

# Fast Projects That Are of Great Value

*Tangible Result Driver – Dave Nichols,  
Director of Program Delivery*

MoDOT customers expect that transportation projects be completed quickly and provide major improvements for travelers. MoDOT will honor project commitments because it believes in integrity.



## Fast Projects That Are of Great Value

### *Percent of estimated project cost as compared to final project cost*

**Result Driver:** Dave Nichols, Director of Program Delivery

**Measurement Driver:** Renate Wilkinson, Planning & Programming Engineer

**Purpose of the Measure:**

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

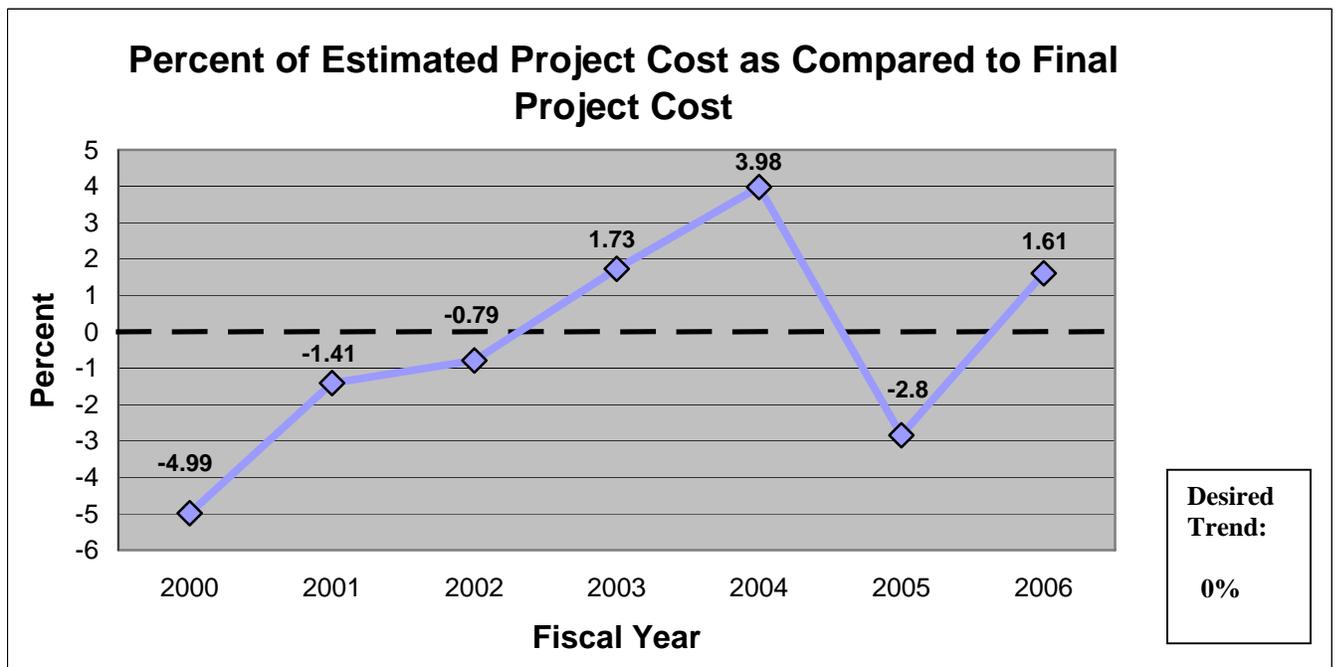
**Measurement and Data Collection:**

MoDOT determines the completed project costs and compares them to the estimated costs. The completed project costs are reported during the state 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.

**Improvement Status:**

The increased cost trend through state fiscal year 2004 reflects the increased number of projects in state fiscal years 2001, 2002 and 2003. The increased work volume resulted in higher awards and overall costs. The decrease in 2005 can be attributed to the lower work volume and increased competition among contractors. The increase in 2006 can be primarily attributed to inflationary pressures. The ideal status is no deviation in the estimated vs. final project cost, or 0 percent.



Positive numbers indicate the final (completed) cost was higher than the estimated cost.

## Fast Projects That Are of Great Value

### *Average number of years it takes to go from the programmed commitment in the Statewide Transportation Improvement Program to construction completion*

**Result Driver:** Dave Nichols, Director of Program Delivery

**Measurement Driver:** Machelles Watkins, Transportation Planning Director

**Purpose of the Measure:**

This measure monitors how quickly projects go from the programmed commitment to construction completion. Customers perceive this time as project wait-time.

**Measurement and Data Collection:**

MoDOT compares how long it takes from when the project is added to the Statewide Transportation Improvement Program to when the project is completed. Data is categorized by the type of work, and distinguishes between design and construction stages.

**Improvement Status:**

Data for projects completed in calendar year 2005 has been added to this Tracker. The new data resulted in adjustments to the previous 2004 major bridge data. The time for the major bridge design and construction phases was amended and moved to calendar year 2005.

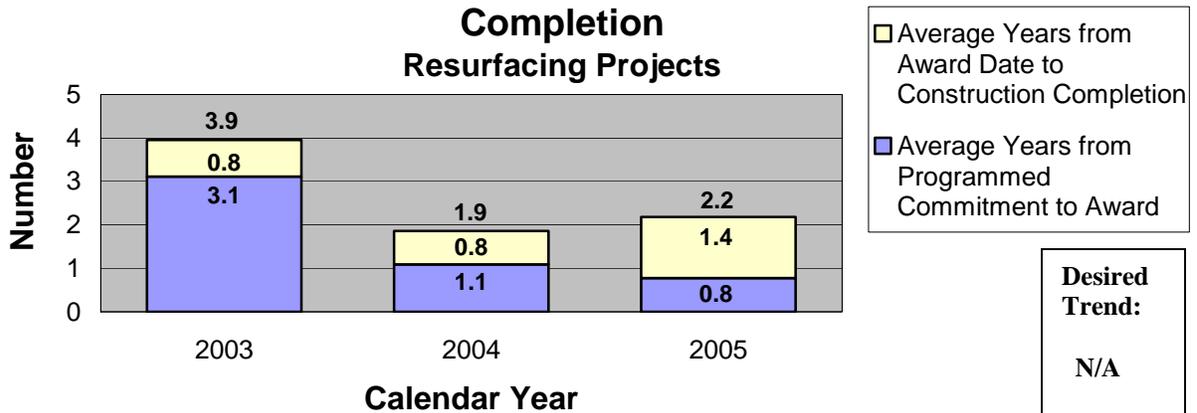
Of the projects completed in 2005, the quickest projects were resurfacing projects, which were completed in a little more than two years. The projects that took the longest time to complete were major bridge replacements, which took almost seven years.

Of the projects completed in 2004, the quickest projects were resurfacing projects, which were completed in less than two years. The projects that took the longest time to complete were new or expanded highways, which took more than five years.

