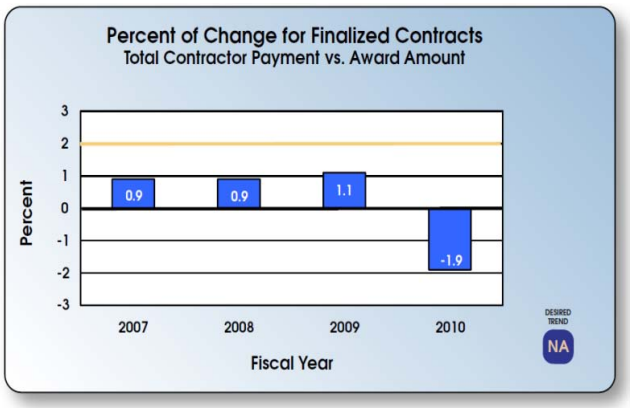
The good news is MoDOT has changed its culture thanks to the collective hard work and commitment of TEAM MoDOT. Ideas and processes such as Practical Design, the EPG, Alternate Bidding, Design-Build, Value Engineering and Alternative Technical Concepts (ATCs) were once considered out-of-the box and innovative. But today, this is the accepted and expected way MoDOT does business. In the past two years alone, final construction costs for projects tracked by the Performance Plus Construction Cost Savings program were almost $21 million less than the award amount. For the same two years, awarded projects included in the Project Scoping and Estimating program came in $295 million less than STIP estimates.

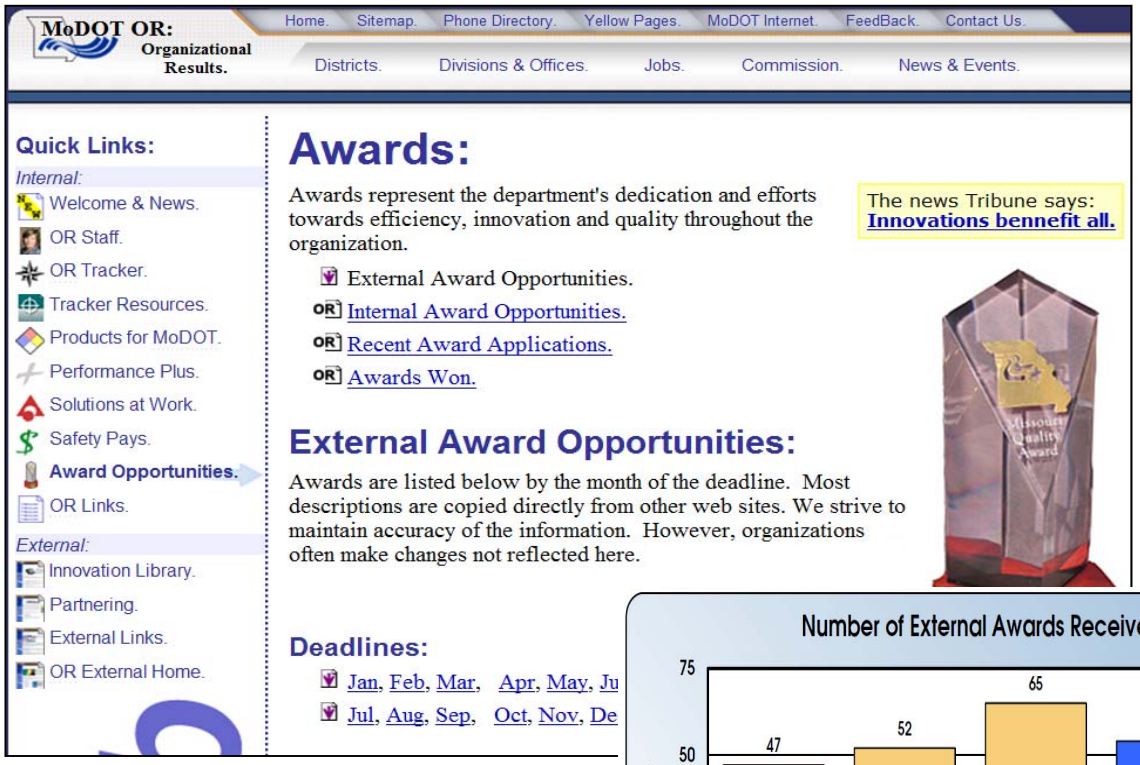
When Performance Plus first began, there were not a large number of project offices and districts who met the performance targets and qualified for the incentives. Over the last three years, it became common for 60 to 80 percent of those eligible to qualify for the incentives.

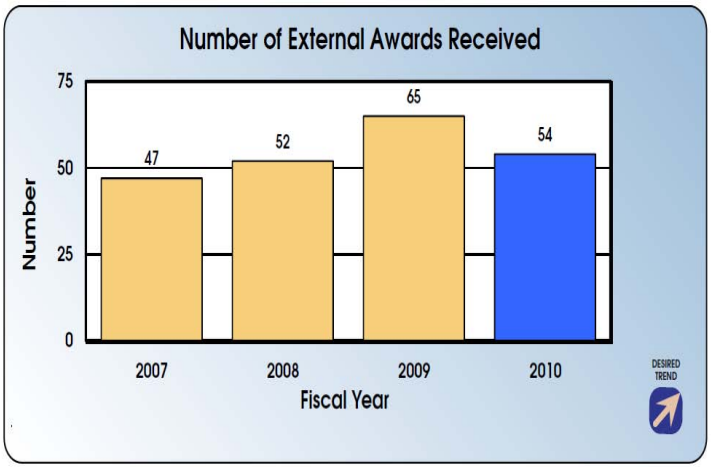
Performance Plus served its purpose well for several years by reinforcing MoDOT's new way of doing business, but it is no longer working as originally intended – as a reward for above and beyond performance. The expectations have been permanently raised and now considered routine work.

PerformancePlus









Measuring Against the Best

MoDOT's mission statement includes the words "world-class transportation experience." But how do you really know if you are delivering at a world-class level? One of the approaches MoDOT uses to identify exemplary levels of performance is to aggressively pursue external award opportunities. These regional and national competitions allow MoDOT to measure itself against the best in the transportation industry as well as other public and private organizations.

To facilitate this approach, MoDOT has charged Organizational Results to coordinate efforts to identify awards and assist with award applications. Staff continually watches for organizational, team and individual efforts that may qualify for an award. The coordination effort also includes scouring industry and professional organizations for award opportunities. Matching achievements to awards is a critical step to not only winning awards, but also getting the best feedback for improvements.

To assist division and district employees in finding the right award, an internal web page is available with listings of award opportunities and links to application forms. The awards also are sorted by month to assist staff with meeting application deadlines.

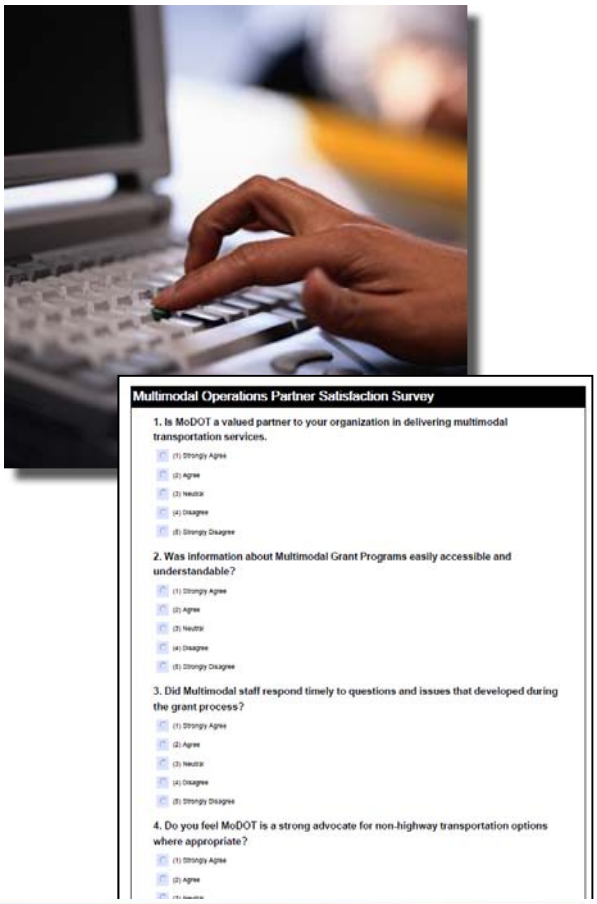
During the past year, this approach has garnered the department some prestigious recognitions including: the Diversity Exemplary Practices Award from the American Public Works Association, Communicator of the Year from the National Association of Government Communicators, five American Concrete Paving Association awards, two Governor's Awards for Quality and Productivity, the AASHTO Chairman's Award for Outstanding Outdoor Advertising and an award for outstanding reporting from Advancing Government Accountability.

