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 considered the project budget.

MEASUREMENT AND DATA COLLECTION:
The completed project costs are reported during the fiscal year in which the 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 projects.

DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

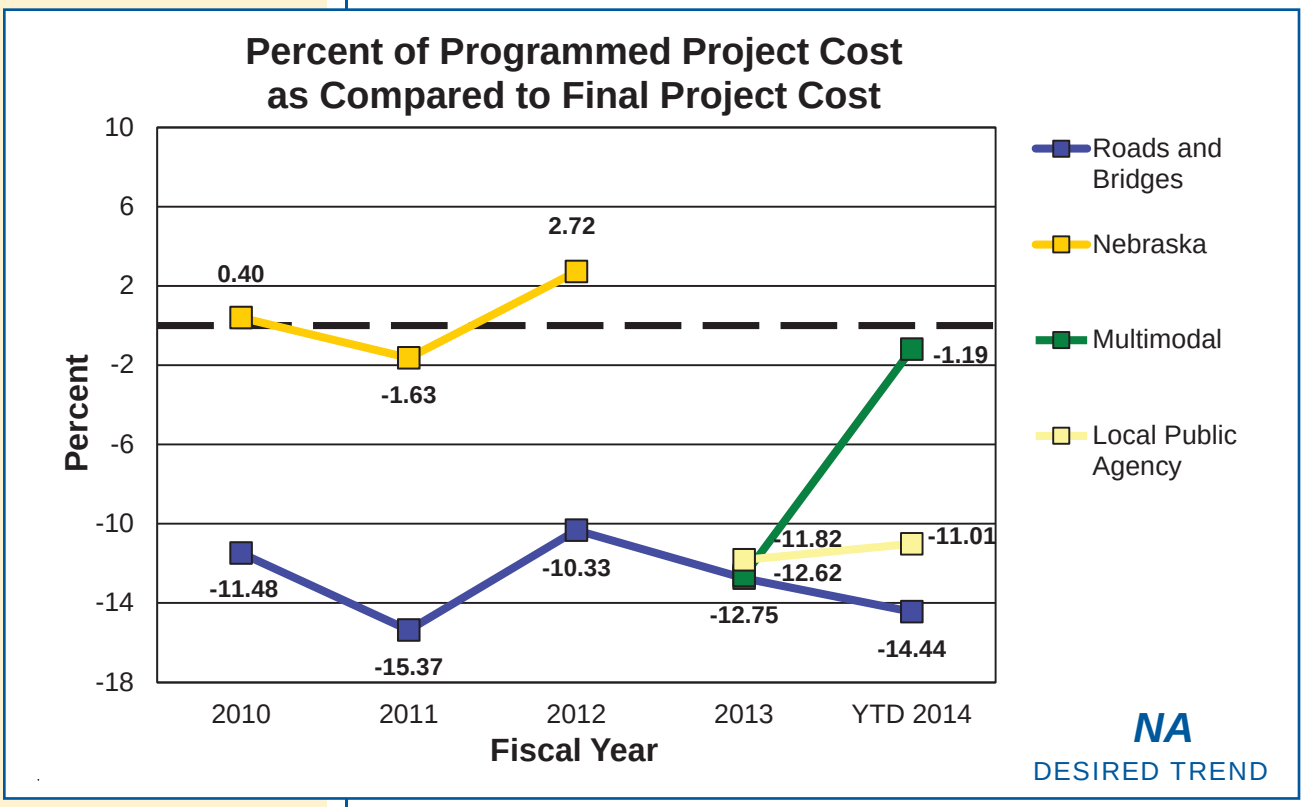
Percent of programmed project cost as compared to final project cost-4a

The focus on accurate program cost estimates has become increasingly important due to decreasing transportation funding and increasing costs. As of December 31, 2013, 201 projects had been completed in fiscal year 2014 at a cost of $443 million. This represents a deviation of -14.4 percent or $75 million less than the programmed cost of $518 million. Of the 201 projects completed, 75 percent were completed within or below budget. In comparison, 72 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 award savings, at 85 percent. Engineering and miscellaneous (right of way, utilities and other costs) savings represent 15 and 8 percent, respectively. Construction phase costs were 8 percent over what was awarded.

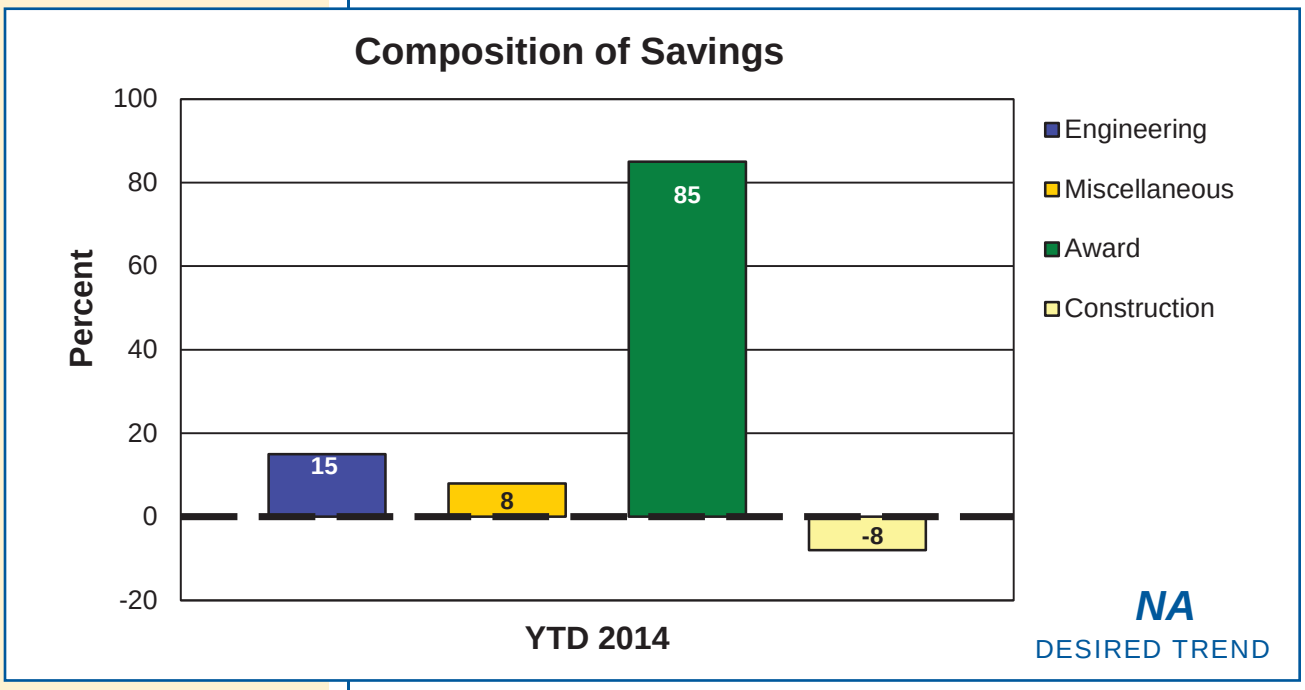
In addition, 28 Multimodal projects were completed for a cost of $25 million, -1.2 percent or $300,000 less than the programmed cost of $25.3 million. And 74 Local Public Agency projects were completed for a cost of $38.6 million, -11 percent or $4.8 million less than the programmed cost of $43.4 million.