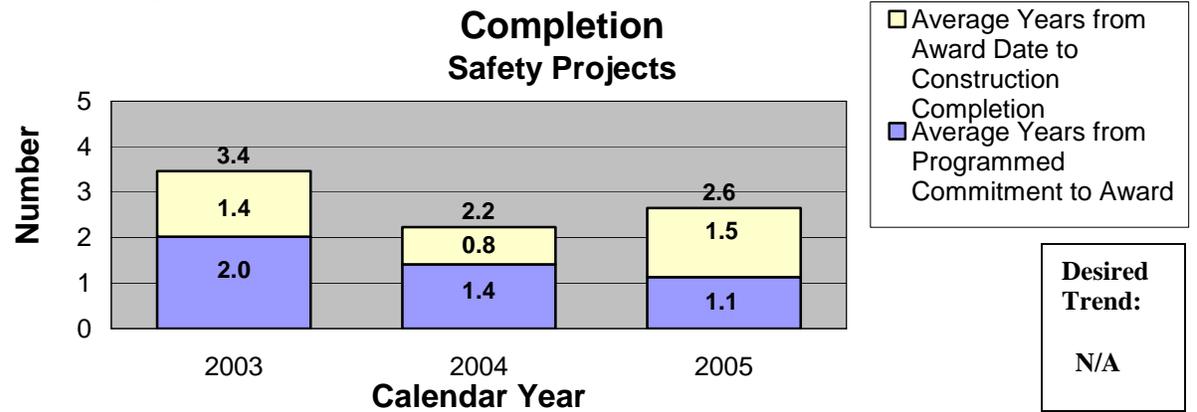
Of the projects completed in 2003, the quickest projects were safety projects, which were completed in less than four years. The projects that took the longest to complete were major bridge replacements, which took almost 12 years.

Overall, for projects completed between 2003 and 2005, resurfacing and safety jobs average 2.7 years from programmed commitment to construction completion. New or improved bridges average 3.9 years. New or expanded highways average 6.9 years. Major bridge replacements average 9.1 years.

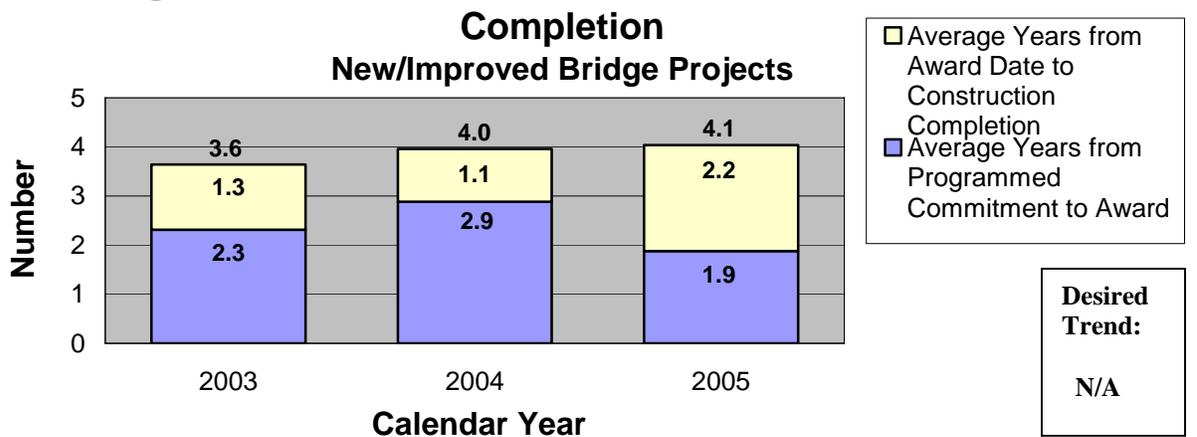
### Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion



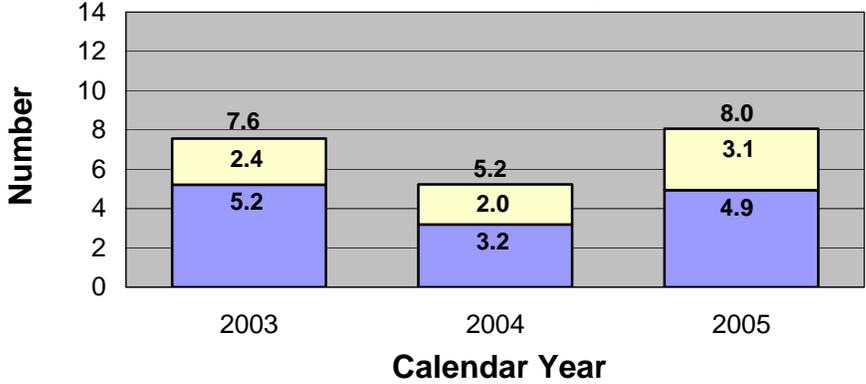
### Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion



### Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion



**Average Number of Years it Takes to Go from the  
Programmed Commitment in the STIP to Construction  
Completion  
New/Expanded Highway Projects**

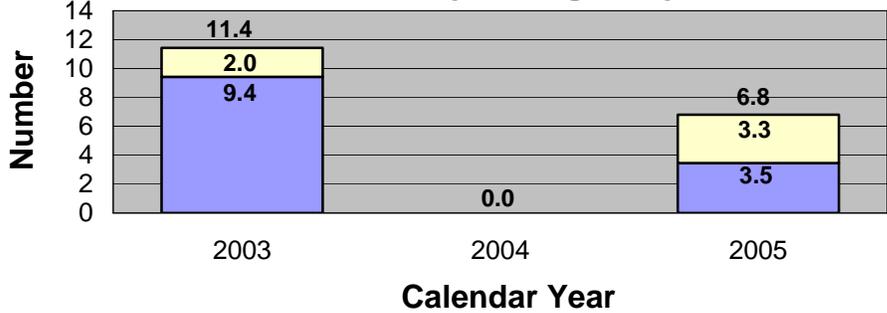


□ Average Years from Award Date to Construction Completion  
■ Average Years from Programmed Commitment to Award

**Desired Trend:**

N/A

**Average Number of Years it Takes to Go from the  
Programmed Commitment in the STIP to Construction  
Completion  
Major Bridge Projects**



□ Average Years from Award Date to Construction Completion  
■ Average Years from Programmed Commitment to Award

**Desired Trend:**

N/A

## Fast Projects That Are Of Great Value

### *Percent of projects completed within programmed amount*

**Results Driver:** Dave Nichols, Director of Project Delivery

**Measurement Driver:** Dave Ahlvers, State Construction Engineer

**Purpose of Measure:**

The measure tracks the percentage of projects completed within the programmed amount. The cost includes such items as engineering, right of way and contract payments.

