Percent of estimated project cost ascompared to final project cost-9a

Result Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Renate Wilkinson, Planning and Programming Engineer

Purpose of the Measure:

This measure determines how close MoDOT's total program completion costs are to the estimated costs.

Measurement and Data Collection:

MoDOT determines the completed project costs and compares them to the estimated costs. The completed project costs are reported during the fiscal year in which the project is completed.

Project costs include design, right of way purchases, utilities, construction, inspection and other miscellaneous costs. The estimated cost is based on the amount included in the most recently approved Statewide Transportation Improvement Program. Completed costs include actual expenditures. The costs do not include those that might result from any legal claims, which are rare occurrences, regarding the projects after they are completed. Positive numbers indicate the final (completed) cost was higher than the estimated cost.

This is an annual measure updated each quarter. In November of each year, this data is provided to the Missouri Legislature through the Report to the Joint Committee on Transportation Oversight.

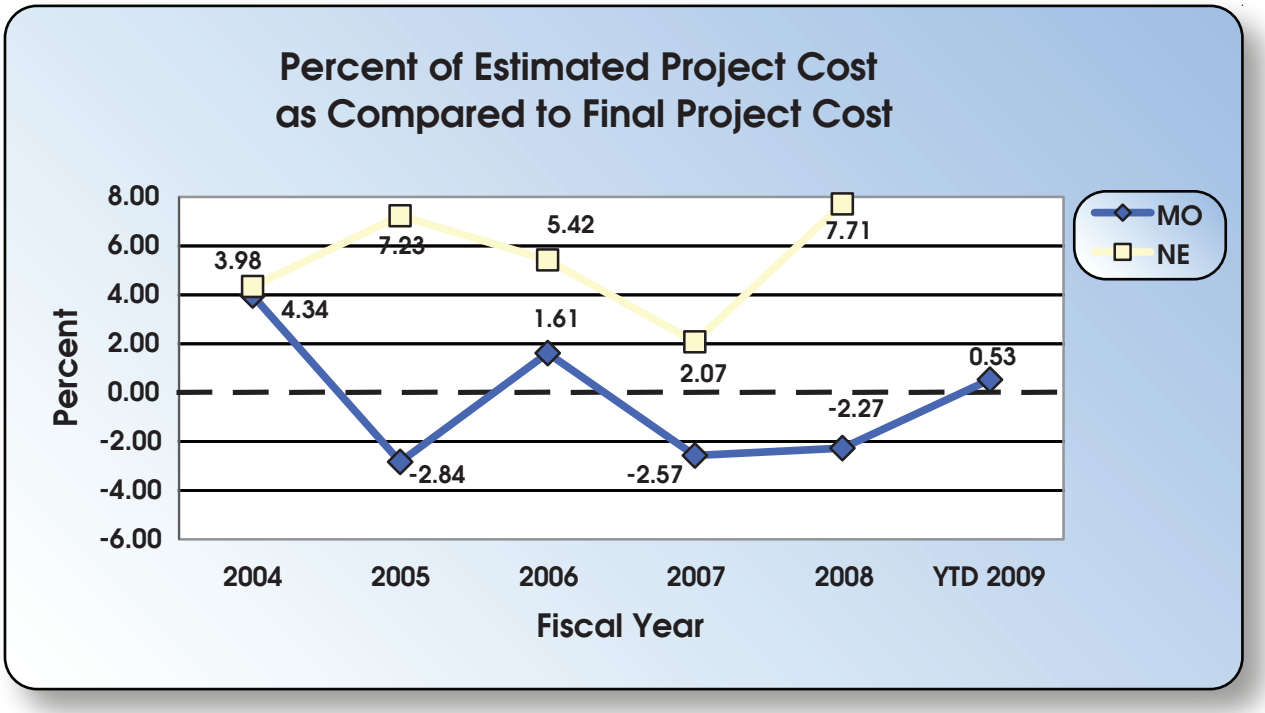
Improvement Status:

As of March 31, 2009, for fiscal year 2009, a total of 305 projects were completed at a cost of $1.163 billion. This represents a deviation of 0.53 percent or $6.2 million more than the estimated cost of $1.157 billion.

For fiscal year 2008, the final value was 543 projects completed at a cost of $1.2463 billion. This represents a deviation of –2.27 percent or $29 million less than the estimated cost of $1.2753 billion. These numbers have been revised slightly since July based on projects that had pending adjustments.

District construction budgets are adjusted based on variation from estimated costs. The ideal status is no deviation in the estimated vs. final project cost, or 0 percent. For projects completed in the five-year period from 2004 to 2008, final costs of $5.546 billion were within 0.69 percent of estimated costs, or $38.5 million less than the estimated cost of $5.585 billion.

While a number of states track construction costs, few provide data for total project costs. Fewer still compare estimated total project costs to final total project cost. The following graph shows how MoDOT performance compares with neighboring Nebraska. In 2004, the performance of both states was nearly the same. In 2007, both states were within 5 percent of each other. In other years, it varied close to 10 percent Data for Nebraska is updated annually.



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

Average number of years it takes to go from the programmed commitment in the Statewide Transportation Improvement Program to construction completion-9b

Result Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Machelle Watkins, Transportation Planning Director

Purpose of the Measure:

This measure monitors how quickly projects go from the programmed commitment to fiscal closure of a construction project.

Measurement and Data Collection:

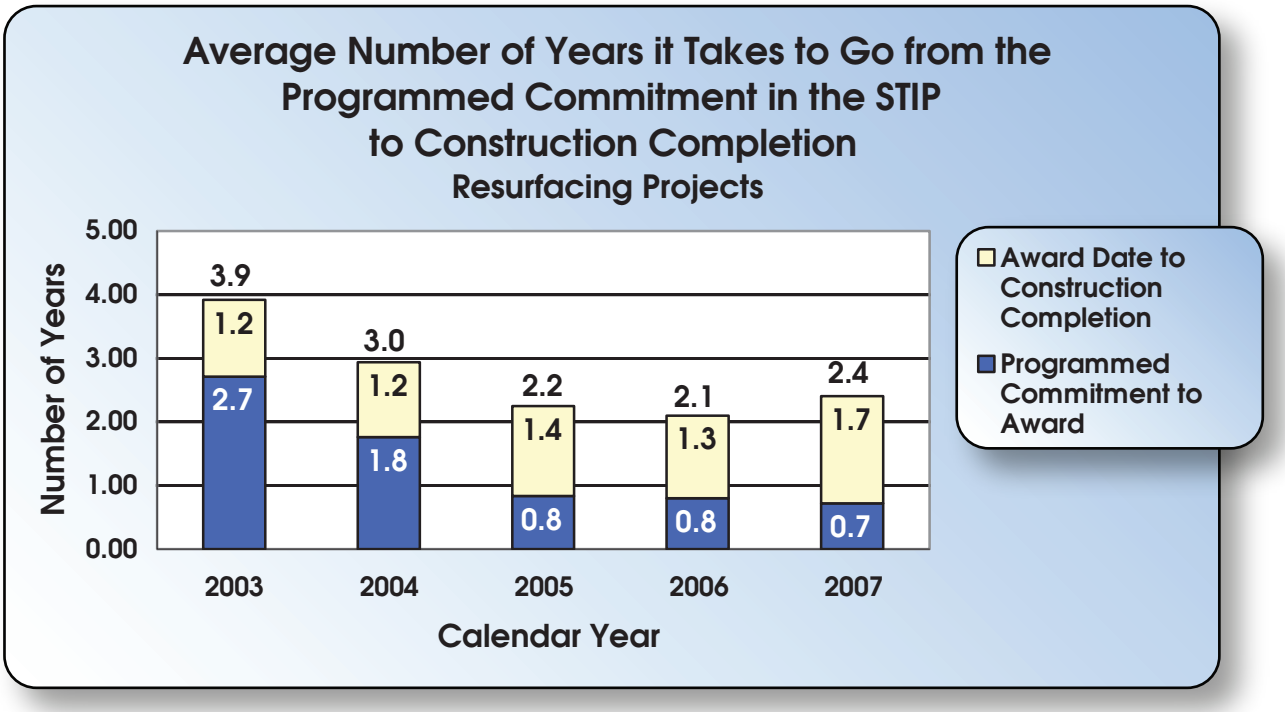
MoDOT compares how long it takes from when the project is added to the Statewide Transportation Improvement Program (STIP) to when the project is completed. Project completion is defined as fiscal closure, which happens after the visible construction work has been completed. Data is categorized by the type of work and distinguishes between design and construction stages. This is an annual measure and data is updated in October.

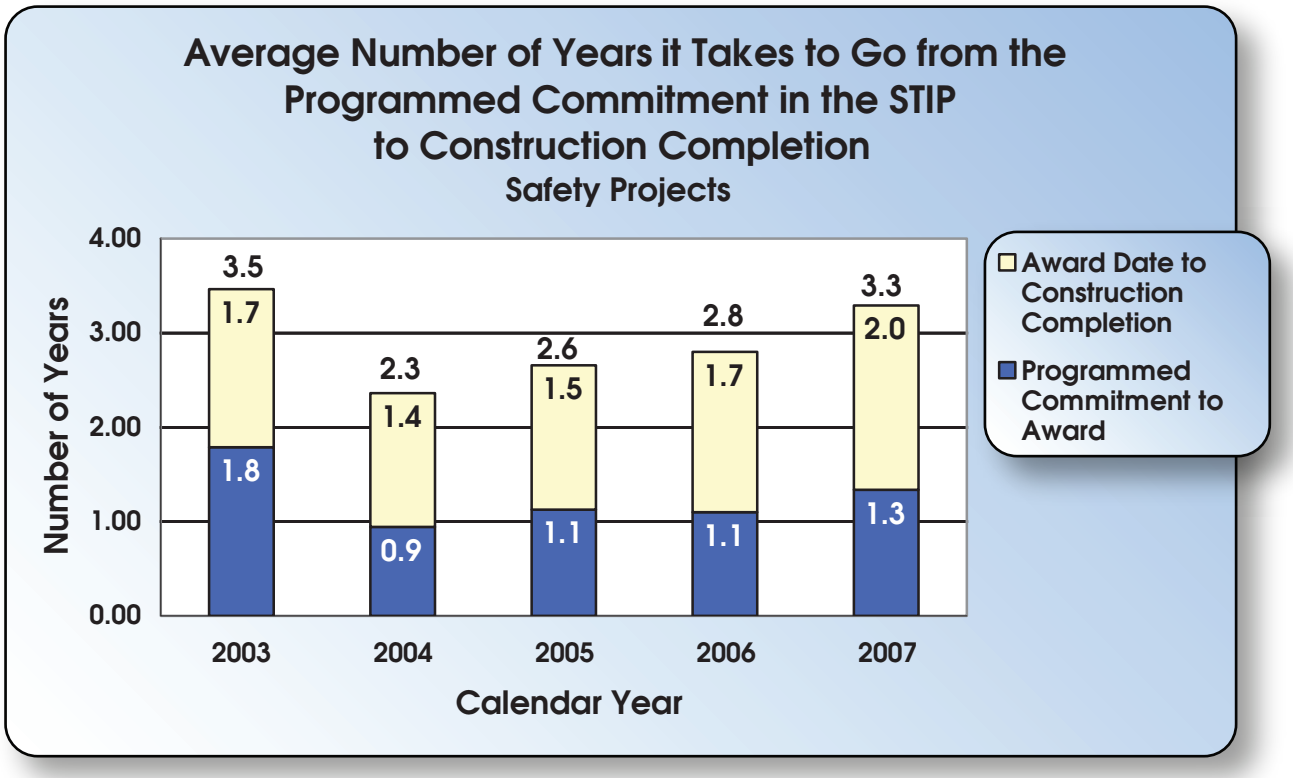
Improvement Status:

