



DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

David Silvester, District Engineer

Tracker

MEASURES OF DEPARTMENTAL PERFORMANCE



MoDOT customers expect transportation solutions delivered on time and within budget. We manage our projects to get them completed quickly and at the best possible value. We work with our transportation partners to leverage innovation in improving our products and how we work. We pledge to honor our commitments and deliver the best, most cost-effective solutions.

RESULT DRIVER:

David Silvester
District Engineer

MEASUREMENT

DRIVER:

Renate Wilkinson
Planning and Programming
Engineer

PURPOSE OF THE MEASURE:

The measure determines how close total project costs are to the programmed costs. The programmed cost is considered the project budget.

MEASUREMENT AND DATA COLLECTION:

Completed project costs are reported during the fiscal year in which a project is completed. Road and bridge project costs include design, right-of-way purchases, utilities, construction, inspection and other miscellaneous costs. The programmed cost is based on the amount included in the most recently approved Statewide Transportation Improvement Program. Completed costs include actual expenditures. Multimodal and local public agency project costs typically reflect state and/or federal funds, but not local funding contributed toward such projects.

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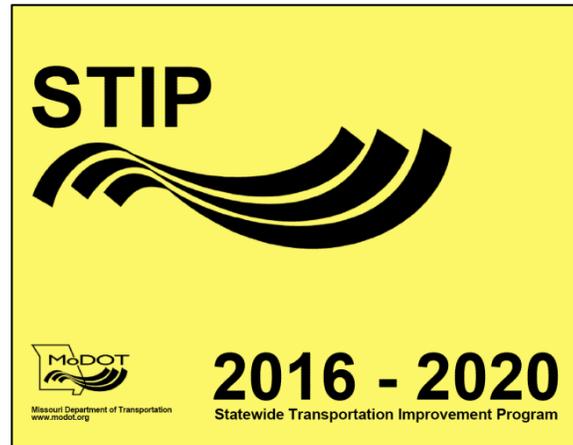
Percent of programmed project cost as compared to final project cost – 4a

The focus on accurate program cost estimates has become increasingly important due to decreasing transportation funding and increasing costs. As of September 30, 2015, 214 road and bridge projects were completed in fiscal year 2016 at a cost of \$483 million. This represents a deviation of 2.08 percent (or \$10 million) less than the programmed cost of \$493 million. Of the 214 road and bridge projects completed, 51 percent were completed within or below budget. In comparison, 62 percent of projects were completed within or below budget as of the same date a year ago. The largest component of

project savings comes from awards at \$14 million.

Miscellaneous savings (right-of-way purchases, utilities and other costs) were \$8 million. Engineering savings were \$1 million. Construction-phase overruns were \$12 million.

In addition, 19 multimodal projects were completed at a cost of \$9.086 million, 4.50 percent or \$391,000 more than the programmed cost of

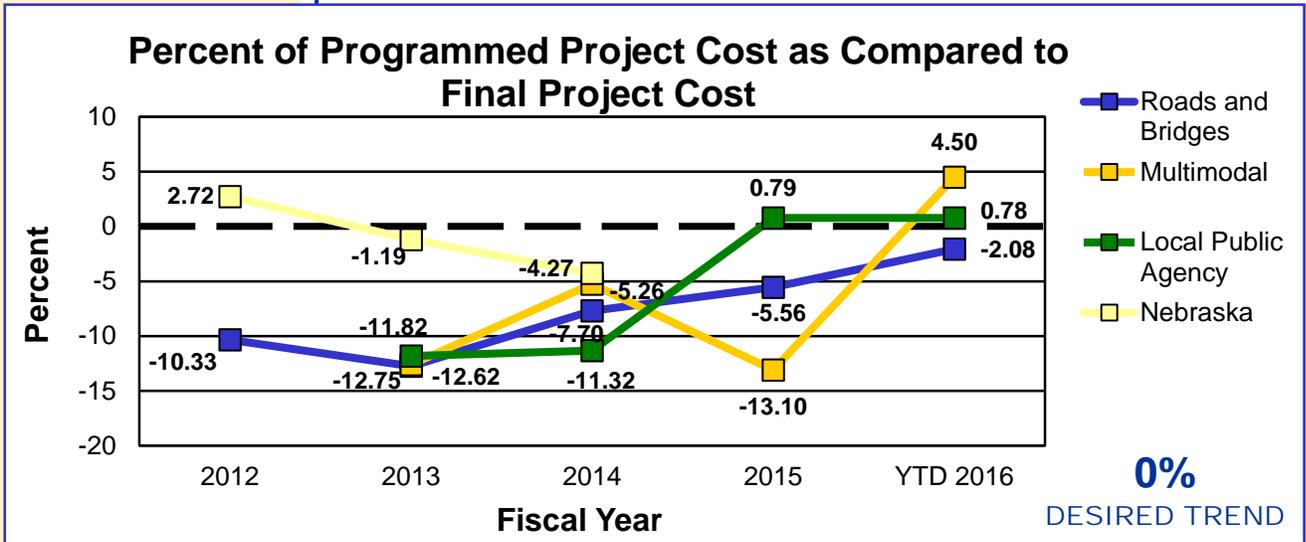


\$8.695 million. A total of 49 local public agency projects were completed at a cost of \$28.975 million, 0.78 percent or \$223,000 more than the programmed cost of \$28.752 million.

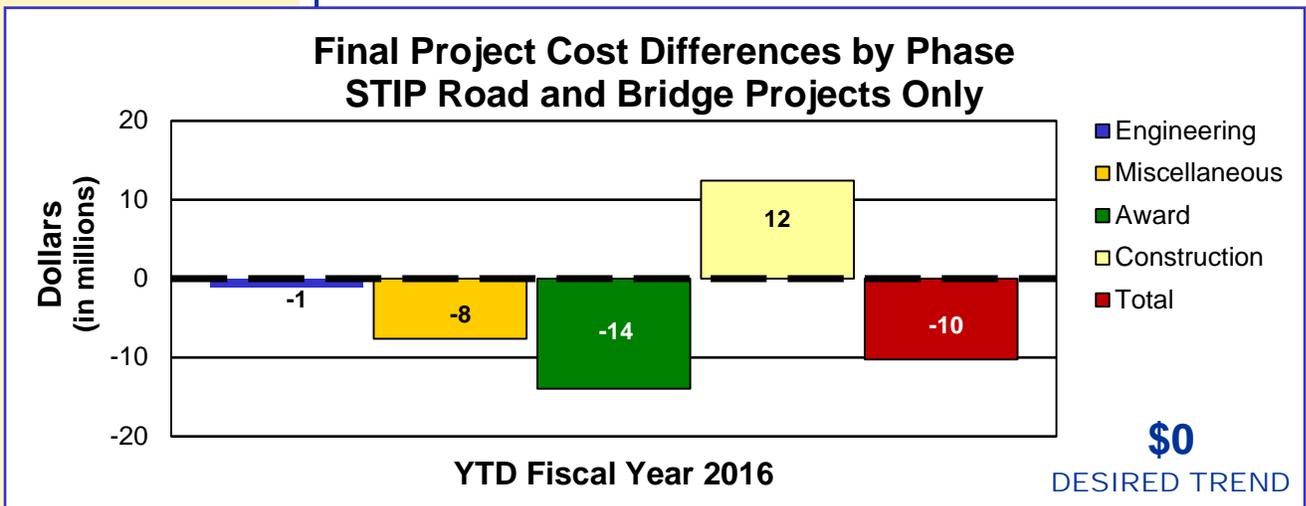
For fiscal year 2015, the final cost of 349 road and bridge projects completed was \$1.4565 billion. This represents a deviation of 5.56 percent (or \$85.7 million) less than the programmed cost of \$1.5422 billion. The multimodal final project cost for fiscal year 2015 was \$38.865 million. This represents a deviation of -13.10 percent or \$5.868 million less than the programmed cost of \$44.723 million. In addition, the local public agency final project cost for fiscal year 2015 was \$76.195 million. This represents a deviation of 0.79 percent or \$599,000 more than the programmed cost of \$75.596 million.