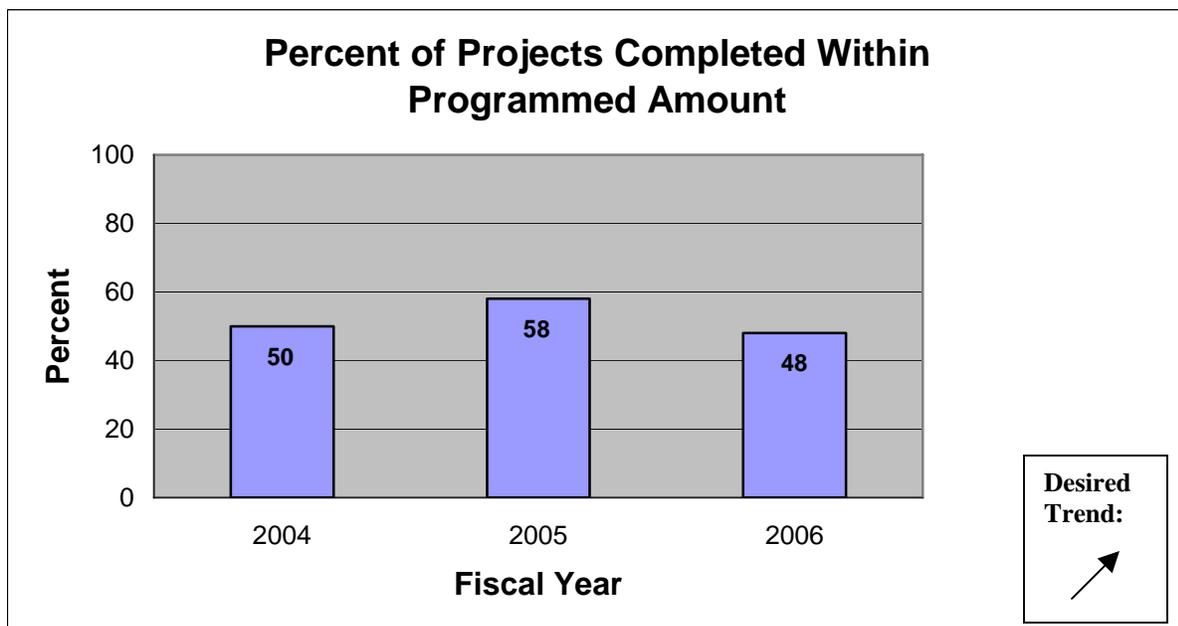
**Measurement and Data Collection:**

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 cost.

**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. Continued emphasis will be placed on scoping projects and developing estimates that represent the true cost of delivering the projects. MoDOT will strive to deliver quality projects cheaper by using practical design.



## Fast Projects That Are Of Great Value

### *Percent of projects completed on time*

**Results Driver:** Dave Nichols, Director of Project Delivery

**Measurement Driver:** Dave Ahlvers, State Construction Engineer

**Purpose of the Measure:**

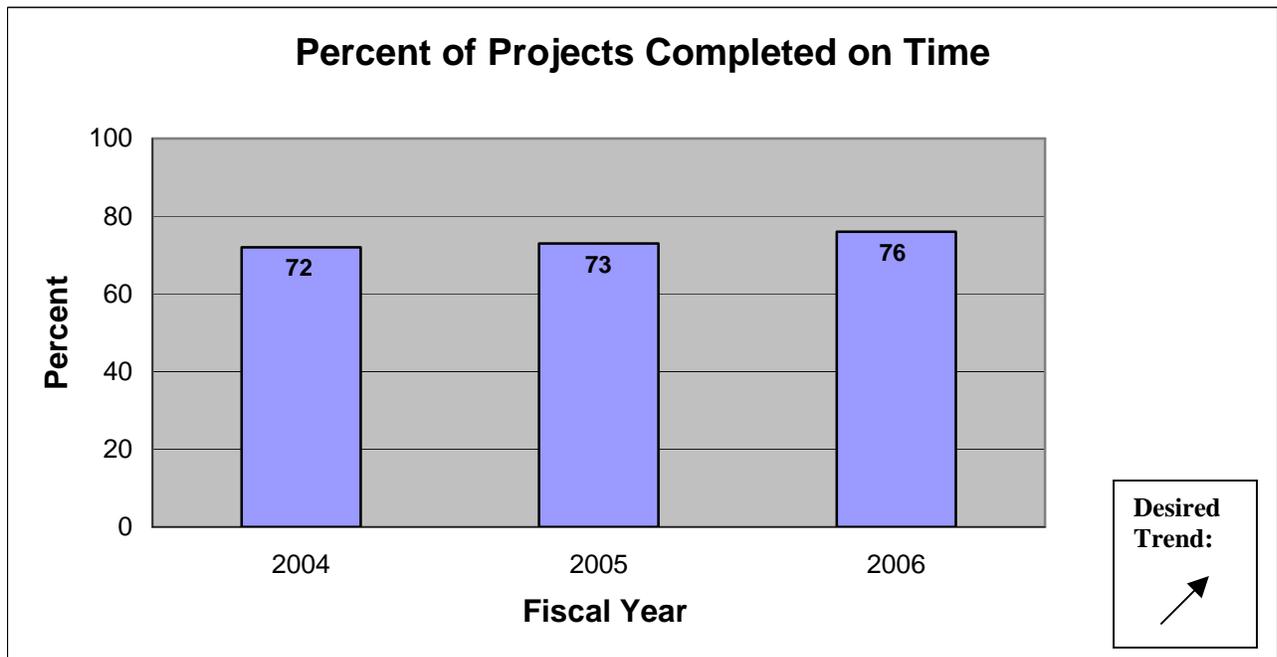
This measure tracks the percentage of projects completed by the commitment date established in the contract. Adjustments to the completion date are made when additional work is required or for unusual weather occurrences. It will indicate MoDOT's ability to complete projects by the agreed upon date.

**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. It will be part of the Plans, Specifications & Estimates submittal. The actual completion date will be documented by the Resident Engineer and placed in MoDOT's Management System.

**Improvement Status:**

The results indicate a small increase from previous years in the percent of projects completed 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. An emphasis has been placed on reviewing construction schedules and assessing liquidated damages, which should lead to improvements in timely completion.



## Fast Projects That Are Of Great Value

### *Percent of change for finalized contracts*

**Results Driver:** Dave Nichols, Director of Project Delivery

**Measurement Driver:** Dave Ahlvers, State Construction Engineer

**Purpose of the Measure:**

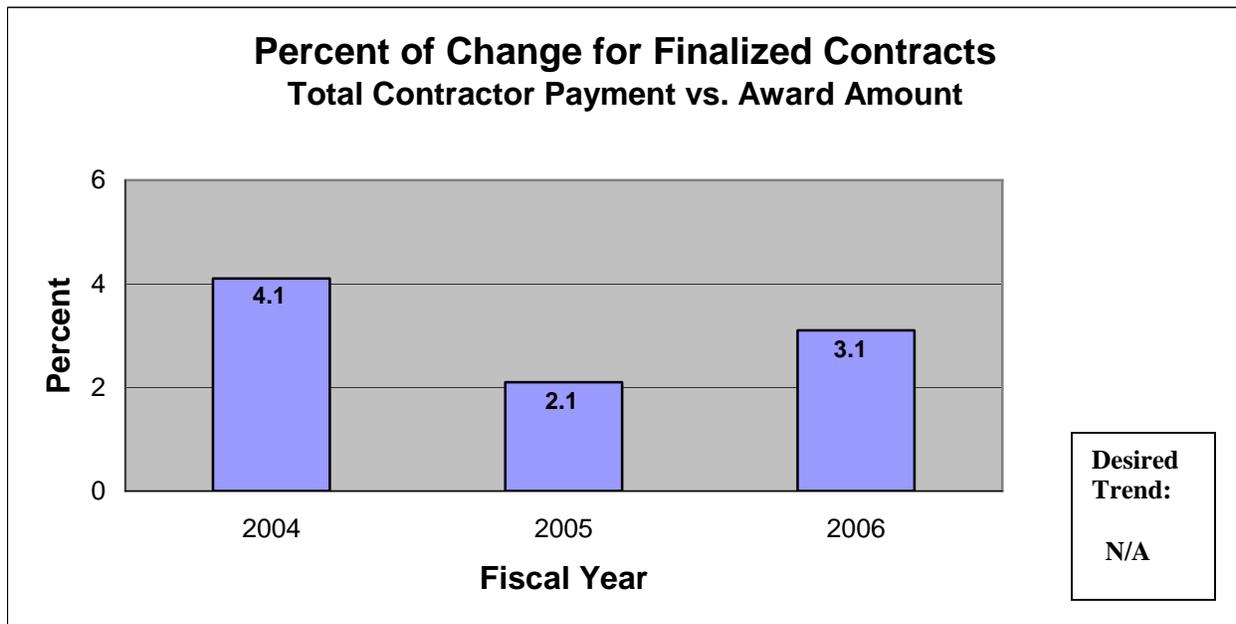
The measure tracks the percentage difference of total construction payouts to the original contract award amounts. This indicates how many changes are made on projects after they are awarded to the contractor.