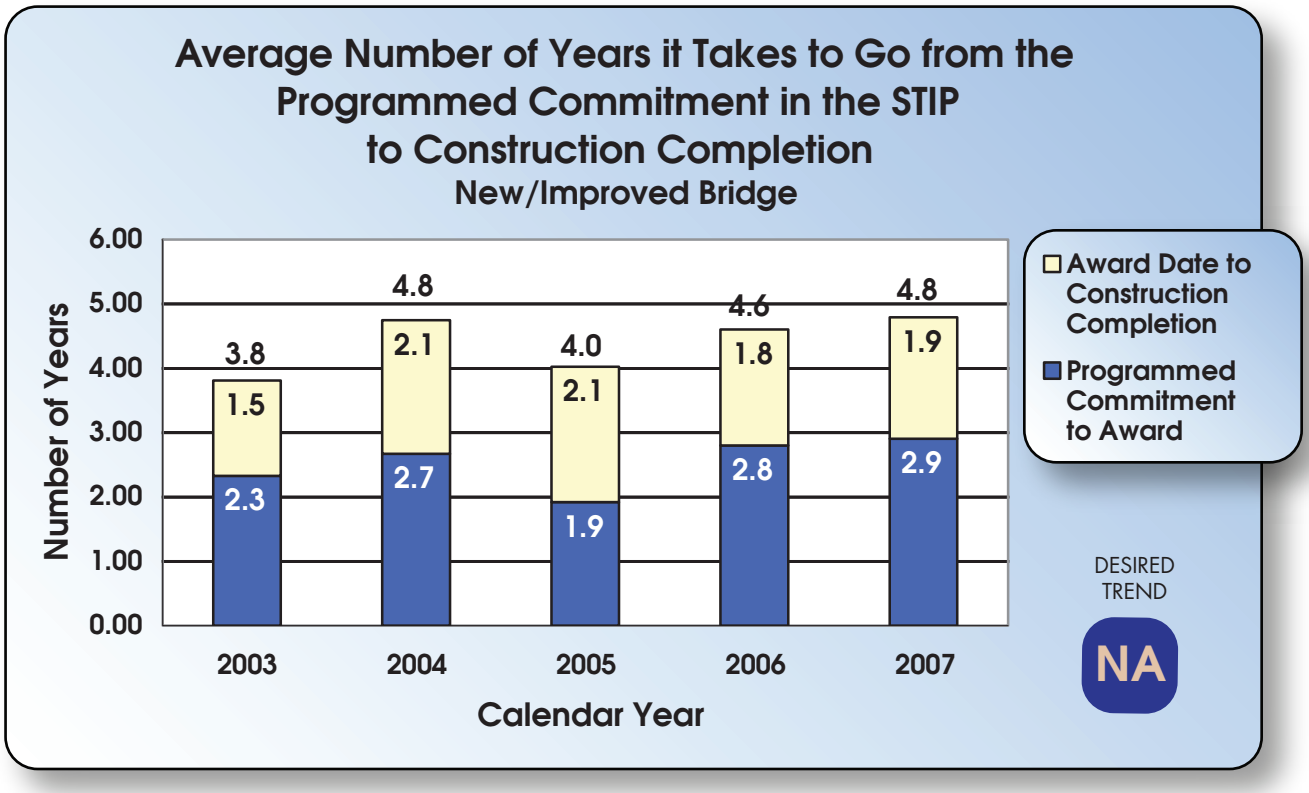
In general, resurfacing and safety projects take the least amount of time to develop and complete, around two to three years. New or improved bridge projects take more time, around five years. New or expanded highways take yet more time, from seven to 10 years. Major bridge projects take the most time, from seven to 12 years to develop and complete.

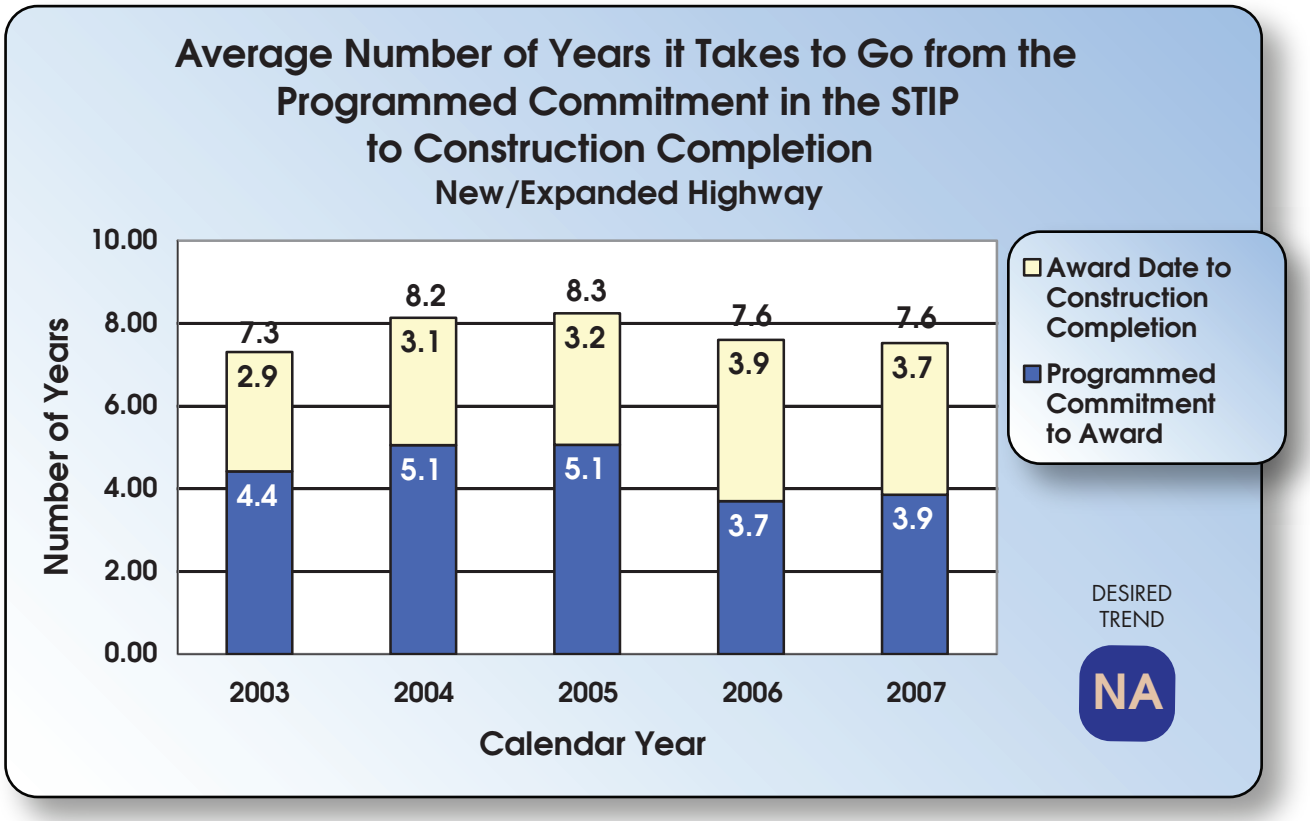
From 2006 to 2007, design time for resurfacing projects decreased slightly to 0.7 years. Design time for safety projects increased slightly to 1.3 years. Design time for new or improved bridges also increased slightly to 2.9 years. The design time average for new or expanded highways increased slightly to 3.9 years. The design time for major bridges decreased from 4.3 years to 1.5 years. Data samples for major bridges are usually small, which allows for one to two projects to affect the averages that are reported.

