



# 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.

### Percent of programmed project cost as compared 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 project completion costs are to the programmed costs. The programmed cost is considered the project budget.

#### **Measurement and Data Collection:**

MoDOT determines the completed project costs and compares them to the programmed 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 programmed 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 programmed 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:**

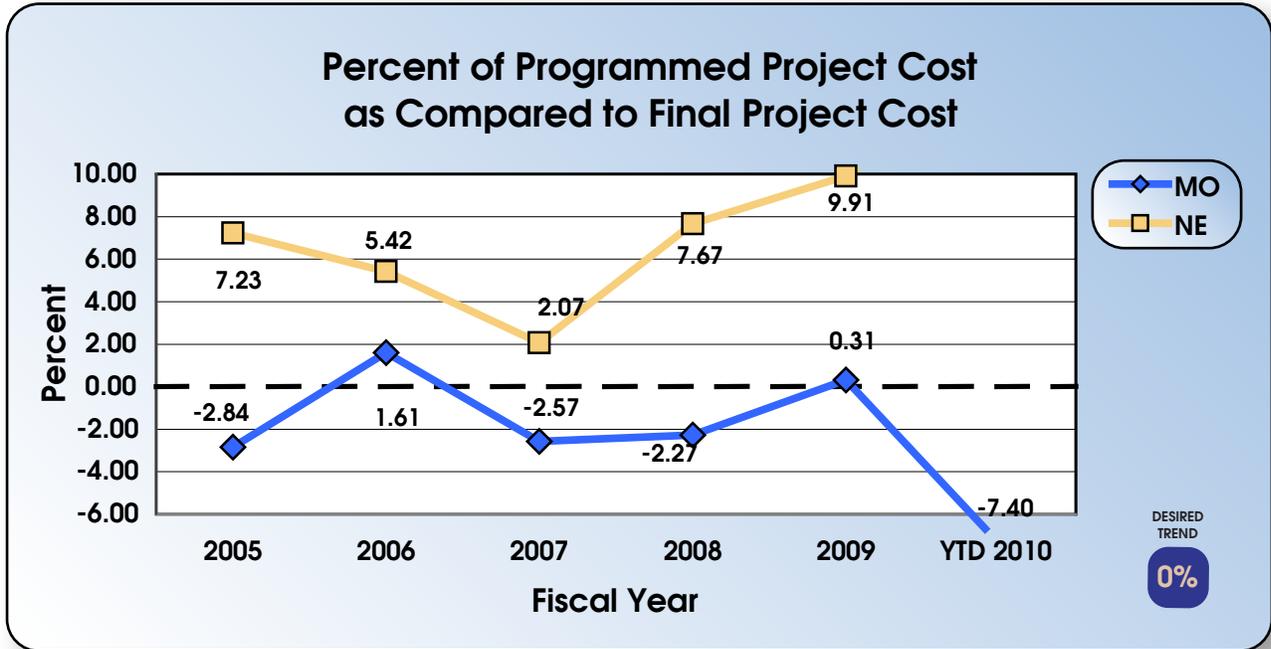
As of March 31, 2010, for fiscal year 2010, a total of 336 projects were completed at a cost of \$918 million. This represents a deviation of -7.4 percent or \$73 million less than the programmed cost of \$991 million.

In fiscal year 2009, a total of 411 projects were completed at a cost of \$1.593 billion. This represents a deviation of 0.31 percent or \$5 million more than the programmed cost of \$1.588 billion.

District construction budgets are adjusted based on variation from programmed costs. The ideal status is no deviation in the programmed vs. final project cost, or 0 percent. For projects completed in the five-year period from 2005 to 2009, final costs of \$6.321 billion were within 1.02 percent of programmed costs, or \$64.8 million less than the programmed cost of \$6.385 billion.

While a number of states track construction costs, few provide data for total project costs. Fewer still compare programmed total project costs to final total project cost. The following graph shows how MoDOT performance compares with neighboring Nebraska. In 2006, both states were within 4 percent of each other. In other years, it varied close to 10 percent. Data for Nebraska is updated annually.