**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.

**Improvements Status:**

MoDOT's performance has improved significantly since 2004. After holding at the two percent level through the first three quarters of FY 2006, the completion of several major projects that had large overruns during the fourth quarter brought the final results up to three percent. The overall improvement in the last two fiscal years 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. Recently, the Performance Plus employee incentive program is placing additional emphasis on completion of projects within budget.



## Fast Projects That Are Of Great Value

### *Average construction cost per day by contract type*

**Results Driver:** Dave Nichols, Director of Project Development

**Measurement Driver:** Dave Ahlvers, State Construction 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:**

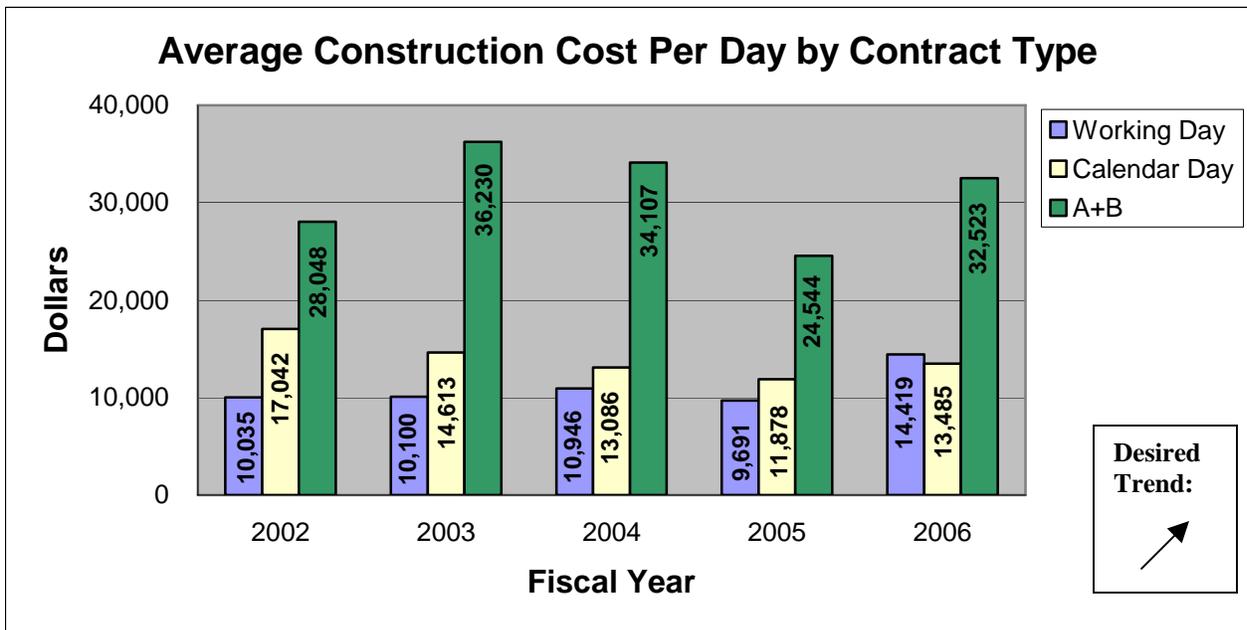
This information is gathered by extracting the actual time used for construction from the summary of working days in the SiteManager database and dividing it by the total costs of the project.

The measurement groups construction contracts into three categories:

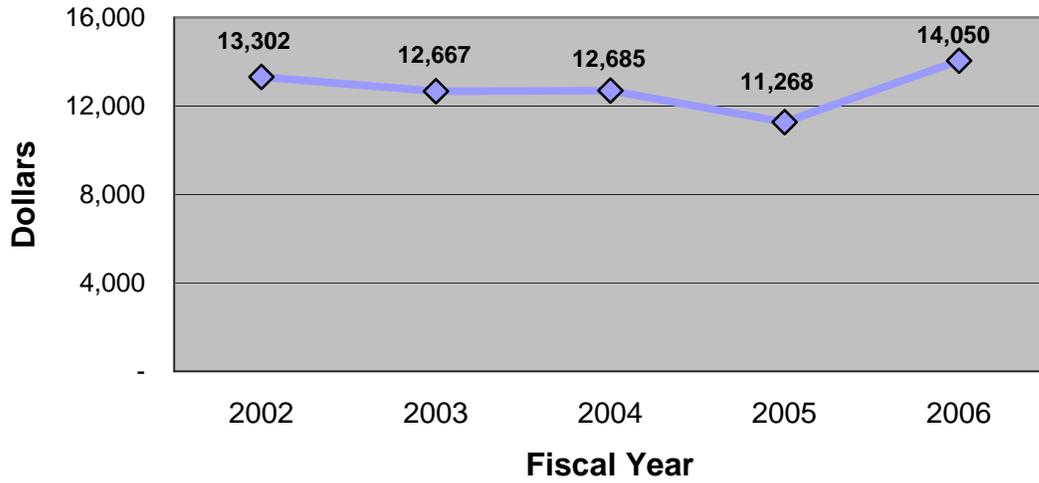
- **WD** working day contracts
- **CD** calendar day contracts and;
- **A + B** or innovative contracts that provide incentive/disincentives to the contractor for early completion.

**Improvement Status:**

The greater use of A+B and calendar day contracts resulted in a larger amount paid per calendar day. MoDOT's strategy of utilizing innovative contracting techniques 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.



