



# 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

## DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

MEASUREMENT  
DRIVER:  
Renate Wilkinson,  
Planning and Programming  
Engineer

PURPOSE OF  
THE MEASURE:  
This measure determines  
how close total project  
completion costs are to the  
programmed costs. The  
programmed cost is consid-  
ered the project budget.

MEASUREMENT  
AND DATA  
COLLECTION:  
Completed project costs  
are reported during the fis-  
cal year in which a project  
is completed. Road and  
bridge project costs include  
design, right-of-way pur-  
chases, utilities, construc-  
tion, inspection and other  
miscellaneous costs. The  
programmed cost is based  
on the amount included  
in the most recently ap-  
proved Statewide Trans-  
portation Improvement  
Program. Completed costs  
include actual expendi-  
tures. Multimodal and local  
public agency project costs  
typically reflect state and/or  
federal funds, but not local  
funding contributed toward  
such projects.

### 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 June 30, 2015, 349 road and bridge projects were completed in fiscal year 2015 at a cost of \$1.4565 billion. This represents a deviation of 5.56 percent (or \$85.7 million) less than the programmed cost of \$1.5422 billion. Of the 349 road and bridge projects completed, 61 percent were completed within or below budget. In comparison, 69 percent of projects were completed with-



in or below budget as of the same date a year ago. The largest component of project savings comes from engineering, at \$42 million. Miscellaneous savings (right-of-way purchases, utilities and other costs) were \$23 million. Award savings were \$34 million. Construction-phase overruns were \$13 million. The final fiscal year 2015 value will be

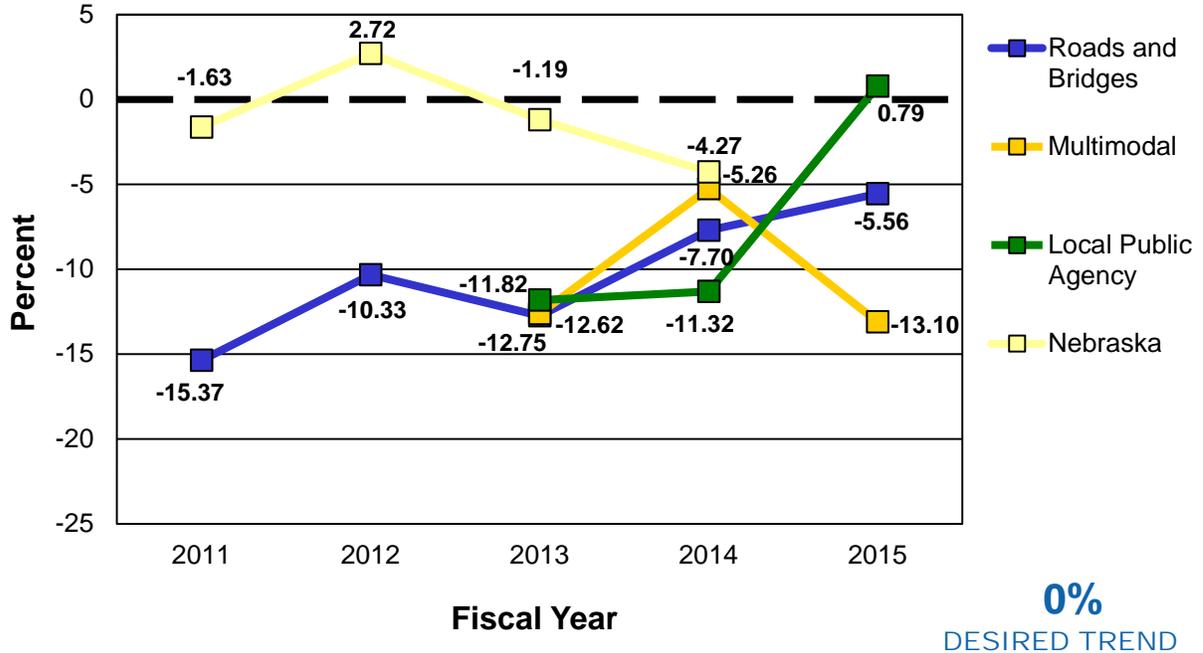
presented in the next Tracker. There may be projects that have adjustments pending, which could cause a slight change in the final values.

In addition, 127 multimodal projects were completed for a cost of \$38.865 million, -13.10 percent or \$5.868 million less than the programmed cost of \$44.723 million. A total of 130 local public agency projects were completed for a cost of \$76.195 million, 0.79 percent or \$0.599 million more than the programmed cost of \$75.596 million.

MoDOT uses this historical data as a guide for programming future projects. In FY 2014, MoDOT added 10 percent of available funding for highway and bridge construction awards, or \$68.5 million worth of projects, in anticipation of award savings. However, awards for FY 2014 were 1 percent higher than programmed. Consequently, the 2015-2019 and 2016-2020 STIPs were developed assuming no award savings. Projects awarded in FY 2015 were -2.1 percent or \$16 million less than programmed values.