For road and bridge projects completed in the five-year period from 2009-2013, final costs of $5.915 billion were within -9.4 percent of programmed costs, or $613 million less than the programmed cost of $6.528 billion.

MoDOT uses this historical data as a guide for programming future projects. In FY2014, 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, award savings to date for FY2014 are averaging only 4 percent. Future programming assumptions will be revised downward to reflect this trend.



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.



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

RESULT DRIVER:
David Silvester,
District Engineer

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.

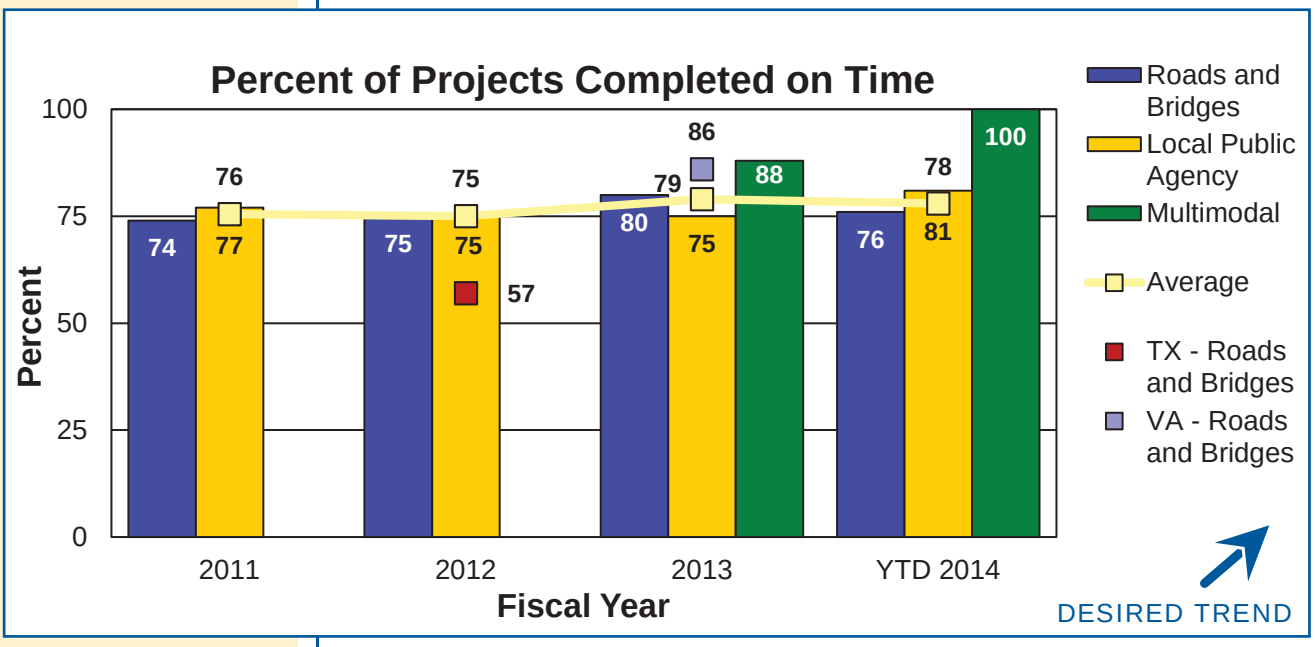
Percent of projects completed on time-4b

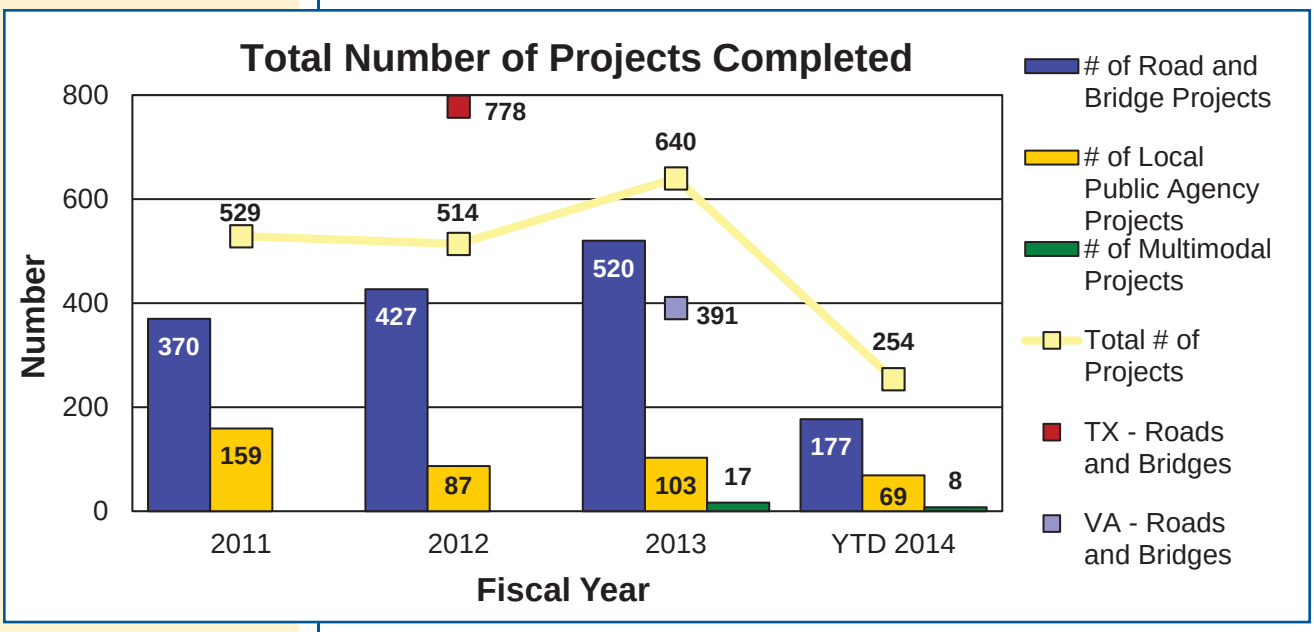
MoDOT's customers expect transportation improvements to be completed quickly with minimal impact to their lives. Delivering projects by the contract completion date is the target for all projects and this is considered a commitment to Missourians and users. Completing projects on time helps maintain 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 users' exposure to work zones and provides good-condition facilities that improve safety and reduce vehicle maintenance costs.