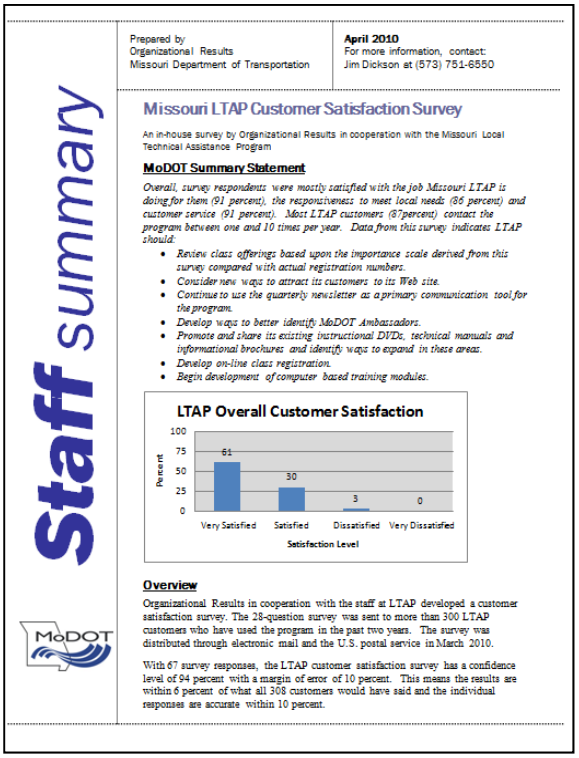
And the Survey Said …

To achieve true customer-focus, employees at all levels of an organization need to know what customers expect and how satisfied they are with its products and services. Without this critical information, decisions are made on assumptions and perceptions that may be moving the organization in the wrong direction.

The easy solution is to simply ask your customers. That's easy if you run a small repair shop with just a few customers each week. But imagine trying to get feedback from a few million transportation users. That's the challenge MoDOT faces and one that Organizational Results has coordinated the past four years.

Each year, Organizational Results staff works with an external survey company to collect statistical samples of adult Missourians' satisfaction with a variety of department products and services. Statewide surveys range from an overall customer satisfaction survey to satisfaction ratings from people involved with MoDOT planning activities.





Staff summary

Prepared by
Organizational Results
Missouri Department of Transportation

April 2010
For more information, contact:
Jim Dickson at (573) 751-6550

Missouri LTAP Customer Satisfaction Survey

An in-house survey by Organizational Results in cooperation with the Missouri Local Technical Assistance Program

MoDOT Summary Statement

Overall, survey respondents were mostly satisfied with the job Missouri LTAP is doing for them (91 percent), the responsiveness to meet local needs (86 percent) and customer service (91 percent). Most LTAP customers (87percent) contact the program between one and 10 times per year. Data from this survey indicates LTAP should:

- *Review class offerings based upon the importance scale derived from this survey compared with actual registration numbers.*
- *Consider new ways to attract its customers to its Web site.*
- *Continue to use the quarterly newsletter as a primary communication tool for the program.*
- *Develop ways to better identify MoDOT Ambassadors.*
- *Promote and share its existing instructional DVDs, technical manuals and informational brochures and identify ways to expand in these areas.*
- *Develop on-line class registration.*
- *Begin development of computer based training modules.*

LTAP Overall Customer Satisfaction
Percent
100
75
50
25
0
61
30
3
0
Very Satisfied
Satisfied
Dissatisfied
Very Dissatisfied
Satisfaction Level

Overview

Organizational Results in cooperation with the staff at LTAP developed a customer satisfaction survey. The 28-question survey was sent to more than 300 LTAP customers who have used the program in the past two years. The survey was distributed through electronic mail and the U.S. postal service in March 2010.

With 67 survey responses, the LTAP customer satisfaction survey has a confidence level of 94 percent with a margin of error of 10 percent. This means the results are within 6 percent of what all 308 customers would have said and the individual responses are accurate within 10 percent.

Along with these larger statewide projects, Organizational Results provides in-house services for smaller scale surveys. Organizational Results staff design surveys, distribute both paper and electronic forms, collect responses and analyze the results.

Innovative Solutions

Putting our research to work and taking advantage of best practices are critical to our success.

- Research implementation
- Coordination of applied technologies
- New products evaluation
- Best practice sharing
- Literature searches

Diverging Diamonds Garners National Attention

On June 21, 2009, the Missouri Department of Transportation opened the first diverging diamond interchange in the western hemisphere at the intersection of Route 13 and Interstate 44 in Springfield, Missouri.

The renowned project was built to alleviate congestion on heavily-traveled Kansas Expressway (Missouri Route 13) at Interstate 44 while providing a unique pedestrian/bicycle crossing down the middle of the bridge. The innovative design was chosen, primarily, for three reasons: timeliness, monetary savings, and safety.

These goals became MoDOT's motto for the project - quicker, cheaper, and safer.

- Quicker: The DDI project was completed in six months instead of 12 to 18 months.
- Cheaper: The DDI project saved $6.8 million by eliminating construction of a new bridge.
- Safer: Drivers faced only six months of construction-related backups. Congestion-related crashes fell by 50 percent by eliminating left-turn conflicts and reducing bumper-to-bumper congestion. A pedestrian walkway protected by a wall on either side with crosswalks at the signals on each end of the bridge resulted in a much safer way to cross the busy bridge.

The diverging diamond interchange has worked remarkably well since the project's completion. Traffic has proven to move smoothly through the interchange and the significant backups of the past have been eliminated even during peak morning and afternoon rush hours and during major traffic-generating events.

More diverging diamond interchanges are being built in Missouri. The innovation is catching on, as many other state transportation departments are looking to replicate MoDOT's innovative project and have begun designing and building diverging diamond interchanges. Additionally, Popular Science magazine named the interchange one of its 100 best innovations for 2009.

Organizational Results worked with Heartland Research to pull local driver satisfaction data from a existing statewide satisfaction survey in December 2009 with the following results:

- Most Springfield area residents were very satisfied with the project and generally believe MoDOT provided the right transportation solution (89.4%).
- More than 85% of the respondents were either "very" or "fairly" familiar with the project roadway.
- The overwhelming majority of respondents thought the project made the roadway safer (96.7%), more convenient (95.1%), less congested (95.2%), easier to drive (86.9%), and was better marked (89.8%).

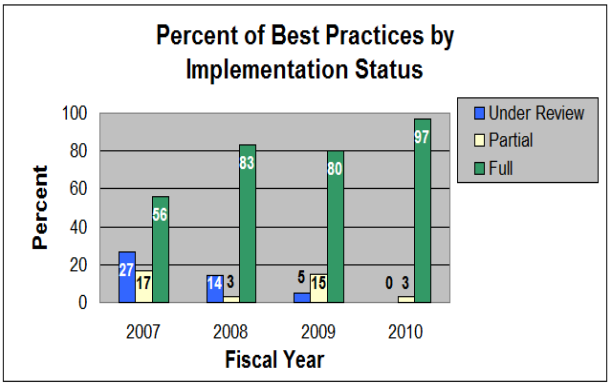
Organizational Results has also assisted MoDOT engineers to produce a lessons learned document based on Missouri's experience with DDIs. The report covers everything from engineering and operational issues to public involvement. Research efforts are continuing at the Springfield location to further evaluate operational and safety benefits.

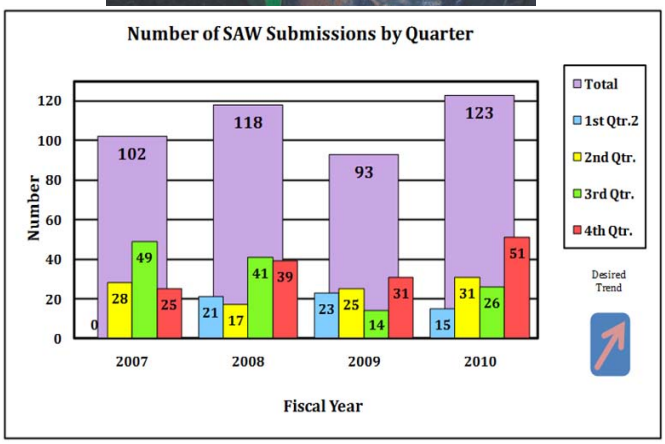
Find the full report and survey summary at:
http://www.modot.mo.gov/services/OR/byDate.htm

Best Practices System Surges with Submissions

The Solutions at Work program was started at MoDOT in November 2006 to collect, evaluate and share employee best practices throughout the organization. Solutions at Work has been successful at doing all three. During the first four years of the program, Solutions at Work received 436 employee submissions with current evaluation times averaging less than 10 days. At the same time, a total of 60 best practices have been identified and shared through an online database and periodic tip sheets.

For the past two years, the annual implementation rate held at a robust 80 percent, but increased to 97 percent in 2010. The number of submissions rebounded this year to 123, an all-time high and 32 percent higher than last year.





The majority of the best practices approved for the year were in Maintenance with 11. Construction, Traffic and Motor Carrier Services each had one best practice. The 14 best practices approved for the year is a nice rebound from the 2009 total of 10.