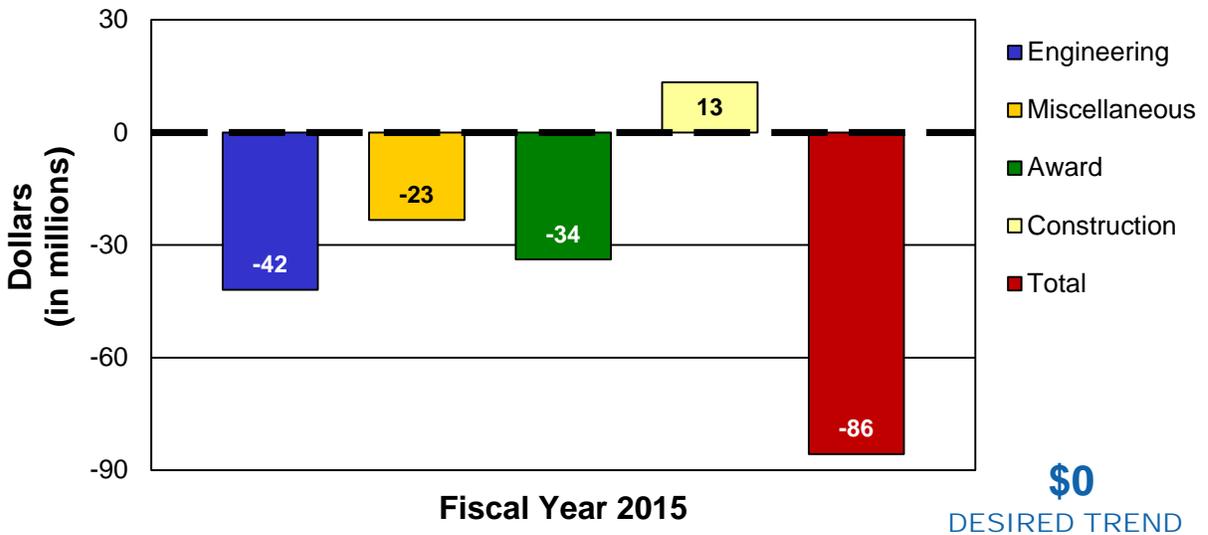
# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

### Percent of Programmed Project Cost as Compared to Final Project Cost



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.

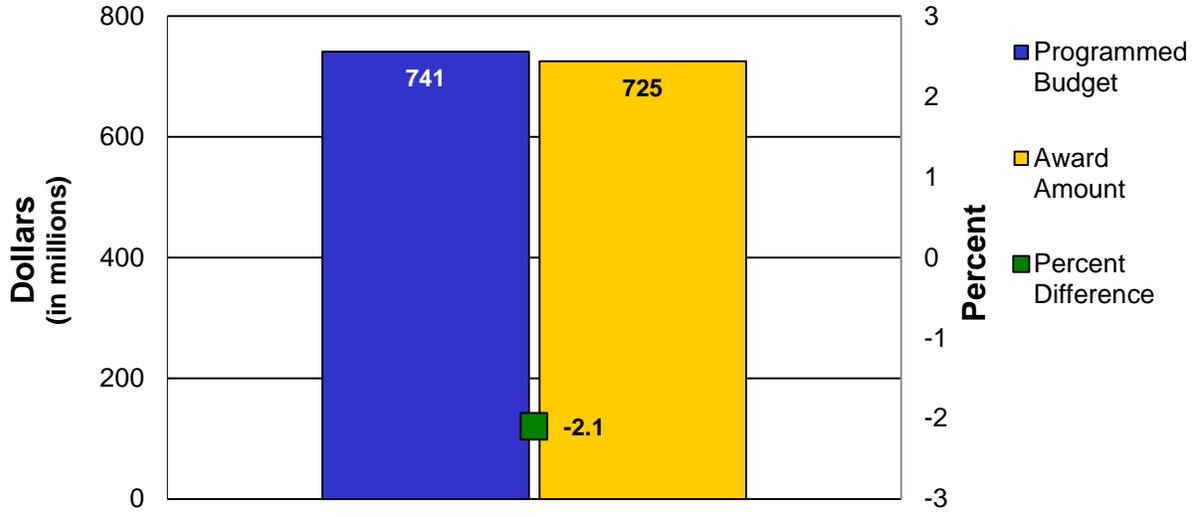
### Final Project Cost Differences by Phase STIP Road and Bridge Projects Only



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

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## Difference in Program vs Award STIP Road and Bridge Projects Only



**0%**  
DESIRED TREND

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

**RESULT DRIVER:**  
David Silvester,  
District Engineer

# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

**MEASUREMENT DRIVER:**  
Jay Bestgen, Assistant State 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.

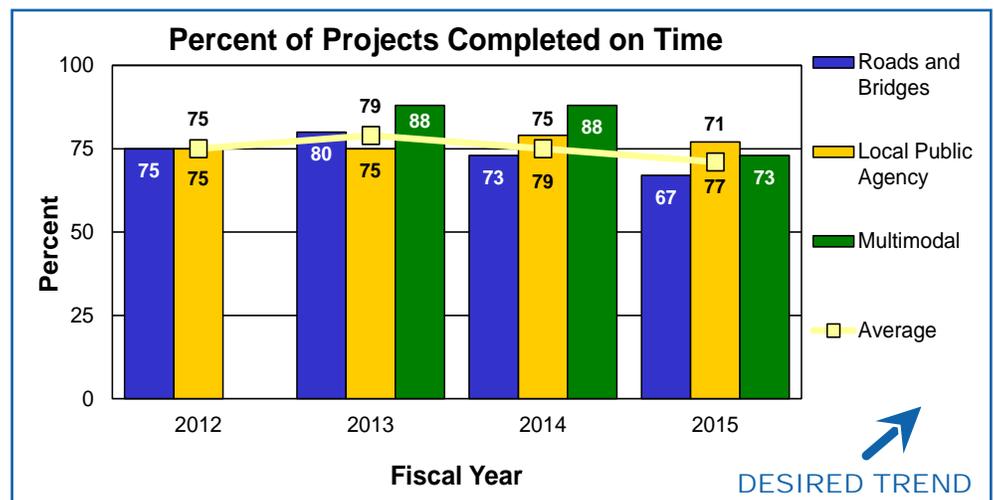
## Percent of projects completed on time-4b

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. In fiscal year 2015, 72 percent of the projects were completed on or ahead of schedule.

