



# 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:  
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.

## DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

### *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, 2014, 69 road and bridge projects were completed in fiscal year 2015 at a cost of \$403 million. This represents a deviation of 4.87 percent or \$19 million greater than the programmed cost of \$384 million. Of the 69 road and bridge projects completed, 62 percent were completed within or below budget. In comparison, 76 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 engineering, at 108 percent. Miscellaneous savings (right of way, utilities and other costs) represent 44 percent. Award-phase deficits were 179 percent, and construction phase deficits were 74 percent.

In addition, 22 multimodal projects were completed for a cost of \$11.18 million, -11.42 percent or \$1.44 million less than the programmed cost of \$12.62 million. A total of 33 local public agency projects were completed



for a cost of \$16.43 million, -3.84 percent or \$-0.66 million less than the programmed cost of \$17.08 million.

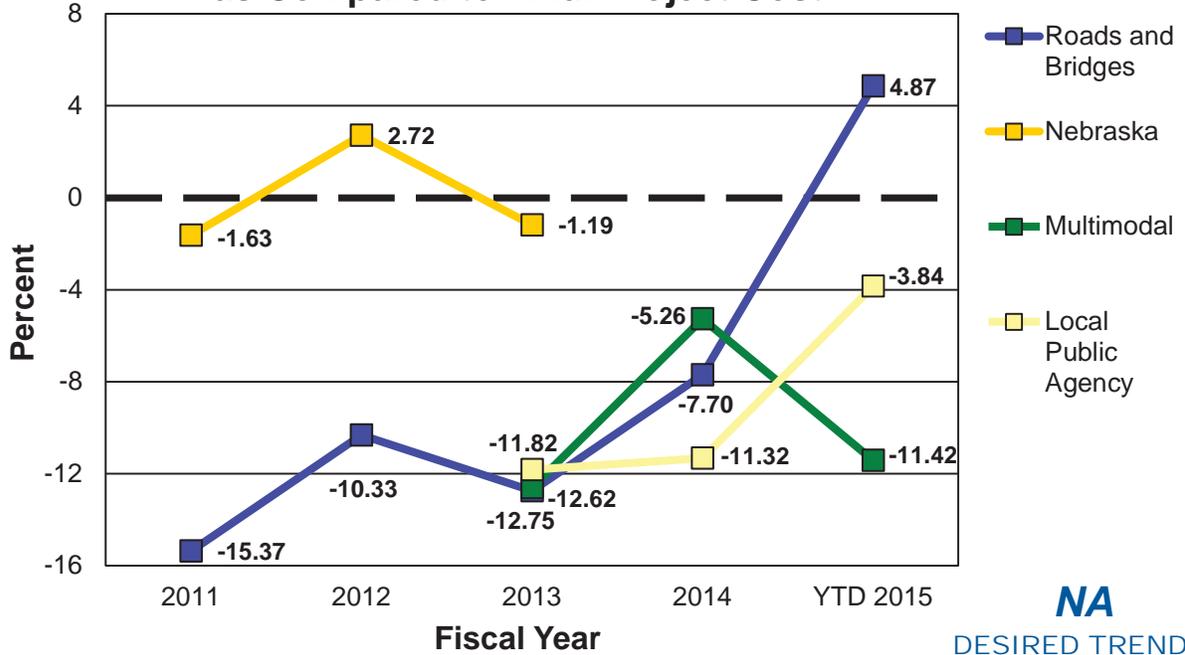
For fiscal year 2014, the revised value is 412 road and bridge projects completed at a cost of \$1.593 billion. This represents a deviation of -7.70 percent or \$133 million

less than the estimated cost of \$1.726 billion. The local public agency final project cost for fiscal year 2014 is \$71.98 million. This represents a deviation of -11.32 percent or \$9 million less than the programmed cost of \$81.17 million. These numbers have been revised slightly since July based on projects that had pending adjustments.

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 STIP was developed assuming no award savings.

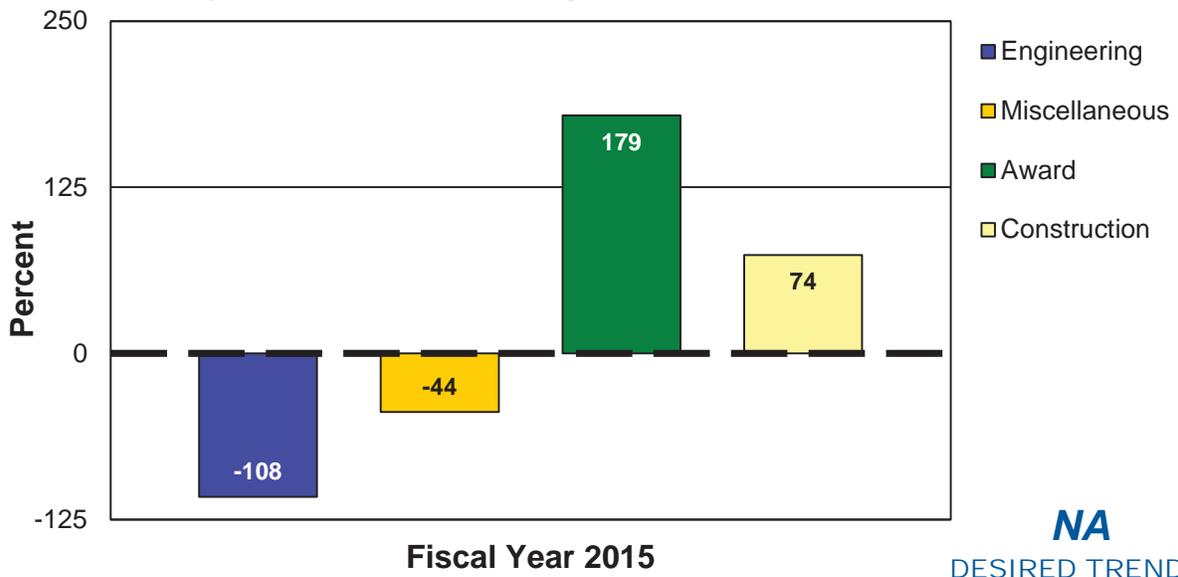
# DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

## 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.

## Composition of Final Project Cost Differences



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

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 engineers use 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 this 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.