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Positive numbers indicate the final (completed) cost was higher than the programmed 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:** Mabelle 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:

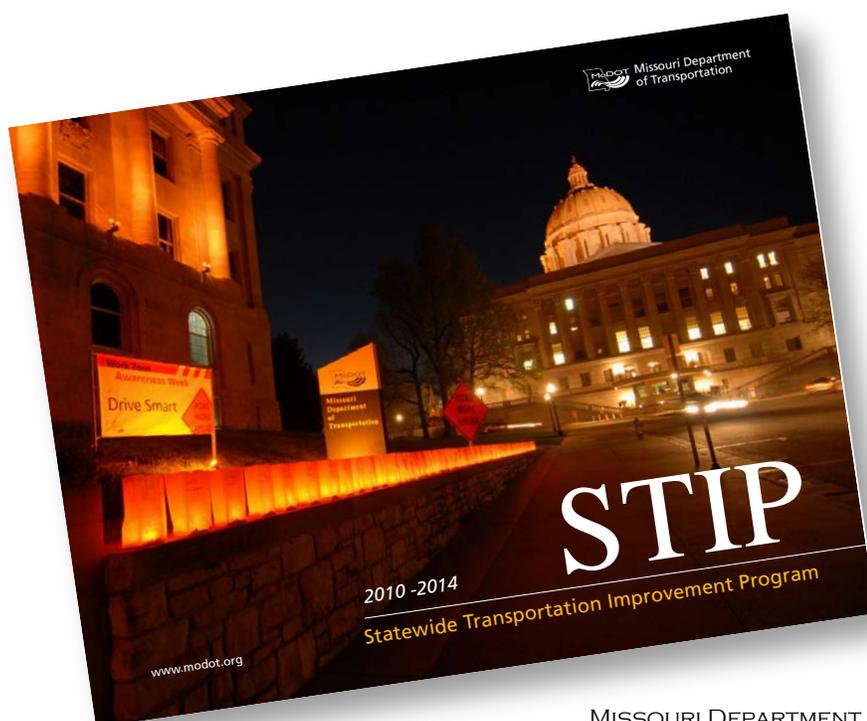
MoDOT compares how long it takes from when the project is added to the Statewide Transportation Improvement Program (STIP) to when the project is completed. Project completion is defined as fiscal closure, which happens after the visible construction work has been completed. Data is categorized by the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

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 four to five years. New or expanded highways and major bridges take yet more time, from four to eight years to develop and complete.

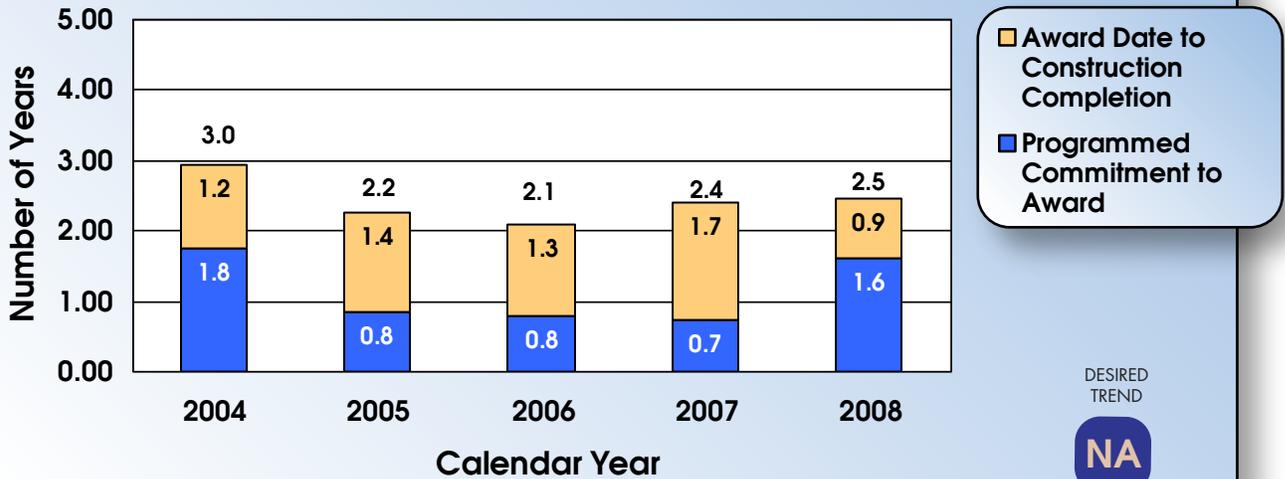
#### Improvement Status:

From 2007 to 2008, design time for resurfacing projects increased to 1.6 years. Design time for safety projects decreased slightly to 1.1 years. Design time for new or improved bridges also decreased slightly to 2.7 years. The design time average for new or expanded highways decreased to 2.7 years. The design time for major bridges increased to 1.9 years. It should be noted, though, that data samples for major bridges are usually small, which allows for one to two projects to affect the averages that are reported.