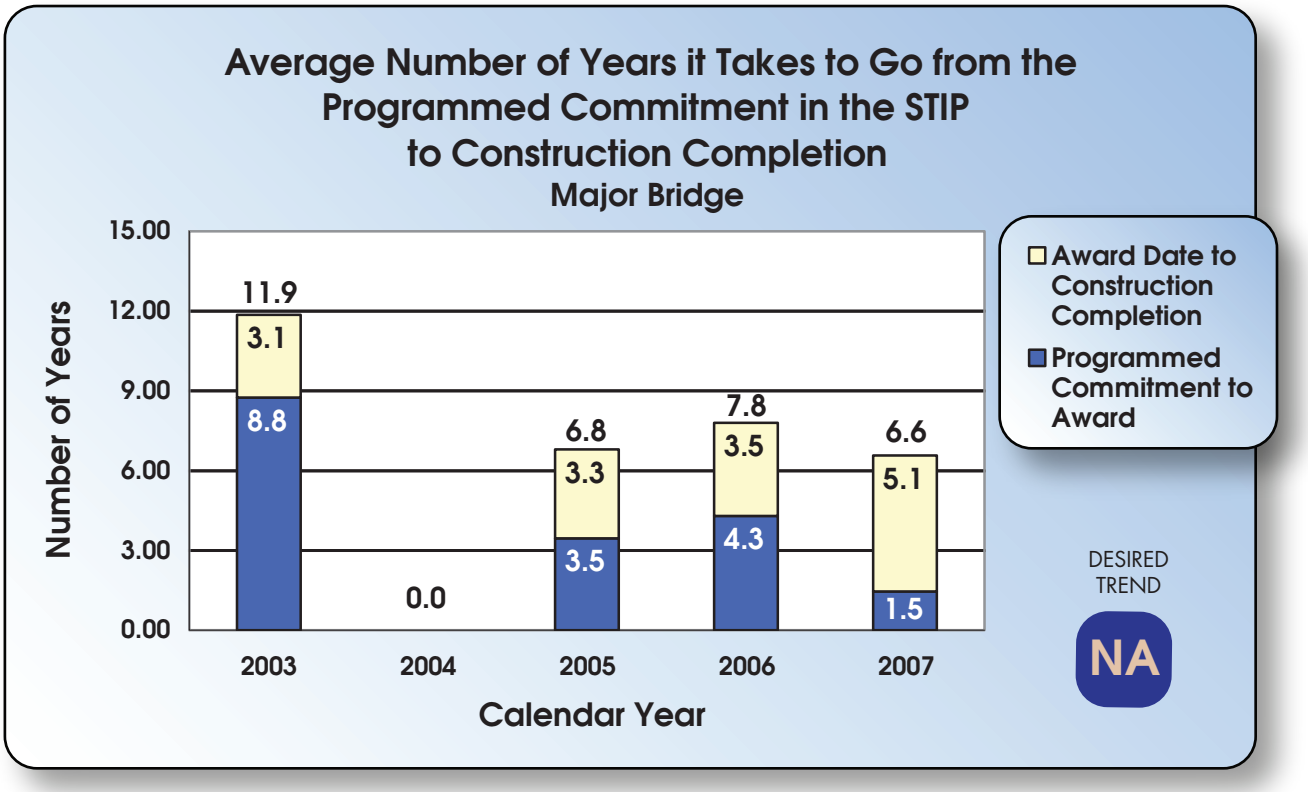
Construction times from 2006 to 2007 increased for resurfacing, safety, new or improved bridge projects and major bridges to 1.7, 2.0, 1.9 and 5.1 years respectively. MoDOT makes an effort to fiscally close completed construction projects that are inactive. Therefore, an increase in the average construction time is expected. New or expanded highways saw a decrease to 3.7 years.


Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion
Resurfacing Projects
Number of Years
5.00
4.00
3.00
2.00
1.00
0.00
3.9
1.2
2.7
3.0
1.2
1.8
2.2
1.4
0.8
2.1
1.3
0.8
2.4
1.7
0.7
2003
2004
2005
2006
2007
Calendar Year
Award Date to Construction Completion
Programmed Commitment to Award


Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion
Safety Projects
Number of Years
4.00
3.00
2.00
1.00
0.00
3.5
1.7
1.8
2.3
1.4
0.9
2.6
1.5
1.1
2.8
1.7
1.1
3.3
2.0
1.3
2003
2004
2005
2006
2007
Calendar Year
Award Date to Construction Completion
Programmed Commitment to Award


Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion
New/Improved Bridge
Number of Years
6.00
5.00
4.00
3.00
2.00
1.00
0.00
3.8
1.5
2.3
4.8
2.1
2.7
4.0
2.1
1.9
4.6
1.8
2.8
4.8
1.9
2.9
2003
2004
2005
2006
2007
Calendar Year
Award Date to Construction Completion
Programmed Commitment to Award
DESIRED TREND
NA


Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion
New/Expanded Highway
Number of Years
10.00
8.00
6.00
4.00
2.00
0.00
7.3
2.9
4.4
8.2
3.1
5.1
8.3
3.2
5.1
7.6
3.9
3.7
7.6
3.7
3.9
2003
2004
2005
2006
2007
Calendar Year
Award Date to Construction Completion
Programmed Commitment to Award
DESIRED TREND
NA


Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion
Major Bridge
Number of Years
15.00
12.00
9.00
6.00
3.00
0.00
11.9
3.1
8.8
0.0
6.8
3.3
3.5
7.8
3.5
4.3
6.6
5.1
1.5
2003
2004
2005
2006
2007
Calendar Year
Award Date to Construction Completion
Programmed Commitment to Award
DESIRED TREND
NA

Percent of projects completed within programmed amount-9c

Results Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Dave Ahlvers, State Construction & Materials Engineer

Purpose of the Measure:

The measure tracks the percentage of projects completed within the programmed amount. It includes separate categories for projects over and under one million dollars.

Measurement and Data Collection:

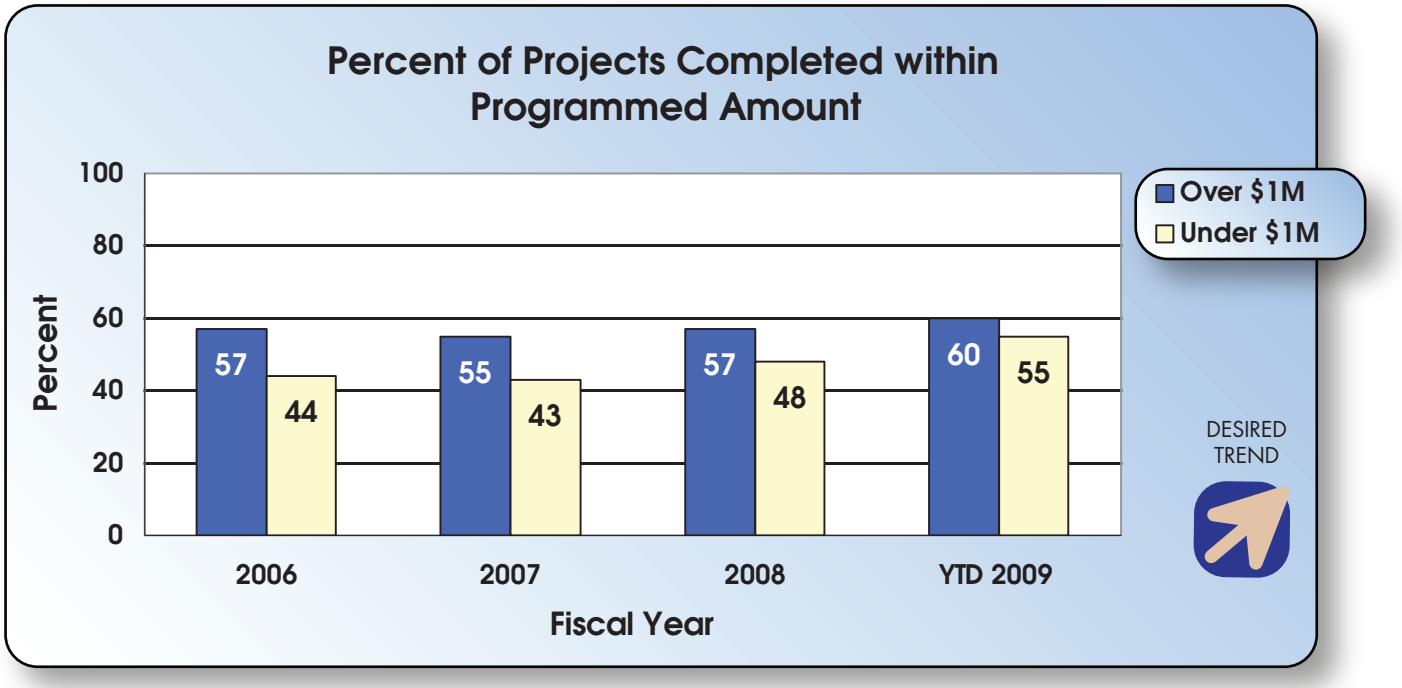
The completed project cost is compared to the estimated cost for each project. The percentage of projects completed within the estimated cost is gathered from across the state.

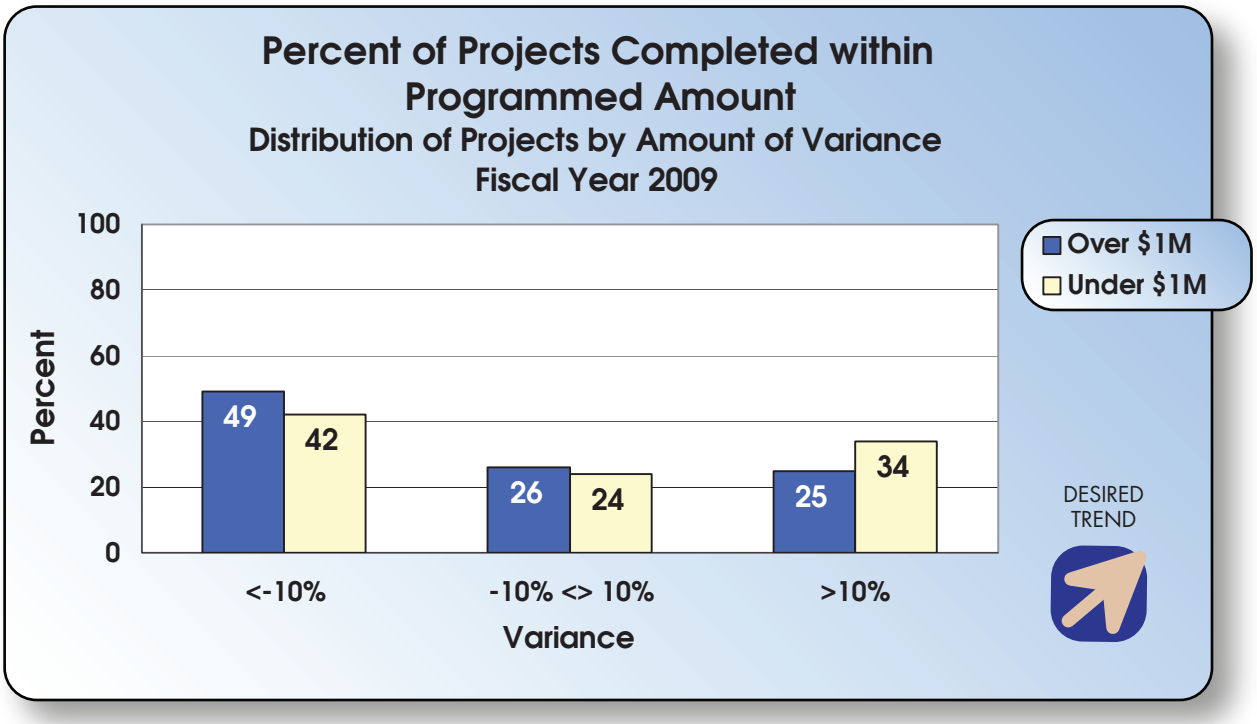
Project costs include design, right-of-way purchases, utilities, construction payments, inspection and other miscellaneous costs.