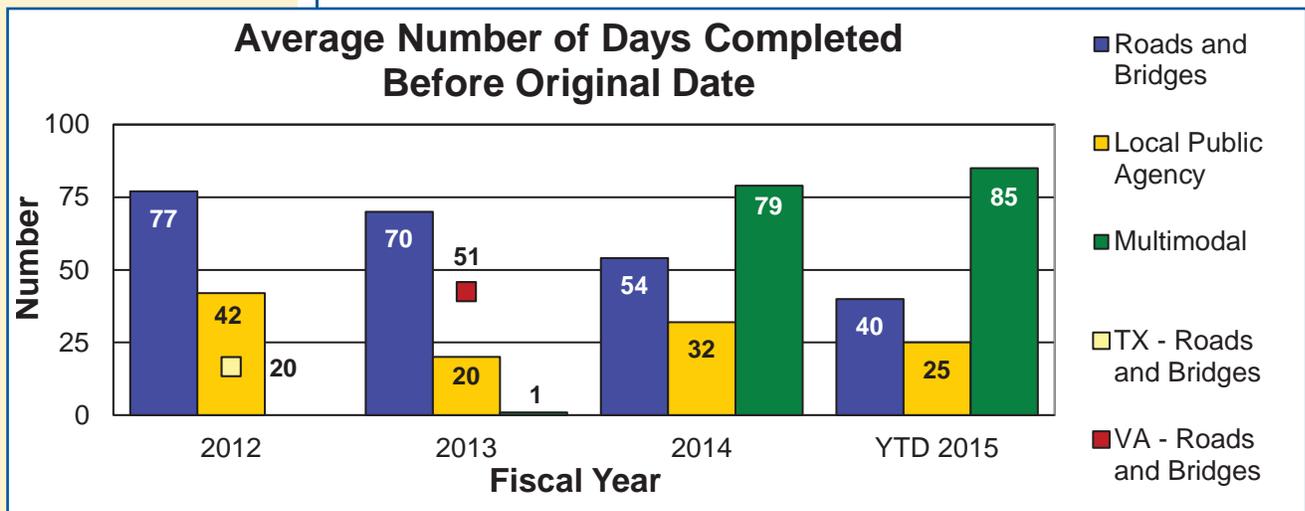
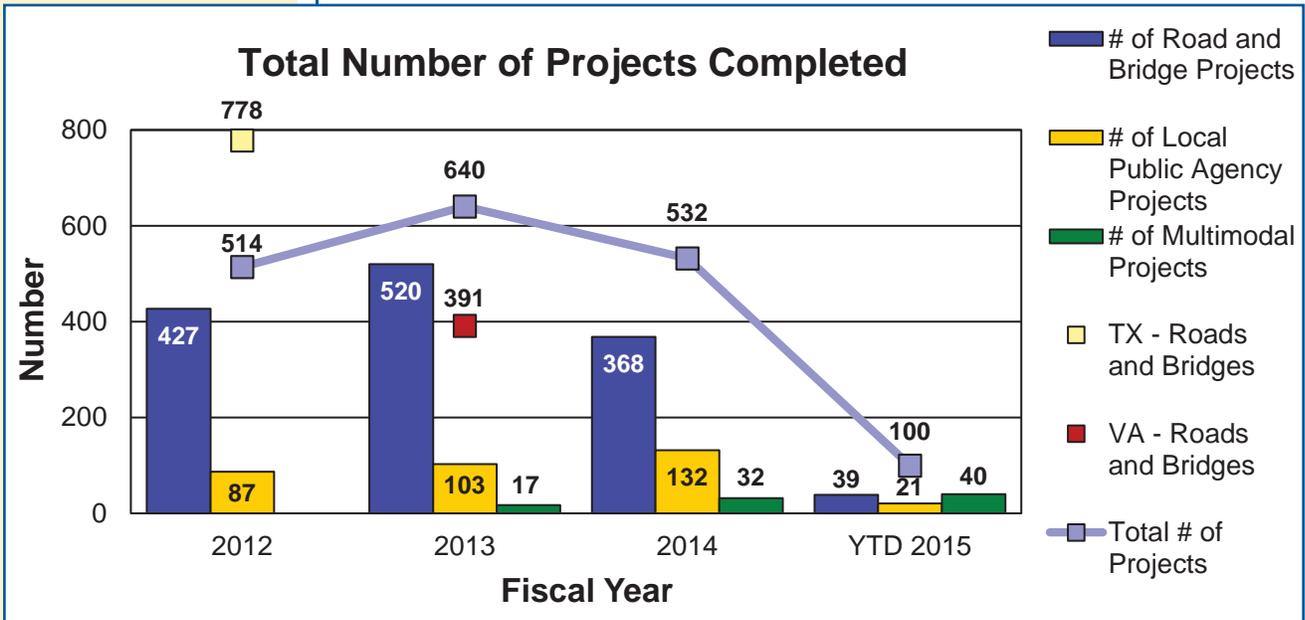
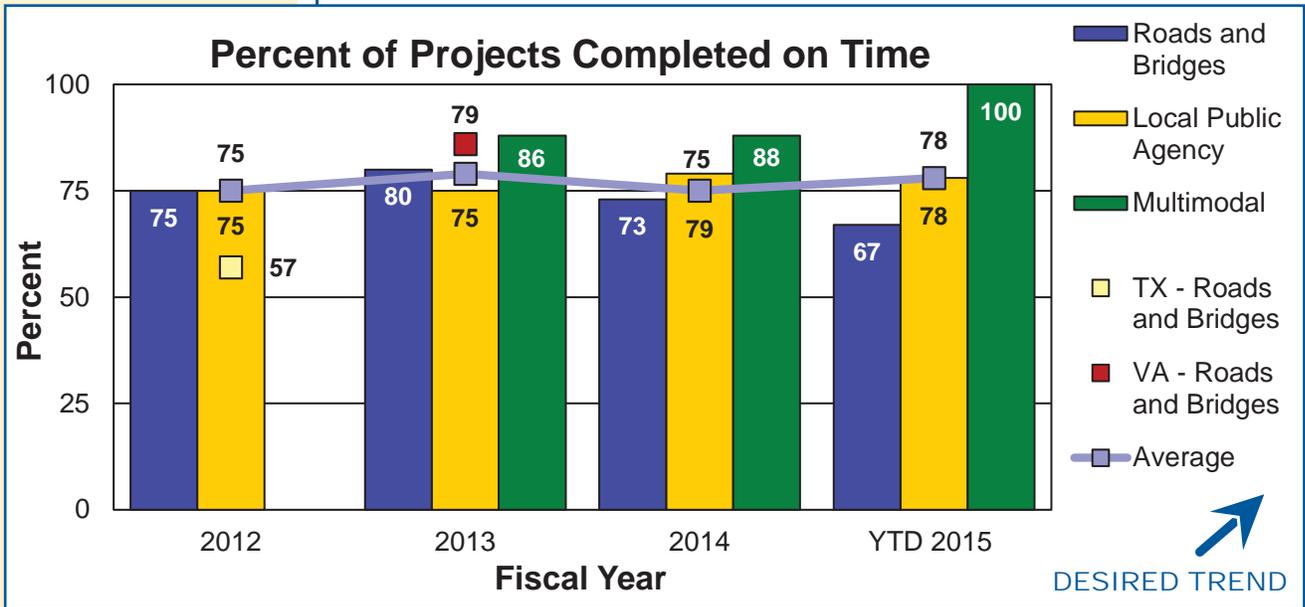
Sometimes, unusual weather or additional contract work necessitates an extension of the completion date. There are also times when a contractor misses the project completion date. In the first quarter of fiscal year 2015, 78 percent of the projects were completed on or ahead of schedule.