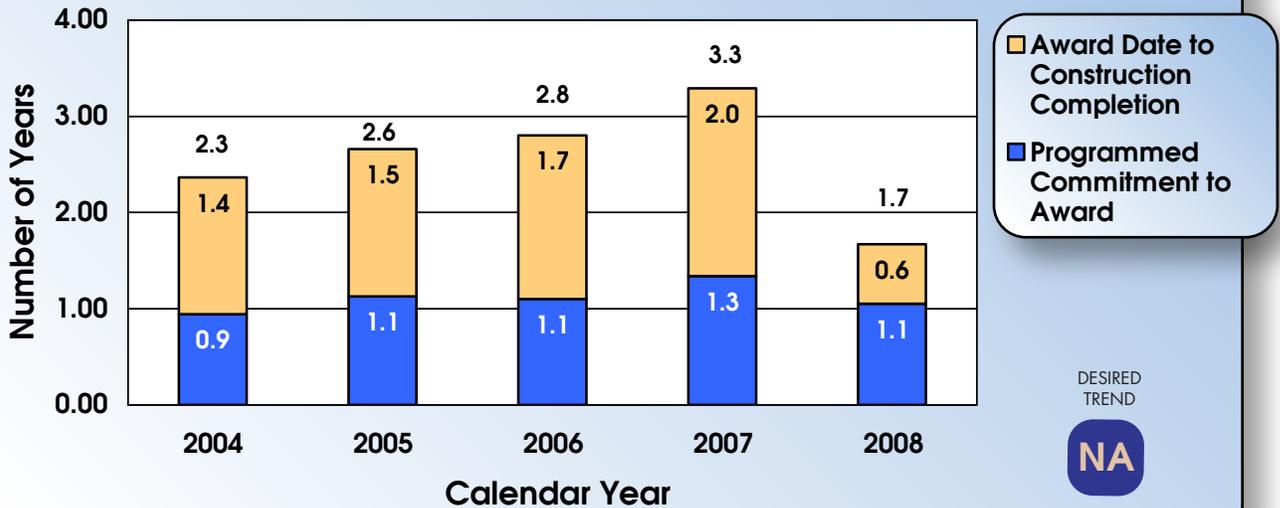
Construction times from 2007 to 2008 decreased by about half for all worktype categories. This can be partially attributed to the fact that the method of calculating construction time has changed. Prior to 2008 the end date of construction was determined by using the date projects were fiscally closed, whereas now the date of substantial work completion is used. The date of substantial work completion more closely corresponds to what the traveling public would perceive as completion of construction.



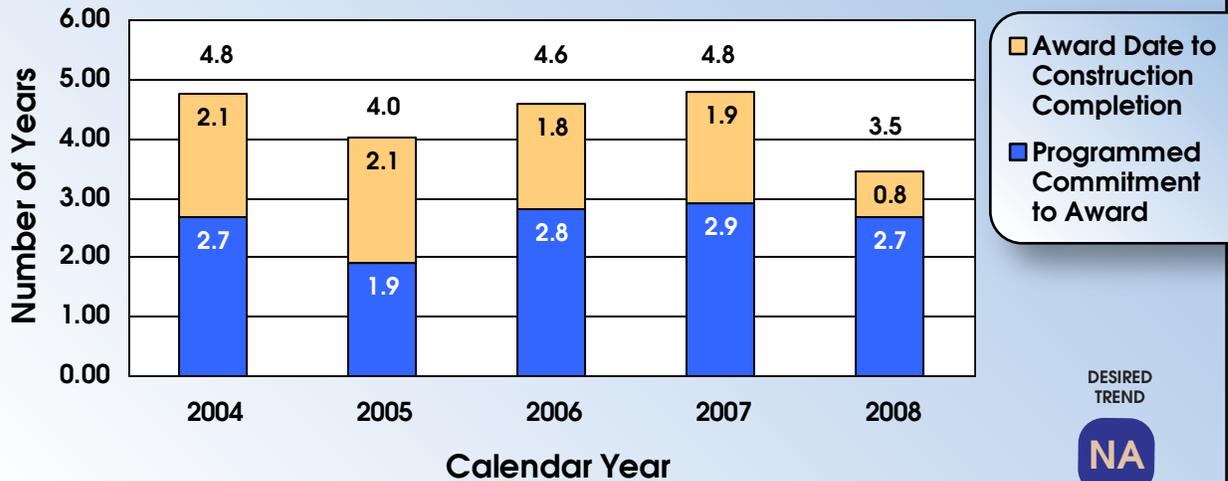
**Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion  
Resurfacing Projects**