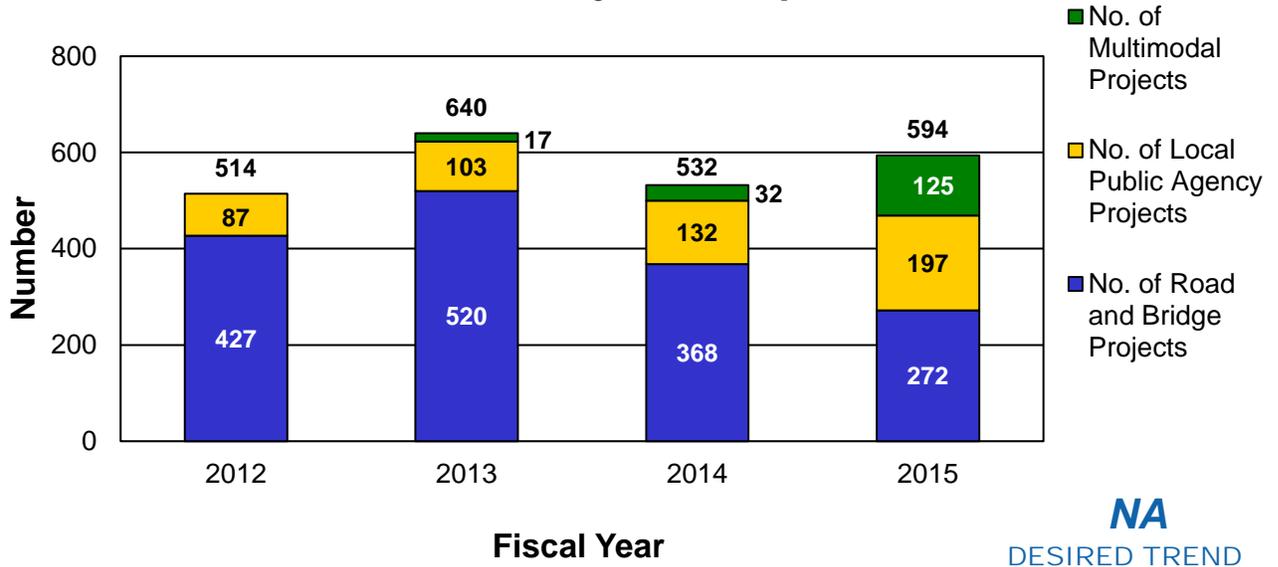
MoDOT works to meet the original completion date by:

- Preparing accurate plans and quantities,
- Setting aggressive, but reasonable completion dates,
- Setting liquidated damages that reinforce completion date without undue bid risks,
- Discussing potential completion times with industry before letting
- Negotiating with contractor to maintain schedule.