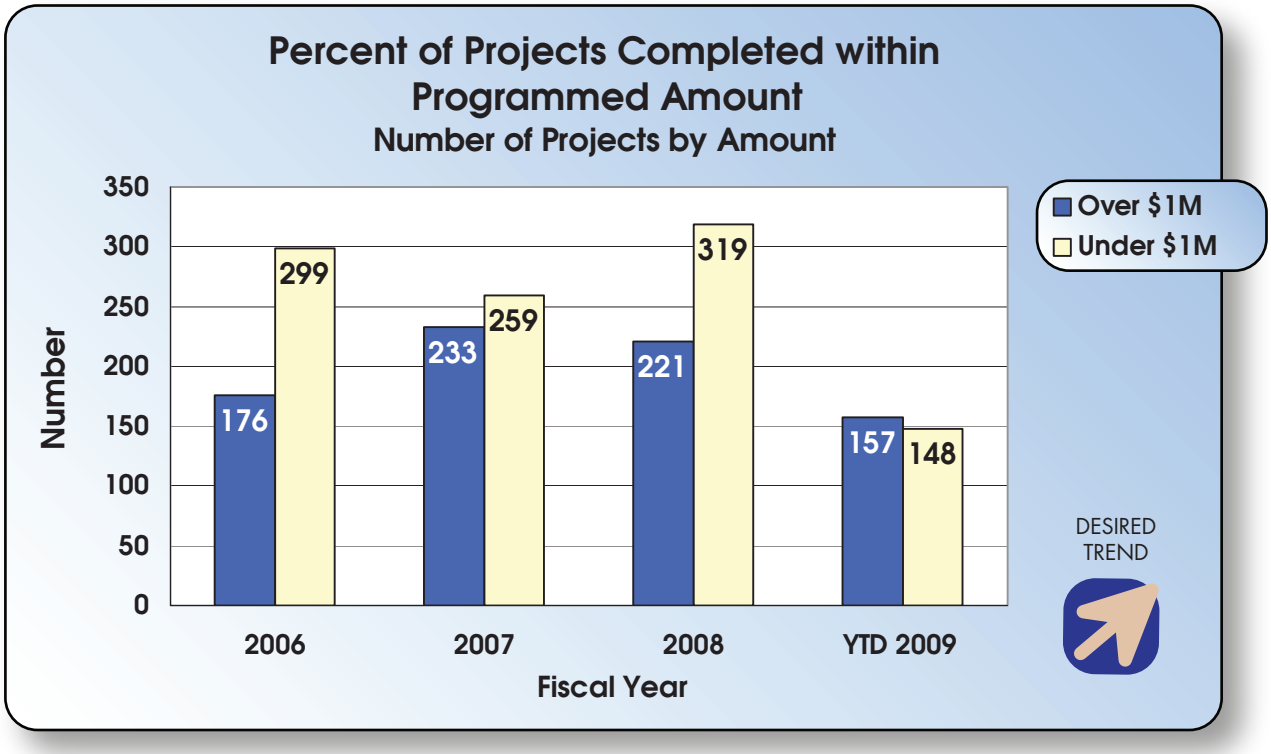
This is an annual measure updated each quarter.

Improvement Status:

MoDOT would like to see all projects completed within the programmed amount. The goal is to deliver projects at the programmed amount, allowing the greatest number of projects to be built with the funding available. MoDOT's data indicates that there is a great deal of deviation among individual projects with half over and half under budget. In fiscal year 2009, 60 percent of projects programmed over $1 million were completed within the budgeted amount, while 55 percent of projects under $1 million came in at or below budget. Emphasis has been placed on scoping projects and developing estimates that represent the true cost of delivering the projects. MoDOT is striving to deliver quality projects cheaper by using practical design and by encouraging the use of value engineering.




Percent of Projects Completed within Programmed Amount
Distribution of Projects by Amount of Variance
Fiscal Year 2009
Percent
100
80
60
40
20
0
49
42
26
24
25
34
<-10%
-10% <> 10%
>10%
Variance
Over $1M
Under $1M
DESIRED TREND


Percent of Projects Completed within Programmed Amount
Number of Projects by Amount
Number
350
300
250
200
150
100
50
0
176
299
233
259
221
319
157
148
2006
2007
2008
YTD 2009
Fiscal Year
Over $1M
Under $1M
DESIRED TREND

Percent of projects completed on time-9d

Results Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Dave Ahlvers, State Construction & Materials Engineer

Purpose of the Measure:

This measure tracks the percentage of projects completed by the commitment date established in the contract. Adjustments to the completion date are made when additional work is required or for unusual weather occurrences. It indicates MoDOT's ability to complete projects by the agreed upon date.

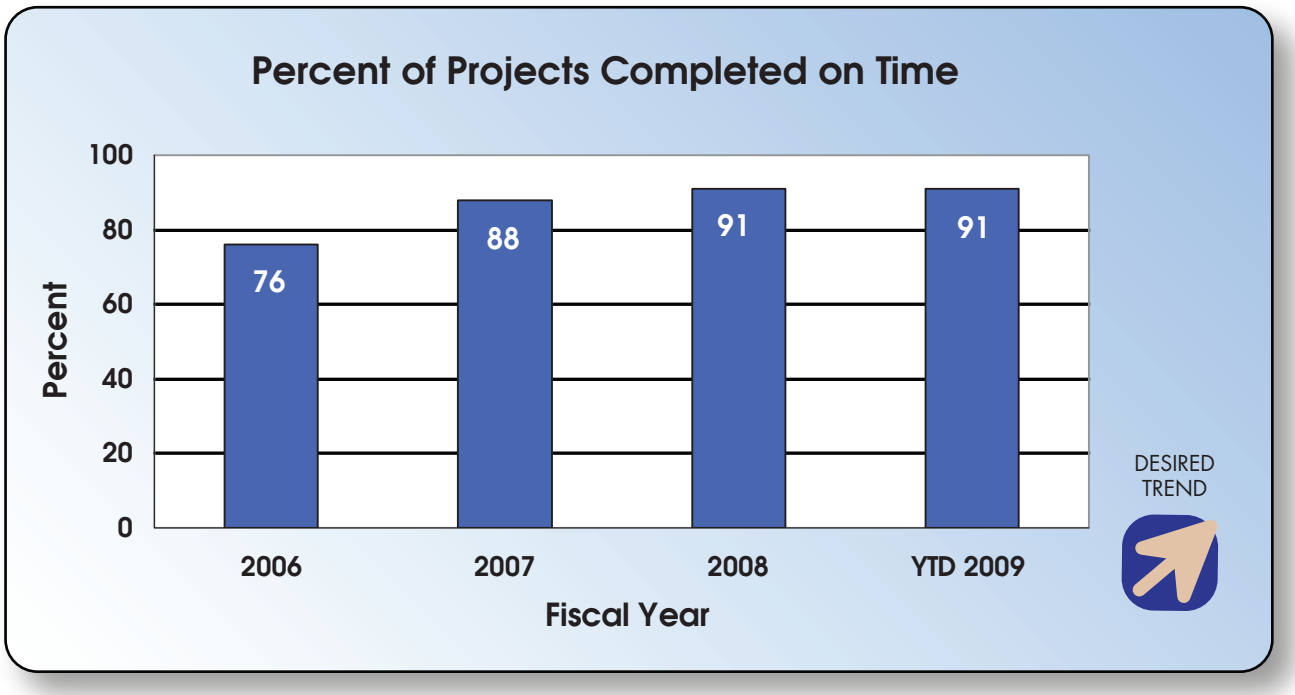
Measurement and Data Collection:

The project manager will establish project completion dates for each project. They are documented in MoDOT's SiteManager and STIP databases, and become part of the Plans, Specifications & Estimates submittal. The actual completion date will be documented by the resident engineer and placed in MoDOT's project management system.

This is an annual measure updated each quarter.

Improvement Status:

The results indicate that 91 percent of projects completed in fiscal year 2009 have been on time. MoDOT has focused on reducing the number of days available for construction in order to reduce congestion and inconvenience to the traveling public, while stressing the importance of completing projects on time. To achieve timely completion of improvement projects, an emphasis has been placed on reviewing construction schedules and assessing liquidated damages.



Percent of change for finalized contracts-9e

Results Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Dave Ahlvers, State Construction & Materials Engineer

Purpose of the Measure:

The 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.

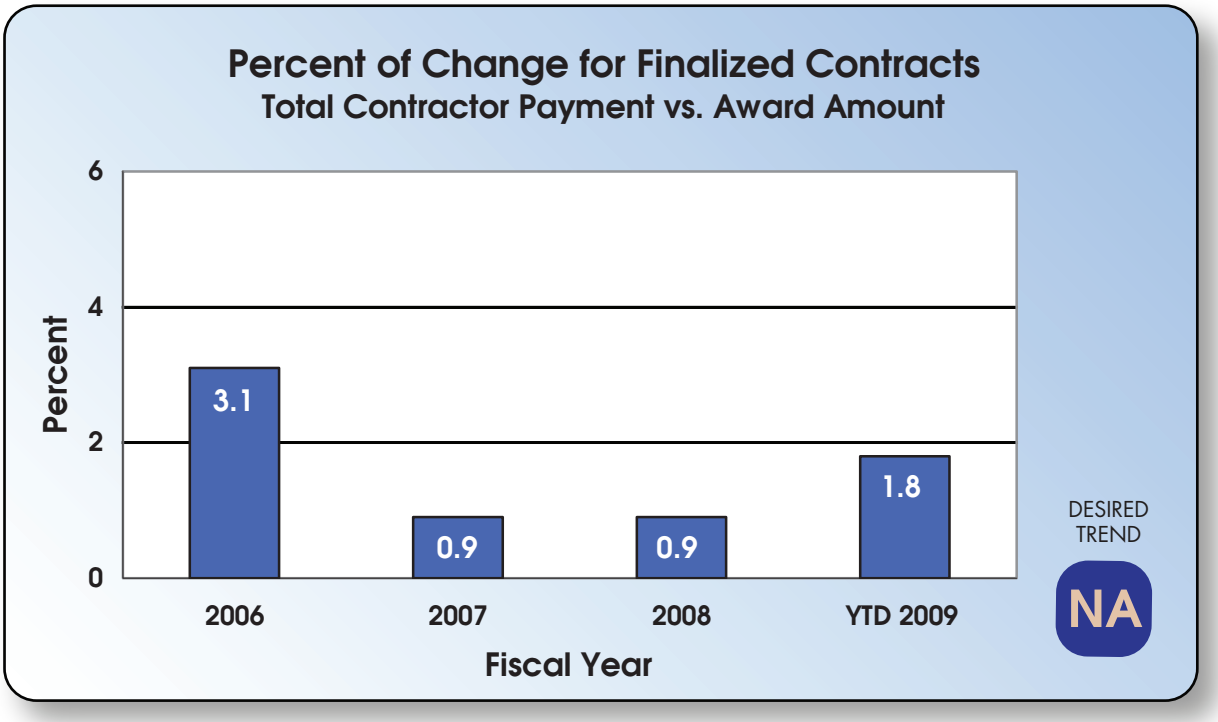
Measurement and Data Collection:

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.