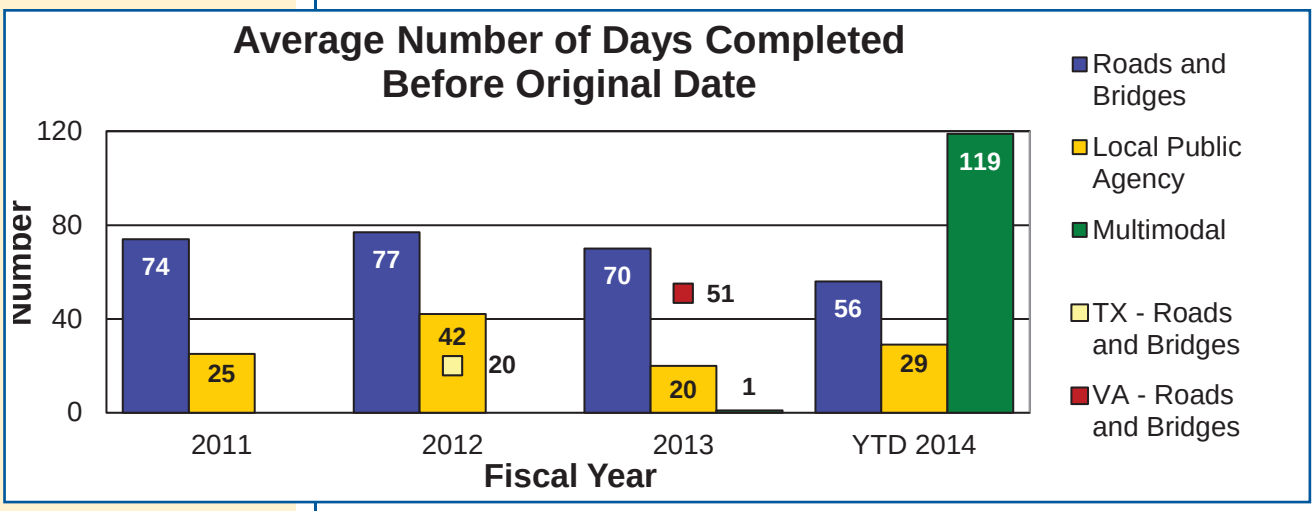
Sometimes, unusual weather or additional contract work necessitates an extension of the completion date. There are also times when a contractor misses the project completion date. In the second quarter of fiscal year 2014, 78 percent of the projects were completed on or ahead of schedule.

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.


Percent of Projects Completed on Time
Percent
100
75
50
25
0
74
77
76
75
75
57
75
80
79
75
86
88
76
81
78
100
2011
2012
2013
YTD 2014
Fiscal Year
Roads and Bridges
Local Public Agency
Multimodal
Average
TX - Roads and Bridges
VA - Roads and Bridges
DESIRED TREND


Total Number of Projects Completed
Number
800
600
400
200
0
370
159
529
427
87
514
520
103
17
640
391
778
177
69
8
254
2011
2012
2013
YTD 2014
Fiscal Year
# of Road and Bridge Projects
# of Local Public Agency Projects
# of Multimodal Projects
Total # of Projects
TX - Roads and Bridges
VA - Roads and Bridges


Average Number of Days Completed Before Original Date
Number
120
80
40
0
74
25
77
42
20
70
20
51
1
56
29
119
2011
2012
2013
YTD 2014
Fiscal Year
Roads and Bridges
Local Public Agency
Multimodal
TX - Roads and Bridges
VA - Roads and Bridges

RESULT DRIVER:
David Silvester,
District Engineer

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.

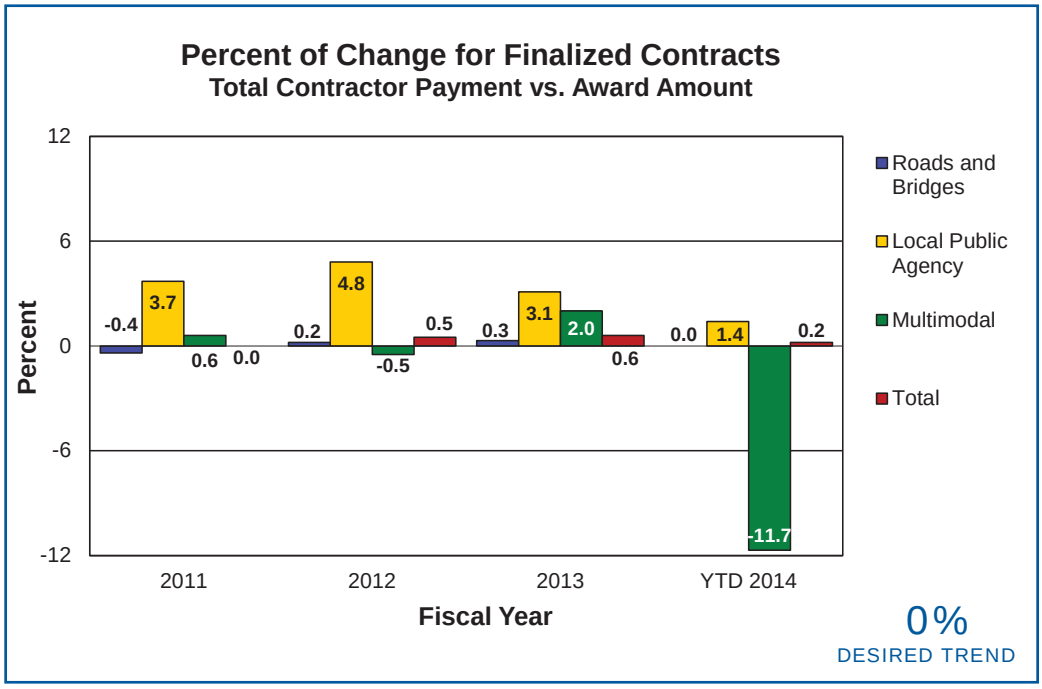
MEASUREMENT AND DATA COLLECTION:
For road and bridge projects, contractor payments are generated through MoDOT's SiteManager database and processed in the financial management system for payment. Change orders document the underrun/overrun of the original contract cost. Local public agencies and multimodal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

DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

Percent of change for finalized contracts-4c

By limiting overruns on contracts, MoDOT can continue to keep the commitments that have been made. Decreasing revenue 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 two quarters of fiscal year 2014 was 0.2 percent ($396 million worth of projects completed $660,000 over the award amount). Many factors can affect the ability to complete a project within 2 percent of the award amount.