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 setting, and
- Negotiating with contractor to maintain schedule.



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

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**MEASUREMENT DRIVER:**

Jeremy Kampeter,  
Construction Management  
Systems Administrator

**PURPOSE OF THE MEASURE:**

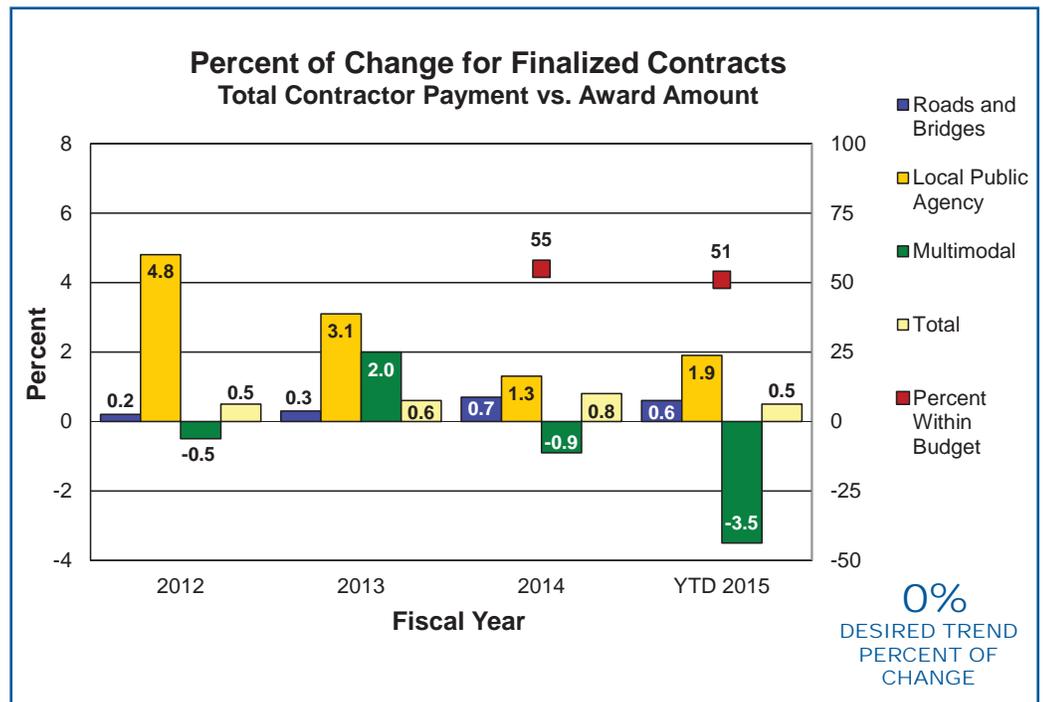
This measure tracks the percentage difference of total construction payouts to the original contract award amounts. This indicates how many changes are made on projects after they are awarded to the contractor. This measure evaluates road, bridge, local public agency and multimodal projects – rail, aviation, 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 commitments. Decreasing transportation funding coupled with the increasing 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 the first quarter of fiscal year 2015 was 0.5 percent (\$105 million worth of projects completed \$500,000 over the award amount). Many factors can affect the ability to complete a project within two percent of the award amount.



RESULT DRIVER:  
David Silvester,  
District Engineer

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MEASUREMENT  
DRIVER:  
Angela Fuerst,  
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*