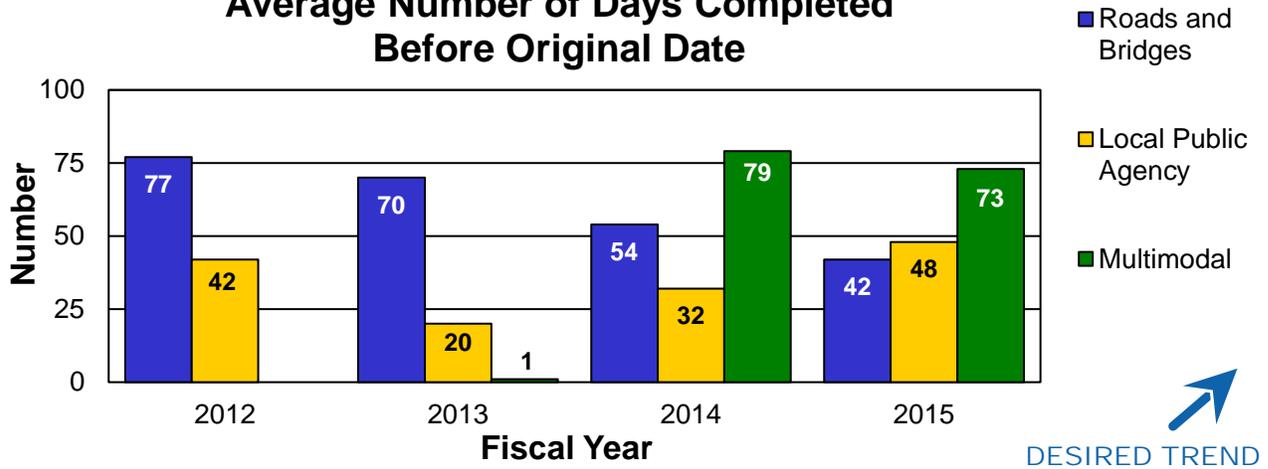


# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

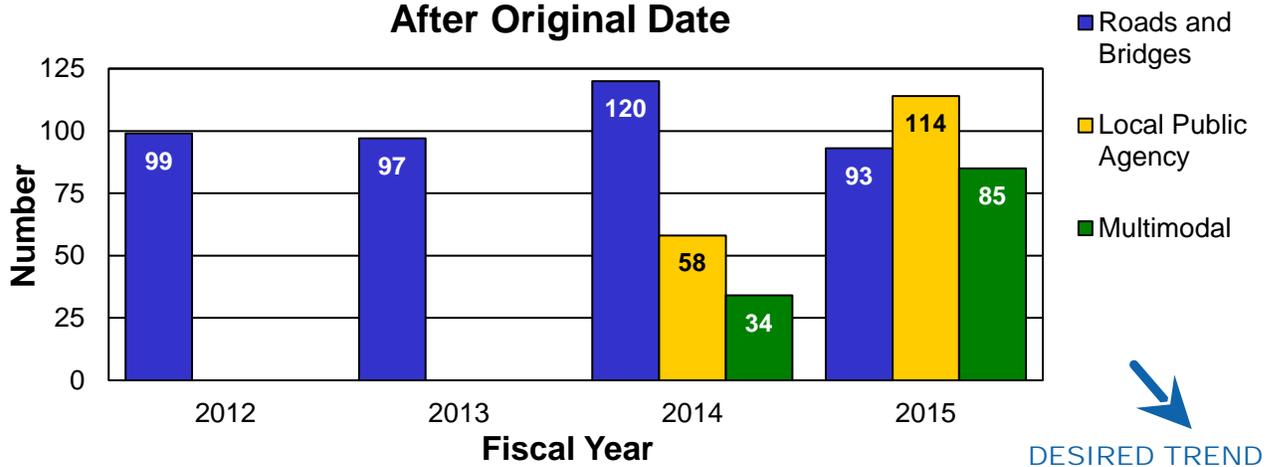
## Total Number of Projects Completed



## Average Number of Days Completed Before Original Date



## Average Number of Days Completed After Original Date



**RESULT DRIVER:**  
David Silvester,  
District Engineer

# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

**MEASUREMENT DRIVER:**

Jeremy Kampeter,  
Construction Management  
Systems Administrator

**PURPOSE OF THE MEASURE:**

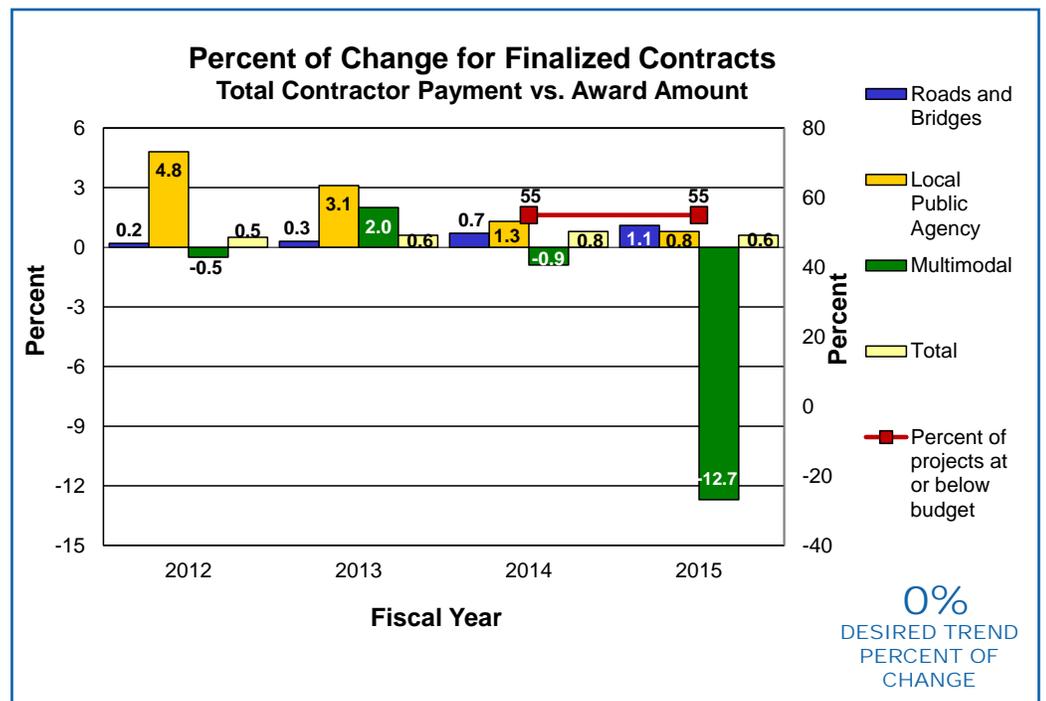
This measure tracks the percentage difference of total construction payouts to the original contract award amounts. This indicates how many changes are made on projects after they are awarded to the contractor. This measure evaluates road, bridge, local public agency and multimodal projects – rail, aviation,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

## Percent of change for finalized contracts-4c

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 constructing 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 2015 was 0.6 percent (\$892 million worth of projects completed \$5.7 million over the award amount). Many factors can affect the ability to complete a project within 2 percent of the award amount.



RESULT DRIVER:  
David Silvester,  
District Engineer

## DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

MEASUREMENT  
DRIVER:  
David Simmons,  
Transportation  
Project Manager

PURPOSE OF  
THE MEASURE:  
This measure tracks the  
use of innovative contract-  
ing methods on MoDOT  
projects including:  
■ A + B Contracts,  
■ Alternate Technical  
Concepts, and  
■ Design-Build Contracts

MEASUREMENT  
AND DATA  
COLLECTION:  
MoDOT projects utilizing in-  
novative contracting meth-  
ods are reported during the  
fiscal year in which they are  
awarded. Contract award  
values are collected through  
MoDOT's bid opening sum-  
maries and project records.

### *Innovative contracting methods-4d*

With the forecast of rapidly declining 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 declining 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. The end of fiscal year 2015 represents the end of the large-scale, system improvement projects MoDOT has delivered due to decreasing transportation funding.

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:

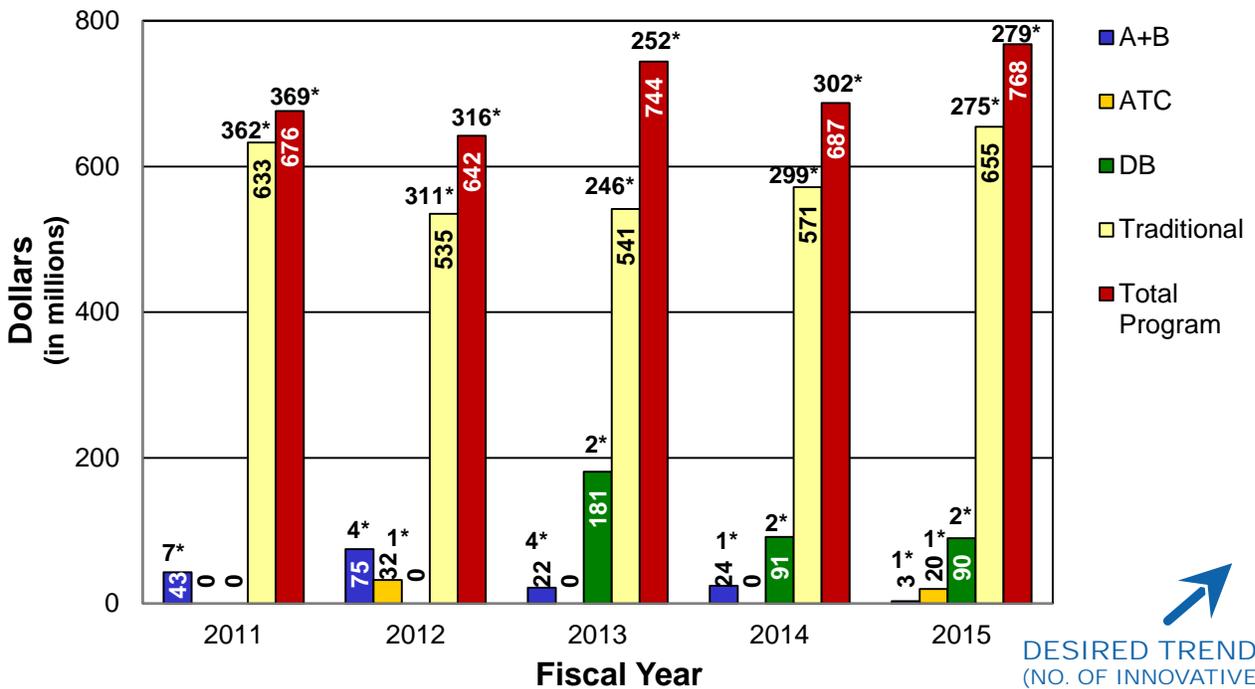
- Cost-plus-time bidding (A + B) aims to expedite project completion through competitive bidding on construction time (days).
- Alternate Technical Concepts (ATCs) give the contractor the opportunity to provide more cost-effective alternative design prior to the bid. ATC discussions are held in a confidential 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.

# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE



### Project Value by Contracting Method



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

RESULT DRIVER:  
Dave Silvester,  
District Engineer

# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

MEASUREMENT  
DRIVER:  
Llans Taylor,  
Innovations Engineer

PURPOSE OF  
THE MEASURE:  
This measure tracks the  
use of value engineering  
during design and construc-  
tion on traditional MoDOT  
projects including:  
■ Value analysis during the  
design phase, and  
■ Construction value en-  
gineering proposals during  
the construction phase.  
■ Implementation of best  
practice into our standards  
and policies.

MEASUREMENT  
AND DATA  
COLLECTION:  
Information on value  
analysis during design is  
gathered from MoDOTs  
Statewide Transportation  
Improvement Program  
information management  
system. Construction value  
engineering change propos-  
al information is gathered  
from MoDOTs Value Engi-  
neering Change Proposals  
database. Implementation  
of best practice progress is  
tracked by MoDOT staff.

## Value Engineering-4e

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 decreasing 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.

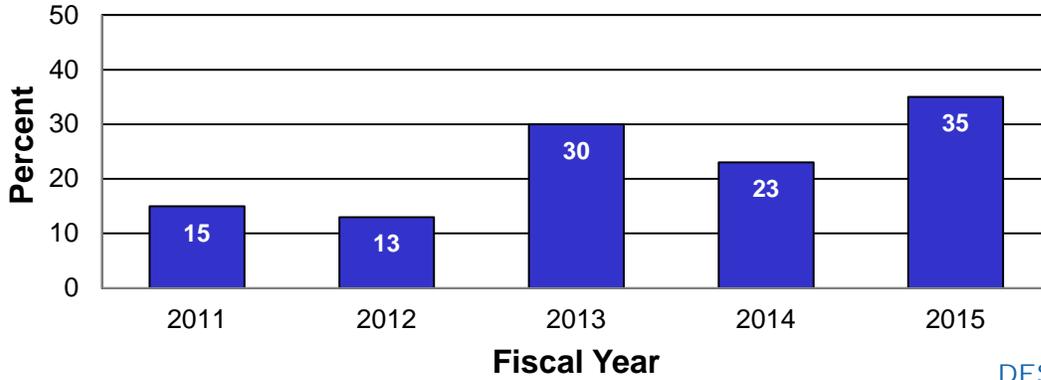
MoDOT uses design-phase value analysis to remove unnecessary scope, reduce project costs and improve project flexibility. For fiscal year 2015, 35 percent of projects underwent some form of value analysis during design. Programmatic value analysis studies associated with the level-course and chip-seal 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 approval percentage. 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.

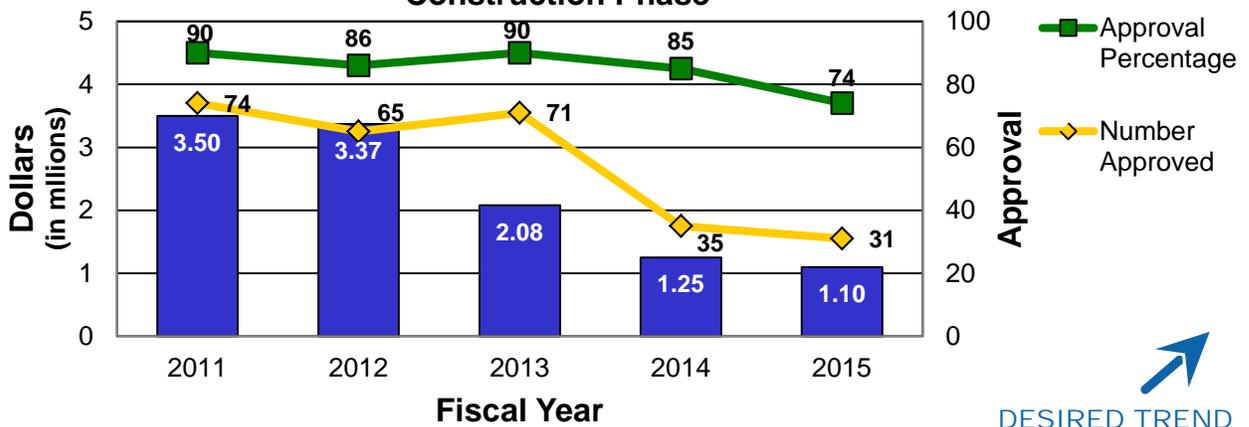
# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