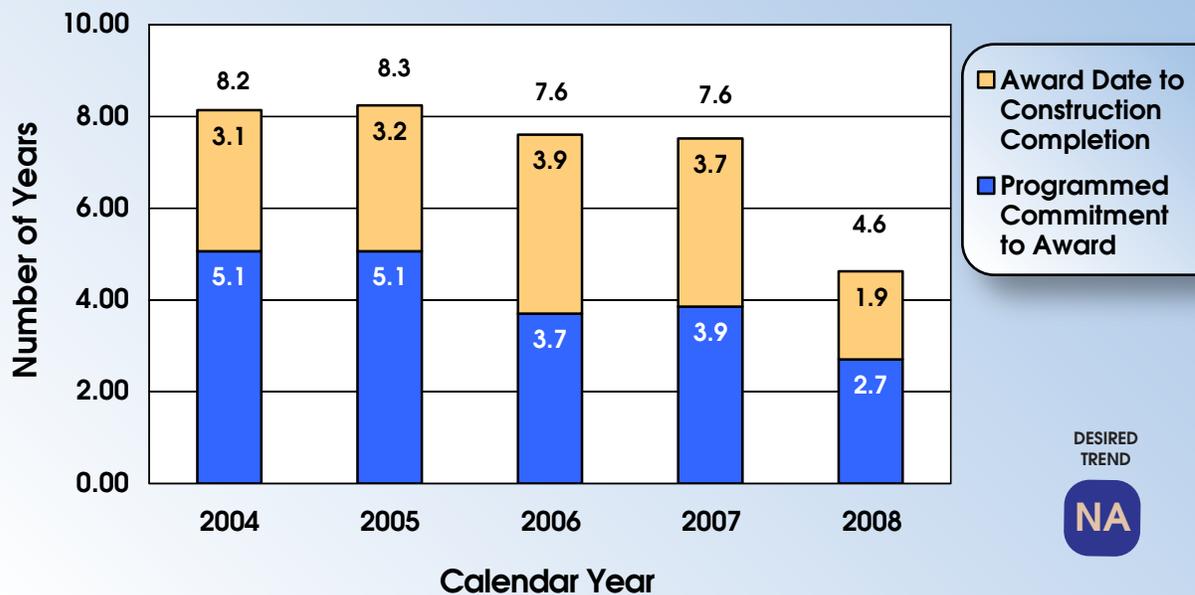
**Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion  
Safety Projects**



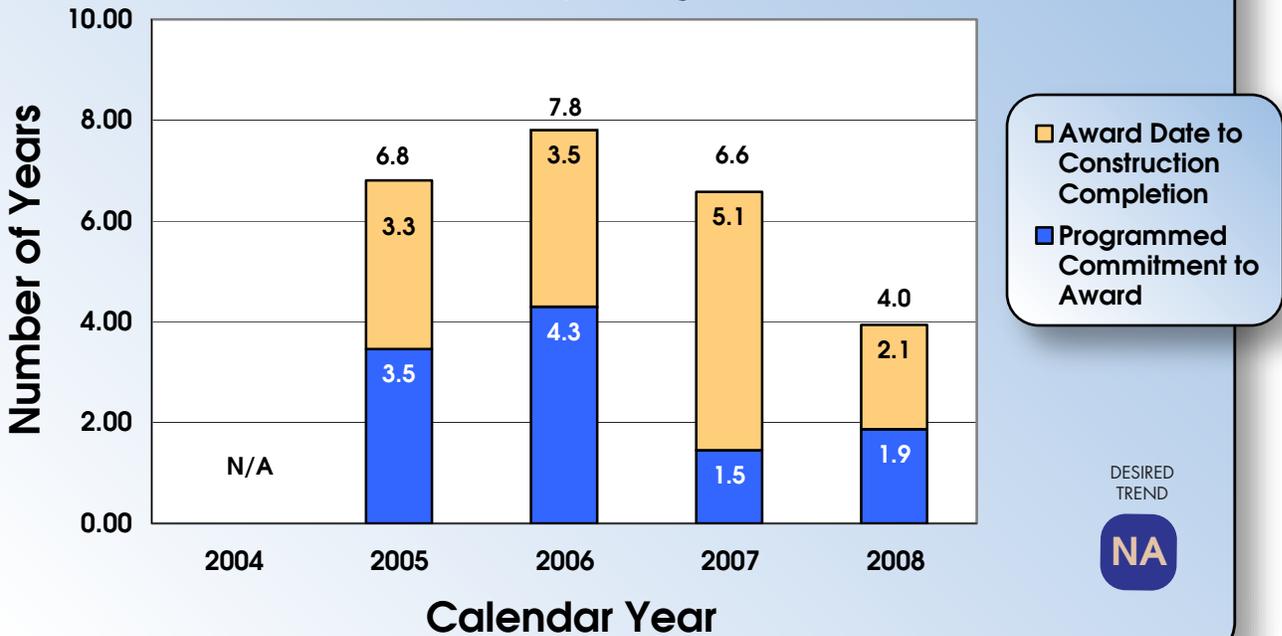
### Average Number of Years it Takes to Go from the Programmed Commitment in the STIP to Construction Completion New/Improved Bridge