With decreasing transportation funding and increasing costs, MoDOT's focus on keeping final project costs within award amounts is more important than ever.



RESULT DRIVER:
David Silvester,
District Engineer

MEASUREMENT DRIVER:
Angela Fuerst,
Transportation Project Manager

PURPOSE OF THE MEASURE:
This measure tracks the use of innovative contracting methods used on MoDOT projects including:

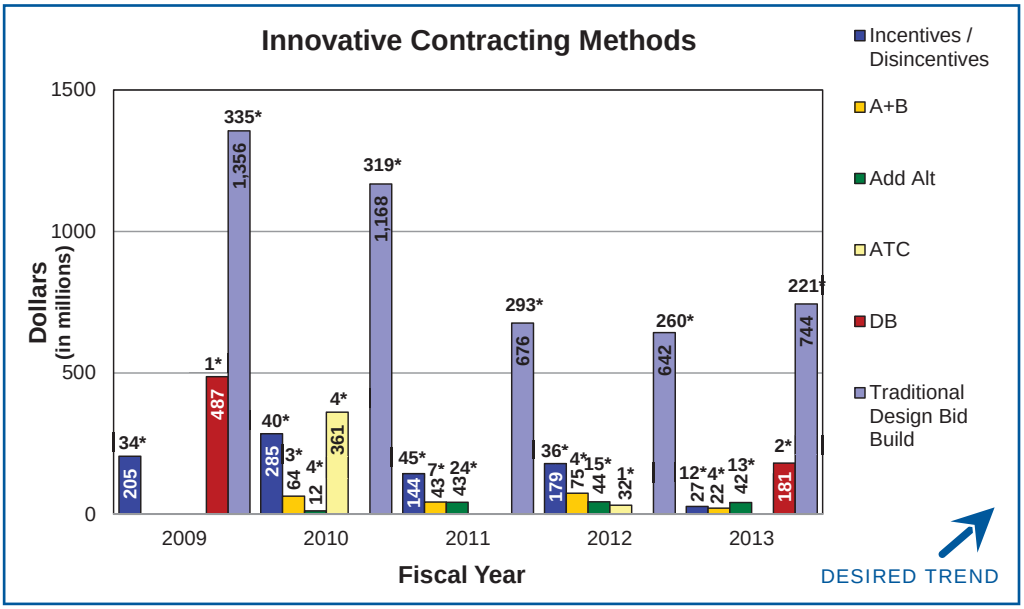
- Incentive/Disincentive Contracts,
- A + B Contracts,
- Add Alternate Contracts,
- Alternate Technical Concepts, and
- Design-Build Contracts

MEASUREMENT AND DATA COLLECTION:
MoDOT projects utilizing innovative contracting methods are reported during the fiscal year they are awarded. Contract award values are collected through MoDOT's SiteManager database, bid opening summaries 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 administration 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 even maintain the current system.

In fiscal year 2013, MoDOT delivered 31 out of 252 projects using innovative contracting methods. The 31 projects totaled $271.904 million out of the $743.952 million program.



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

Value Engineering-4e

RESULT DRIVER:
Dave Silvester,
District Engineer

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, and
- Construction value engineering proposals during the construction phase.

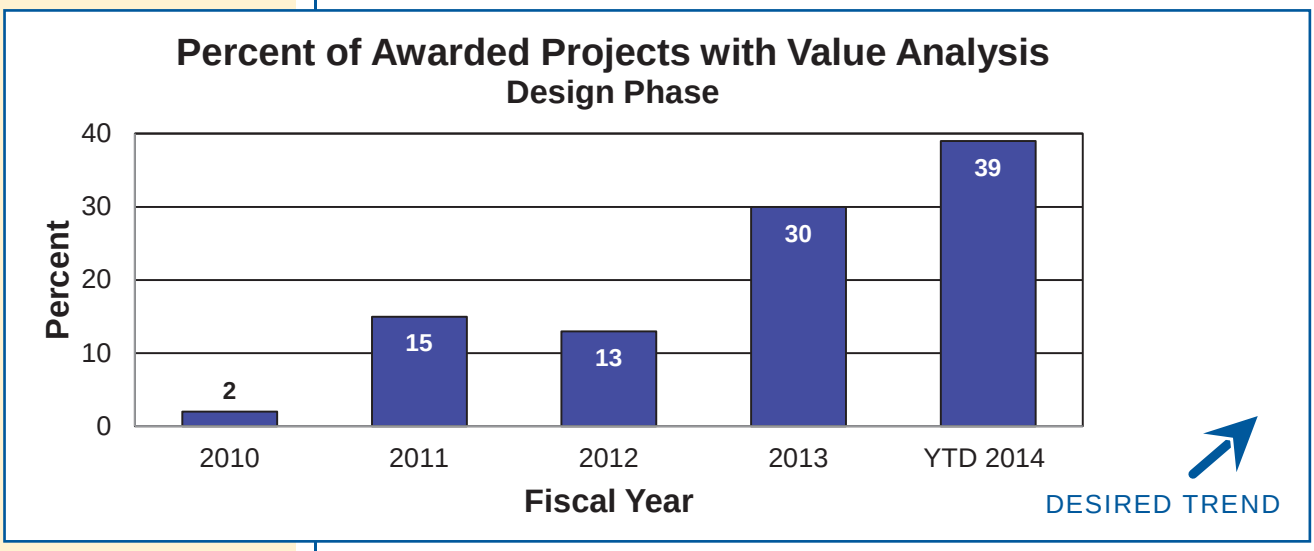
MEASUREMENT AND DATA COLLECTION:
Information on value analysis during design is gathered from MoDOT's STIP Information Management System application. Construction value engineering change proposal information is gathered from MoDOT's value engineering change proposal database.