MoDOT uses this historical data as a guide for programming future projects. Projects awarded in FY 2014 and 2015 were 1 percent higher and 2 percent lower, respectively, than programmed values. Consequently, the 2015-2019 and 2016-2020 STIPs were developed assuming no significant award savings. Projects awarded in FY 2016 through September were 11 percent less than programmed values.

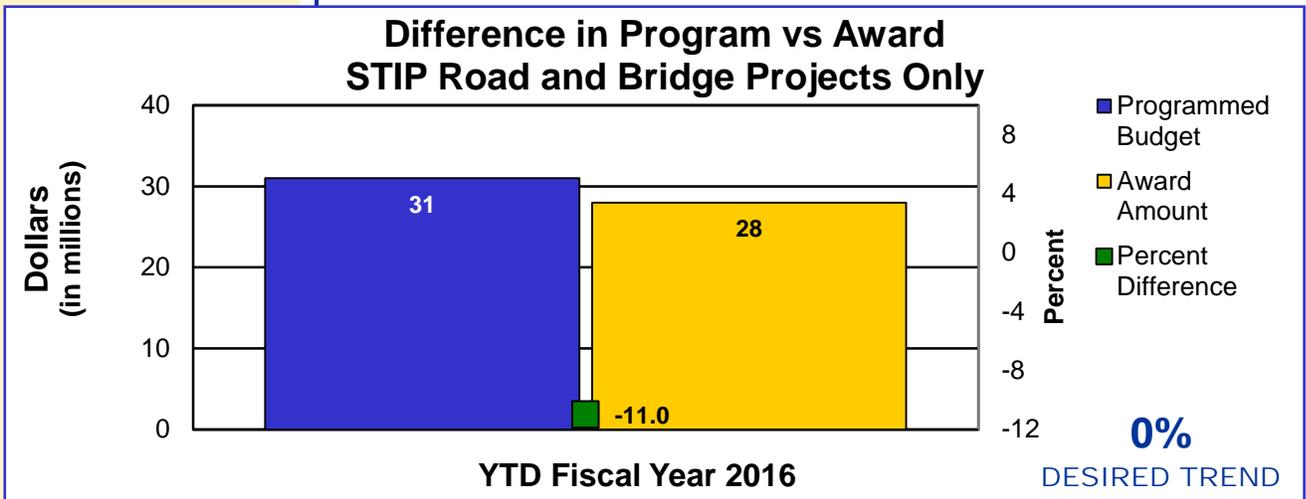
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Positive numbers indicate the final (completed) cost was higher than the programmed cost. Comparative data is from Nebraska Department of Roads, one-year schedule of highway improvement projects.



Negative numbers indicate savings. Miscellaneous includes right-of-way purchases, utilities and other costs.



Amounts include STIP road and bridge projects with 2 percent construction contingency applied.

RESULT DRIVER:

David Silvester
District Engineer

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Percent of projects completed on time – 4b

MEASUREMENT DRIVER:

Jay Bestgen
Assistant Construction and Materials Engineer

PURPOSE OF THE MEASURE:

This measure tracks the percentage of projects completed by the commitment date established in the contract. This includes road, bridge, local public agency and multimodal projects – rail, aviation, waterway and transit.

MEASUREMENT AND DATA COLLECTION:

For road and bridge projects, the project manager collaborates with the project team to establish the project completion date, and the resident engineer uses the SiteManager system to track and document the work. Local public agencies and multimodal agencies use staff or consultant resources to set contract completion dates and track performance.

MoDOT's customers expect transportation improvements to be completed quickly with minimal impact to their lives. Delivering projects by the contract completion date is the target for all projects and is considered a commitment to Missourians and users. Completing projects on time helps maintain credibility which is of utmost importance to maintaining Missourians' long-term support for times when more resources are needed to adequately maintain the transportation system. Completing projects on time minimizes user exposure to work zones and provides facilities in good condition that improve safety and reduce vehicle maintenance costs.