Approved Best Practices for FY 2010

- MCS Online Vertical Clearance Map *(Central Office)*
- Inline Asphalt Filter *(District 2)*
- V-Bed Removal Tool *(District 1)*
- Plow Lift Chain Bracket *(District 2)*
- CMP Lifting Bracket *(District 2)*
- Pocket Hitches *(District 7)*
- Culvert Flusher *(District 10)*
- As-Built Plans Tracking System *(District 6)*
- Snow Plow Cradle *(District 7)*
- Dipper Box *(District 7)*
- Traffic Management Documentation *(District 6)*
- Jackhammer Sprayer *(District 5)*
- Belly Plow Jacks *(District 10)*
- Cable Tensioning System *(District 10)*

Tool and Equipment Challenge Builds on Past Success

MoDOT's Tool and Equipment Challenge was bigger and better than ever as several hundred department employees gave 37 exhibits a thorough inspection. The third Tool and Equipment Innovation Showcase was held March 30 in Springfield. The showcase brought together the best innovations in the areas of snow and ice response, drainage and preventive pavement maintenance.

A team of technical experts, including an evaluator from each district, rated innovations on overall cost effectiveness, ease of use, versatility and the ability to implement statewide. Six individual winners would take home $500 for themselves and an extra $10,000 for their district budget.

2010 Tool and Equipment Innovation Showcase Winners

Snow and Ice Response Tools

First Place – V-Bed Removal Tool - Operators safely stay on the ground to load or unload v-bed spreaders using this specially designed reach tool. *(District 1)*
Honorable Mention – Snow Plow Cradle - A modified 10-ton floor jack allows one person to install snow plow blades and backup blades at the same time. *(District 7)*

Snow and Ice Response Equipment

First Place – Plow Lift Chain Bracket - This bracket nearly has eliminated chain breakage and allows replacements during a snowstorm without welding**.** *(District 2)*
Honorable Mention – Tractor Plow & Spreader - Idle tractors can now help keep intersections and ramps cleared during snow fights with four-wheel traction**.** *(District 3)*

Drainage Tools

First Place – CMP Lifting Bracket - Brackets slip onto any size pipe in just minutes. Crews can install pipes without getting into the trench. *(District 2)*

Drainage Equipment

First Place – Culvert Flusher - This customized high-pressure nozzle is attached to a flusher truck to make culvert cleaning quick and easy. It also can be used to identify clogged pipes. *(District 10)*
Honorable Mention – Loader Ditching Bucket - An oversized bucket converts a front loader into a ditching unit. There's no need for a backhoe or tire excavator. *(District 6)*

Preventive Pavement Maintenance Tools

First Place – Inline Asphalt Filter - This unit is placed between the vendor's asphalt tanker and MoDOT's asphalt distributor to reduce contaminated particles that clog distributor screens. *(District 2)*

Preventive Pavement Maintenance Equipment

First Place – Pocket Hitches - Pocket receivers make changing attachments fast, safe and secure**.** Hitches are designed to work with a variety of implements including edge-rut boxes. *(District 7)* This innovation also received the Best of Show Trophy.

Details on winning innovations were shared statewide for implementation. Employees can access information on all 37 displays at the Tool and Equipment internal website. Next year's program will have a new name, Innovations Challenge, and will be expanded to include processes in six focus areas critical to the new Five-Year Direction.

Innovative Solutions Summaries Published

Full research summaries can be found at:
http://www.modot.mo.gov/services/OR/byDate.htm

Advancements

A Research Bulletin
Prepared by Organizational Results
Missouri Department of Transportation

January 2010
For more information, contact:
Bob Gummelheimer at 314-877-0330

New LowP Bridge Overlays Performing Well In St. Louis Area

Business Issue

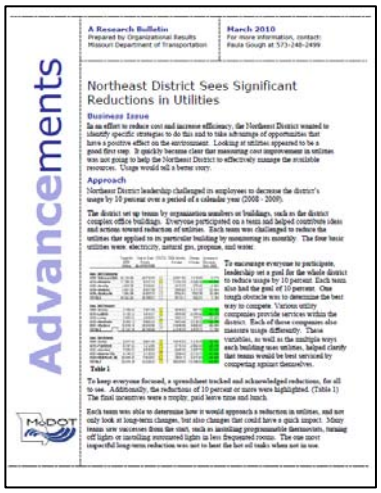
Approach

New LowP Bridge Overlays Performing Well in St. Louis Area

Project Purpose:
Closing bridge decks for rehabilitation is an inconvenience for Missouri motorists. MoDOT is aggressively pursuing alternate materials to speed up this process to provide a smooth pavement with minimal traffic interruptions. Unfortunately, many materials that offer faster cure rates are not very durable. A new product, called LowP, is a combination of the CTS Rapid Set Cement and proprietary add mixtures. LowP offers high early strength, low permeability, with the added benefit of corrosion protection.

Northeast District Sees Significant Reductions in Utilities

Project Purpose:
Northeast District's Utility Challenge results show what a team effort can do. Further, benefits of the changes can now be directly tied to MoDOT's Tangible Results. Environmentally Responsible: all the Northeast District buildings reduced energy use. Best Value for Every Dollar Spent: the Northeast District reduced utility usage, thus providing cost savings.


Advancements

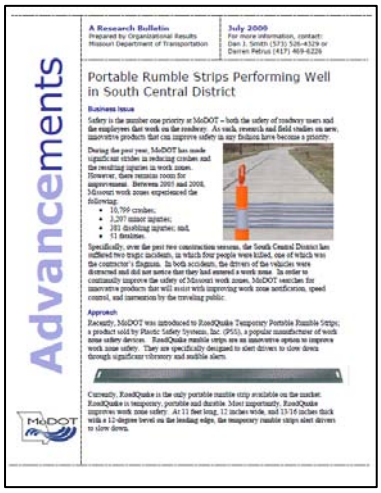
A Research Bulletin
Prepared by Organizational Results
Missouri Department of Transportation

March 2010
For more information, contact:
Paula Gough at 573-248-2499

Northeast District Sees Significant Reductions in Utilities

Business Issue

Approach


Advancements

A Research Bulletin
Prepared by Organizational Results
Missouri Department of Transportation

July 2009
For more information, contact:
Dan J. Smith (573) 526-4329 or
Darren Petrus (417) 469-6226

Portable Rumble Strips Performing Well in South Central District

Business Issue

Approach

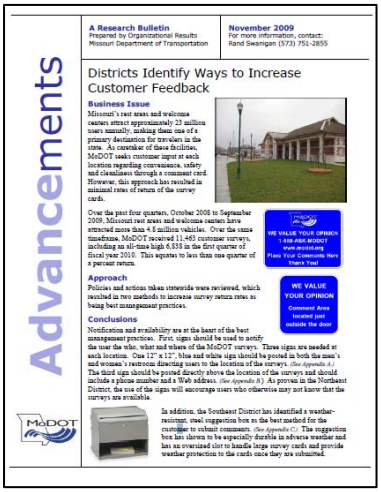
Portable Rumble Strips Performing Well in South Central District

Project Purpose:
Based on both the manufacturer and MoDOT field tests, the responsiveness of drivers due to the RoadQuake product is positive. Reduced speeds of five to ten miles per hour, as well as the increased attentiveness from the audible and vibratory alert will increase safety in work zones. However, the field tests on the product are extremely limited. Two specific issues need further study: the effect on motorcycles and the effect of rainy conditions on the product.

Innovative Solutions Summaries Published *(cont'd.)*

Districts Identify Ways to Increase Customer Feedback at Rest Areas

Project Purpose:
Policies and actions taken statewide were reviewed, which resulted in two methods to increase survey return rates as being best management practices. New informational signs and better availability of rest area comment cards have proven to significantly increase customer response rates.


Advancements

A Research Bulletin
Prepared by Organizational Results
Missouri Department of Transportation

November 2009
For more information, contact:
Rand Swanigan (573) 751-2855

Districts Identify Ways to Increase Customer Feedback

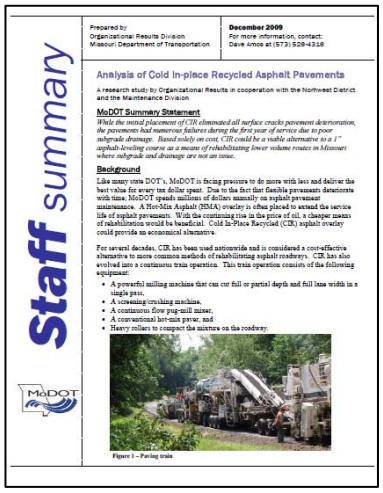
Business Issue

Approach

Conclusions

Analysis of Cold In-place Recycled Asphalt Pavements

Project Purpose:
While the initial placement of CIR eliminated all surface cracks and pavement deterioration, the pavements had numerous failures during the first year of service due to poor subgrade drainage. Based solely on cost, CIR could be a viable alternative to a 1" asphalt-leveling course as a means of rehabilitating lower volume routes in Missouri where subgrade and drainage are not an issue.


Staff summary

Prepared by
Organizational Results Division
Missouri Department of Transportation

December 2009
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Dave Amos at (573) 526-4318

Analysis of Cold In-place Recycled Asphalt Pavements

MoDOT Summary Statement

Background

Customer Survey Shows Support for Ice Alert Signing

Project Purpose:
Based on this field survey, overall the public embraces the Ice Alert System concept. However, the current size and design of the signs have not fully gained the public's attention and understanding. The reflectors may be too small to be seen on Interstates at highway speeds, as only 26 percent of citizens polled noticed the signs and statements were made that the signs need to be larger in size to capture motorist attention.