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



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



## 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:

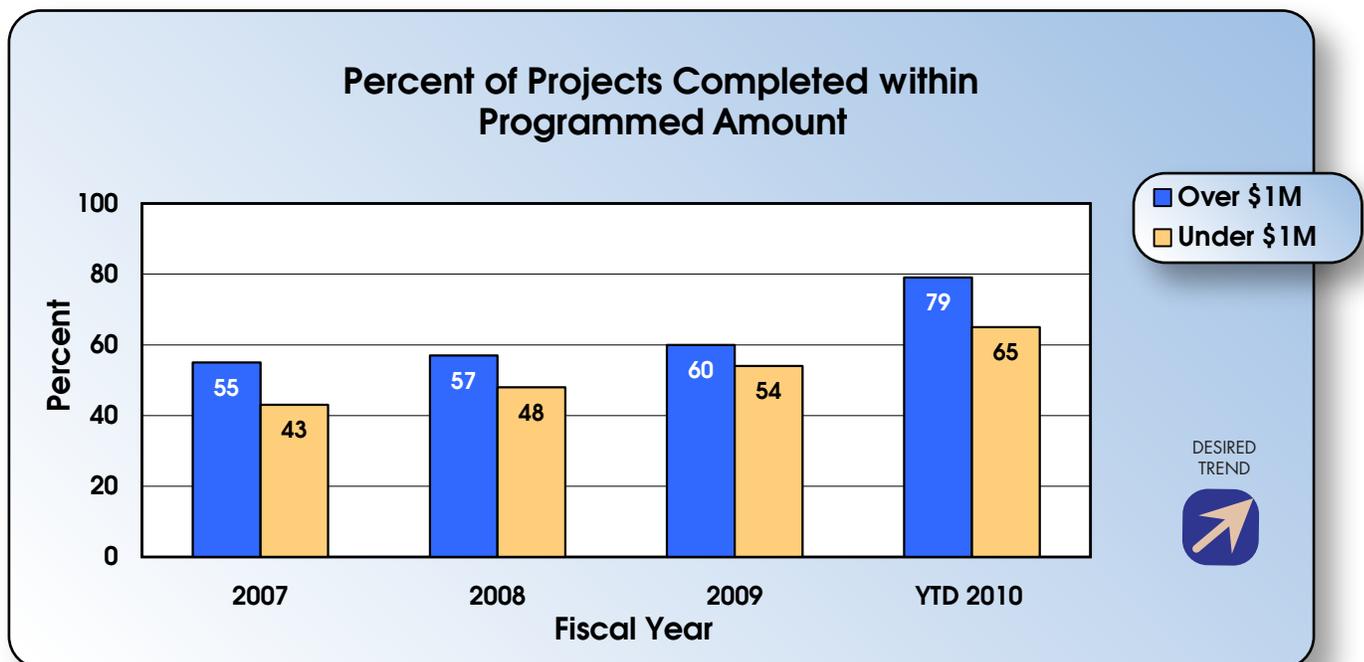
The completed project cost is compared to the estimated cost for each project. The percentage of projects completed within the estimated cost is gathered from across the state.