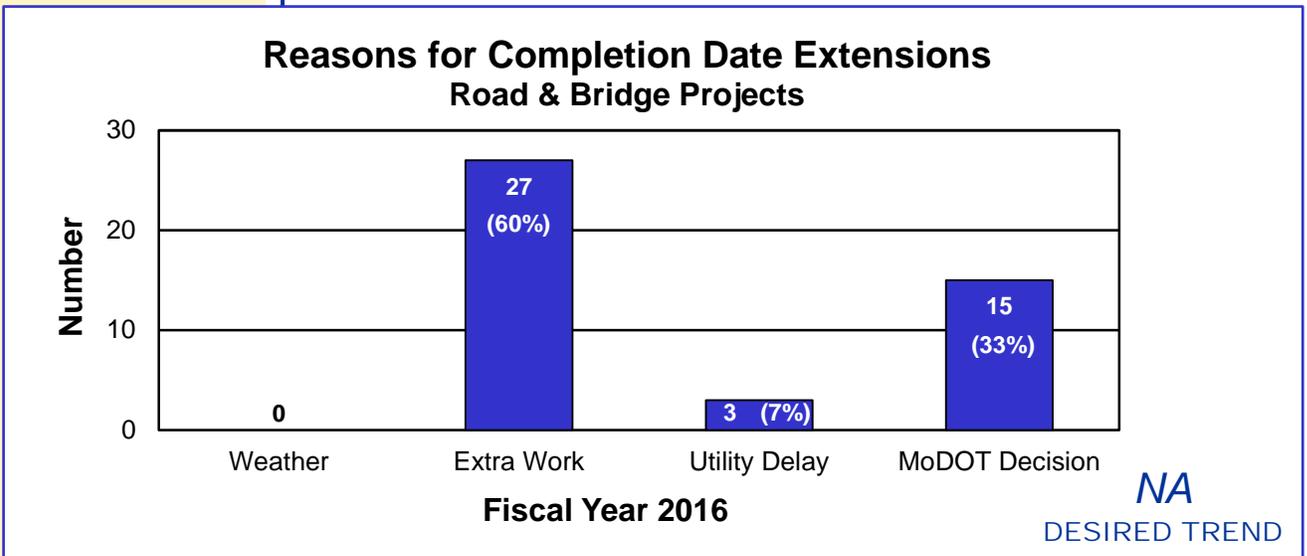
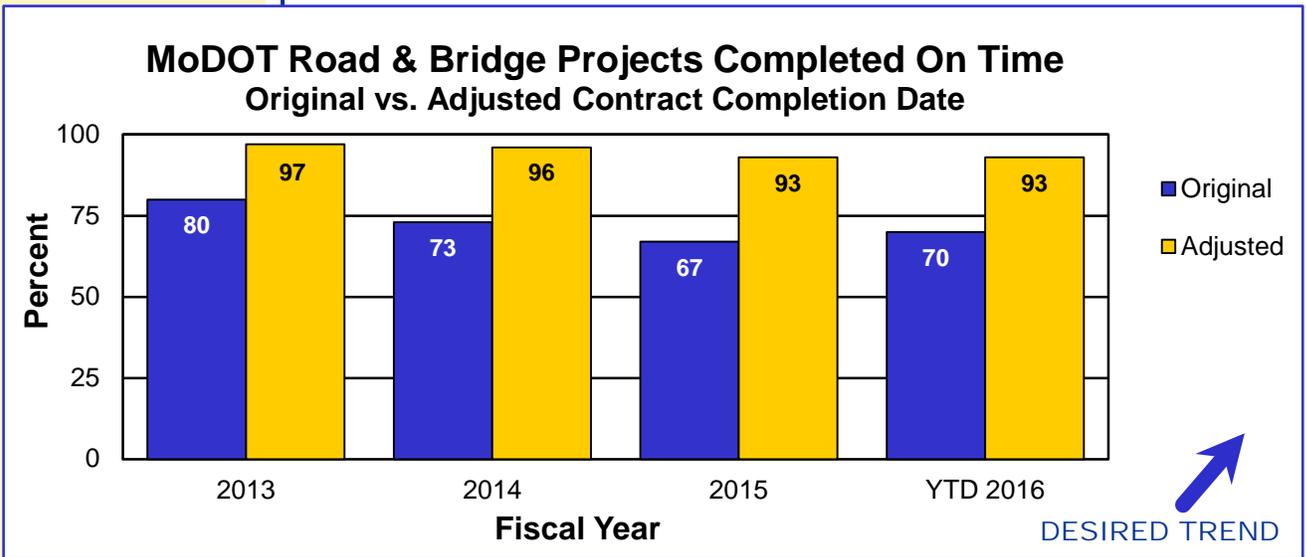
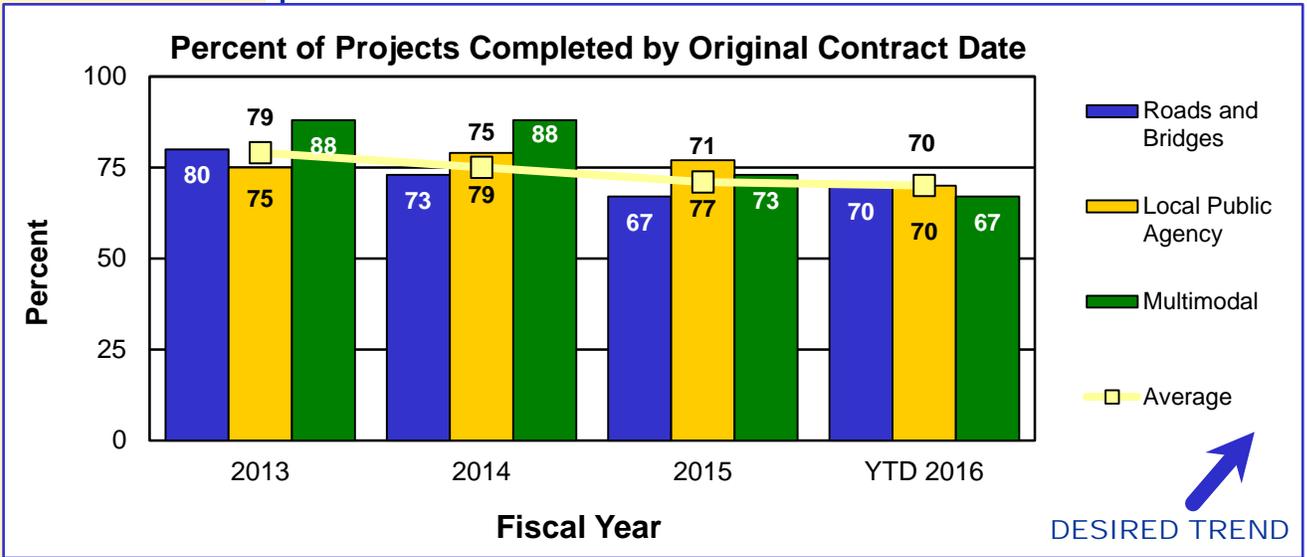
Sometimes, unusual weather or additional contract work necessitates an extension of the completion date. There also are times when a contractor misses the project completion date and the contract may have damages assessed. To date in fiscal year 2016, 70 percent of the closed out projects were completed on or ahead of schedule.

MoDOT works to meet the original completion date by preparing accurate plans and quantities, setting aggressive but reasonable completion dates and setting liquidated damages to reinforce completion dates without undue bid risks. Staff also works with the contracting industry to set potential completion times before letting and with project contractors to maintain schedules.

Of the road and bridge projects completed in the first quarter of fiscal year 2016 with approved time extensions, 60 percent were for extra work, seven percent experienced utility delays and 33 percent were extended due to a decision by MoDOT.