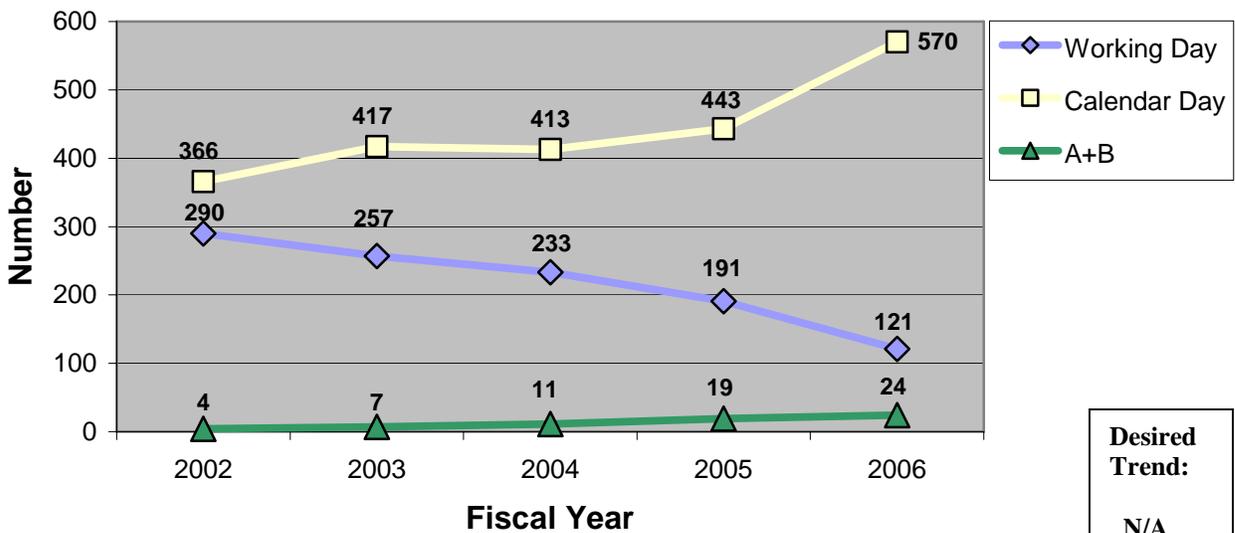
### Average Construction Cost Per Day by Contract Type All Contract Types



Desired Trend:



### Average Construction Cost Per Day by Contract Type Number of Active Contracts



Desired Trend:

N/A

## Fast Projects That Are Of Great Value

### *Percent of customers who feel completed projects are the right transportation solutions*

**Result Driver:** Dave Nichols, Director of Program Delivery

**Measurement Driver:** Kathy Harvey, State Design Engineer

**Purpose of the Measure:**

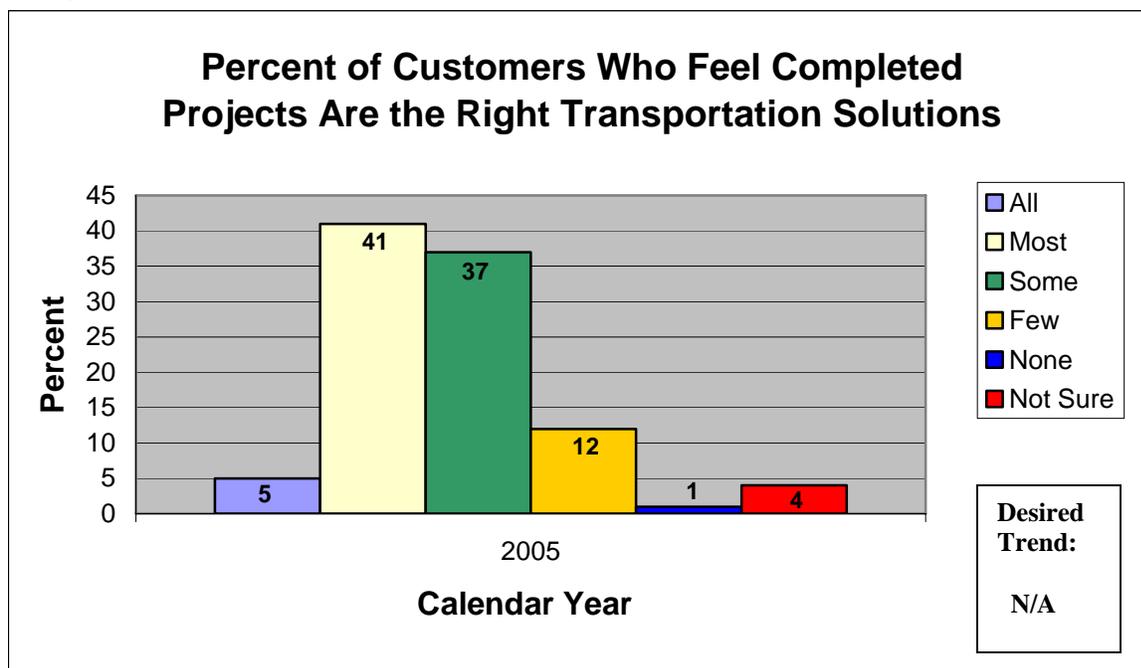
This measure provides information regarding the public's perception of MoDOT's performance in providing the right transportation solutions.

**Measurement and Data Collection:**

MoDOT districts have identified 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). These projects have been completed within the past year and are now open to traffic. Surveys will be tailored to the users of each specific facility, and administered by MTI. This measure will be reported annually. Districts will continue to identify one project in each of the three categories to be surveyed, although it is recognized that in the future it might not be possible for every district to have three projects that meet the criteria each year.

**Improvement Status:**

The chart shown below reflects the 2005 customer satisfaction survey conducted as a part of the Missouri Advance Planning initiative. Forty-six percent of the sample indicated that most or all of MoDOT's transportation solutions were the right solutions. Thirty-seven percent indicated that some of the projects were the right solutions, and 13 percent felt that few or none of the projects were the right solutions to transportation needs. Additional analysis of the respondents' stating that few or none of the projects were the right solutions did not reveal any substantive, actionable trends in the data. To better evaluate this measure and receive more precise information, the data collection method is changing. Starting this fall, specific projects will be targeted to survey the users' opinion and satisfaction with these transportation solutions. In order to address the range of projects and considerations across the state, a diverse selection of projects will be included from all 10 districts. The new results will be reported in the January 2007 Tracker.