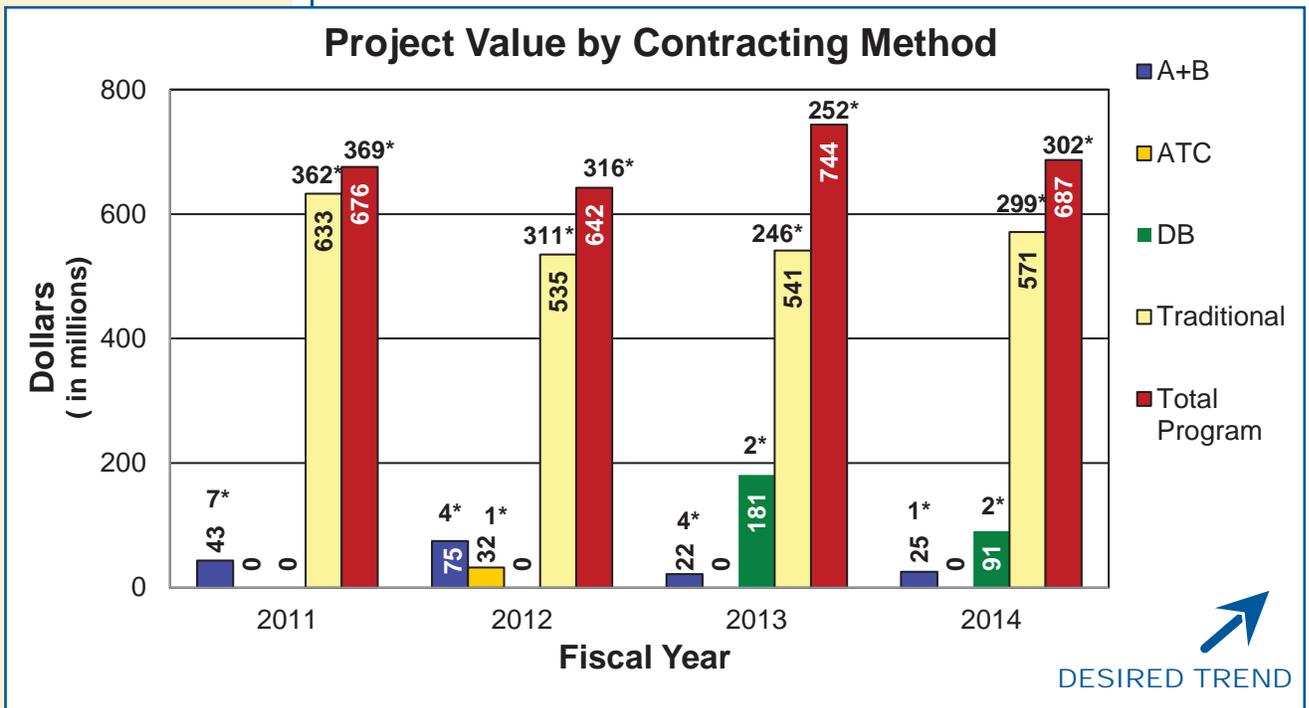
With decreasing transportation funding and increasing costs, MoDOT looks to implement non-traditional methods and practices in contract procurements to improve efficiency, increase flexibility and maximize value for its customers. By promoting the use of innovative contracting tools, MoDOT is better able to mitigate declining resources and meet each project's unique challenges and to provide the best-value solution to the needs being addressed. MoDOT uses innovative contracting to ensure the public receives full value for every tax dollar invested in Missouri's transportation system. However, dwindling resources will result in a dramatic reduction in the number of large-scale, system-improvement projects MoDOT can afford. Even with innovative contracting techniques, MoDOT will be challenged to simply maintain the current system.

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 an alternate more-cost-effective 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 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 2014, MoDOT delivered three out of 302 projects using innovative contracting methods, with two being delivered as Design-Build and one being delivered as A + B. The three projects accounted for \$115 million of the \$687 million program.

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

RESULT DRIVER:  
Dave Silvester,  
District Engineer

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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 analy-  
sis during design is gath-  
ered from MoDOT's STIP  
information management  
system. Construction value  
engineering change pro-  
posal information is gath-  
ered from MoDOT's VECP  
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.

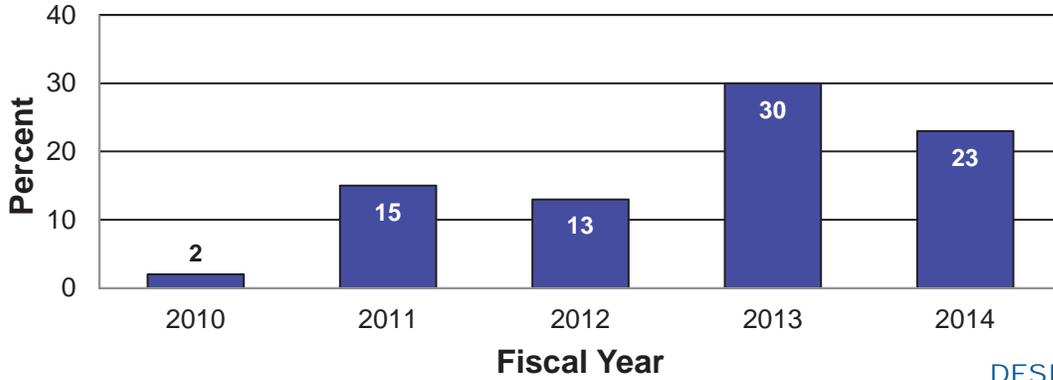
MoDOT uses design-phase value analysis to remove unnecessary scope, reduce project costs and to improve project flexibility. Value analysis includes specific, targeted processes aimed to improve the project value, including the formal VE program studies. Tracking progress toward the goal of evaluating all projects for value allows MoDOT to accurately gauge its performance. For FY 2014, 23 percent of projects underwent some form of value analysis during design. Recognizing a performance gap, efforts are being made to look for opportunities to expand coverage and develop new tools.

MoDOT partners with industry to find more cost-effective methods to accomplish proposed project work. During the construction phase, the VECP process encourages contractors to submit proposals to deliver improved projects. After award of a project, contractor proposals are considered. If accepted, contractors receive up to a maximum of 50 percent of the savings. For FY 2014, 39 VE proposals were approved resulting in MoDOT savings of \$1,360,000. Outreach and partnering opportunities were identified as tools to improve upon the recent trend. A pamphlet about the program was developed and distributed to MoDOT's contracting partners.

A successful VECP program incorporates approved VECPs into future projects, so MoDOT can realize all of the affiliated savings. A multi-disciplinary team reviews approved VECPs in order to integrate the approved concepts into engineering policies, standards and specifications. Starting with fiscal years 2012 and 2013, the team considered each approved VECP to determine if there was an opportunity to improve the way MoDOT does business. To date, 134 approved VECPs have been reviewed with two changes implemented and 30 potential revisions being investigated. Approved VECPs from 2014 and future years will be considered on a biannual basis.