This is an annual measure updated each quarter.

Improvements Status:

MoDOT's performance of 1.8 percent in fiscal year 2009 is below the target of two percent. The overall improvement is a result of a strong emphasis placed on constructing projects within budget, the use of practical design and value engineering. By limiting overruns on contracts, MoDOT can deliver more projects, leading to an overall improvement of the entire highway system. The Performance Plus employee incentive program has placed additional emphasis on completion of projects within budget.



Average construction cost per day by contract type-9f

Results Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Dave Ahlvers, State Construction & Materials Engineer

Purpose of the Measure:

This measure tracks the cost per day for project completion to determine the impact to the traveling public, enabling MoDOT to better manage project completion needs.

Measurement and Data Collection:

This information is gathered by extracting the actual time used for construction from the summary of days used in the SiteManager database and dividing it by the total costs of the project.

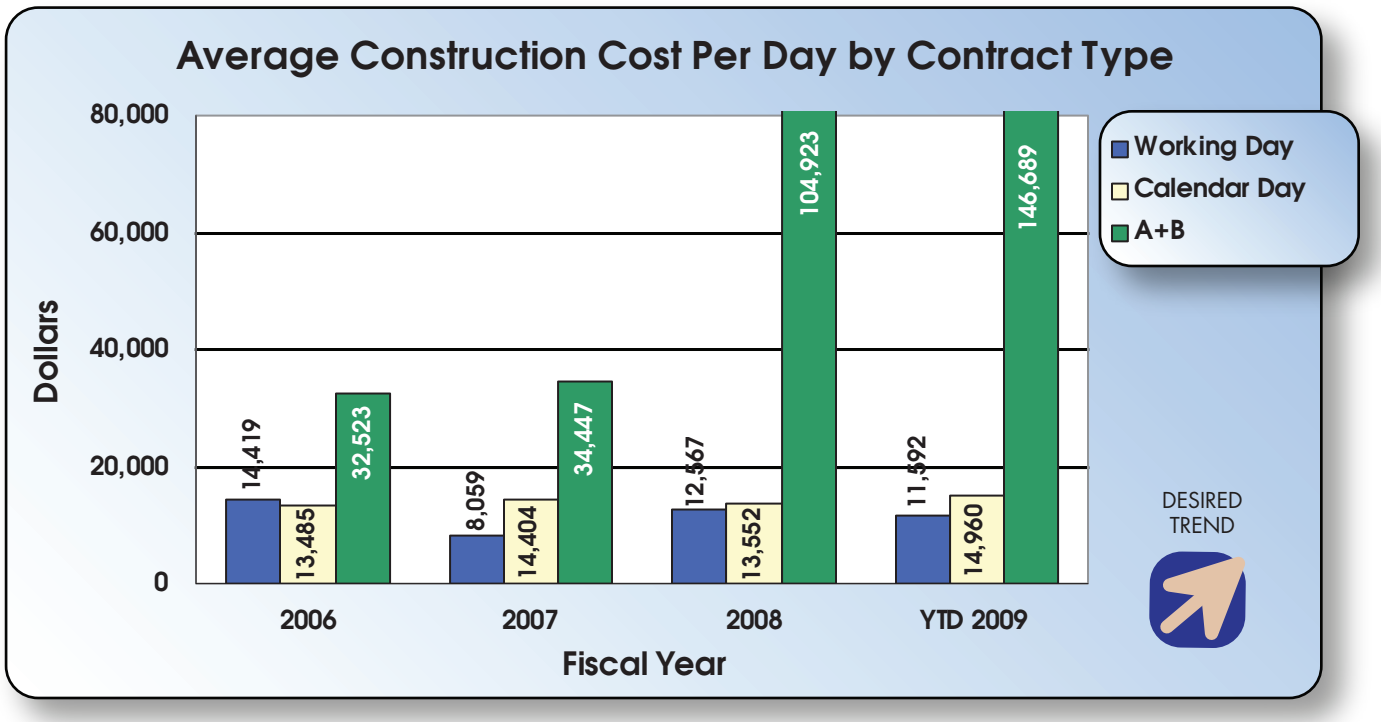
The measurement groups construction contracts into three categories:

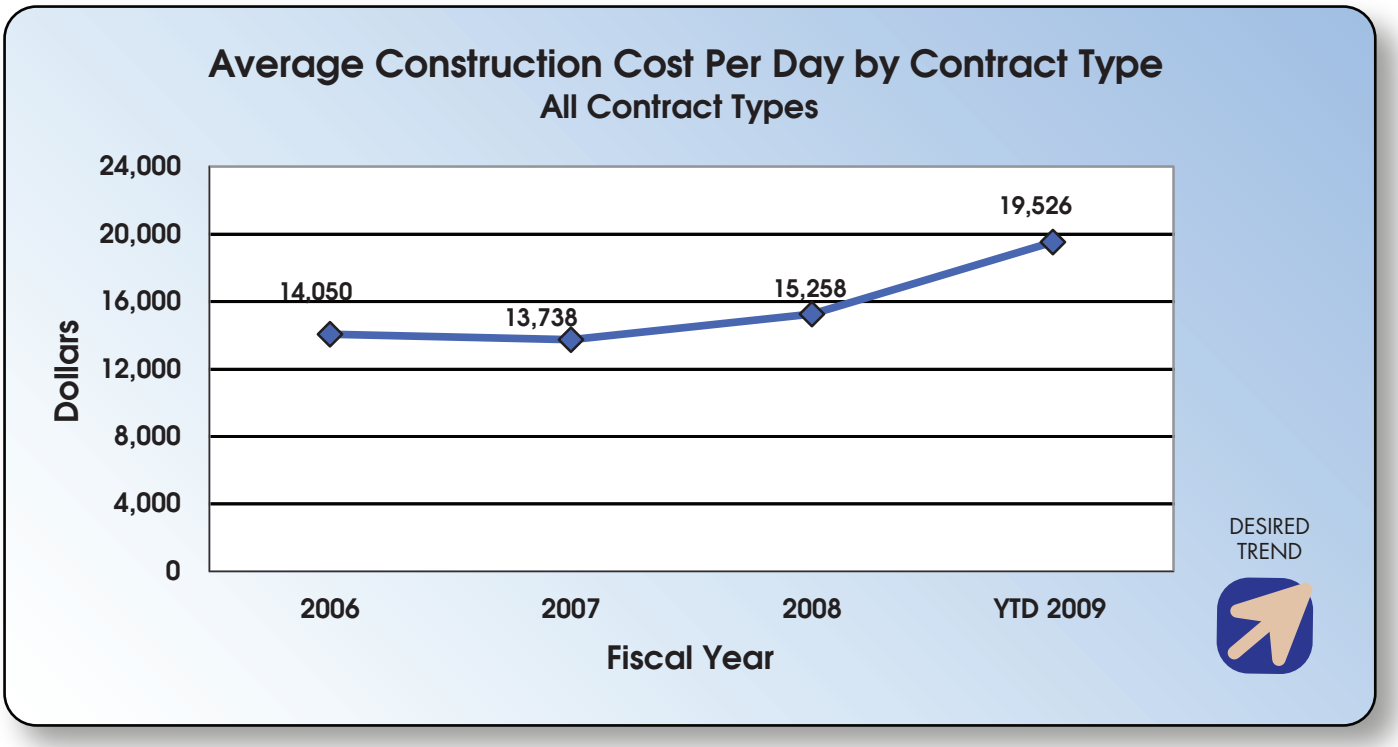
- **WD** working day contracts
- **CD** calendar day contracts and;
- **A + B** or innovative contracts that provide incentive/disincentives to the contractor for early completion.

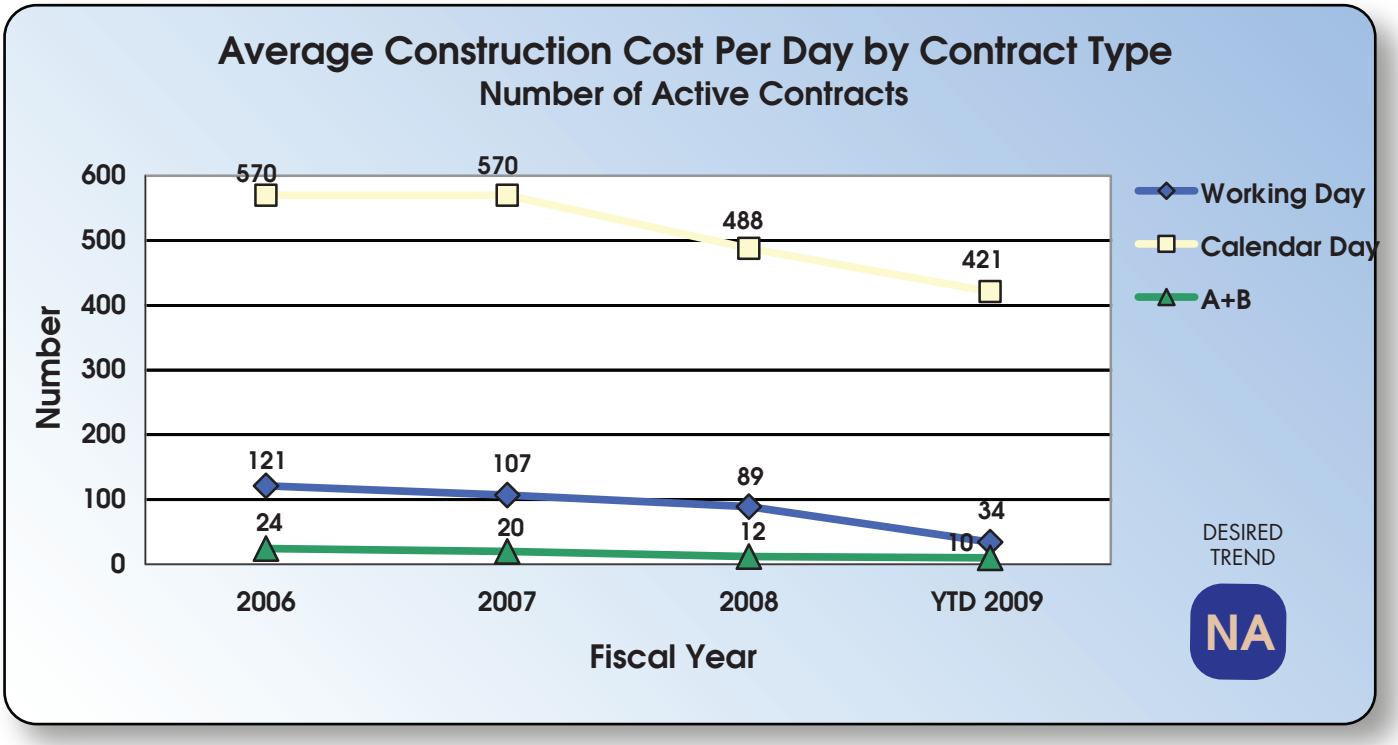
This is an annual measure updated each quarter.