## Fast Projects That Are of Great Value

### *Unit cost of construction expenditures*

**Result Driver:** Dave Nichols, Director of Program Delivery

**Measurement Driver:** Travis Koestner, Technical Support Engineer – Contract Services Engineer

**Purpose of the Measure:**

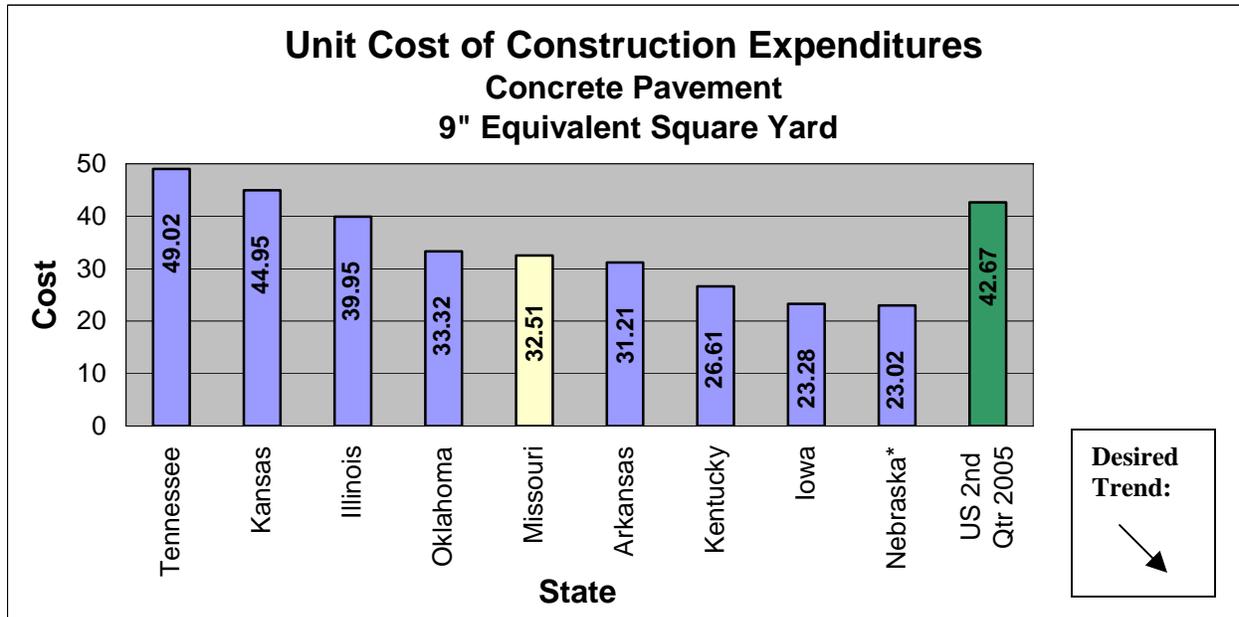
This measure tracks how MoDOT projects provide great value by comparing the cost of major items of work for MoDOT projects to other state DOTs.

**Measurement and Data Collection:**

Value in this measure has simply been related back to dollars per unit of measure. Completed in January 2006, the raw data, provided by an outside vendor, was categorized by MoDOT staff. This information should be the most current representation of what DOTs pay for these major work items.

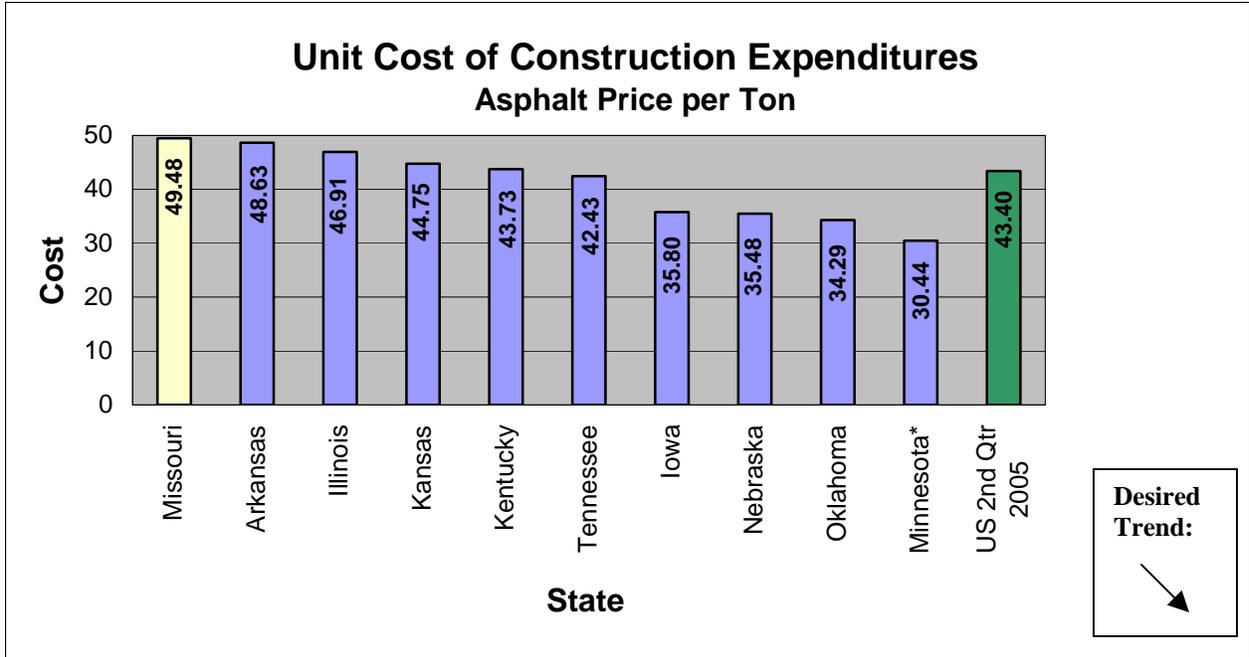
**Improvement Status:**

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. MoDOT can use this information to gain an understanding of how prices in Missouri relate to surrounding states and eventually the rest of the country. DOTs that have similar market conditions may be able to share information regarding specifications or bidding practices that result in lower cost. The states identified as having the “best” prices have been contacted for information regarding the standards and practices associated with those items.



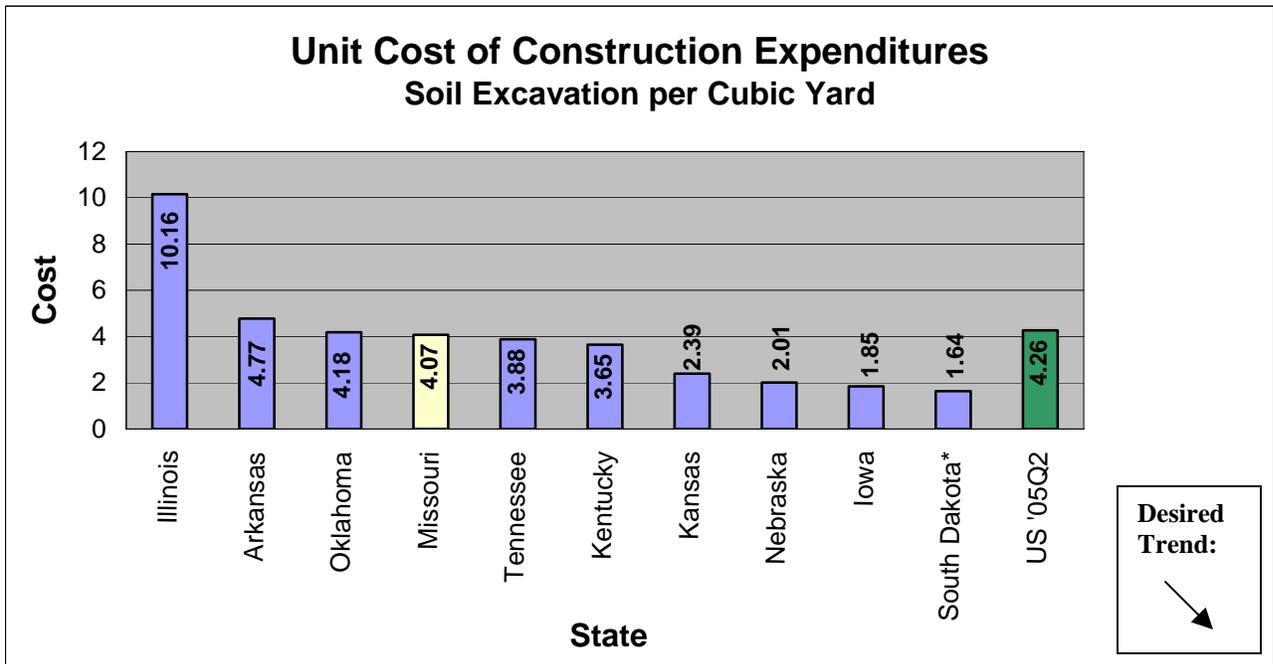
\*Lowest in US

Source Data for states other than Missouri from Oman Systems Bid Tabs Professional latest data available as of January 1, 2006. Items included; concrete pavement items paid for by the square yard converted to a 9 in equivalent. US Data from FHWA “Price Trends for Federal-Aid Highway Construction” Second Quarter 2005. Missouri Data from MoDOT bid history.