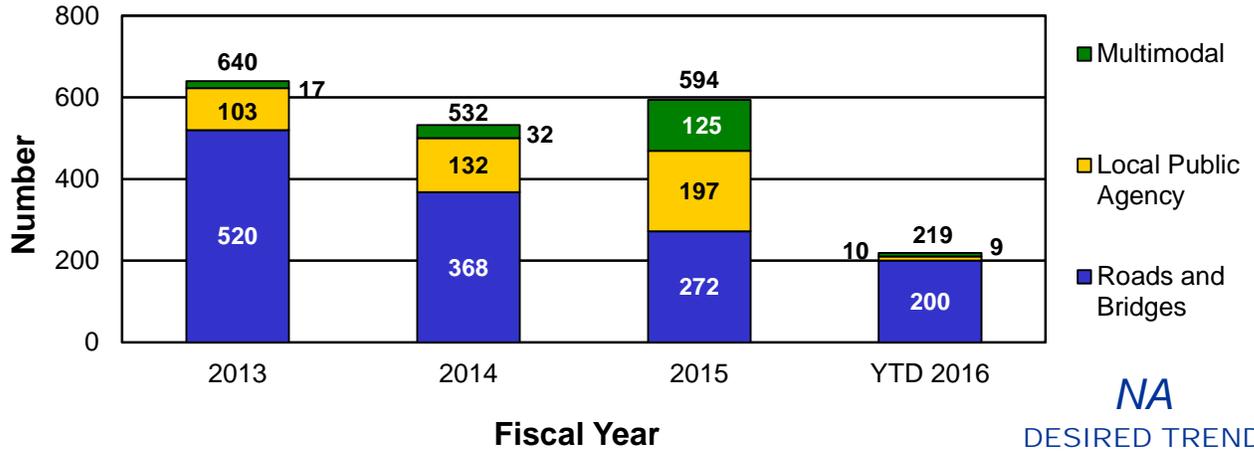


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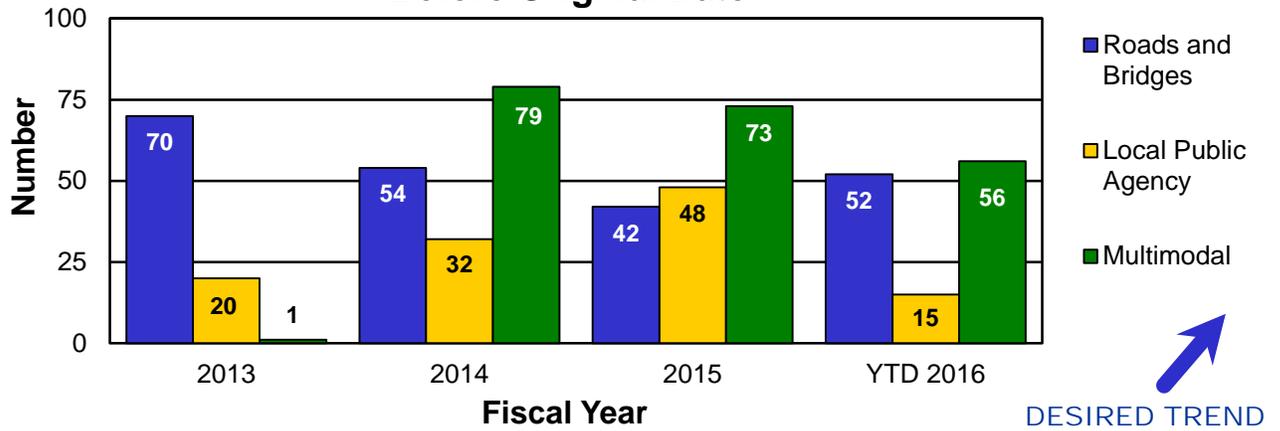


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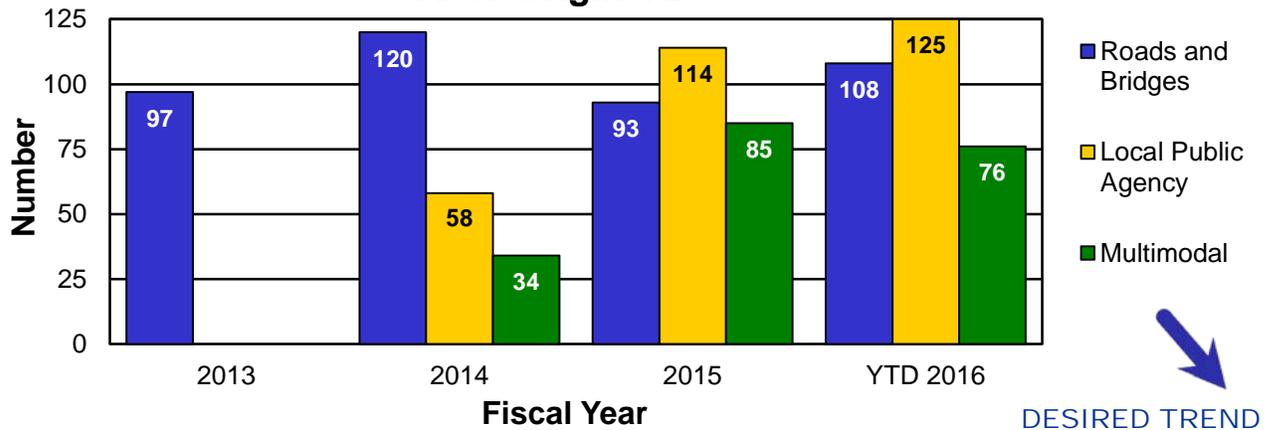
Total Number of Projects Completed



Average Number of Days Completed Before Original Date



Average Number of Days Completed After Original Date



RESULT DRIVER:

David Silvester
District Engineer

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Percent of change for finalized contracts – 4c

MEASUREMENT DRIVER:

Jeremy Kampeter
Construction Management System Administrator

PURPOSE OF THE MEASURE:

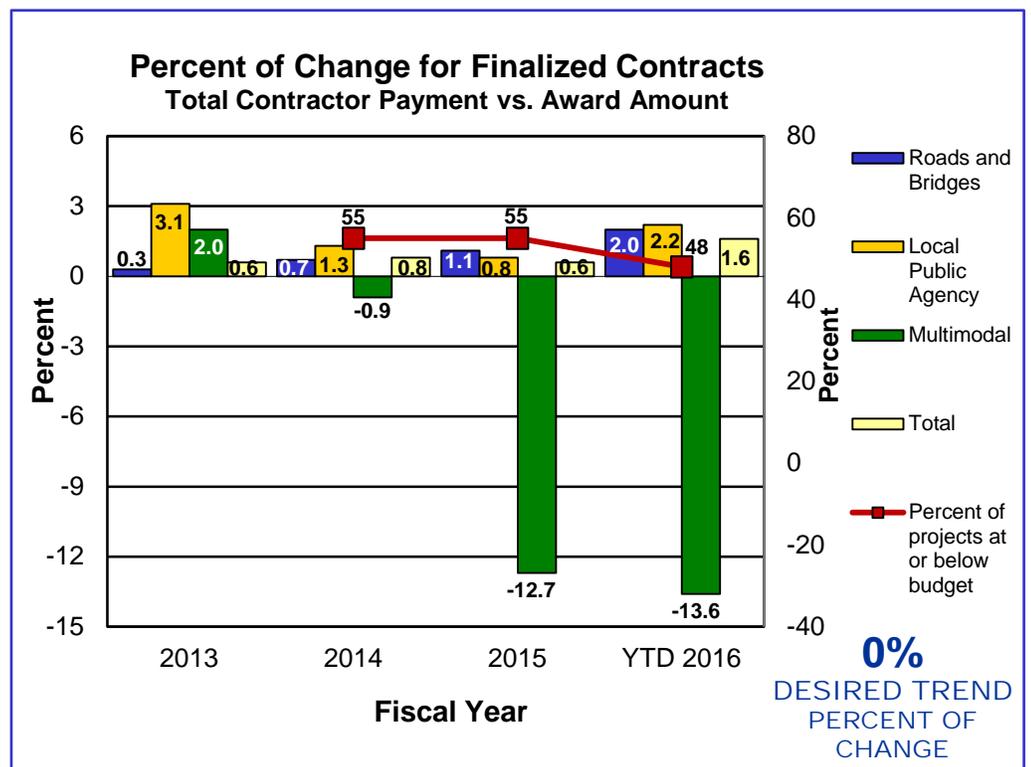
This measure tracks the percentage difference of total construction payouts to the original contract award amounts. This indicates how many changes are made on projects after they are awarded to the contractor for road, bridge, local public agency and multimodal projects – rail, aviation, waterway and transit.