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

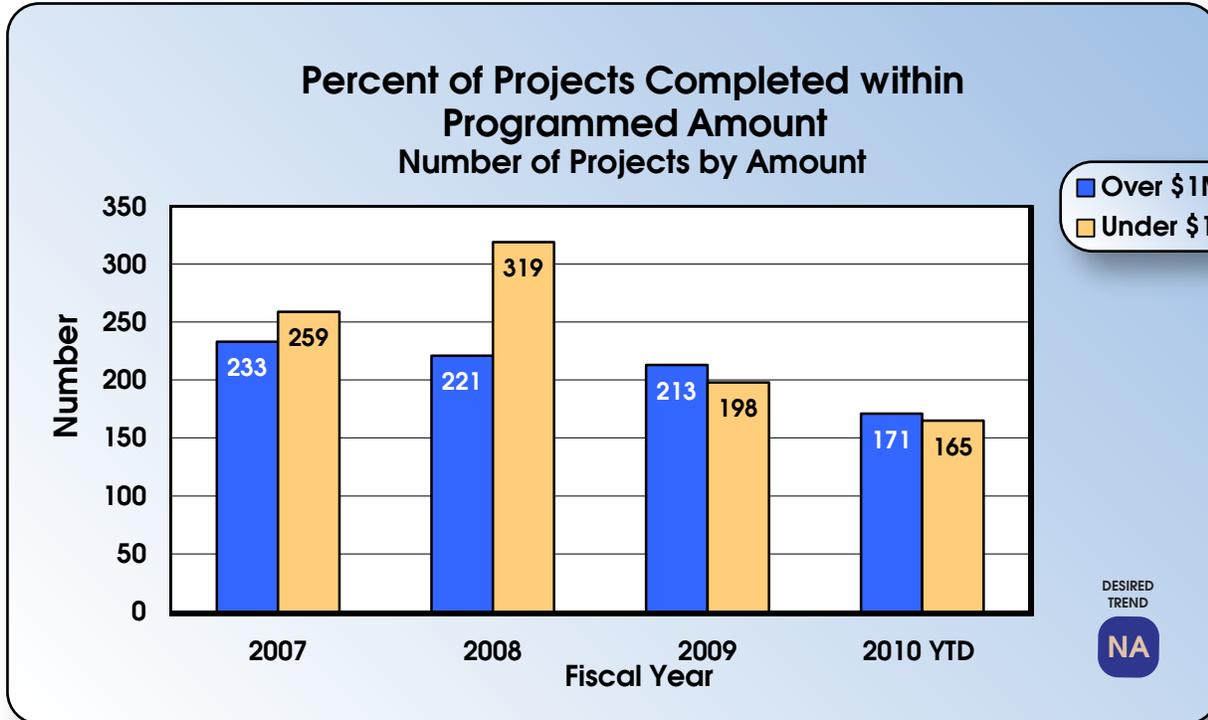
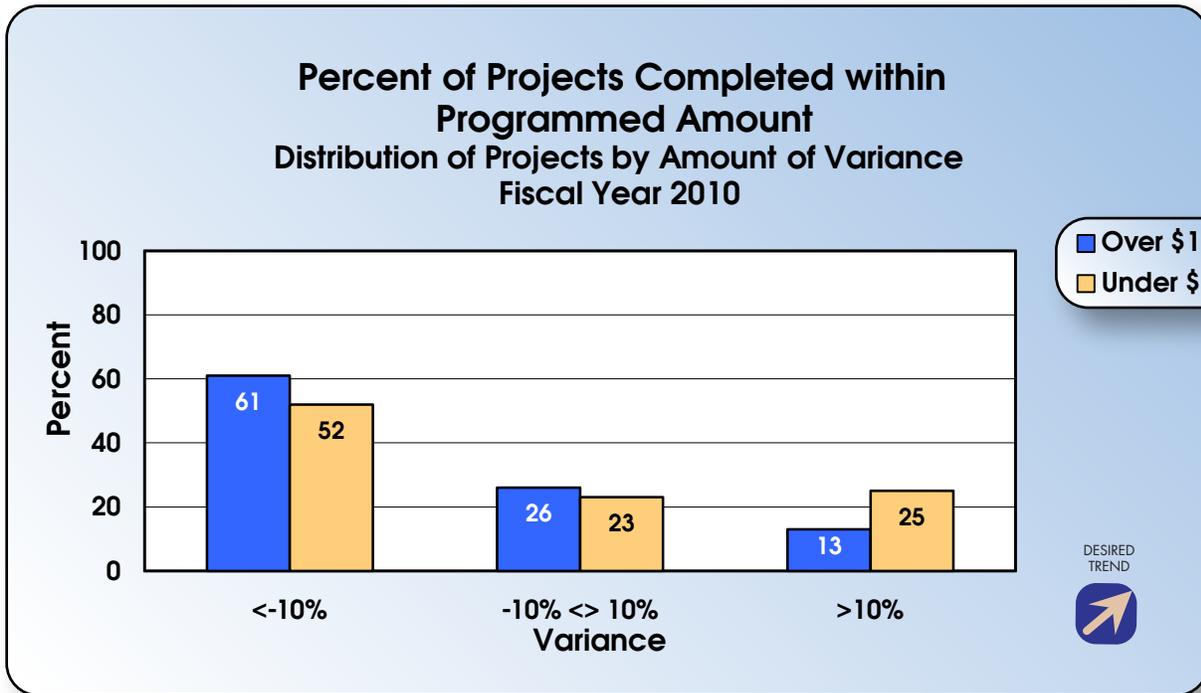
This is an annual measure updated each quarter.

### Improvement Status:

MoDOT desires that all projects be completed within the programmed amount, thereby allowing the greatest number of projects to be built with the funding available. The data indicates that there is a great deal of deviation among individual projects with half over and half under budget. In fiscal year 2010, 79 percent of projects programmed over \$1 million have been completed within the budgeted amount, while 65 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 project delivery. MoDOT is striving to deliver quality projects cheaper by using practical design and by encouraging the use of value engineering.