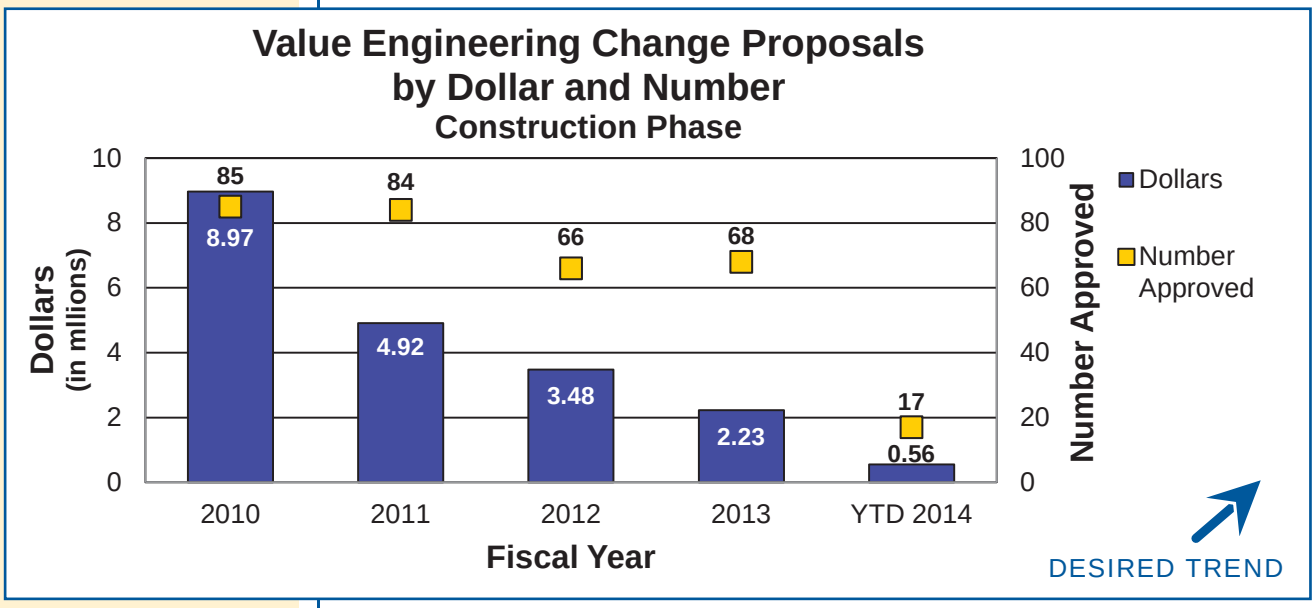
The goal of value engineering is to build the right project at the right time, meeting the project need with appropriate project scope. MoDOT uses the VE program to ensure the public receives great value for every tax dollar invested in Missouri's transportation system. Due to decreasing funding, MoDOT 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 innovative solutions to reduce project costs and provide additional value.

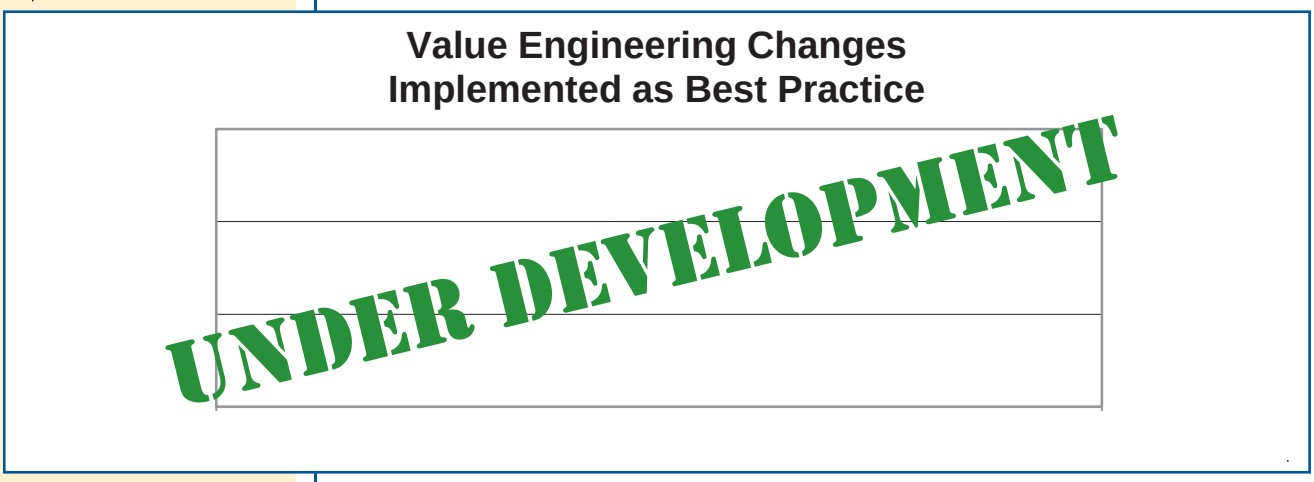
MoDOT uses design phase value analysis to remove unnecessary scope, reduce project costs and to improve project flexibility. Value analysis includes specific, targeted processes aimed to improve the project value, including the formal VE program studies. Tracking progress toward the goal of evaluating all projects for value allows MoDOT to accurately gauge its performance. So far, for fiscal year 2014, 39 percent of projects underwent some form of value analysis during the design phase.

MoDOT partners with industry to find more cost effective methods to accomplish the proposed work on our projects in order to better use our limited available funds. During the construction phase, the Value Engineering Change Proposal process encourages contractors to submit proposals to deliver improved projects of the best attainable value. After award of a project, contractor proposals for cost reduction are considered and if accepted, the contractor receives a portion of the savings, up to a maximum of 50 percent. Even though the savings are shared, the program generates savings on active projects that can be used to offset project cost escalation or reduce cost of delivering the project. So far for fiscal year 2014, 17 VE proposals were approved resulting in MoDOT savings of $555,000. Although with reduced project scopes there are fewer opportunities, MoDOT leaders will continue to challenge department staff and industry partners to improve the value of construction projects.

A successful VECP program will incorporate approved VECPs into future design plans, so MoDOT can realize 100 percent of the affiliated savings for future projects. VE changes implemented as MoDOT best practices are incorporated into MoDOT's Engineering Policy Guide.


Percent of Awarded Projects with Value Analysis
Design Phase
Percent
40
30
20
10
0
2
15
13
30
39
2010
2011
2012
2013
YTD 2014
Fiscal Year
DESIRED TREND


Value Engineering Change Proposals
by Dollar and Number
Construction Phase
Dollars
(in mllions)
10
8
6
4
2
0
85
8.97
84
4.92
66
3.48
68
2.23
17
0.56
100
80
60
40
20
0
Number Approved
Dollars
Number Approved
2010
2011
2012
2013
YTD 2014
Fiscal Year
DESIRED TREND