MEASUREMENT AND DATA COLLECTION:

For road and bridge projects, contractor payments are generated through MoDOT's SiteManager database and processed in the financial management system for payment. Change orders document the underrun/overrun of the original contract cost. Local public agencies and multimodal agencies use staff or consultant resources to set contract completion dates and track performance.

By limiting overruns on contracts, MoDOT can continue to keep its maintenance and construction commitments. Decreased transportation funding coupled with increased costs of products such as asphalt, concrete and steel has placed an even stronger emphasis on keeping construction projects within budget. This emphasis combined with the use of practical design and value engineering has contributed to limiting overruns on contracts. MoDOT's performance in fiscal year 2016 was 1.6 percent (\$416 million worth of projects completed \$6.6 million over the award amount).

Many factors can affect the ability to complete a project within two percent of the award amount. These factors can include design changes, differing conditions, additional work items and administrative decisions. For MoDOT Road & Bridge projects completed in the first quarter of fiscal year 2016, an additional \$850,000 of contract costs on 36 projects were incurred due to a decision to replace guardrail end treatments on the state highway system. Another project with a \$10.7 million bid amount had an overrun of \$2.5 million to add sound walls. These change orders amount to \$3.3 million of the total \$6.6 million in cost overruns, which is 0.8% of the total.



RESULT DRIVER:

David Silvester
District Engineer

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Innovative contracting methods – 4d

MEASUREMENT

DRIVER:

David Simmons
Transportation Project
Manager

PURPOSE OF THE MEASURE:

This measure tracks the use of innovative contracting methods on MoDOT projects including: A + B contracts, alternate technical concept contracts, and design-build contracts.

MEASUREMENT AND DATA COLLECTION:

MoDOT projects utilizing innovative contracting methods are reported during the fiscal year in which they are awarded. Contract award values are collected through MoDOT's bid opening summaries and project records.

With the forecast of limited transportation funding and increasing costs, MoDOT looks to implement non-traditional methods and practices in contract procurements to improve efficiency, increase flexibility, and maximize value for its customers. By executing innovative contracting tools, MoDOT is better able to mitigate limited resources, meet each project's unique challenges and maximize collaboration with the public and private sectors. MoDOT uses innovative contracting to ensure the public receives maximum value for every tax dollar invested in Missouri's transportation system. MoDOT continues to capitalize the use of Design-Build by shifting its focus to smaller projects.

When selecting a project delivery method and innovative contracting options, MoDOT takes into account project characteristics (risks) such as project size (cost), type (preservation, rehabilitation or reconstruction) and complexity (urban or rural, significant traffic impact, number of project elements). Innovative contracts promote accelerated project completion or facilitate achievement of other performance objectives. MoDOT's A+B, ATC, and Design-Build contracting methods change how projects are procured and delivered. The advantages of MoDOT's innovative contracting methods are as follows:

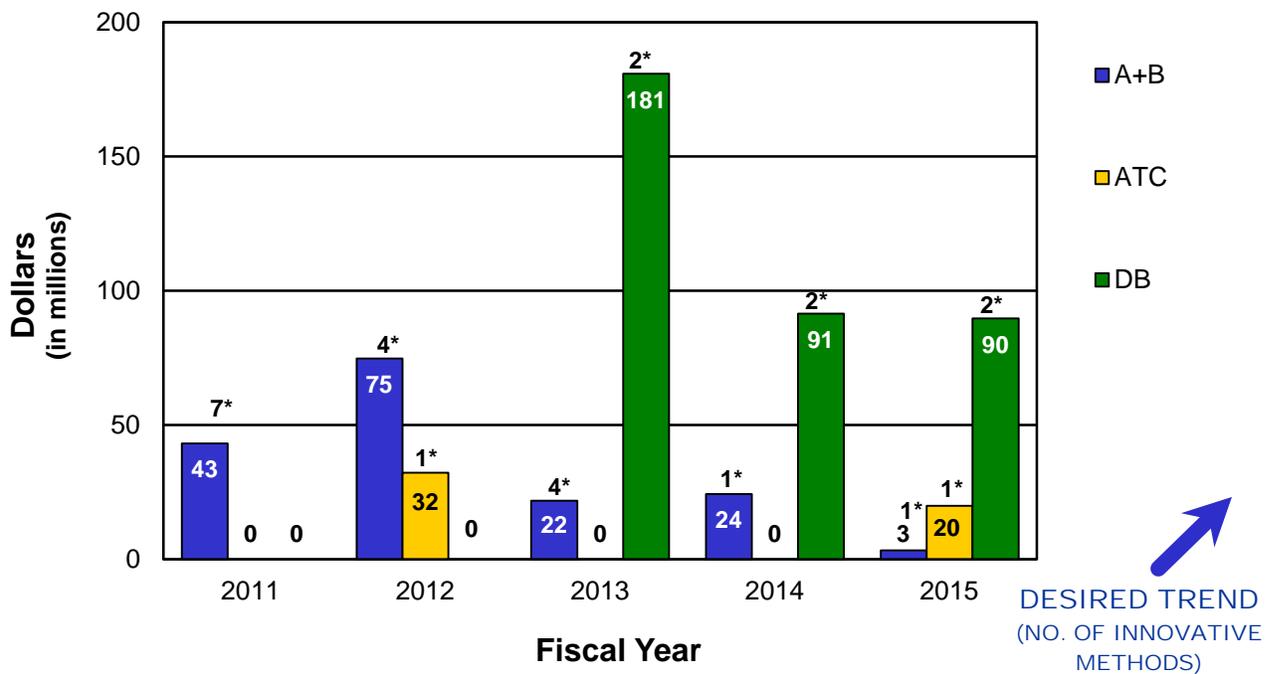
- Cost-plus-time bidding (A + B) aims to expedite project completion through competitive bidding on construction time (days).
- Alternate Technical Concepts (ATCs) give the contractor the opportunity to provide more cost-effective alternative design prior to the bid. ATC discussions are held in a confidential environment which maximizes competitive bidding. The low bid is awarded the contract.
- Design-Build (DB) contracts include design and construction under one contract, which is procured using a two-phased, contractor-selection process. MoDOT scores proposals using a best-value or "build-to-budget" scoring scenario. Nationally, Design-Build projects are completed 33 percent faster and 6 percent cheaper than conventional Design-Bid-Build projects.

In fiscal year 2015, MoDOT delivered four out of 279 projects using innovative contracting methods, with two delivered as Design-Build, one delivered as A + B, and one delivered using the ATC process. The four projects accounted for \$113.2 million of the \$767.77 million program.

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Project Value by Contracting Method



*Reflects total number of projects for each innovative contract method.