Staff summary

Prepared by
Organizational Results Division
Missouri Department of Transportation

April 2010
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Seth Bollinger at (573) 472-6257

Customer Survey Shows Support for IceAlert Signing

MoDOT Summary Statement

Background

Research

Our business and engineering research program is targeted to have the greatest impact on delivering a world-class transportation experience.

- Administration of research contracts with public and private organizations
- Coordination of multi-state research projects
- *Management of in-house research activities*

Highlighted Research

TR 09-004

Evaluation of Motorist Assist Return on Investment

A research study by Organizational Results in cooperation with the St. Louis Area District Traffic and Highway Safety Division was conducted to evaluate the effectiveness of the Motorist Assist program managed by the St. Louis District. This research builds on the previous Return on Investment (ROI) Study of Motorist Assist (1994) that evaluated the St. Louis Motor Assist program to establish and update current benefits of this program. The research evaluated the value of both the Freeway Motorist Assist (MA) program and the Traffic Response (TR) program that was temporarily deployed on the arterial roadway system during the full-closure of I-64.

St. Louis Motor Assist (Freeway) Program

- Produced a benefit-cost ratio is 38.25 to 1
- Reduced 1,082 secondary crashes per year with annual net social benefits of $78,264,017
- Reduced $1,130,000 in annual congestion cost
- Supported Community Emergency Response (ER)
- Resulted in safer and quicker incident response and clearance
- Reduced ER resources for traffic incident management (TIM) activities freeing them for other community needs

I-64 Traffic Response (Arterial) Program

- I-64 Traffic Response conservative benefit-cost ratio was 8.3:1
- I-64 Traffic Response reduced an estimated 183 secondary crashes per year
- I-64 Traffic Response reduced $1,034,000 in annual congestion cost by safer and quicker incident response and clearance
- Reduction in ER resources for TIM activities freeing them for other community needs

Principal Investigator(s):
University of Missouri-Columbia and HDR Engineering

Total Amount Expended:
$59,970

State and Regional Value: TR services can be viewed as a vital component of an overall Traffic Incident Management (TIM) strategy. Responders, such as the police, validate this perspective by commenting that TR is better equipped to handle traffic control, which allows the police to take other actions such as investigating the incident. The evaluating team's initial recommendations are: 1) TR is a valid best practice when a major construction impacts a region's mobility, and 2) TR should be considered as a viable TIM strategy when addressing a major urban region's safety and traffic congestion concerns.

MA services also are a critical component of an overall Traffic Incident Management strategy. The evaluators recommend for MA to be strengthened. Research such as this has provided MoDOT and its partners with information and data to continue to provide MA services and also the basis to justify the expansion of the current MA coverage.

Find the full report at:
http://www.modot.mo.gov/services/OR/byDate.htm

Highlighted Research

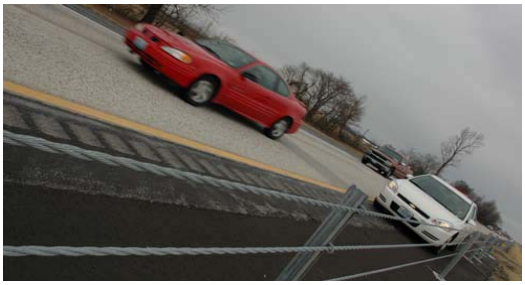
RI 08-039

Median Guard Cable Performance in Relation with Median Slope on Interstate 70

A preliminary study conducted in 2006 on I-44 showed that there is no statistically significant difference of success rate between guard cables installed on medians with flatter (≥6H:1V) and steeper slopes (<6H:1V). That is to say, steepness of the slope alone does not cause the median guard cable to fail any more or less. Considering the limited sample size (225) for the study along I-44, FHWA and other research facilities recommended a larger data set be collected to lend the study more credibility.

The main purpose of this study was to find out how median slopes influence guard cable effectiveness based on analysis of a larger data set. The entire Interstate 70 was chosen to conduct the current study. A total of 521 survey forms representing the 521 identified crash sites (study goals) were distributed to the involved districts to collect median and crash data.

Data analysis showed that the success rates for guard cables installed on both steeper and flatter slopes are high. Median slope does not solely affect guard cable effectiveness. Factors such as vehicle type, roadway horizontal and vertical alignment, and guard cable horizontal distance, do not solely contribute to the effectiveness of guard cable either. The inclusion of crash related data such as vehicle speed and collision angle could make it possible to get a more complete capture of guard cable performance.



State and Regional Value: Overall, median guard cable is an effective safety measure with an average of 95.6% success rate in preventing vehicles encroaching into opposing lanes along I-70. The success rates for guard cables installed on both steeper and flatter slopes are pretty high, with 98.1% for steeper slopes and 93.9% for flatter ones. The fact that guard cable success rate for steeper slopes (<6H:1V) is not any lower than the rate for flatter slopes (≥6H:1V) showed that median slope does not solely affect guard cable effectiveness. Other factors also contribute to the success or failure of median guard cable in keeping vehicles from encroaching into the opposite lane.

Find the full report at:
http://www.modot.mo.gov/services/OR/byDate.htm

Principal Investigator(s):
Missouri Department of Transportation

Total Amount Expended:
In-house

Highlighted Research

RI 08-026

Evaluation of Adaptive Traffic Signal System:

Route 291 in Lee's Summit

In March 2009, the Missouri Department of Transportation installed a new adaptive traffic signal system along the Route 291 corridor between Interstate 470 and Route 50 in Lee's Summit. This was MoDOT's first installation of the InSync system developed by Rhythm Engineering. The 12-signal Route 291 corridor included more signals than any previous installation of the system. MoDOT engaged Midwest Research Institute (MRI) to evaluate the system's performance by comparing operational measures taken before the implementation of the system to the same measures taken one month and five months after implementation. These measures included:

- travel time runs through the corridor,
- delay experienced by drivers through the corridor and at individual intersections,
- vehicle emissions,
- fuel consumption,
- number of stops, and
- minor-street delay at four intersections along the corridor.

In addition to these measurements, MRI also collected volume data along the corridor to ensure that changes in these measures were not due to a change in volume. Finally, a turning-movement count was conducted at Chipman Road for comparison with traffic counts collected by the InSync detection cameras.

Principal Investigator(s):
Midwest Research Institute

Total Amount Expended:
$48,728

State and Regional Value: The evaluation results indicate that the adaptive traffic signal system is effective in reducing travel time, delay, emissions, fuel consumption, and number of stops by traffic in the corridor. There may be some increase in minor-street delay, but this is more than offset by the decrease in major-street delay. While a detailed benefit-cost analysis was not included in the scope of this study, it appears that installation of the adaptive traffic signal system was a good investment for MoDOT.

Installation of adaptive traffic signal systems are recommended for further consideration for corridors where traffic demand changes quickly or in an unpredictable manner, where traditional timing plans are unable to accommodate coordination in two directions of travel, or where travel times are 50 percent or more higher than free-flow travel times after signal timing plans have been optimized.

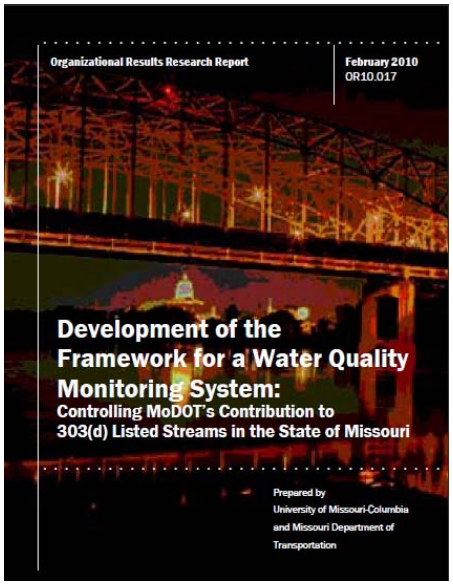
Find the full report at:
http://www.modot.mo.gov/services/OR/byDate.htm

Research Reports Published

Full reports can be found at:
http://www.modot.mo.gov/services/OR/byDate.htm

RI 08-031

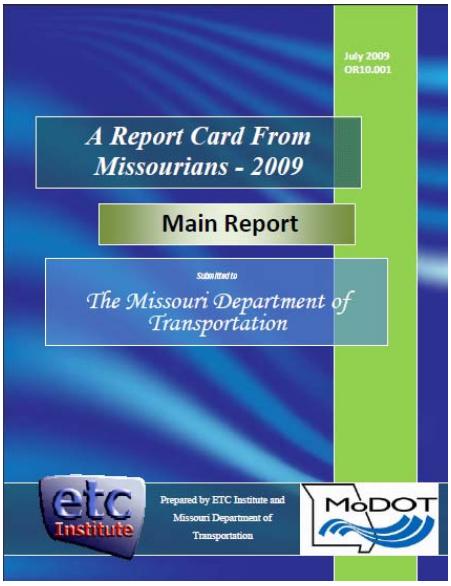
Development of the Framework for a Water Quality Monitoring System



Principal Investigator:
University of Missouri-Columbia

Total Amount Expended:
$45,000

Project Purpose:
Faced with the possibility of having to place water quality monitoring systems on hundreds of locations across the state, MoDOT turned to its research partners at the University of Missouri-Columbia to develop a computer assessment tool to reduce the number of sites. Federal regulations soon may require MoDOT to place water quality monitoring systems at locations where runoff from the state highway system might affect a designated list of water bodies across the state. However, not all highway crossings meet the requirements for needing a monitoring system. Using existing GIS data, MoDOT now has a decision tool that will significantly reduce the number of monitoring systems required while maintaining environmental responsibility.