Value Engineering Changes
Implemented as Best Practice
UNDER DEVELOPMENT

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

RESULT DRIVER:
David Silvester,
District Engineer

MEASUREMENT DRIVER:
Natalie Roark,
Bidding and Contract Services Engineer

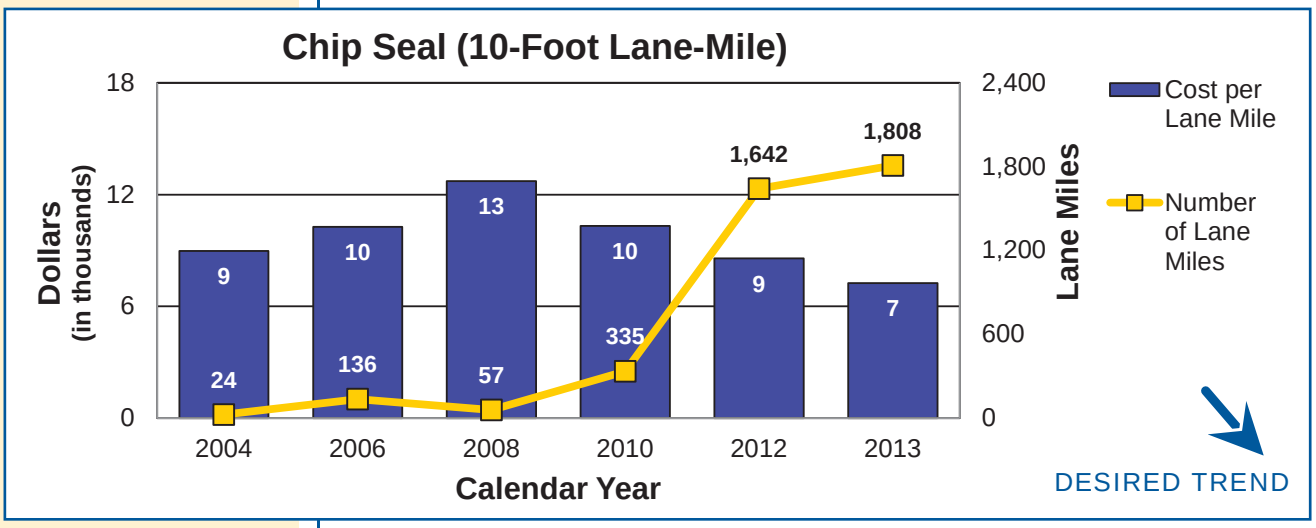
PURPOSE OF THE MEASURE:
This measure tracks the costs to construct a variety of common highway and bridge construction projects including the costs for equipment, labor and fringe benefits and materials to construct a project.

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 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 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-lane 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.

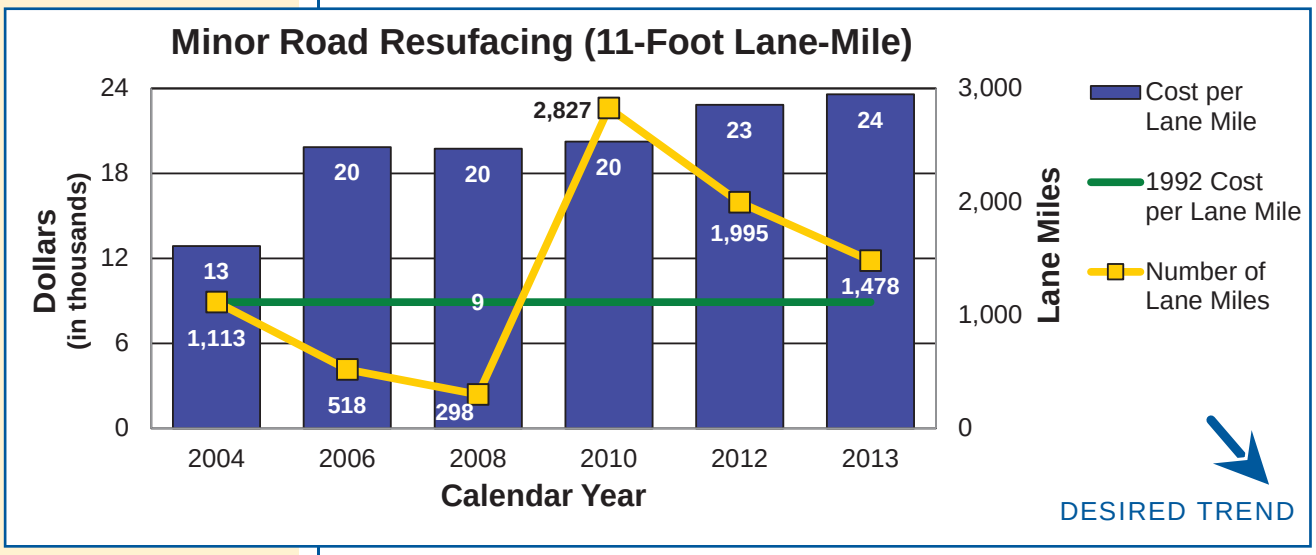
A great many factors affect the cost of road and bridge projects, some that can be managed by MoDOT and others that are affected by the economy. For example, Missouri's highway system has long depended on fuel taxes, but now people drive less and vehicles are more fuel efficient. Meanwhile, inflation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

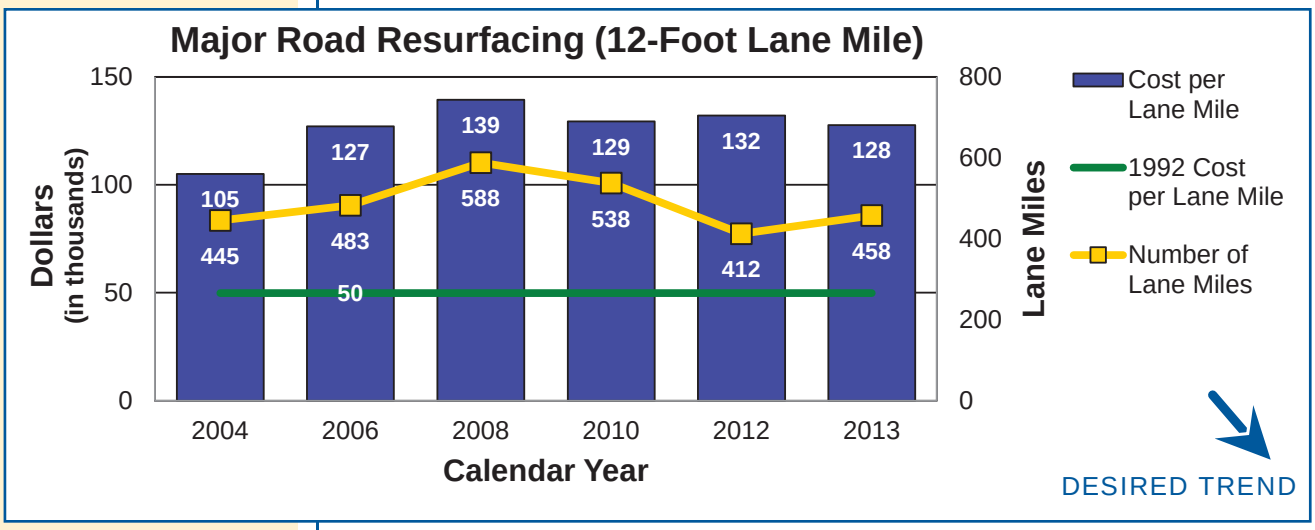
With MoDOT's construction program having dropped by about half in the last five years, few complex two- and four-lane projects have been available for contractors to bid. For the larger, more robust projects, MoDOT continues to partner with industry to allow flexibility and encourage innovation while 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.