RESULT DRIVER:

David Silvester
District Engineer

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Value Engineering – 4e

MEASUREMENT DRIVER:

Llans Taylor
Innovations Engineer

PURPOSE OF THE MEASURE:

This measure tracks the use of value engineering during design and construction on traditional MoDOT projects including: value analysis during the design phase, construction value engineering proposals, and implementation of best practice into standards and policies.

MEASUREMENT AND DATA COLLECTION:

Information on value analysis during design is gathered from MoDOT's Statewide Transportation Improvement Program information management system. Construction value engineering change proposal information is gathered from MoDOT's Value Engineering Change Proposals database. Implementation of best practice progress is tracked by MoDOT staff.

The goal of value engineering is to build the right project at the right time, meeting the project need with appropriate project scope. MoDOT uses the VE program to ensure the public receives great value for every tax dollar invested in Missouri's transportation system. Due to limited funding, MoDOT is increasingly focused on smaller, maintenance-type projects that are not traditionally targeted by the VE program. Still, MoDOT must be innovative in utilizing the VE process to search for solutions to reduce project costs and provide additional value.

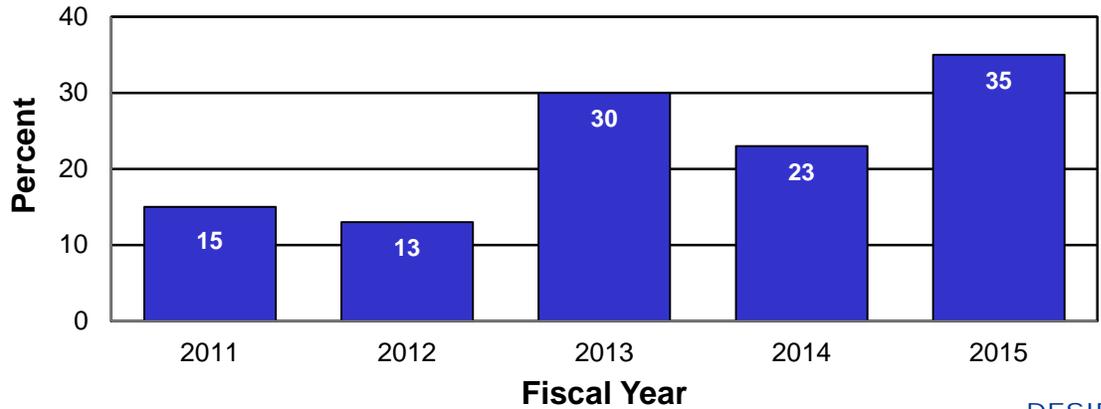
MoDOT uses design-phase value analysis to remove unnecessary scope, reduce project costs and improve project flexibility. For fiscal year 2015, 35 percent of projects underwent some form of value analysis during design. Programmatic value analysis studies associated with the level-course and chip-seal programs accounted for the largest portion of this percentage. In an effort to improve in this area, a self-led practical value analysis tool was distributed to district staff to assist them in considering and documenting their efforts to find alternative solutions within projects on which value analysis would not otherwise occur.

MoDOT partners with industry to find more cost-effective solutions during the construction phase. Value Engineering Change Proposals engage contractor ideas to deliver improved projects. For fiscal year 2015, 31 VE proposals were approved resulting in MoDOT savings of \$1.1 million. This represents a 74 percent approval rate. Outreach continues in an effort to improve in this area and to find innovative approaches to grow this program.

A successful VECP program incorporates approved VECPs into future projects, in order for MoDOT to realize all of the affiliated savings. To date, 202 approved VECPs have been reviewed by a multidisciplinary team resulting in five revisions to policy and 16 potential items still being investigated, with one of these potential items being included in the most recent ballot. The team continues to review approved VECPs for potential implementation and looks for opportunities to implement improved policies.

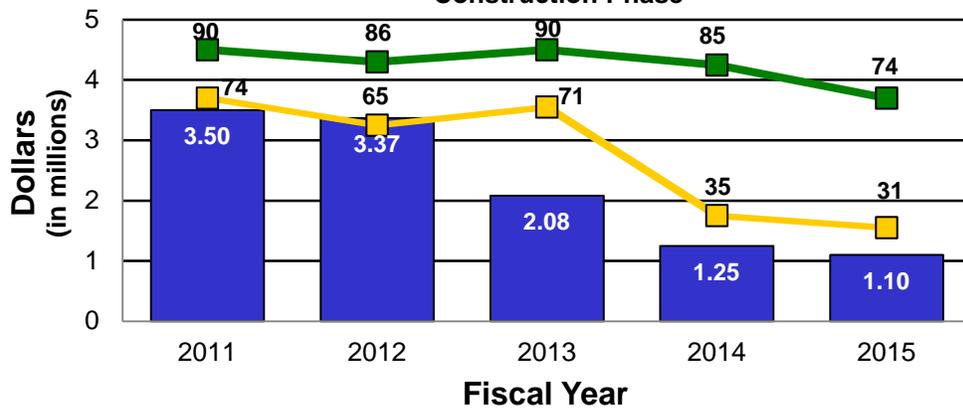
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Percent of Awarded Projects with Value Analysis Design Phase



DESIRED TREND

Value Engineering Change Proposals by Dollar and Number Construction Phase



DESIRED TREND

RESULT DRIVER:

David Silvester
District Engineer

MEASUREMENT DRIVER:

Jason Vanderfelt
Bidding and Contract Services
Engineer

PURPOSE OF THE MEASURE:

This measure tracks the costs to construct a variety of common highway and bridge construction projects including the costs for equipment, labor and fringe benefits and materials to construct a project.

MEASUREMENT AND DATA COLLECTION:

Data is collected from MoDOT bid opening prices. Construction costs for 1992 are used for comparison because that was the year Missouri's fuel tax was increased to the current rate of 17 cents per gallon. Costs for chip seal and minor road one-inch asphalt resurfacing include the pavement, traffic control and temporary pavement marking. Costs for major highway and interstate asphalt resurfacing include the pavement, traffic control, permanent pavement marking, rumble strips, pavement repair, guardrail and signing. New two- and four-lane construction costs include grading, drainage, pavement, bridge and all incidental costs. The average cost per square-foot of bridge is tabulated and applied to the area of the average bridge on the state system to simplify comparison.