RI 08-018

A Report Card from Missourians - 2009

Principal Investigator:
ETC Institute

Total Amount Expended:
$74,850

Project Purpose:
The 2009 assessment by adult Missourians gave MoDOT high marks in almost all areas of satisfaction. *A Report Card from Missourians* showed overall satisfaction dipped slightly from 85% to 83%, but nearly 94% of Missourians said they thought MoDOT should receive more money. In addition, 92% of Missourians said they trust MoDOT to keep its commitments. The ETC Institute conducted the annual assessment with more than 3,500 adults in all ten regions of the state.

Research Reports Published *(cont'd.)*

TYyy1015

2010 MoDOT kcICON Survey

Principal Investigator:
ETC Institute

Total Amount Expended:
$26,850

Project Purpose:
This survey measured the Kansas City area residents' satisfaction with the kcICON project, their perceptions of MoDOT as a result of the project and what, if anything, would impress them regarding the kcICON project. A professional calling center was contracted to obtain a representative sample of MoDOT's Kansas City Area District to obtain a 95% confidence level with a precision of at least +/- 2.4% for the survey. Potential respondents were contacted through random digit dialing (RDD) from late January through mid-February 2010. A total of 1,606 interviews were completed for the study.

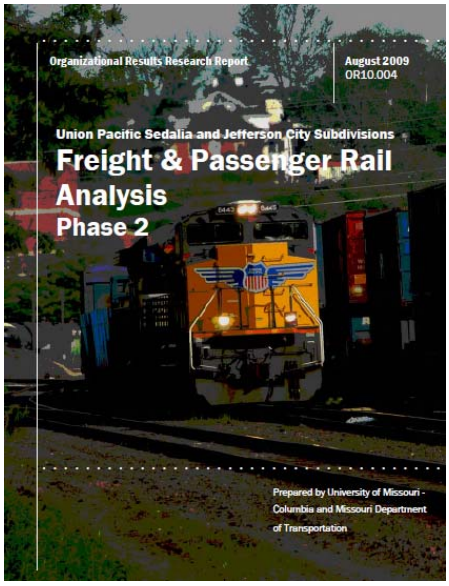
RD 09 -049

Union Pacific Sedalia and Jefferson City Subdivisions Freight and Passenger Rail Analysis, Phase 2

Principal Investigator:
University of Missouri-Columbia

Total Amount Expended:
$17,628

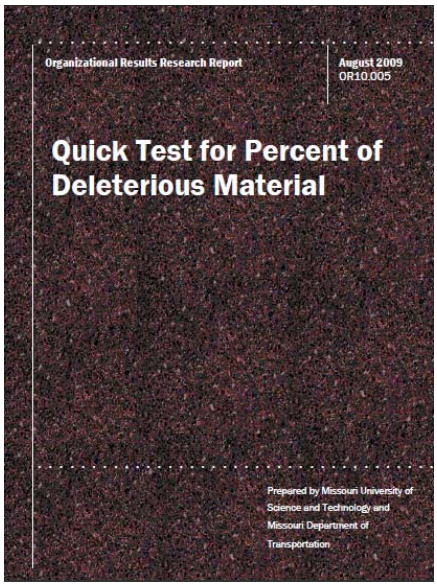
Project Purpose:
Thanks to improvements along the St. Louis to Kansas City line, passengers and freight are getting to their destinations on time. A recently completed assessment of freight and passenger delays showed that delay minutes have been reduced by 33 percent and delays for passenger trains resulting from freight train interference have dropped 50 percent. The assessment also identified a new list of possible improvements along with the impact each would have on freight and passenger services.



Research Reports Published *(cont'd.)*

RI 07-052

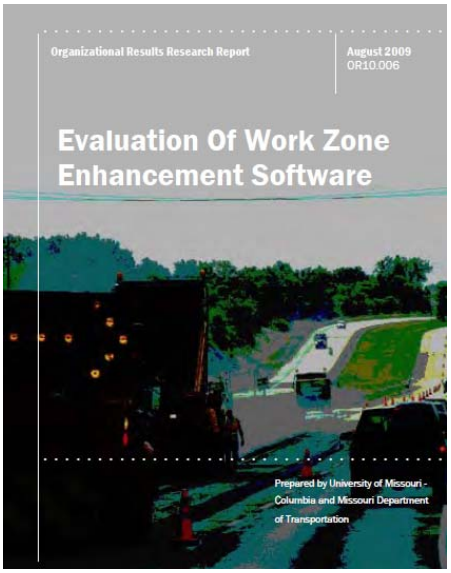
Quick Test for Percent of Deleterious Material



Principal Investigator:
Missouri University of Science and Technology

Total Amount Expended:
$44,736

Project Purpose:
Ask the average person about the contents of a pile of rocks, and he or she would probably say it contained rocks. Ask an engineer that same question and the answer could easily fill this page. It's that type of attention to the smallest particles within aggregate that results in strong, long-lasting pavements. However, testing aggregate for those small particles can take a considerable amount of time. That's why the department teamed up with the Missouri University of Science and Technology to find testing methods that could do the job faster with an acceptable level of accuracy.



RI 07-062

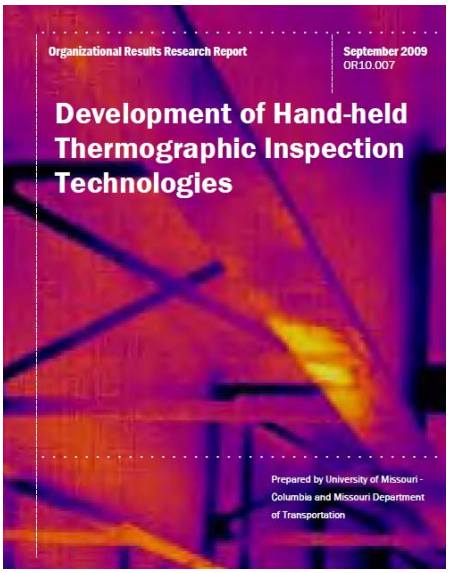
Evaluation of Work Zone Enhancement Software

Principal Investigator:
University of Missouri-Columbia

Total Amount Expended:
$50,086

Project Purpose:
Setting up a work zone is a complex process involving a myriad of variables that must be considered to keep workers and travelers safe and traffic flowing. In response, several work zone softwares have entered the market with promises of simplifying the process. But which one does the best job? This study by the University of Missouri-Columbia suggests that as many as three individual software solutions may be the best approach with each used for a specific set of circumstances such as the possibility of impacting traffic on adjacent roadways or the number of travel lanes.

Research Reports Published *(cont'd.)*



RI 06-038

Development of Hand-Held Thermographic Inspection Technologies

Principal Investigator:
University of Missouri-Columbia

Total Amount Expended:
$241,533

Project Purpose:
This study explored the application of hand-held thermographic cameras for the detection of subsurface delaminations in concrete bridges. The goal of the research was to provide maintenance and inspection personnel with an effective tool for detecting and monitoring concrete deterioration without disrupting traffic flow. The objectives of the research included developing guidelines for the use and application of the technology by characterizing the environmental conditions (solar loading, diurnal temperature variations, wind speed and relative humidity) necessary for thermography to be effective in the field.

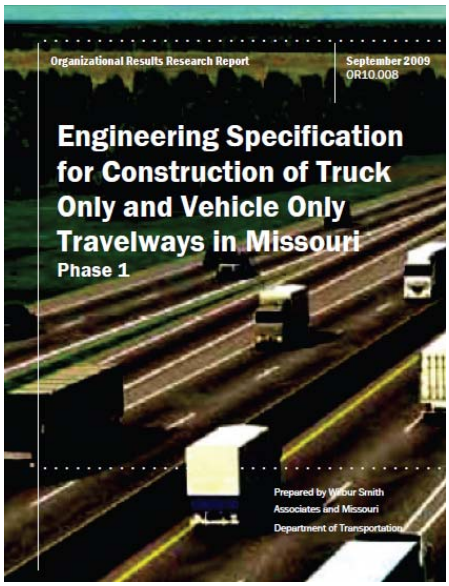
RI 08-030

Engineering Specifications for Construction of Truck Only and Passenger Vehicle Only Travelways in Missouri Phase 1

Principal Investigator:
Wilbur Smith Associates

Total Amount Expended:
$98,909

Project Purpose:
The objective of this study was to provide information detailing the safety consideration specifications for possible truck only and passenger only facilities for Interstates 70 and 44. The categories covered in this report include: Traffic Operation and Truck Only Lane (TOL) Configuration, Public Policy Questions, Literature Review, and Public Outreach Tools.