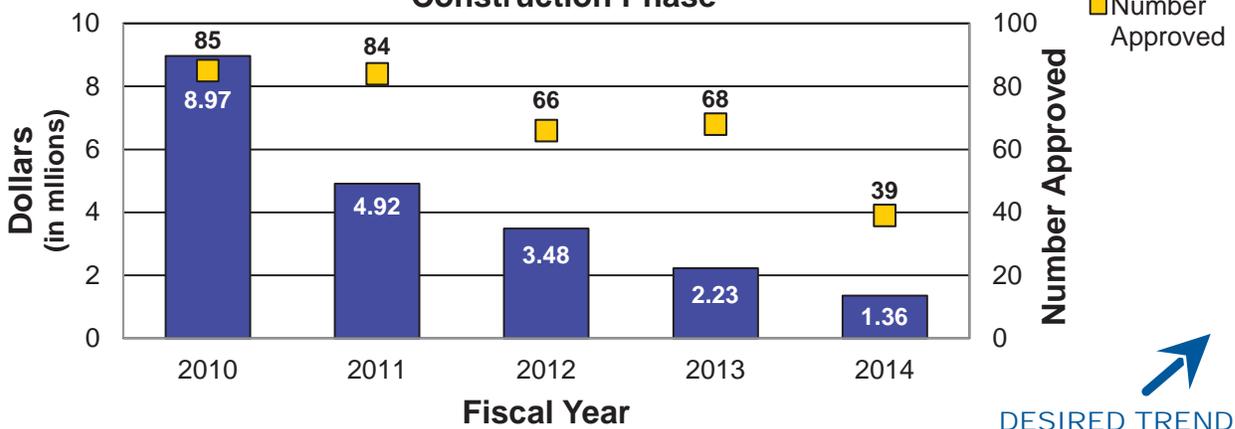
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## Percent of Awarded Projects with Value Analysis Design Phase



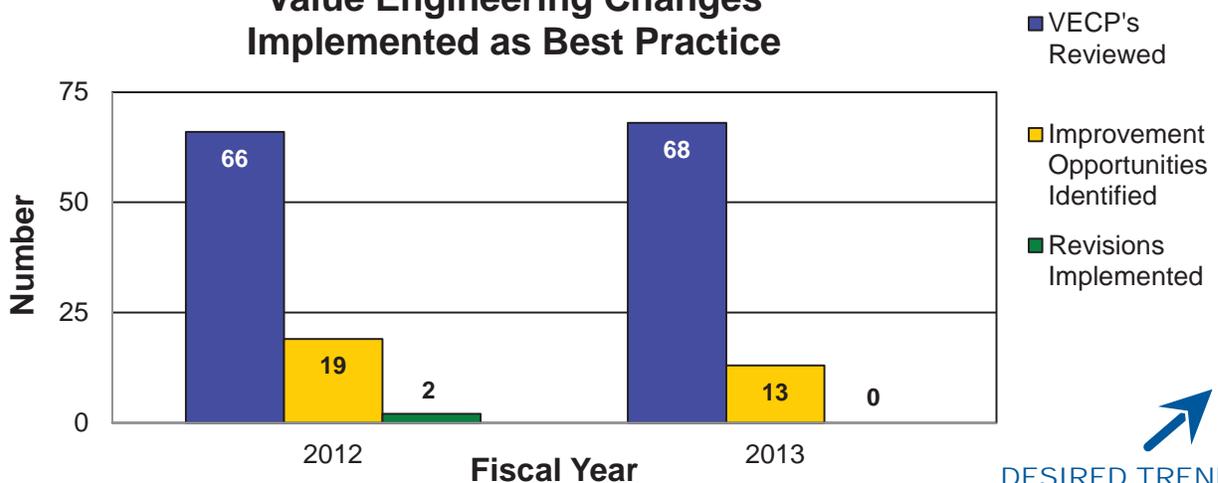
DESIRED TREND

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



DESIRED TREND

## Value Engineering Changes Implemented as Best Practice



DESIRED TREND

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

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**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 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 rate 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 pave-  
ment marking. Costs for ma-  
jor highway and interstate  
asphalt resurfacing include  
the pavement, traffic control,  
permanent pavement mark-  
ing, rumble strips, pavement  
repair, guardrail and signing.  
New two-lane and four-lane  
construction costs include  
grading, drainage, pave-  
ment, bridge and all inciden-  
tal 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 sim-  
plify comparison.

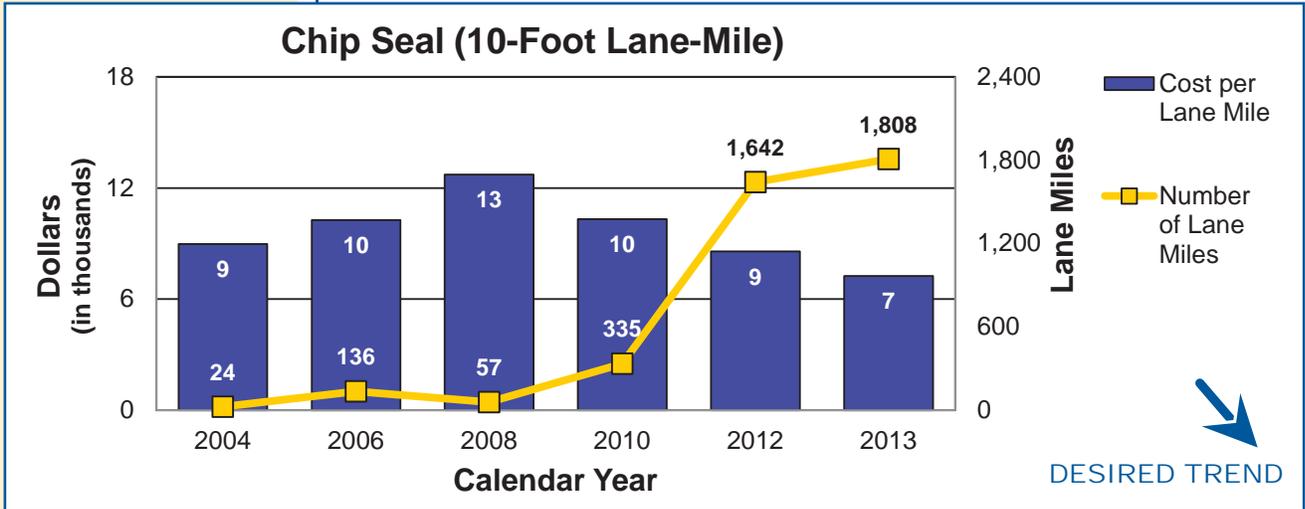
### *Average highway lane-mile and bridge construction costs-4f*