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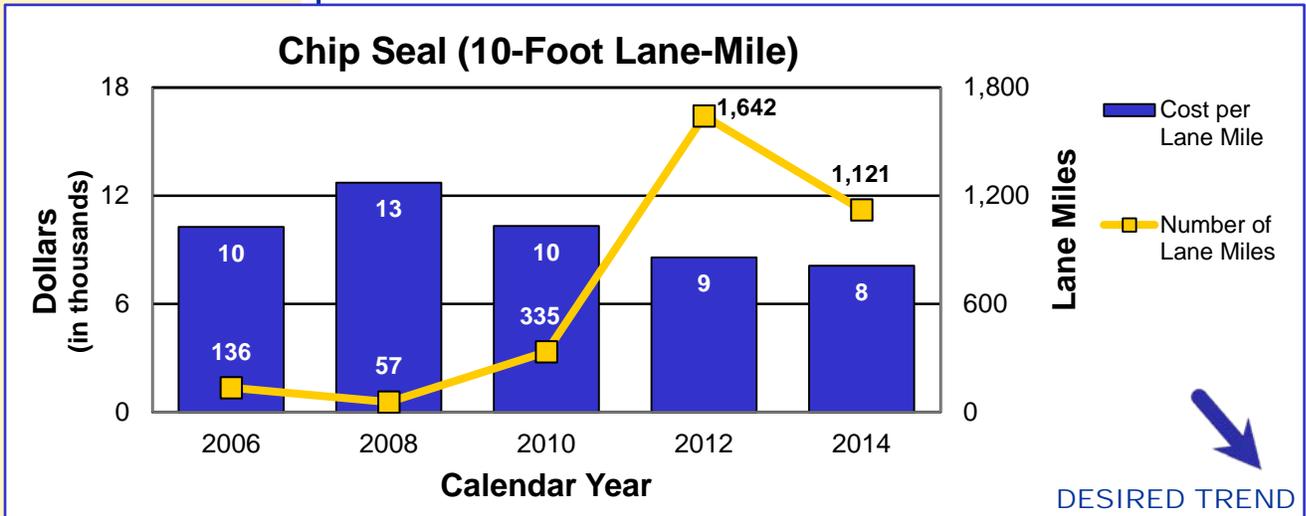
Average highway lane-mile and bridge construction costs – 4f

A great many factors affect the cost of road and bridge projects, some can be managed by MoDOT, and others are affected by the economy. For example, Missouri's highway system has long depended on fuel taxes, but consumers look for ways to decrease their personal transportation costs by driving less and turning to smaller, more fuel-efficient vehicles. Since these vehicles cost less, sales taxes are lower, resulting in lower transportation revenues. Meanwhile, inflation has increased the cost of projects, resulting in reduced purchasing power for MoDOT. Minor road asphalt resurfacing costs have increased in recent years due to a combination of fluctuating fuel and oil prices and increased material costs. Overall, the prices of asphalt, concrete and steel are double or triple what they were 20 years ago.

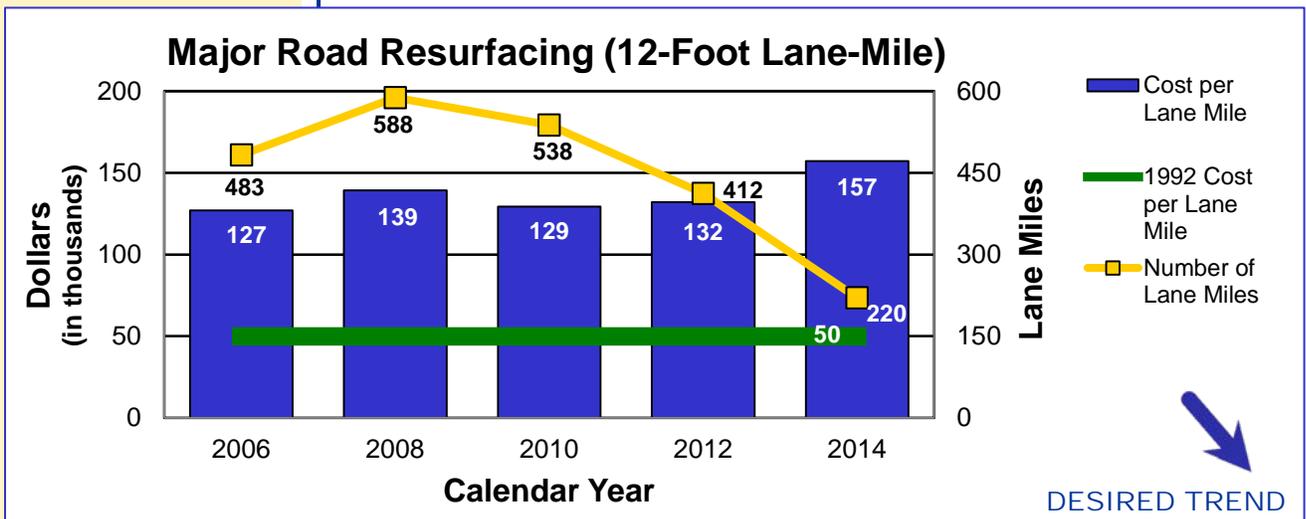
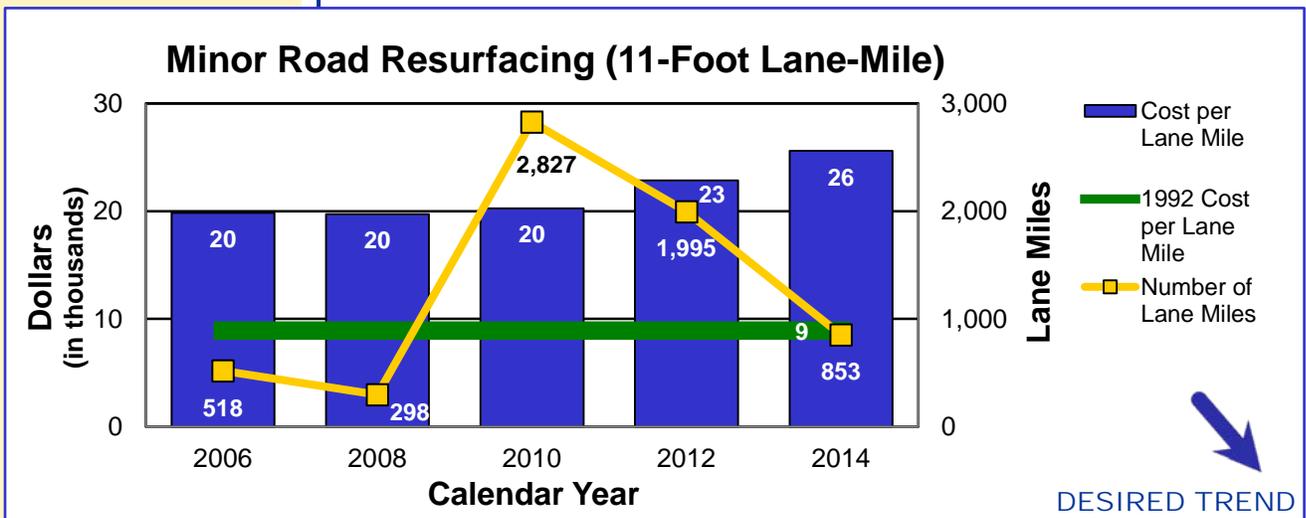
With MoDOT's construction program having dropped from \$1.3 billion in 2009 to \$720 million in fiscal year 2015, few complex two- and four-lane projects have been available for contractors to bid. For the larger, more robust projects, MoDOT continues to partner with industry to allow flexibility and encourage innovation while strategically scheduling bid openings to spread out the amount of work and financial obligation for the bidders. With decreasing revenue and increasing costs, MoDOT is challenged to make improvements to the existing system. MoDOT is being challenged just to maintain the system of roads and bridges Missourians enjoy today.