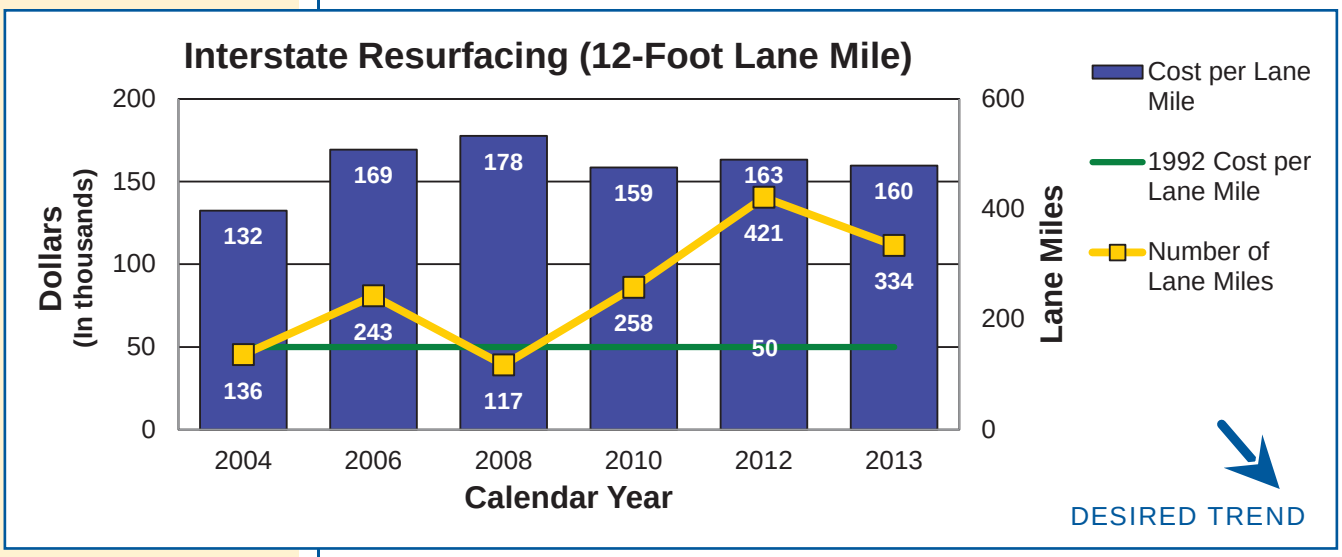
DELIVER TRANSPORTATION SOLUTIONS OF GREAT VALUE

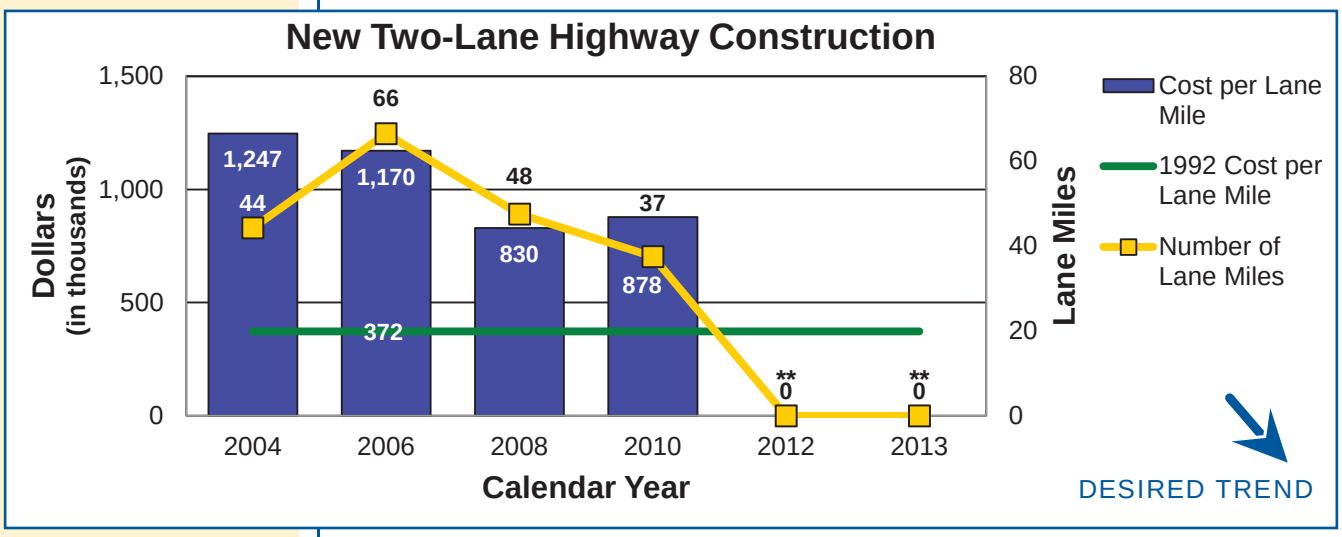


Note: No contract chip seal projects in 1992.