Improvement Status:

The greater use of A+B and calendar-day contracts resulted in a larger amount paid per calendar day in the first three quarters of fiscal year 2009. The I-64 and kcICON Design-Build projects are included in the A+B category. MoDOT's strategy of utilizing innovative contracting techniques and Design-Build projects has resulted in faster contract completion and fewer delays to the traveling public. Contract types are reviewed to make a determination of the most effective use of resources for timely completion of projects.




Average Construction Cost Per Day by Contract Type
All Contract Types
24,000
20,000
16,000
12,000
8,000
4,000
0
Dollars
14,050
13,738
15,258
19,526
2006
2007
2008
YTD 2009
Fiscal Year
DESIRED TREND


Average Construction Cost Per Day by Contract Type
Number of Active Contracts
600
500
400
300
200
100
0
Number
570
570
488
421
121
107
89
34
24
20
12
10
2006
2007
2008
YTD 2009
Fiscal Year
Working Day
Calendar Day
A+B
DESIRED TREND
NA

Unit cost of construction expenditures-9g

Result Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Kenneth Voss, Bidding and Contract Services Engineer

Purpose of the Measure:

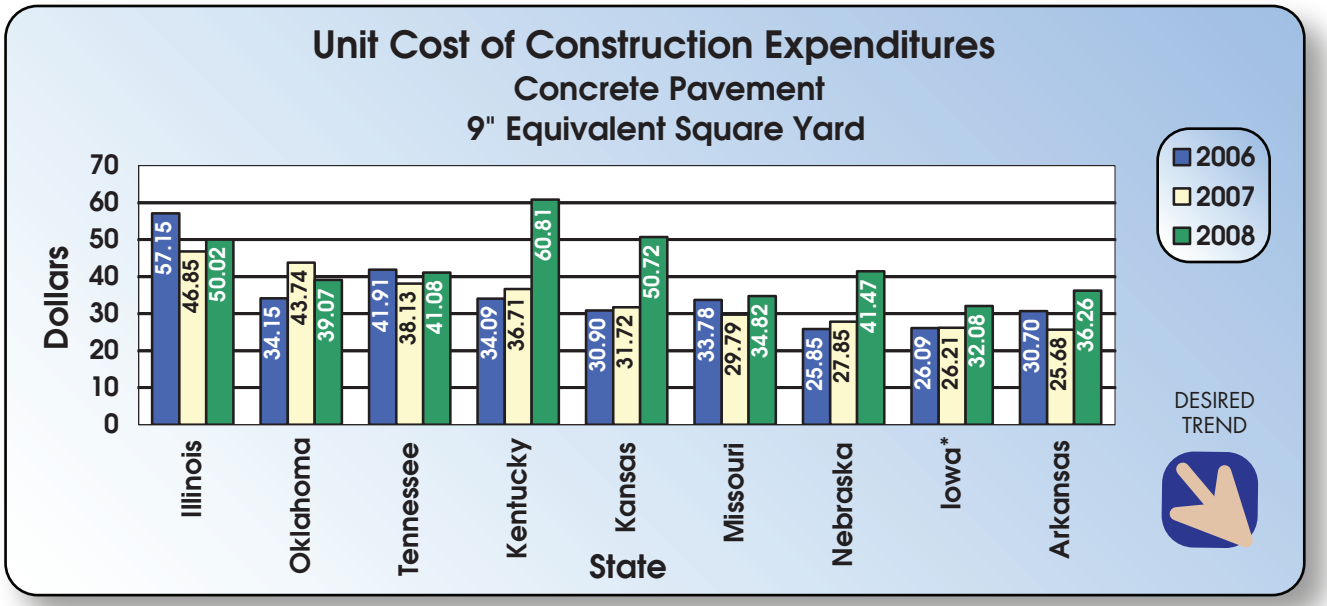
This measure tracks how MoDOT projects provide great value by comparing the cost of major items of work for MoDOT projects to other state DOTs. MoDOT customers should be able to gain an understanding of what it costs for a DOT to install an item of work. While value should not be defined as MoDOT prices per unit being the lowest as compared to other DOTs, prices can be compared keeping in mind that labor rates, material availability and general project conditions such as urban vs. rural will vary from state to state.

Measurement and Data Collection:

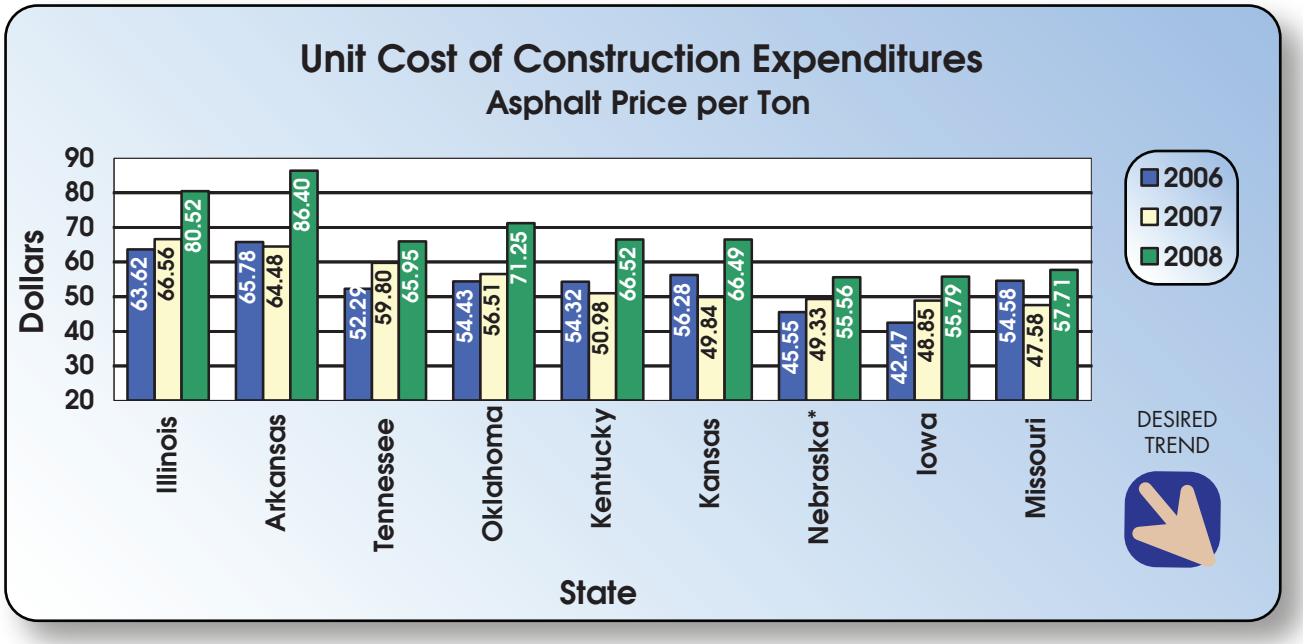
Value in this measure has simply been related back to dollars per unit of measure. MoDOT staff categorizes raw data from an outside vendor for the unit cost from other states. FHWA is the source for determining the "lowest in the U.S." FHWA is currently retooling its method of determining state price indexes. This is a success for DOTs since FHWA's old method produced numerous pieces of erroneous data. Due to the data discrepancies the lowest in the country was selected from the best of what was available and the overall index of some of the surrounding states is not reported. This is an annual measure updated each January.

Improvement Status:

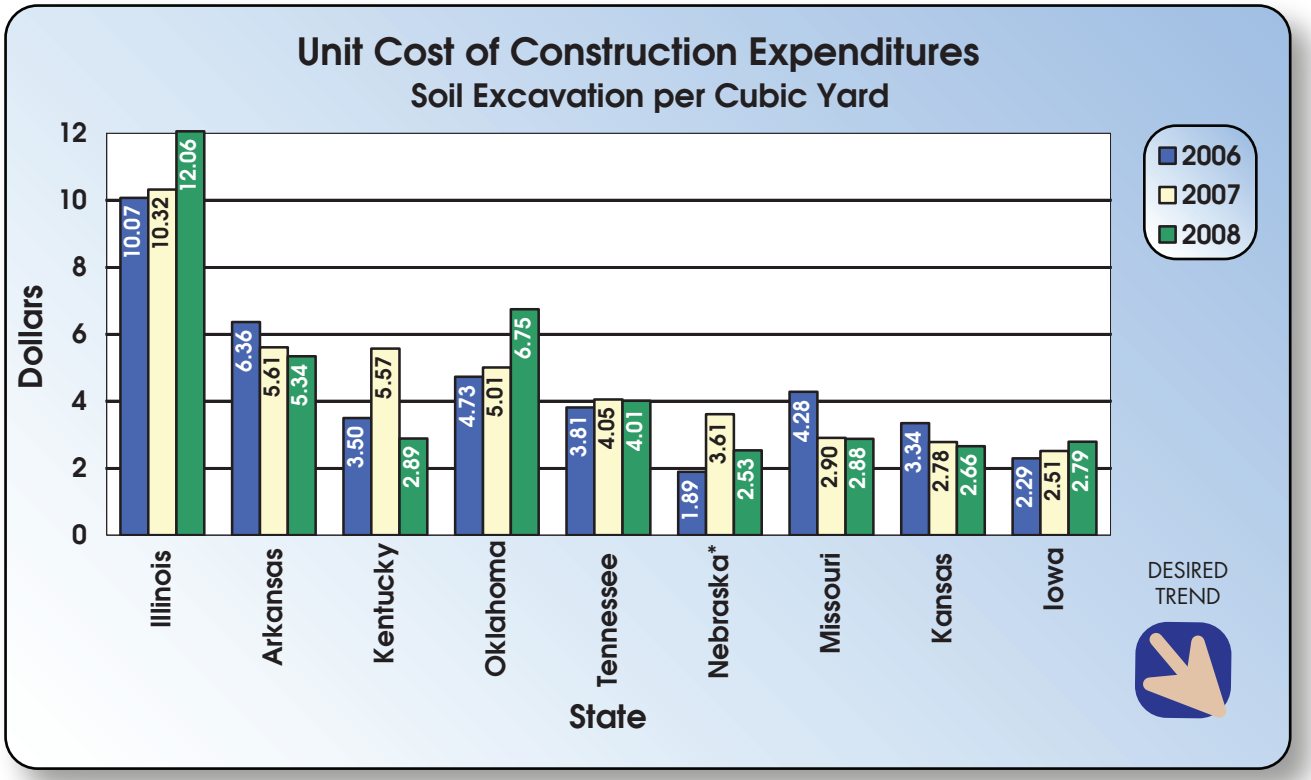
Excellent competition in the past year has enabled MoDOT to realize almost a seven percent reduction in unit prices for bridge construction – the second largest percentage decrease in this area among Missouri's surrounding states. MoDOT was also below the surrounding states average increase in unit prices for concrete and asphalt paving. The 21 percent increase in unit prices for asphalt paving is due to a spike in the cost of asphalt binder. In the past year, MoDOT had an average of more than 4.8 bidders per proposal as compared to fewer than 3.5 bidders per proposal just a couple of years ago. Projects over $20 million are receiving an average of more than six bids per proposal which can be attributed to smaller programs in surrounding states and MoDOT's efforts to "balance" the bid openings by spreading out the big jobs in different months. MoDOT has also expanded the use of alternate technical concepts that give bidders and designers more flexibility to deliver the best value for every dollar spent.



* Lowest for surrounding states

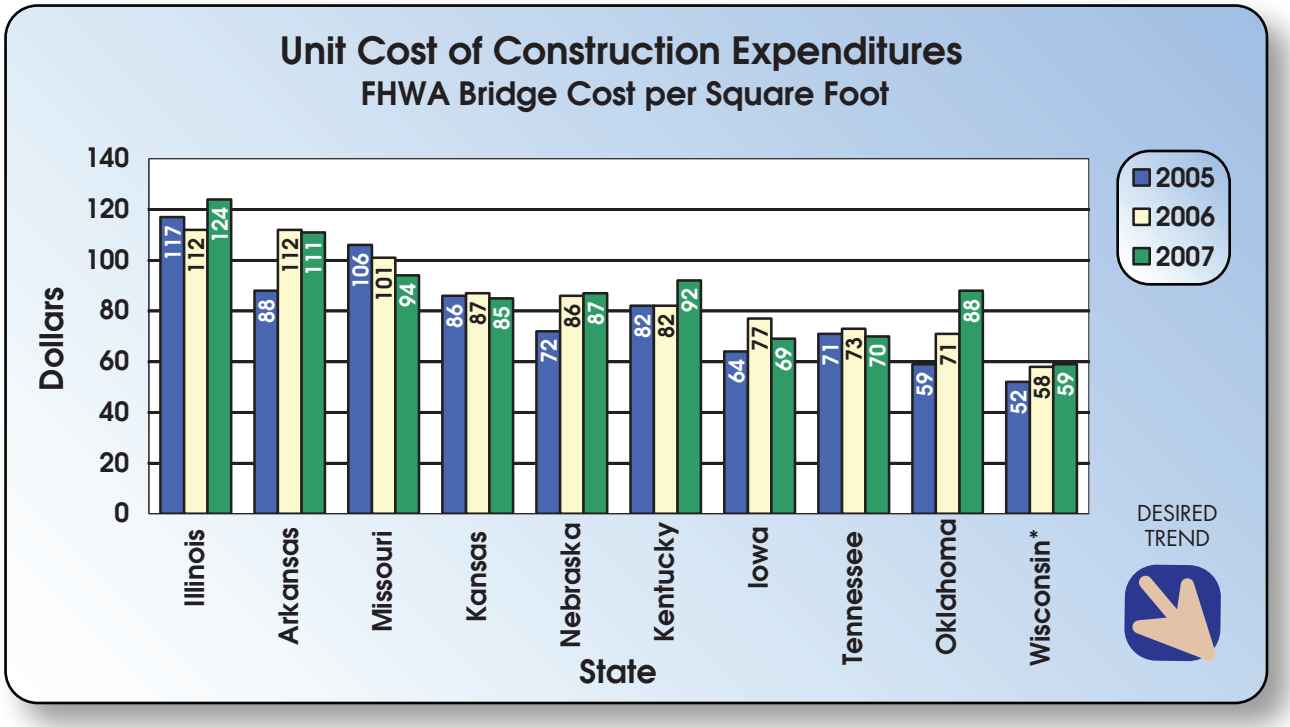


* Lowest for surrounding states



* Lowest for surrounding states

Footnote for the charts above:
Source data for states other than Missouri from Oman Systems Bid Tabs Professional latest data available as of January 2009. Items include common excavation items paid for by the cubic yard. Missouri data from MoDOT bid history.



*Lowest in U.S.
Source data from FHWA memo "Bridge Construction Unit Cost" dated January 2009. FHWA does not publish an average U.S. cost per square foot for bridges.

Annual dollar amount saved by implementing value engineering-9h

Result Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Kathy Harvey, State Design Engineer

Purpose of the Measure:
This measure tracks the amount of money MoDOT saves by implementing value engineering proposals.

Measurement and Data Collection:

Value Engineering has saved MoDOT over $449 million since 1988. VE achieves savings at the design phase and at the construction phase of a project. VE utilizes a team approach to refine the purpose and need and then develop innovative and creative ideas, which result in project savings while optimizing project performance. The VE team is usually independent from the project core team and includes participants from various disciplines both from within and outside of MoDOT. VE studies are done on projects at all stages of development, from the concept stage to final design and during construction.

Traditionally, VE studies during the design phase of a project were a five-day formal event that required a tremendous amount of organization and facilitation. As a result, VE studies were only done on the significant few projects where large savings could be realized. In an effort to increase the number of VE studies being done and thus increase the potential for cost savings, the format of the study has been revised to be more flexible. VE studies now match the size and needs of the project, ranging from four hours to five days. This change has increased the number of VE studies being done during the design phase of the projects.

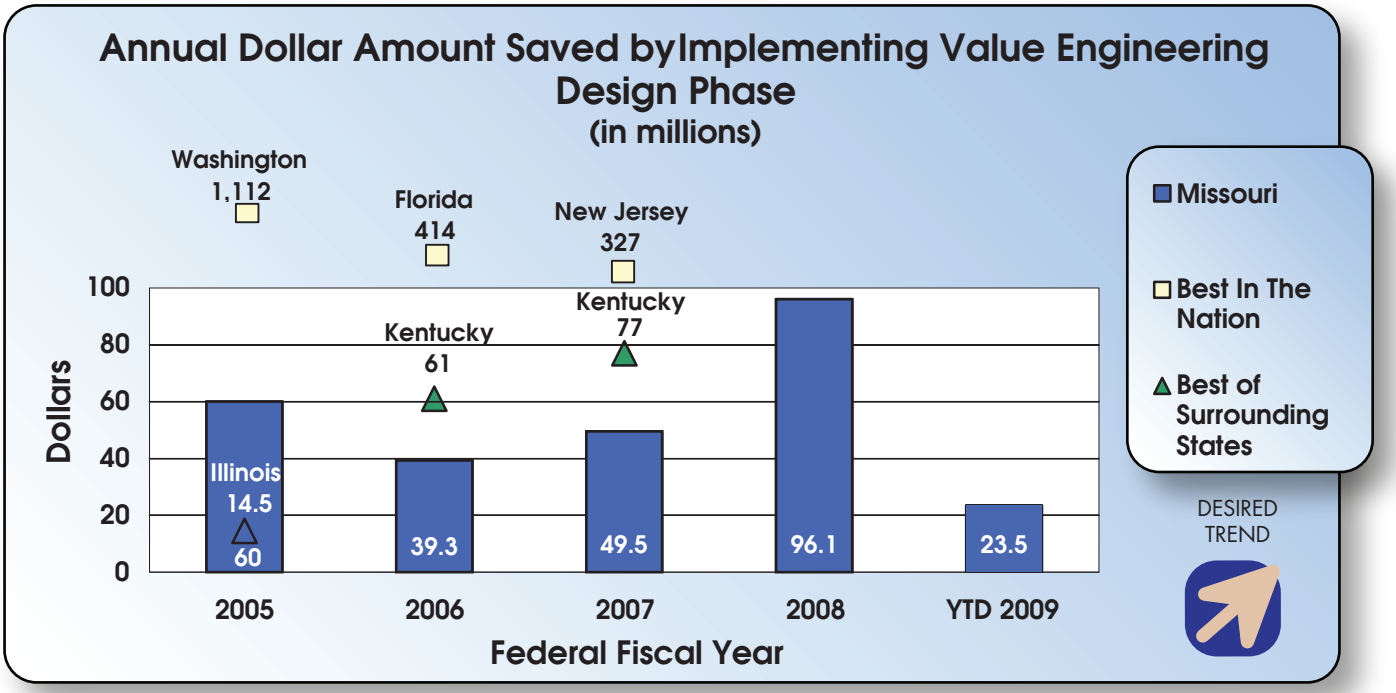
VE savings are reported annually to the Federal Highway Administration by each state and the national results are available for Federal Fiscal Year 2007. For design phase savings, New Jersey is the best in the nation showing $327 million implemented. For construction phase savings, Florida is the best in the nation showing $5.25 million implemented. When compared to states surrounding Missouri, Kentucky reported $77 million saved during design and Iowa reported $1.12 million saved during construction. Direct comparison to other states is challenging because of differences in construction program size and project development processes. Nationwide results from federal fiscal year 2008 are being compiled and are unavailable at the current time.