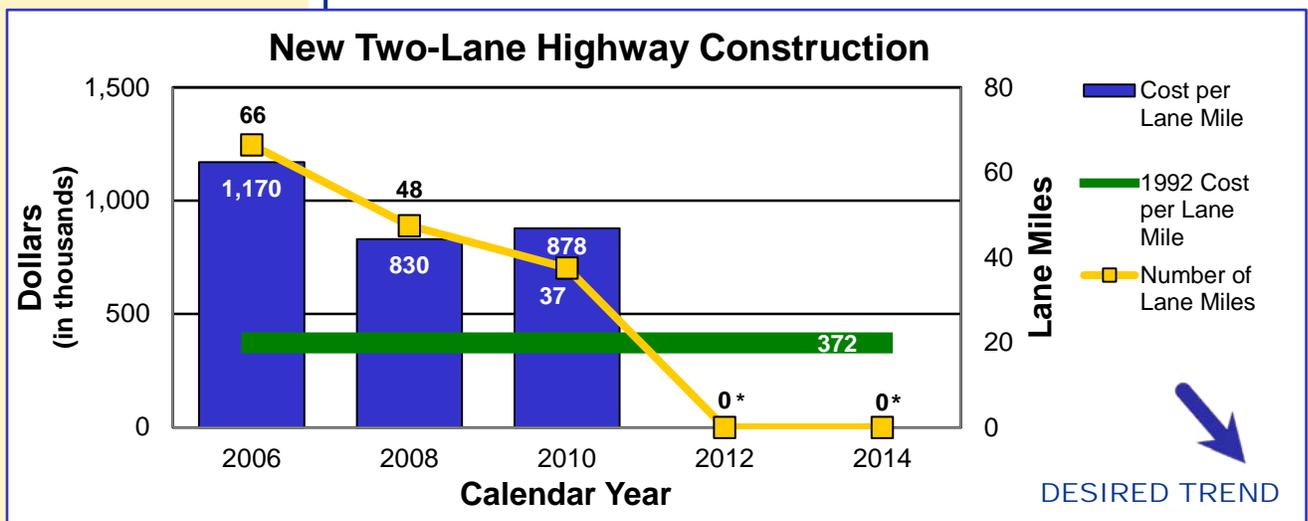
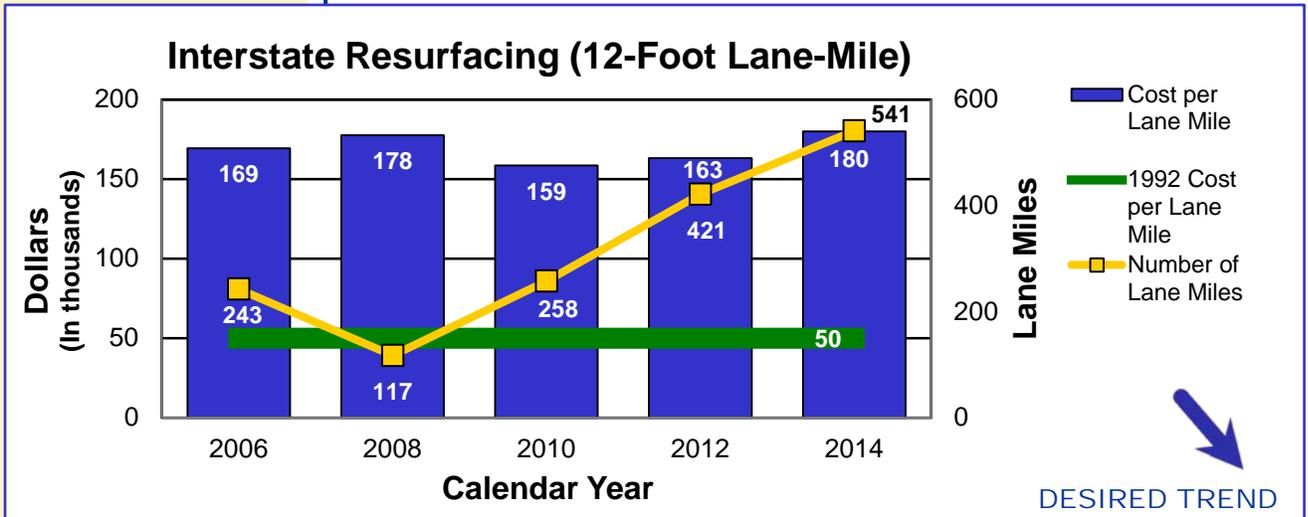
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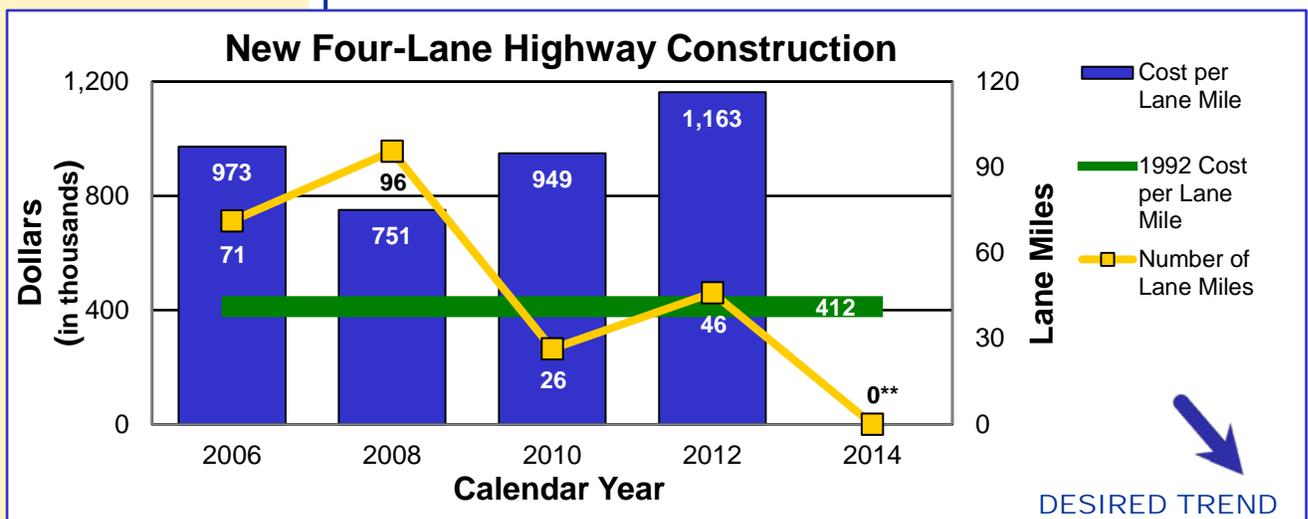
Note: There were no contract chip seal projects in 1992.



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* There were no two-lane projects bid in 2012, 2013 and 2014.



**There were no four-lane projects bid in 2013 and 2014.

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