RI 07-035

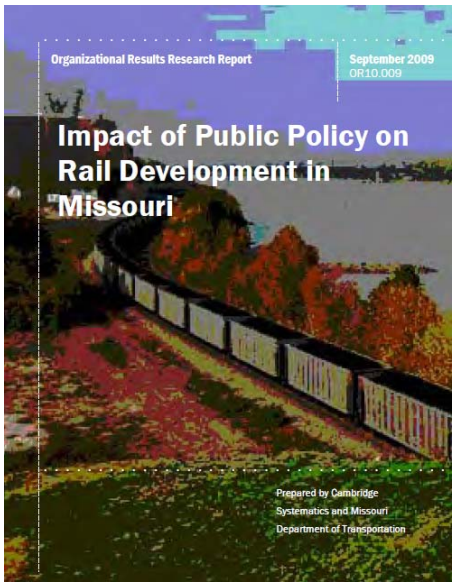
Impacts of Public Policy on Rail Development in Missouri

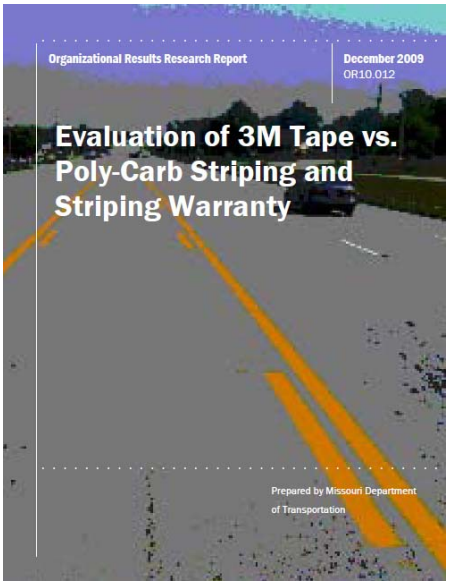
Principal Investigator:

Cambridge Systematics

Total Amount Expended:
$59,717

Project Purpose:
Identifying the state policies that most directly affect or advance railroad development begins with an understanding of how railroads make investment decisions. Railroads are a capital-intensive business, owning all physical assets, locomotives, and many rail cars, and are responsible for each train movement and for the systems that manage traffic on the entire rail network. State policies that enhance the financial return of maintenance or expansion projects can attract investments to a State.





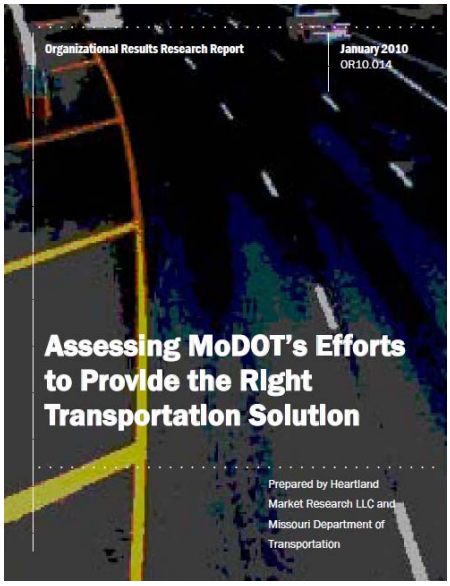
RD 09-019

Evaluation of 3M Tape vs. Poly-Carb Striping and Striping Warranty

Principal Investigator:
Missouri Department of Transportation

Total Amount Expended:
In-house

Project Purpose:
Thanks to this field study in the Kansas City and St. Louis areas, Missouri motorist can expect to see brighter highway striping in all conditions. And better yet, the cost of doing that striping is coming down. Presently MoDOT uses a wet reflective tape that averages about $5 per linear foot. Field studies have shown that POLY-CARB striping can meet or exceed reflectivity requirements for less than half the cost. The field study also tested the feasibility of striping warranties.



RD 09-034

Assessing MoDOT's Efforts to Provide the Right Transportation Solutions

Principal Investigator:
Heartland Market Research

Total Amount Expended:
$38,374

Project Purpose:
The basic research design for the project was to sample opinions on a variety of projects spread across the state. When available, a small, medium, and large project from each of the 10 MoDOT districts was selected by a regional manager for a total of 30 projects. Each survey was focused on one of 30 individual projects, which was briefly described on the survey. The majority of survey questions related to the recently completed project, such as determining if the completion of the project increased safety, convenience, and made it easier to drive.

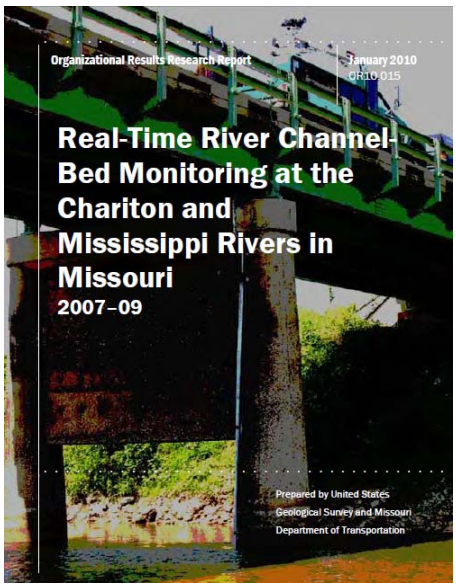
RI 08-002

Real-Time River Channel-Bed Monitoring at the Chariton and Mississippi Rivers in Missouri 2007-2009

Principal Investigator:
United States Geological Survey

Total Amount Expended:
$78,600

Project Purpose:
Scour and depositional responses to hydrologic events have been important to the scientific community studying sediment transport as well as potential effects on bridges and other hydraulic structures within river systems. A river channel-bed monitor composed of a single-beam transducer was installed on two bridges crossing the Chariton River and a Mississippi River bridge location near Mehlville, Missouri.

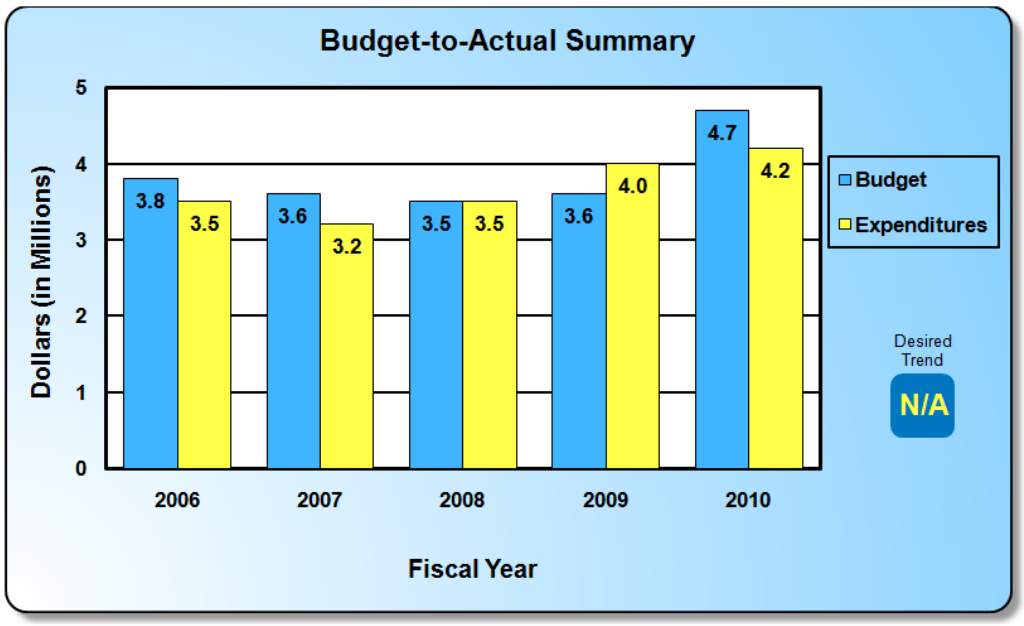


Budget and Performance Data

Organizational Results always strives to deliver:

- The best value for every dollar spent,
- Innovative transportation solutions, and
- Fast projects that are of great value.

Budget-to-Actual Summary



Organizational Results' approved budget for FY 2010 was $4,735,631, which was higher than the FY 2009 budget of $3,607,920. The increase was for a two-year, $2,000,000 commitment to thrust area projects in partnership with Missouri Transportation Institute (MTI). Of the total FY 2010 budget amount, $1,483,547 was budgeted for personal services and fringe benefits, and $3,252,084 was budgeted for E&E.