A great many factors affect the cost of road and bridge projects, some that can be managed by MoDOT and others that are affected by the economy. For example, Missouri's highway system has long depended on fuel taxes, but now people drive less and vehicles are more fuel efficient. 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 increased fuel, oil and material costs. Overall, the prices of asphalt, concrete and steel are double and triple what they were 20 years ago, when fuel taxes were last raised.

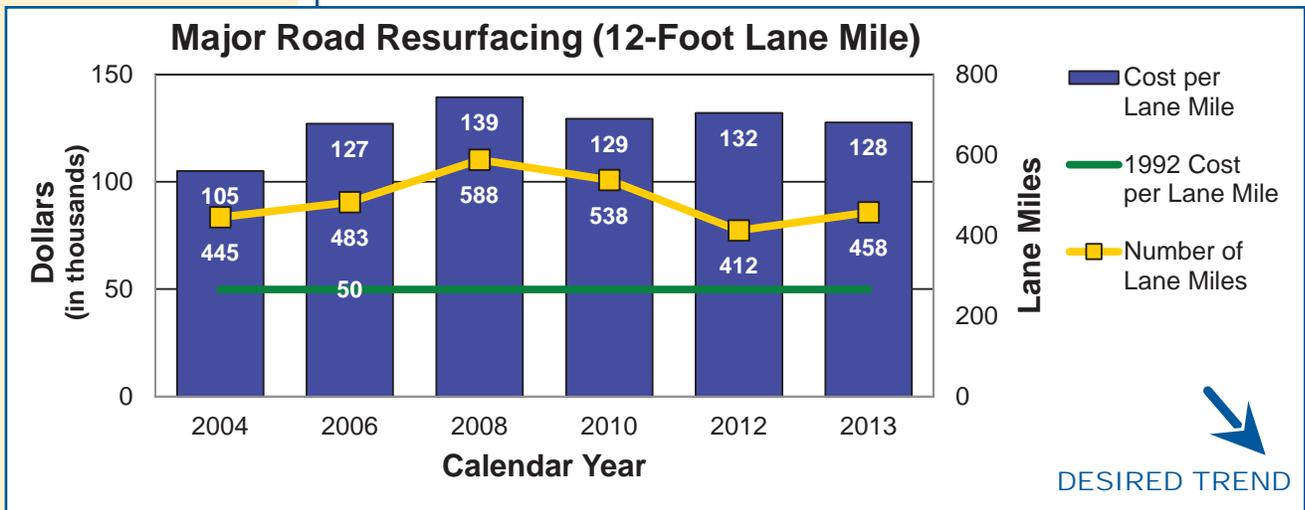
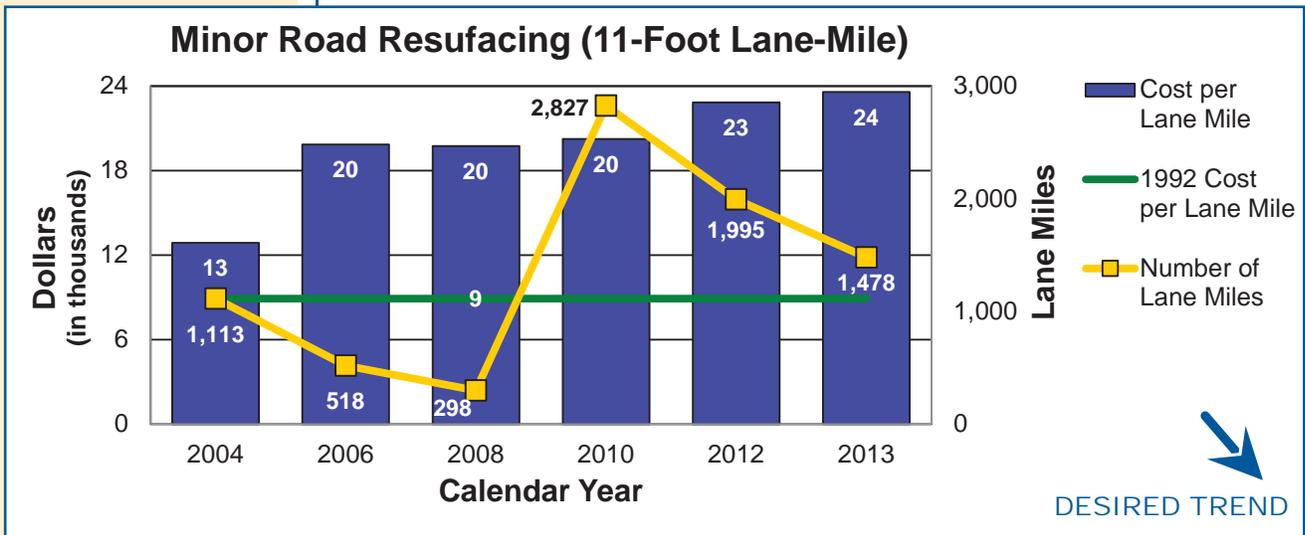
With MoDOT's construction program having dropped from \$1.3 billion in 2009 to \$685 million in fiscal year 2014, few complex two- and four-lane projects have been available for contractors to bid. For the larger, more robust projects, MoDOT continues to partner with industry to allow flexibility and 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. In time, MoDOT will be challenged just to maintain the system of roads and bridges Missourians enjoy today.