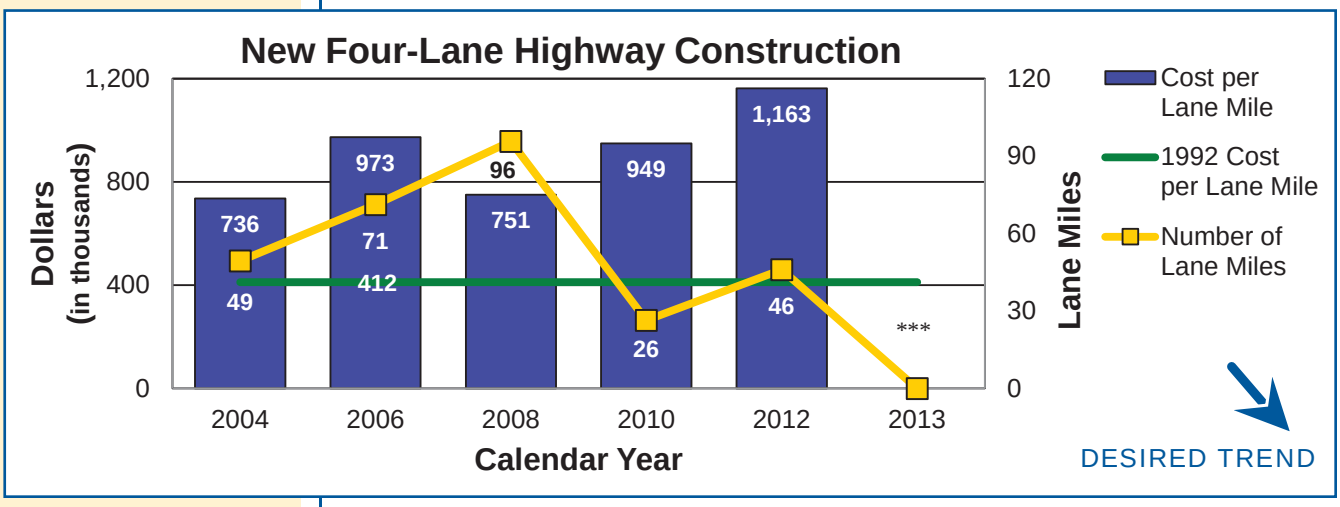




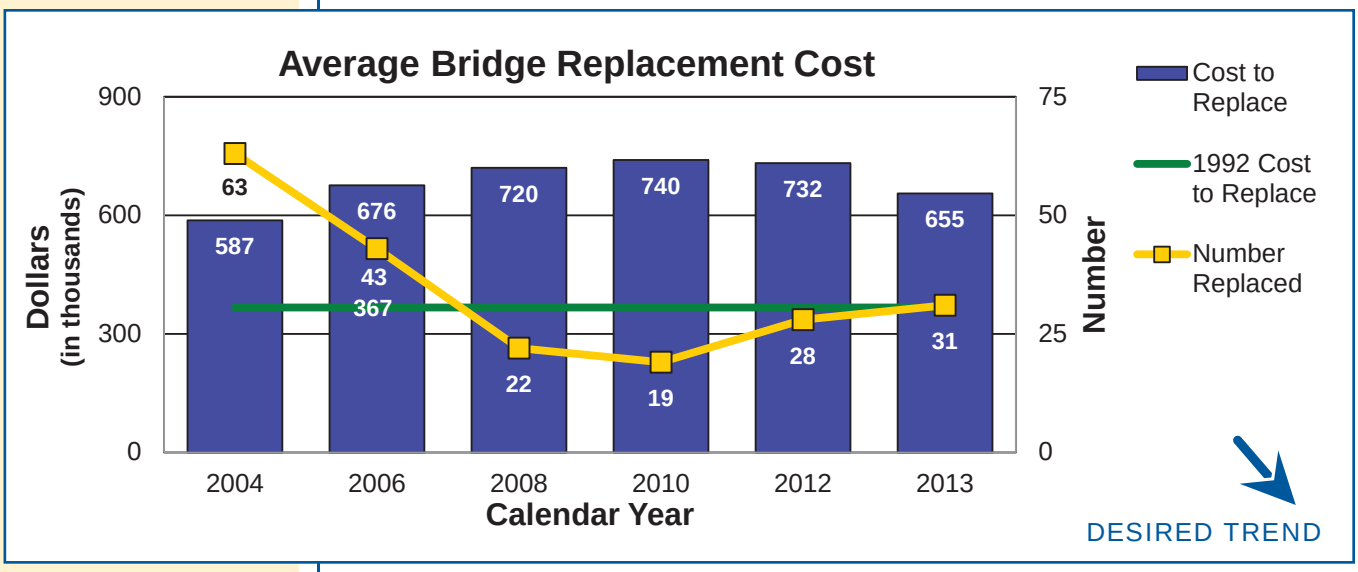


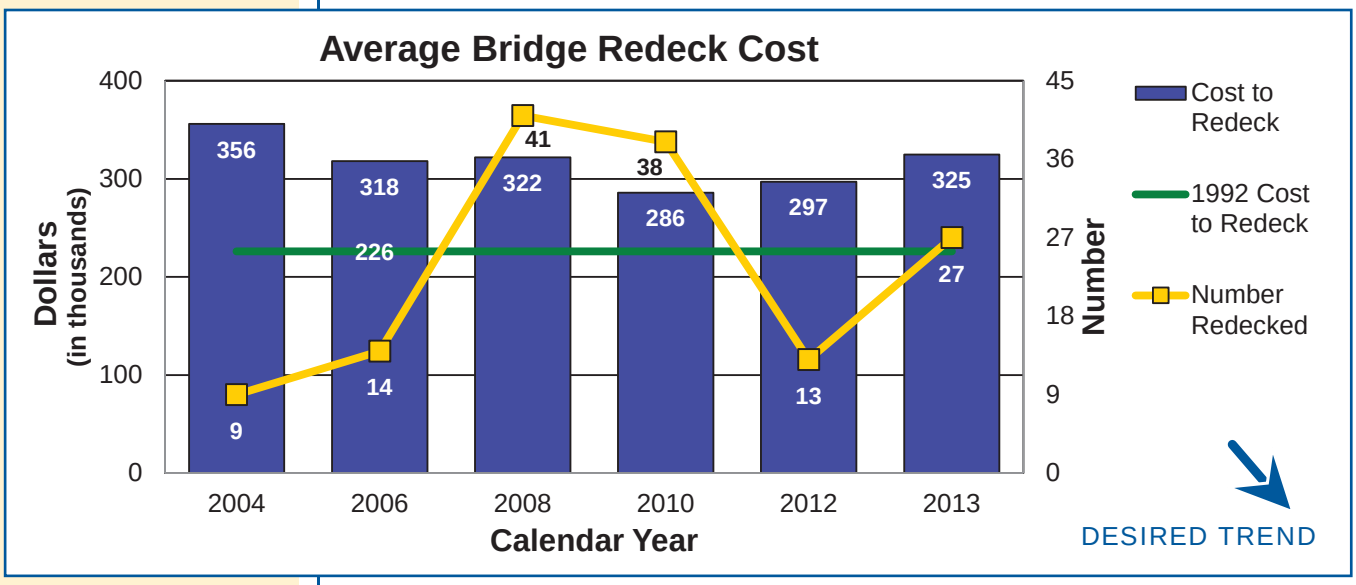


** No two-lane projects bid in 2012 and 2013.



*** No four-lane projects bid in 2013.


Average Bridge Replacement Cost
Dollars (in thousands)
900
600
300
0
75
50
25
0
Number
587
676
720
740
732
655
63
43
22
19
28
31
367
2004
2006
2008
2010
2012
2013
Calendar Year
Cost to Replace
1992 Cost to Replace
Number Replaced
DESIRED TREND


Average Bridge Redeck Cost
Dollars (in thousands)
400
300
200
100
0
45
36
27
18
9
0
Number
356
318
322
286
297
325
9
14
41
38
13
27
226
2004
2006
2008
2010
2012
2013
Calendar Year
Cost to Redeck
1992 Cost to Redeck
Number Redecked
DESIRED TREND