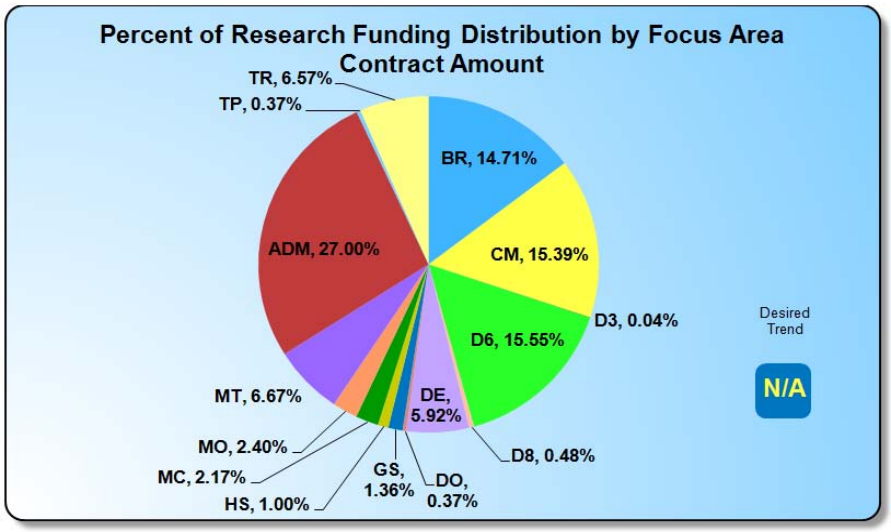
SPR FY 2010 Budget Summary

	Budget Amount	Expenditures	Percent Expended
Administration	$746,067	$680,737	91.24%
Research	$3,393,234	$2,515,362	74.12%
Development	$91,544	$70,322	76.82%
Technology Transfer	$380,635	$398,879	104.79%
Part II Total	$4,611,480	$3,665,300	79.47%
Part 1 Total	$654,316	$578,650	88.44%
Grand Total	**$5,265,796**	**$4,243,960**	**80.59%**
MTI (Rollover Funding)	-$574,351	$0	
Adjusted Total	**$4,691,445**	**$4,243,960**	**90.46%**

During fiscal year 2010, Organizational Results Division realized a 9.54 percent budget surplus or $447,485. The adjusted budget reflects a reduction of $574,351 for unused funding by MTI that will be rolled over to the fiscal year 2011 budget.

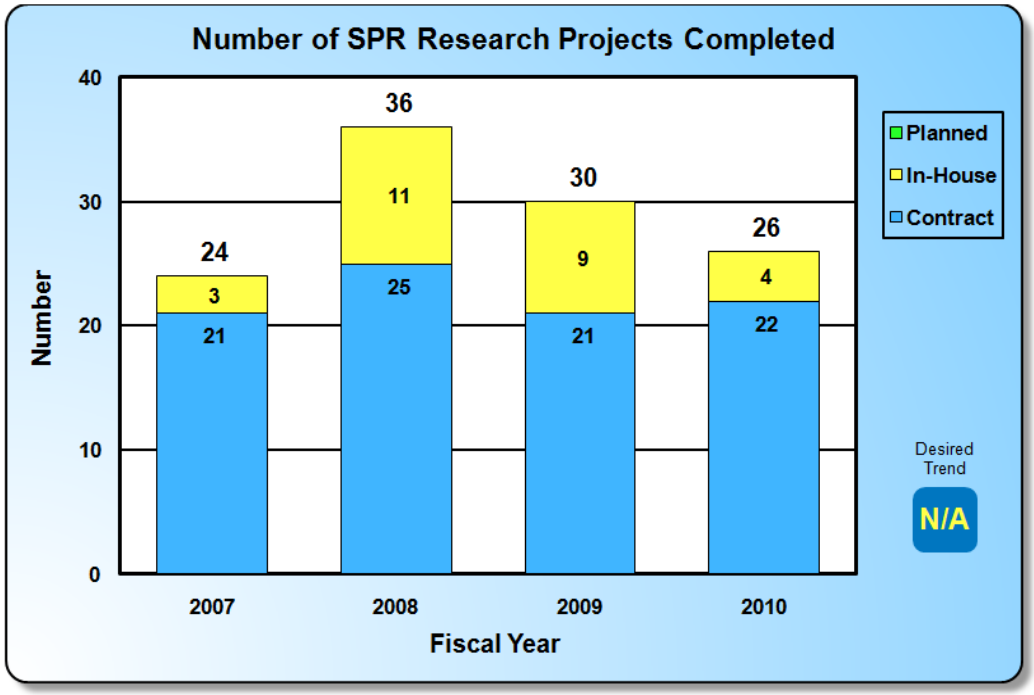
Percent of Research Funding by Focus Area

The distribution of research funds for FY 2010 was primarily to Administration (27.00%), District 6 (15.55%), Construction/Materials (15.39%), Bridge (14.71%) and Traffic (6.57%) representing 79.22% of funding. Administration's major projects were TRB Research Subscription, 2009 and 2010 LTAP Program, a three-year Customer Service Statewide Telephone Survey, and a two-year Library Contract. District 6 projects were the I-64 Evaluation and Variable Speed Limits. Construction and Materials projects were MTI-Geotech and Recycled Asphalt Shingles. The Bridge projects were MTI Bridge Thrust Areas. Traffic's major projects were Customer Service Motor Assist Survey, Roadway Review and LED Life Expectancy.

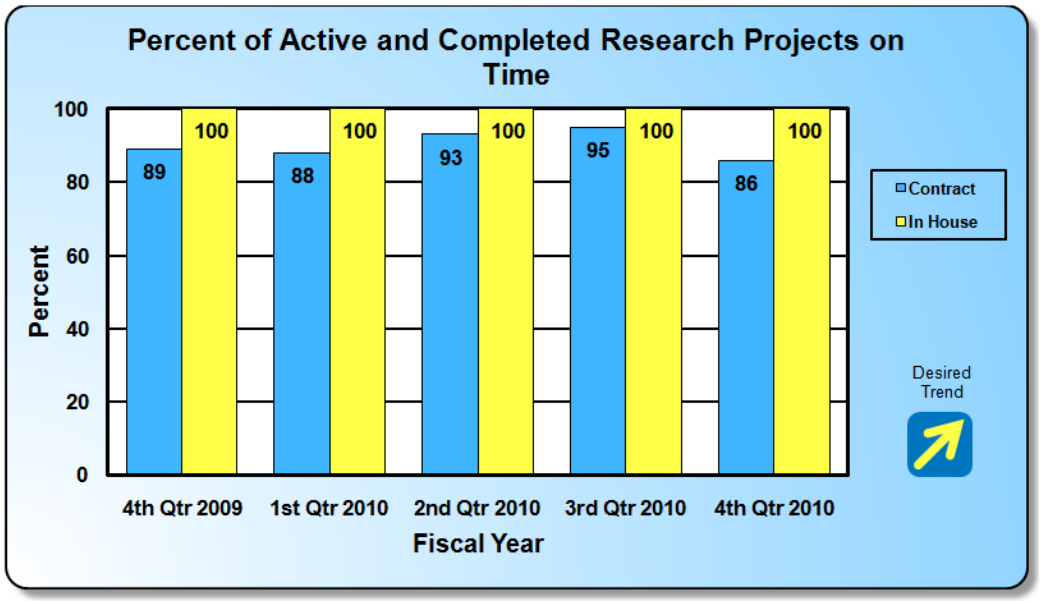


Number of SPR Research Projects Completed

A total of twenty-six SPR research projects were completed during fiscal year 2010, consisting of twenty-two research contracts and four in-house projects. This is down slightly from FY 2009.

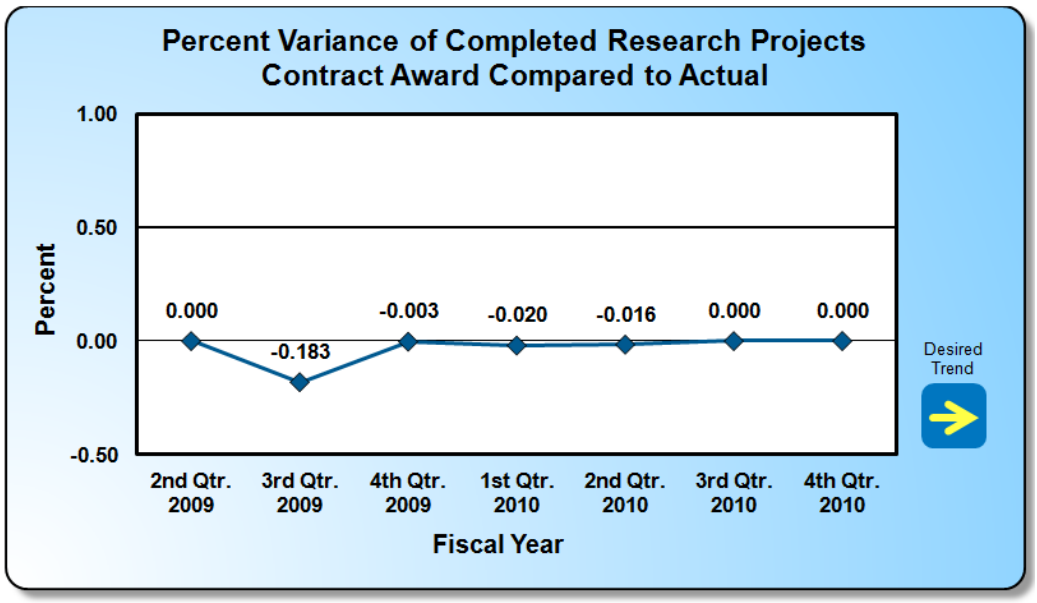


Percent of Contracted Research Projects On Time



Starting with the first quarter of fiscal year 2009, OR began measuring the percent of research projects on time to include in-house and contract research, both active and completed. MTI contract research with time extensions created the overall downward trend for contract research.