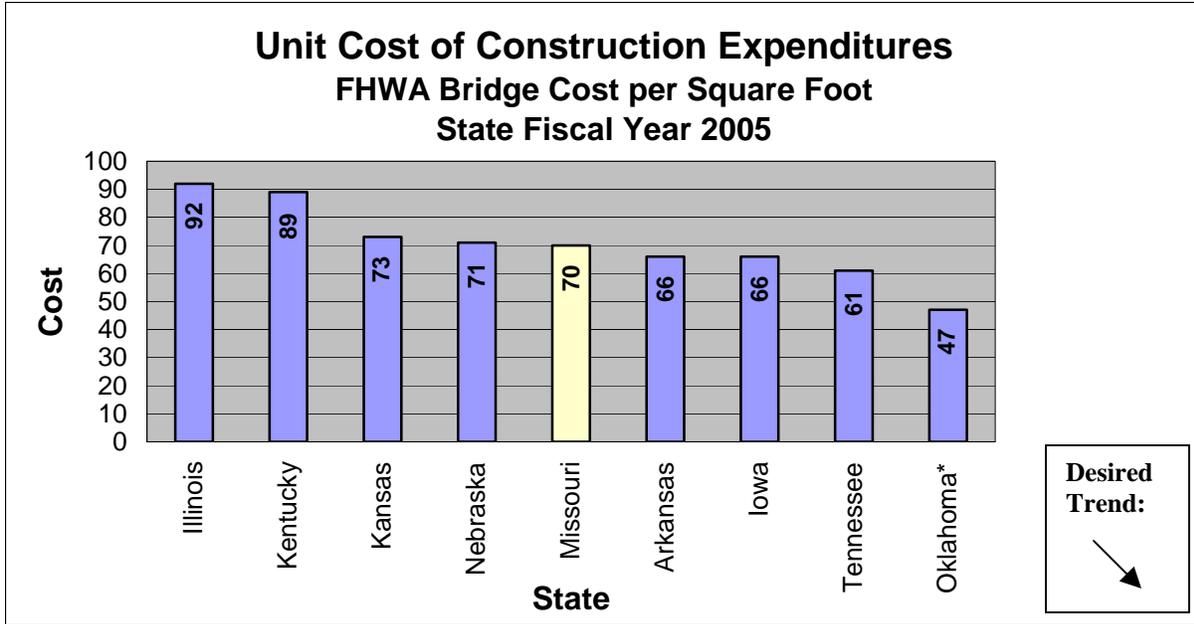
\*Lowest in US

Source Data for states other than Missouri from Oman Systems Bid Tabs Professional latest data available as of January 1, 2006. Items included asphalt items paid for by the ton. US Data from FHWA "Price Trends for Federal-Aid Highway Construction" Second Quarter 2005. Missouri Data from MoDOT bid history.



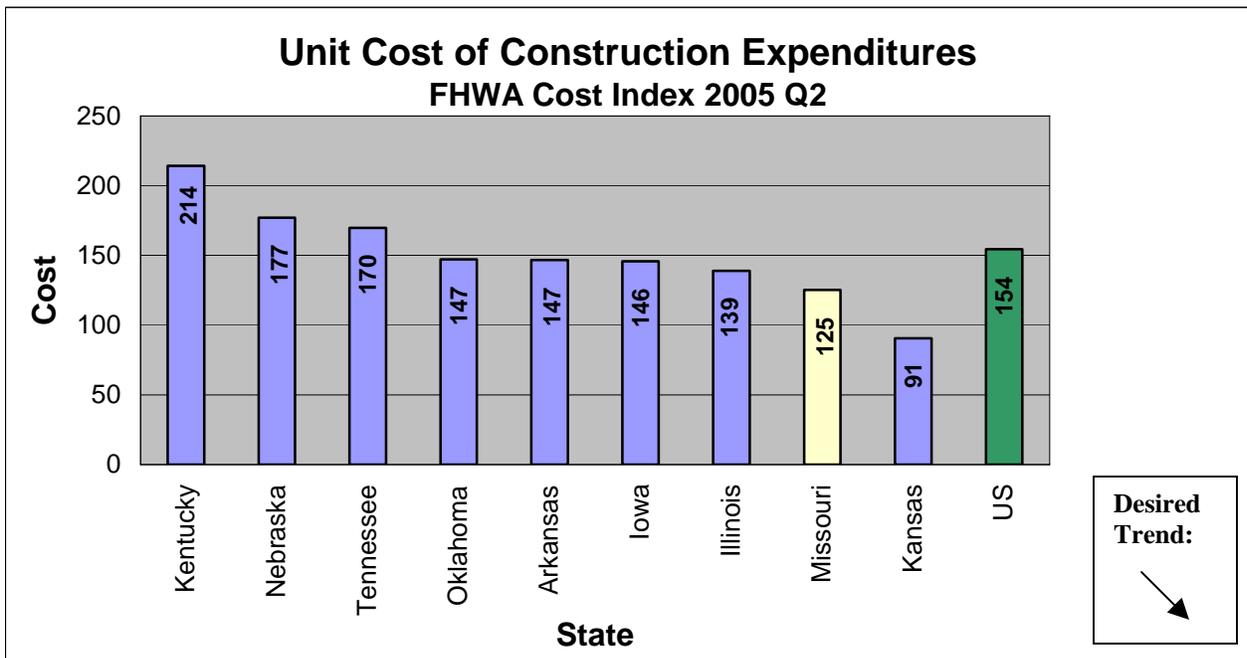
\*Lowest in US

Source Data for states other than Missouri from Oman Systems Bid Tabs Professional latest data available as of January 1, 2006. Items include; common excavation items paid for by the cubic yard. US Data from FHWA "Price Trends for Federal-Aid Highway Construction" Second Quarter 2005. Missouri Data from MoDOT bid history.



\*Lowest in US

Source data from FHWA memo "Bridge Construction Unit Cost" dated December 7, 2005. FHWA does not publish an average US cost per square foot for bridges.



Source "Price Trends for Federal-Aid Highway Construction" Second Quarter 2005.

## Fast Projects that are of Great Value

### *Annual dollar amount saved by implementing value engineering*

**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 (VE) has saved MoDOT over \$230 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.

Direct comparison to other states is challenging because of differences in construction program size and project development processes state by state. However, VE savings are reported annually to the Federal Highway Administration by each state.