## Percent of Awarded Projects with Value Analysis Design Phase



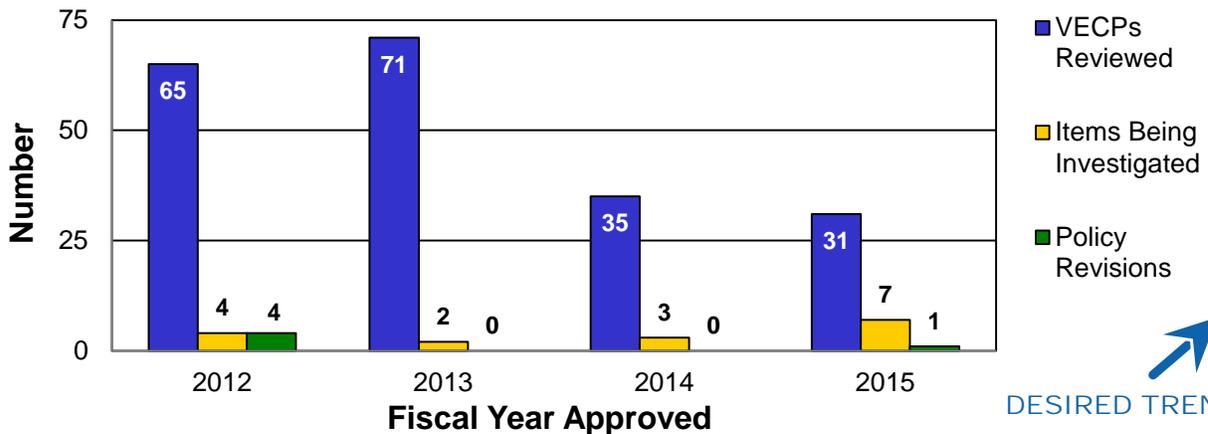
DESIRED TREND

## Value Engineering Change Proposals by Dollar and Number Construction Phase



DESIRED TREND

## Value Engineering Changes Implemented as Best Practice



DESIRED TREND

RESULT DRIVER:  
David Silvester,  
District Engineer

## DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

MEASUREMENT  
DRIVER:  
Jason Vanderfeltz,  
Bidding and Contract  
Services Engineer

PURPOSE OF  
THE MEASURE:  
This measure tracks the  
costs to construct a variety  
of common highway and  
bridge construction proj-  
ects 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 gal-  
lon. 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 aver-  
age cost per square-foot  
of bridge is tabulated and  
applied to the area of the  
average bridge on the state  
system to simplify compar-  
ison.

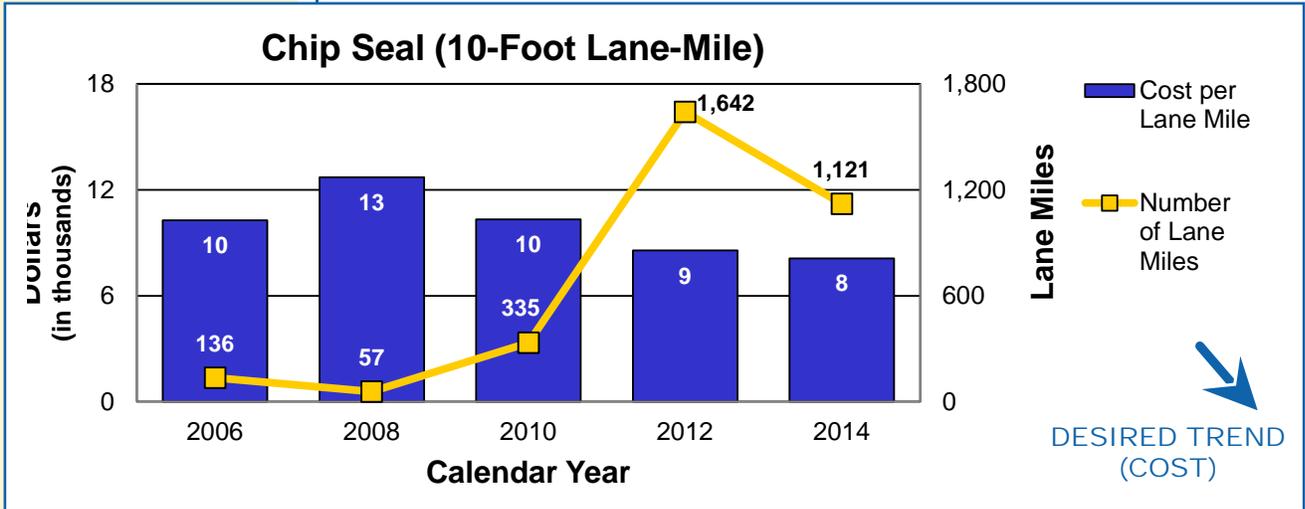
### *Average highway lane-mile and bridge construction costs-4f*

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.