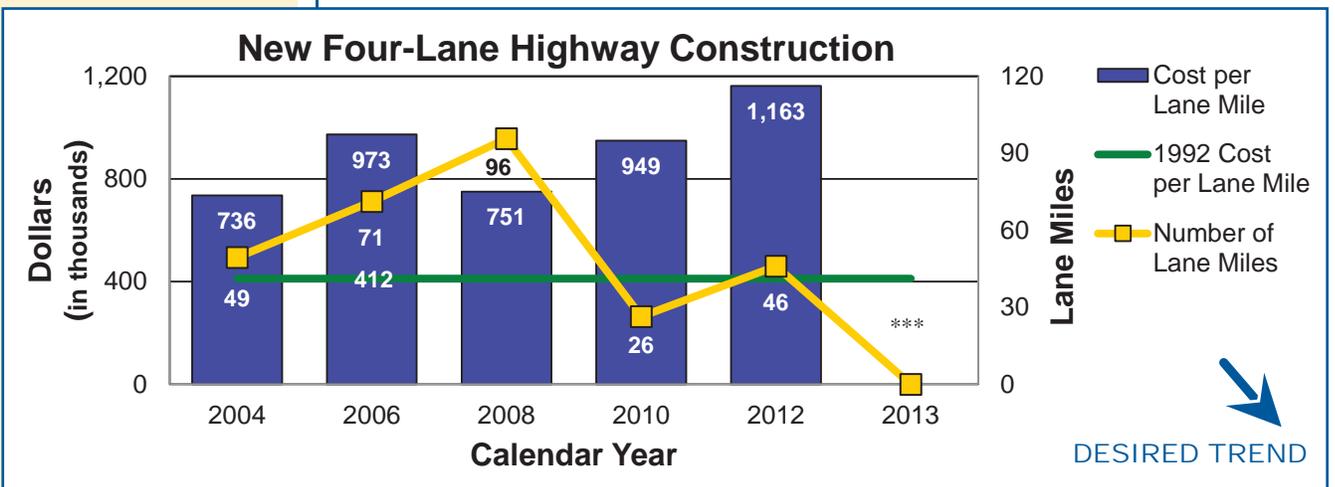
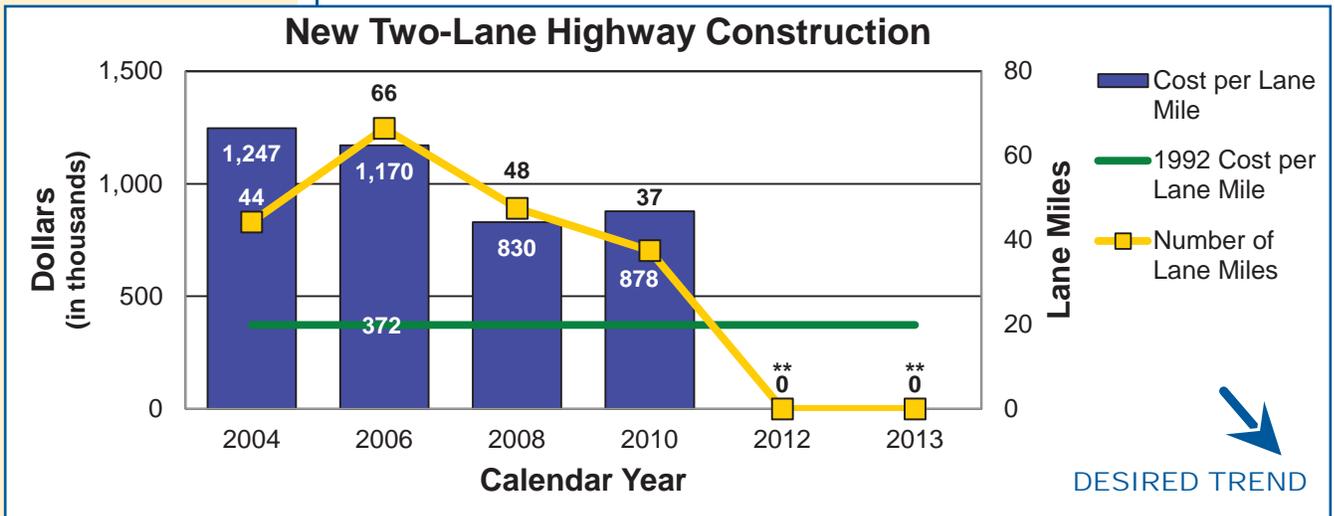
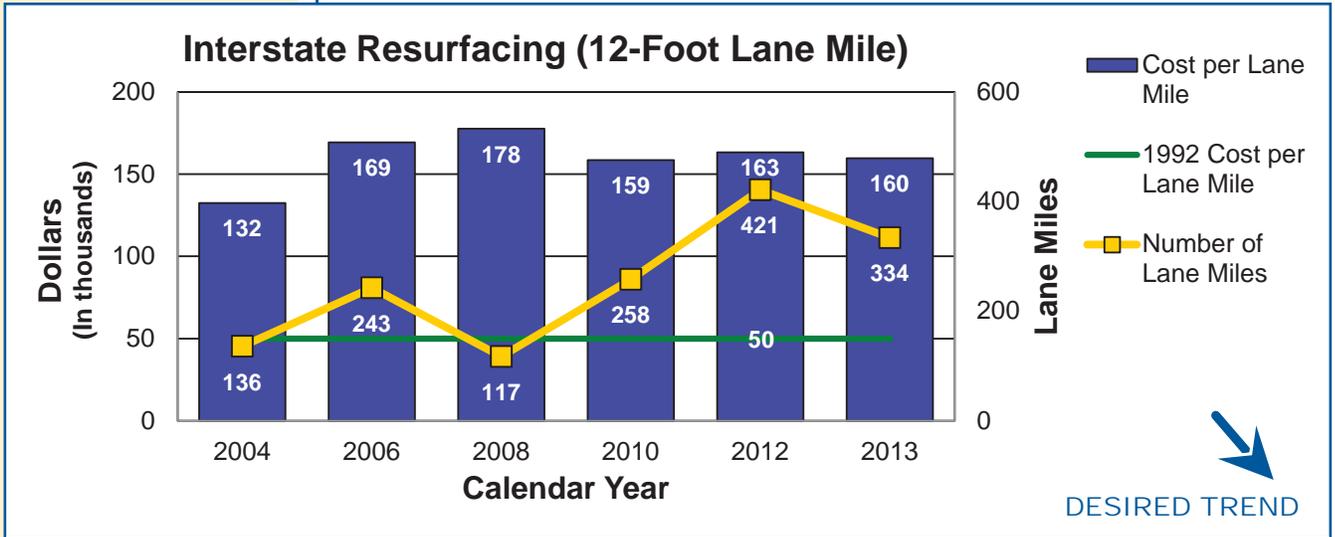
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