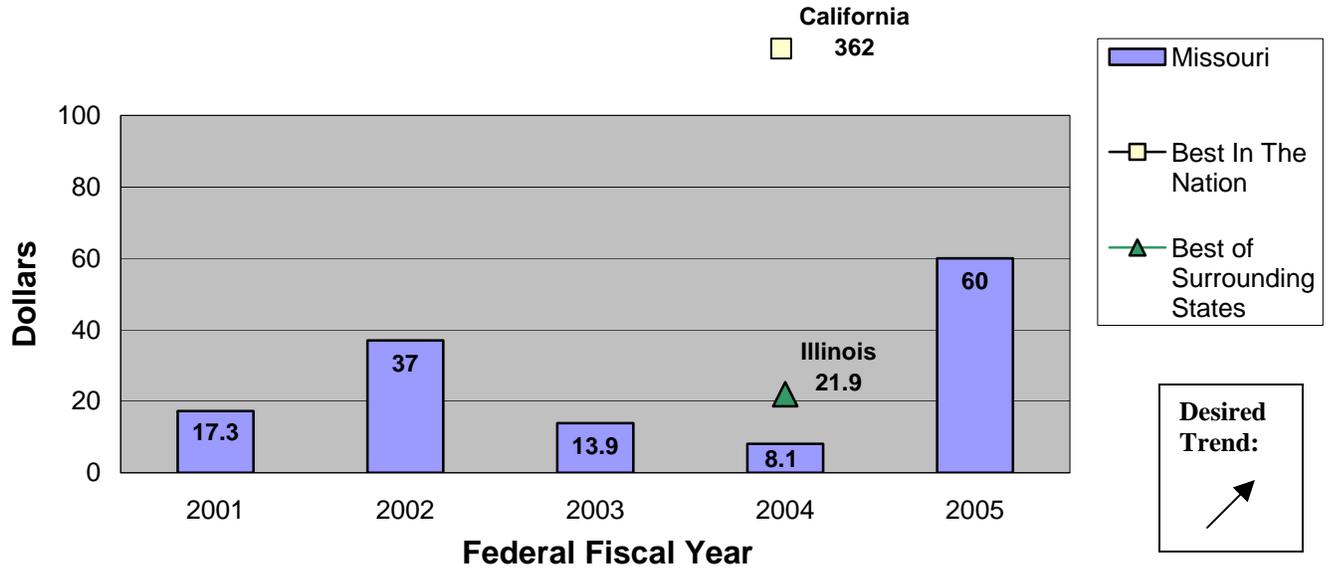
**Improvement Status:**

A recent emphasis on “Concept Stage” VE studies (CSVE) has proven to be successful at defining project scope and identifying basic functions of what the project must achieve. The focus has been to look at many concepts early in the project development process so that when a preferred concept is selected the design may continue with fewer challenges. By covering all the options early in the process, the design team gets answers sooner which saves on design time. Including external partners on VE teams will continue to prove valuable at building consent.

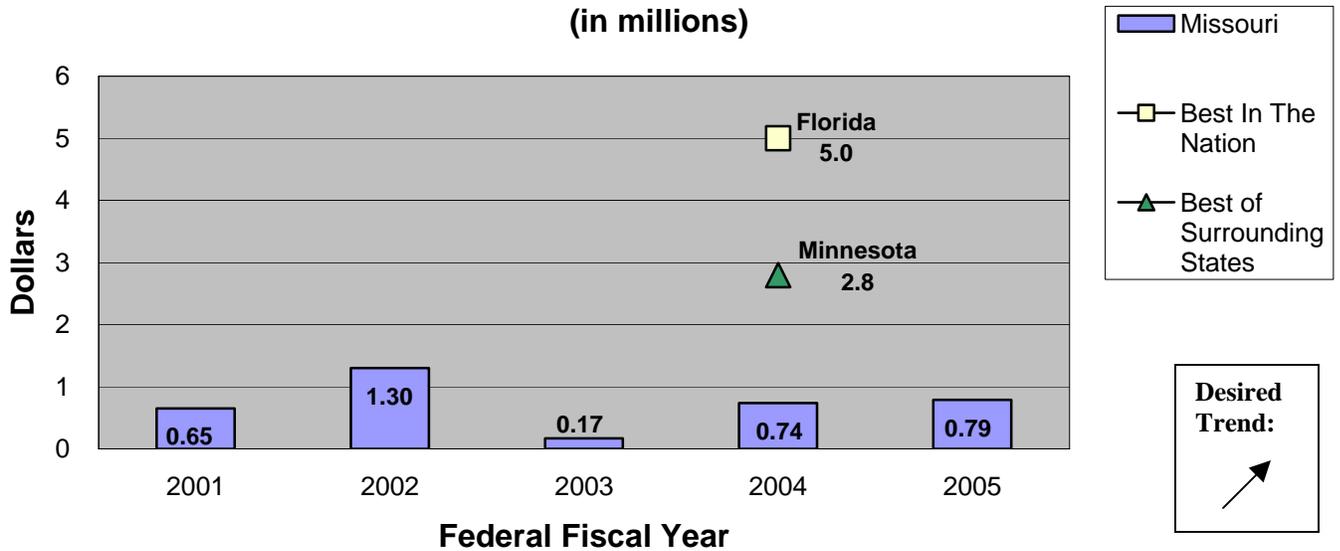
On the construction side, the implementation of the Performance Plus pilot program has increased the interest in VE studies by contractors. In addition, there has been a large effort to educate resident engineers on what VE’s are and their importance. Another component has been to encourage better reporting associated with the change order process. Year-to-date, construction savings from VE studies is \$2,660,560; a significant increase from past years.

VE savings are reported annually to the Federal Highway Administration by each state and the results are available for Federal Fiscal Year 2004. For design phase savings, California is the best in the nation showing \$362 million implemented. For construction phase savings, Florida is the best in the nation showing \$5 million implemented. When compared to states similar to Missouri in program size, Illinois reported \$21.85 million saved during design and Minnesota reported \$2.8 million saved during construction.

### Annual Dollar Amount Saved by Implementing Value Engineering Design Phase (in millions)



### Annual Dollar Amount Saved by Implementing Value Engineering Construction Phase (in millions)



## Fast Projects that are of Great Value

### *Annual dollar amount saved by implementing practical design*

**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 practical design concepts.

**Measurement and Data Collection:**

At the project level, significant innovations that result in cost savings can be realized through design modifications. These are variations from standards to fit the individual characteristics and needs of a specific project. In MoDOT's new design environment, "Practical Design" is the umbrella for a more widespread application of this process. Practical design savings were previously reported as an annual lump sum for our 2005-09 STIP. During that initial implementation of practical design, \$400 million was saved and put back into the construction program.

This measure is currently under development and will contain new data with the October 2006 Tracker edition. The new measure will take a look at categories of work awarded by MoDOT during fiscal year 2006 compared to the same categories of projects awarded during fiscal year 2004 (pre practical design) with costs inflated to 2006 amounts. Categories that will be reported on include bridge replacements, resurfacing and new roadway projects.

**Improvement Status:**

**Measure is Under  
Development**

*(This page is intentionally left blank for duplexing purposes)*