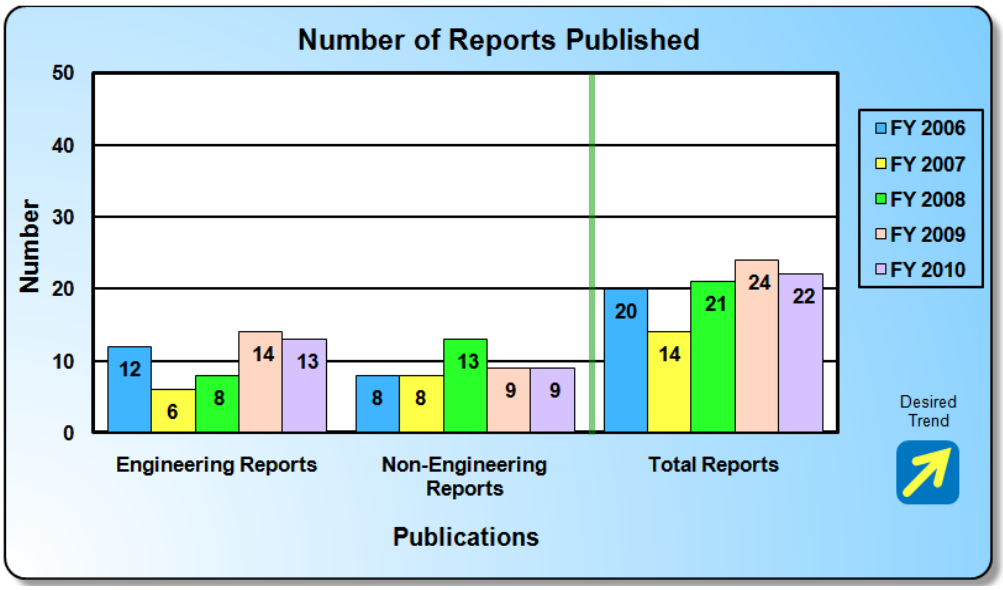
Percent Variance of Completed Research Projects



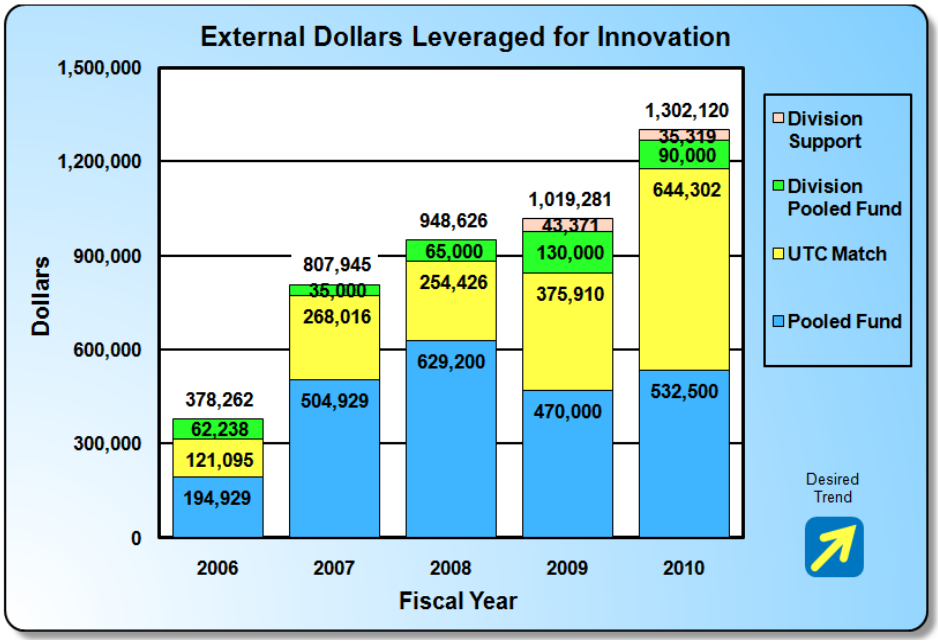
Starting with the first quarter of FY 2009, OR began measuring the percent of research projects contract award compared to actual. During the second quarter of FY 2009, expenditures were within 0% of the contract amount. For the fourth quarter of FY 2010, expenditures were within 0% of the contract amount.

Number of Reports and Summaries Published

The total number of published reports during fiscal year 2010 was 22, which was only slightly down from the total for 2009. The number of staff summaries published also dipped slightly from 43 to 38, which was still nearly 60 percent more than the 2008 total. Community Relations, Traffic and Design accounted for nearly half of the total number of publications for during FY 2010.



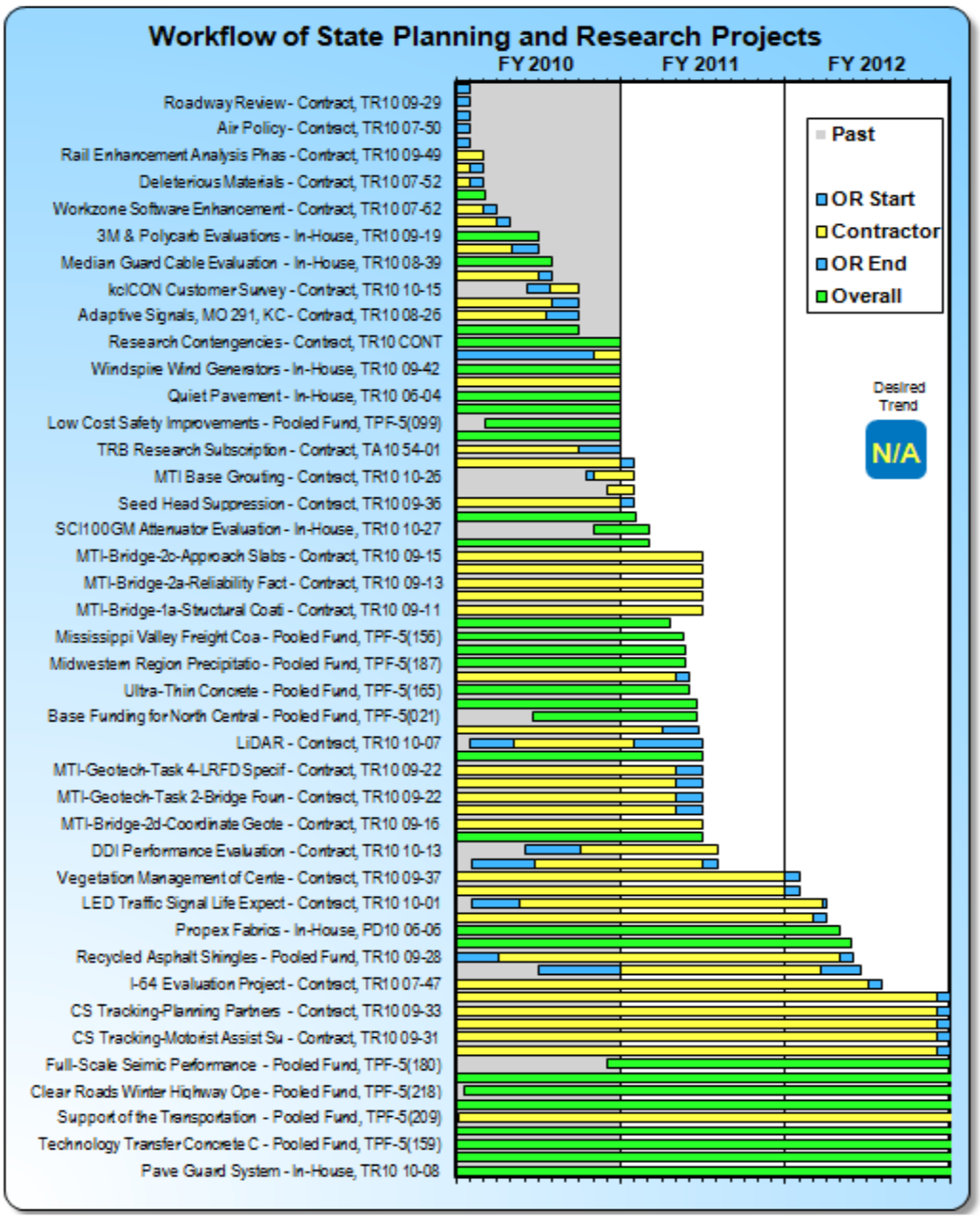
External dollars leveraged for innovation



For FY 2010, the Springfield Area District contributed $14,315.56 toward the Full Depth Reclamation Project, Traffic contributed $21,003.12 toward the LED Traffic Signal Life Expectancy Project and Traffic contributed $90,000 for division pooled funds. In FY 2009, other MoDOT divisions contributed $130,000 in state funds to pooled fund projects.

MoDOT's participation in pooled funds decreased from $629,200 in FY 2008 to $470,000 in FY 2009 and increased in FY 2010 to $532,500. UTC funding amounts increased from $375,910 for FY 2009 to $644,301.73 for FY 2010. Current partnerships within the University of Missouri System have provided more opportunities to utilize available UTC funds.

Workflow of State Planning and Research Projects



This is a new measure for FY2010. Tracking the timeline of projects will help Organizational Results manage projects and resources better. By adjusting projects to end at different times of the year, Organizational Results can provide professional and better quality of service, as opposed to having all projects due at the same time.

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