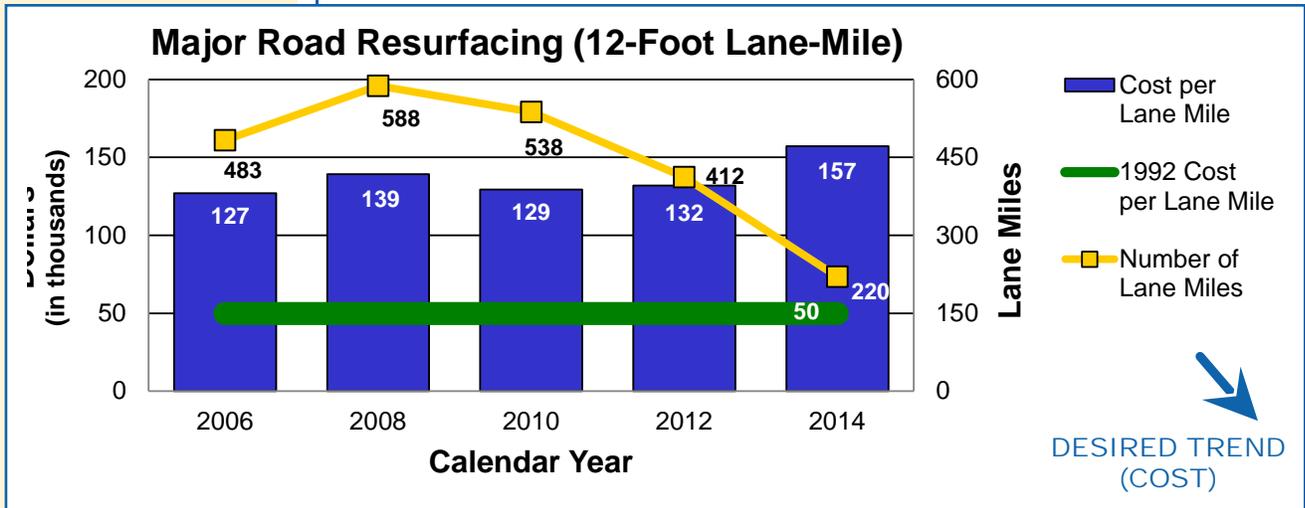
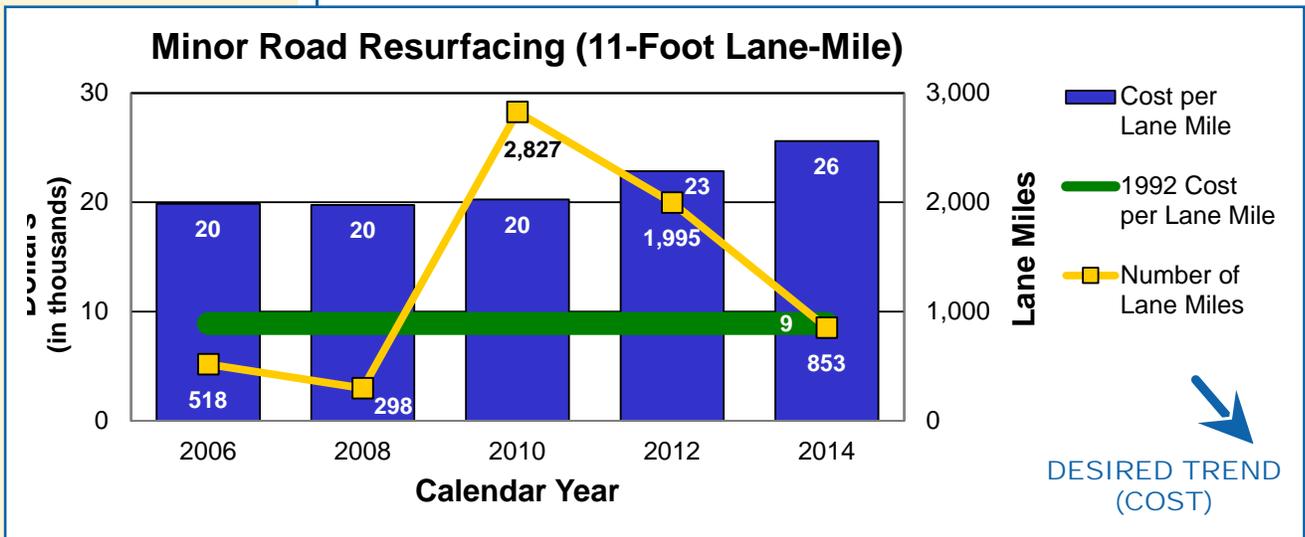
With MoDOT's construction program having dropped from \$1.3 billion in 2009 to \$720 million in fiscal year 2015, few complex two- and four-lane projects have been available for contractors to bid. For the larger, more robust projects, MoDOT continues to partner with industry to allow flexibility and 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.