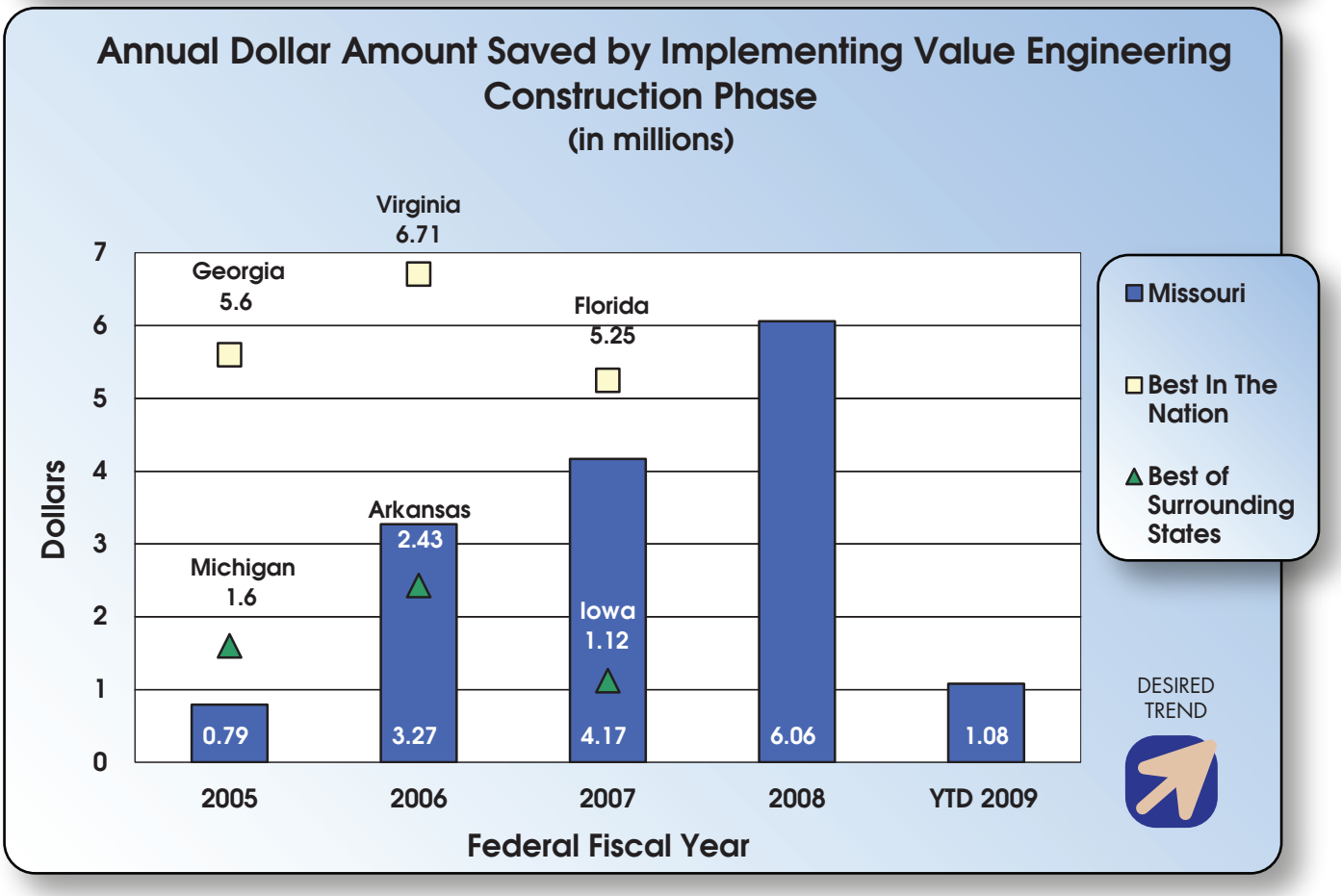
This is an annual measure using a federal fiscal year, running from Oct. 1 to Sept. 30. Annual updates are reported in the October Tracker edition, however the year-to-date total for the current fiscal year is included in each of the other editions.

Improvement Status:

In 2008, MoDOT design savings from VE studies were $96.1 million, a 94 percent increase from 2007. So far, for 2009, design savings are $23.5 million.

In 2008, MoDOT construction savings from VE Change Proposals were $6.06 million, a 45 percent increase over the previous year, and 73 out of 93 proposals submitted were approved. As of the second quarter of federal fiscal year 2009, MoDOT construction savings from VECP are $1.08 million and 31 out of 40 proposals submitted were approved.


Annual Dollar Amount Saved byImplementing Value Engineering
Design Phase
(in millions)
Washington
1,112
Florida
414
New Jersey
327
Kentucky
61
Kentucky
77
Illinois
14.5
60
39.3
49.5
96.1
23.5
100
80
60
40
20
0
Dollars
2005
2006
2007
2008
YTD 2009
Federal Fiscal Year
Missouri
Best In The Nation
Best of Surrounding States
DESIRED TREND


Annual Dollar Amount Saved by Implementing Value Engineering
Construction Phase
(in millions)
Virginia
6.71
Georgia
5.6
Florida
5.25
Arkansas
2.43
Michigan
1.6
Iowa
1.12
0.79
3.27
4.17
6.06
1.08
7
6
5
4
3
2
1
0
Dollars
2005
2006
2007
2008
YTD 2009
Federal Fiscal Year
Missouri
Best In The Nation
Best of Surrounding States
DESIRED TREND

Percent of customers who feel completed projects are the right transportation solutions-9i

Result Driver: Dave Nichols, Director of Program Delivery
Measurement Driver: Kathy Harvey, State Design Engineer

Purpose of the Measure:

This measure provides information regarding the public's perception of MoDOT's performance in providing the right transportation solutions.

Measurement and Data Collection:

Data for this measure is collected through an annual survey that is sent to users of projects that were completed and opened to traffic within the previous year. The goal is for the MoDOT districts to identify 30 projects – three per district – in three different categories (large – major route listed as or funded through major project dollars; medium – district-wide importance; and small – only local significance).

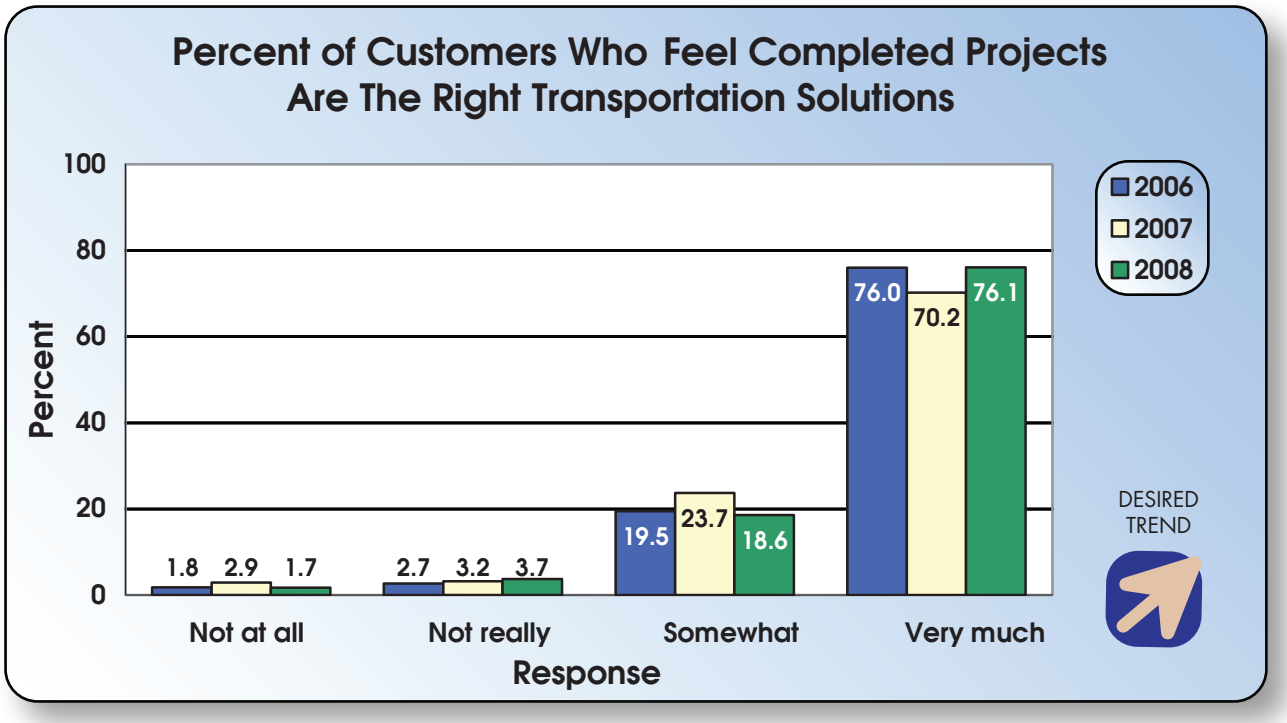
A sample of residents is drawn from zip code areas adjoining the roadway where the project was recently completed. The samples have included 400 addresses per project areas for a total of 12,000 surveys in 2006 and 2008, and 11,600 in 2007 (29 projects). Nearly 2,900 surveys were returned in the initial survey, more than 2,300 were returned in 2007, and 2,697 were returned in the most recent survey.

This measure is reported annually in January. Districts will continue to identify one project in each of the three categories to be surveyed, although it is recognized that it might not be possible for every district to have three projects that meet the criteria each year.

Improvement Status:

Project-specific questions were asked of MoDOT customers and each showed a high level of satisfaction with important goals such as safety, convenience, less congestion, handles traffic efficiently, easy to navigate, easy to understand and well marked.

The overall results show that most Missourians are very satisfied with both the local project and generally believe that MoDOT provides the right transportation solutions. 92.8 percent of the respondents were either "very" or "fairly" familiar with the project roadway. 69.2 percent of the respondents were regular users of the affected roadway. The majority of respondents thought that the project made the roadway safer (95.4 percent), more convenient (91.2 percent), less congested (82.7 percent), easier to drive (94.2 percent), better marked (92.3 percent) and was the right transportation solution (94.7 percent).


Percent of Customers Who Feel Completed Projects Are The Right Transportation Solutions
Percent
100
80
60
40
20
0
1.8
2.9
1.7
2.7
3.2
3.7
19.5
23.7
18.6
76.0
70.2
76.1
Not at all
Not really
Somewhat
Very much
Response
2006
2007
2008
DESIRED TREND