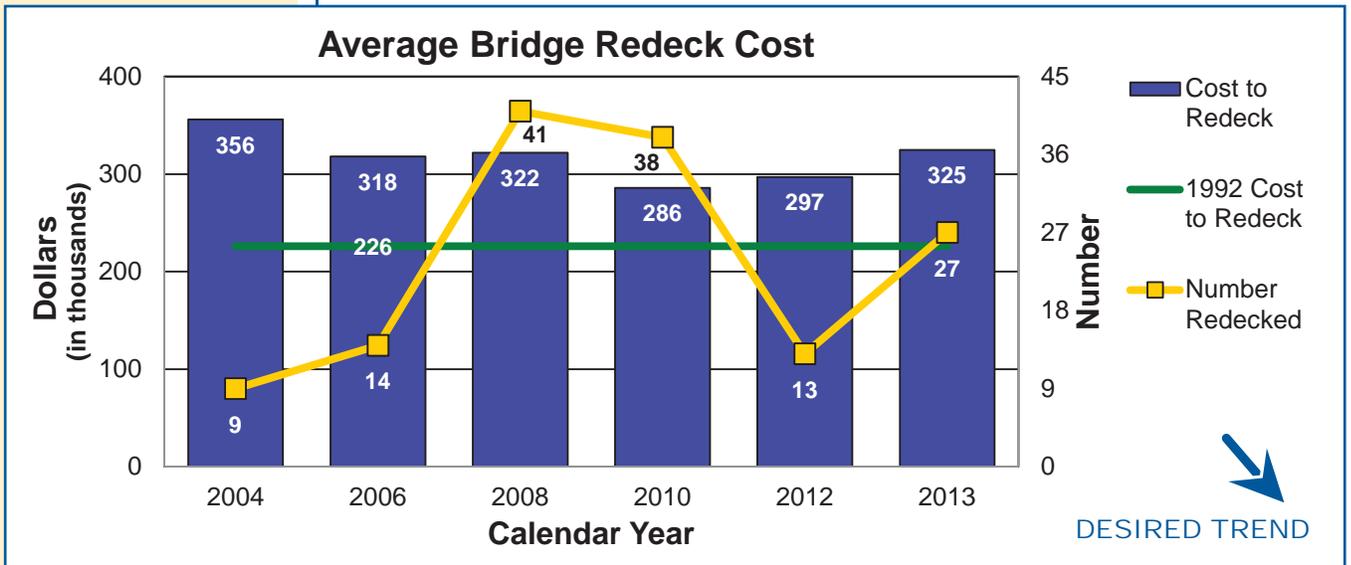
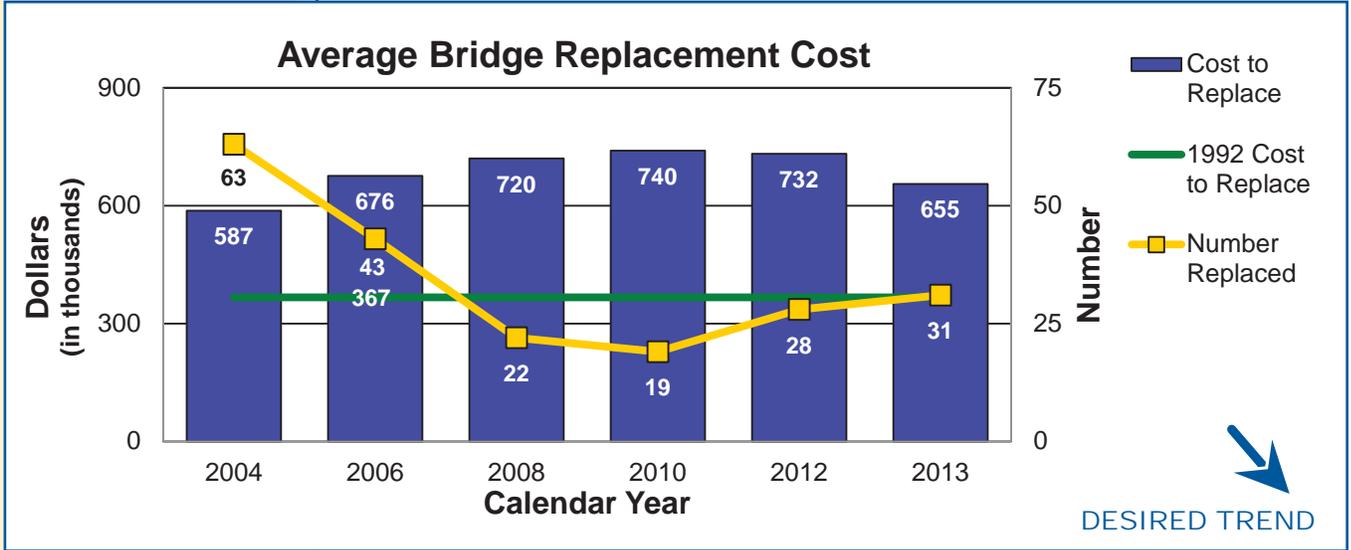
Note: No contract chip seal projects in 1992.



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