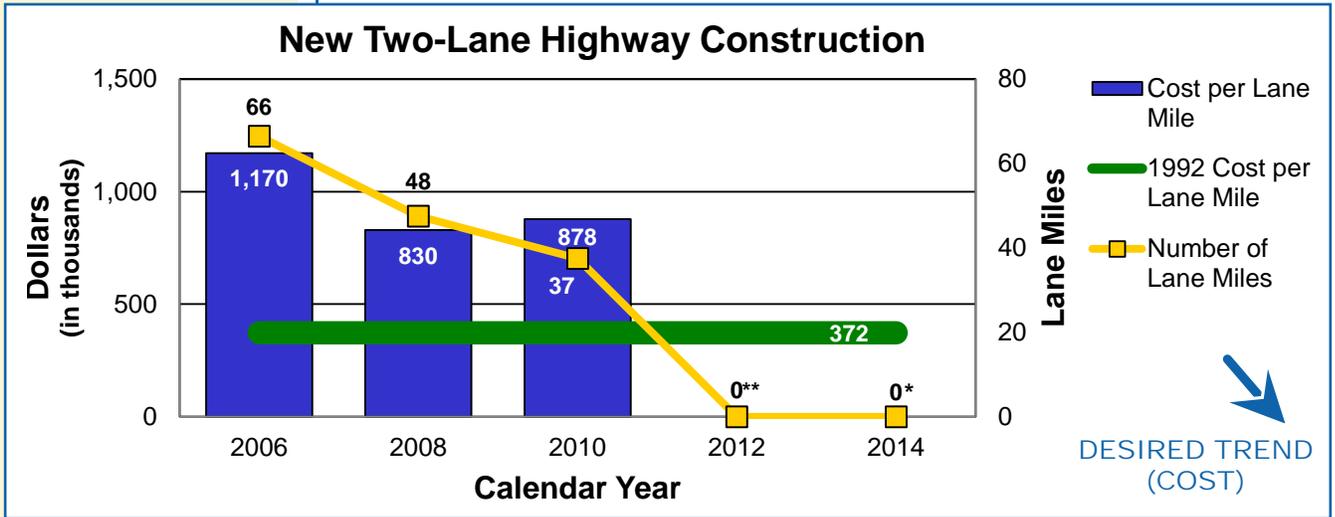
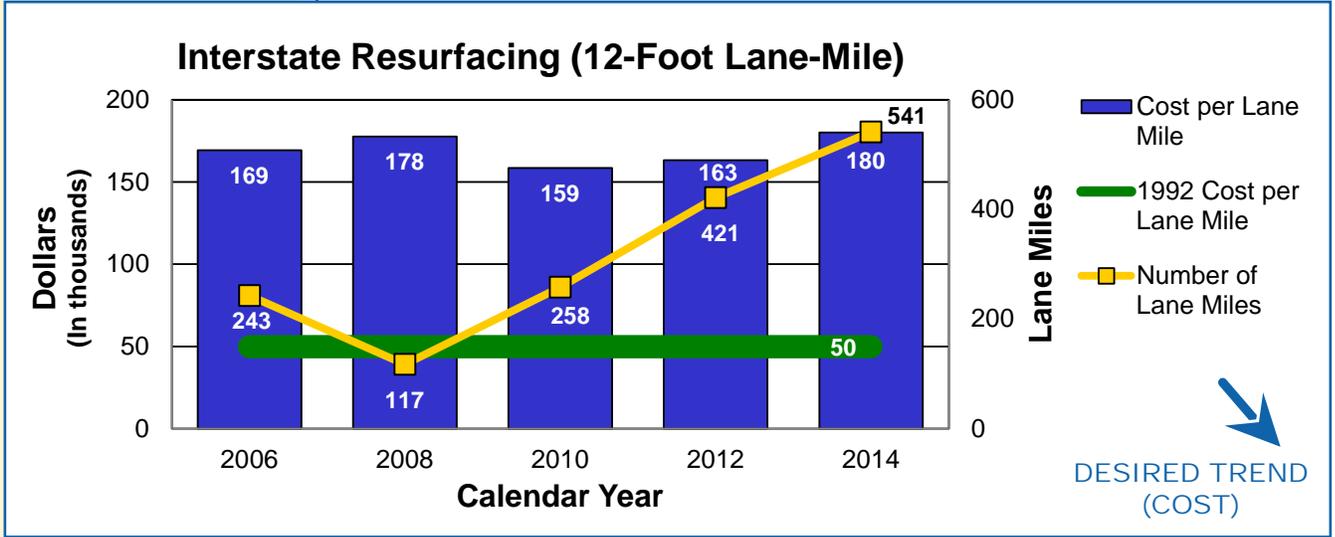
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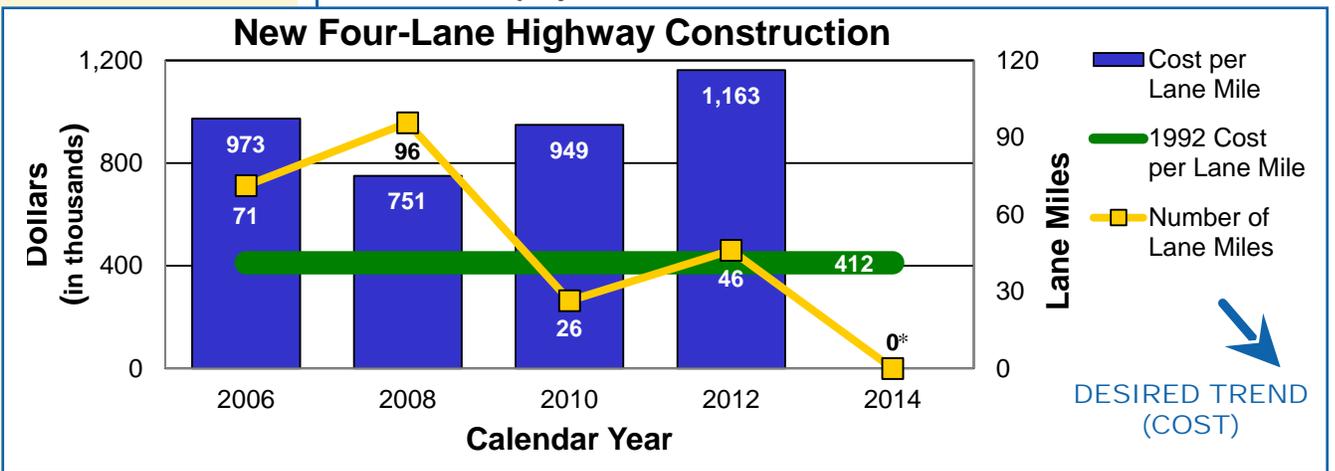
Note: No contract chip seal projects in 1992.



# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE



\*\* No two-lane projects bid in 2012, 2013, and 2014.



\*\*\* No four-lane projects bid in 2013 and 2014.

# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