# FAST PROJECTS THAT ARE OF GREAT VALUE



## 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.

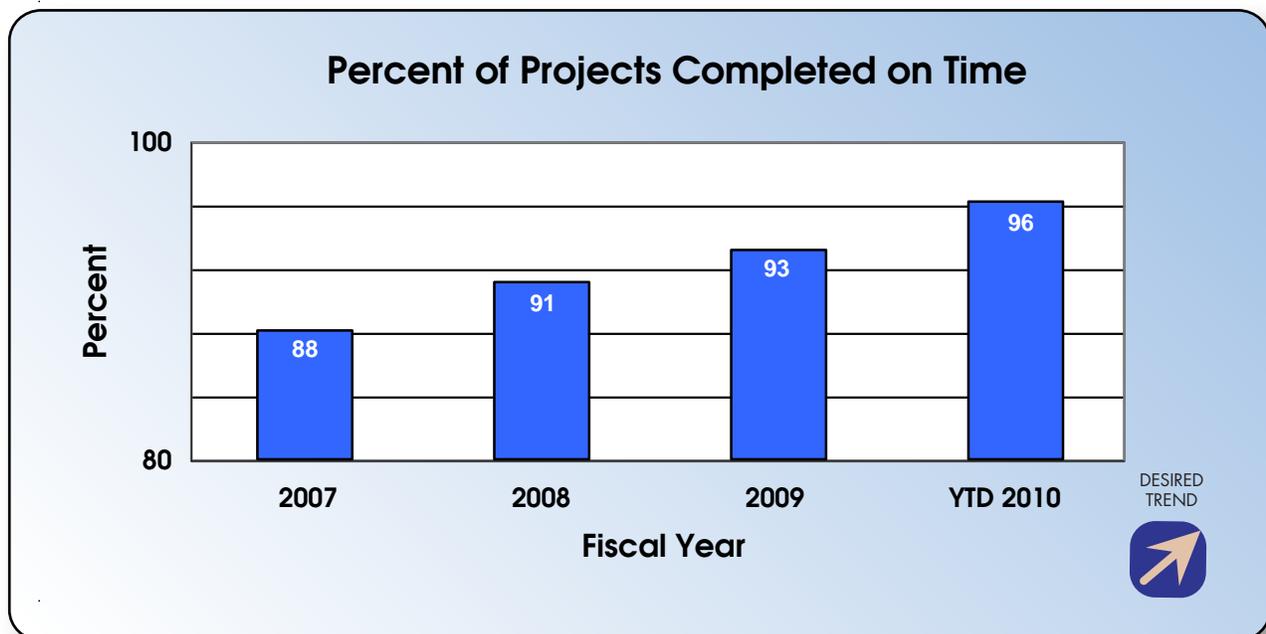
### Measurement and Data Collection:

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 is 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 96 percent of projects completed in fiscal year 2010 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.

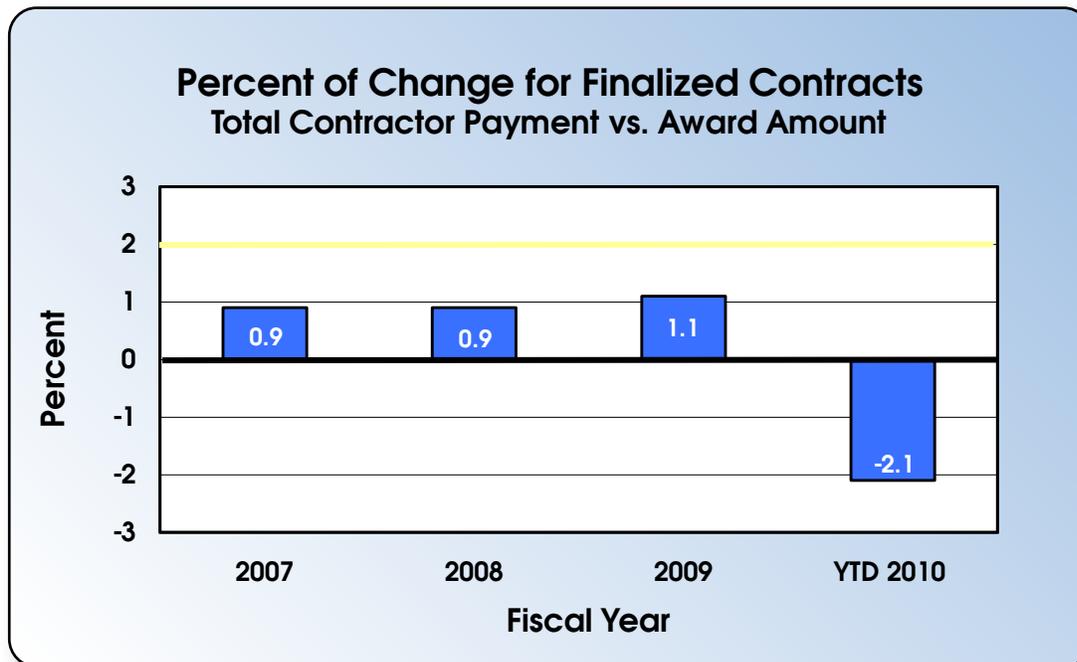
### Measurement and Data Collection:

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.

### Improvements Status:

MoDOT's performance of -2.1 percent in fiscal year 2010 is below the target of 2 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.

This is an annual measure updated each quarter.



## Average construction cost per day by contract type-9f

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

**Measurement Driver:** Dave Ahlvers, State Construction & Material 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.

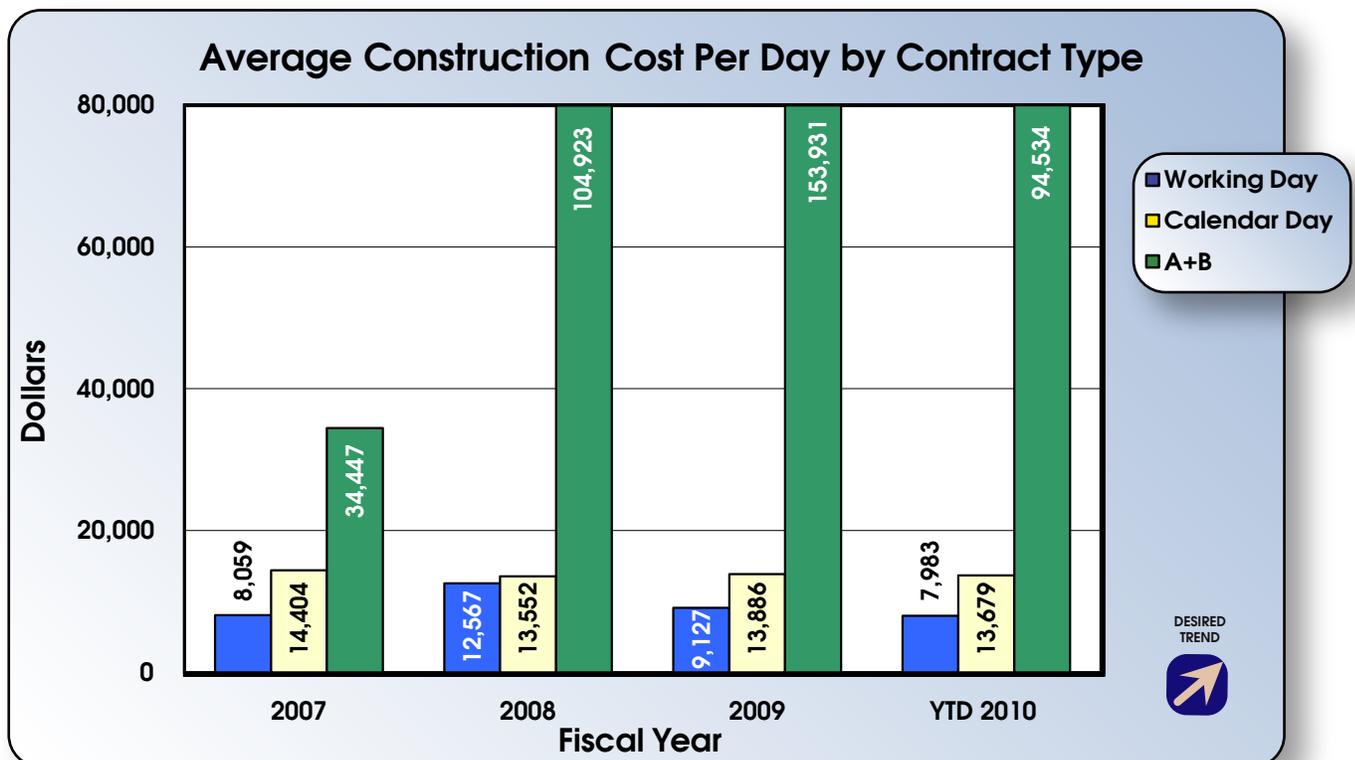
The measurement groups construction contracts into three categories:

- **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.

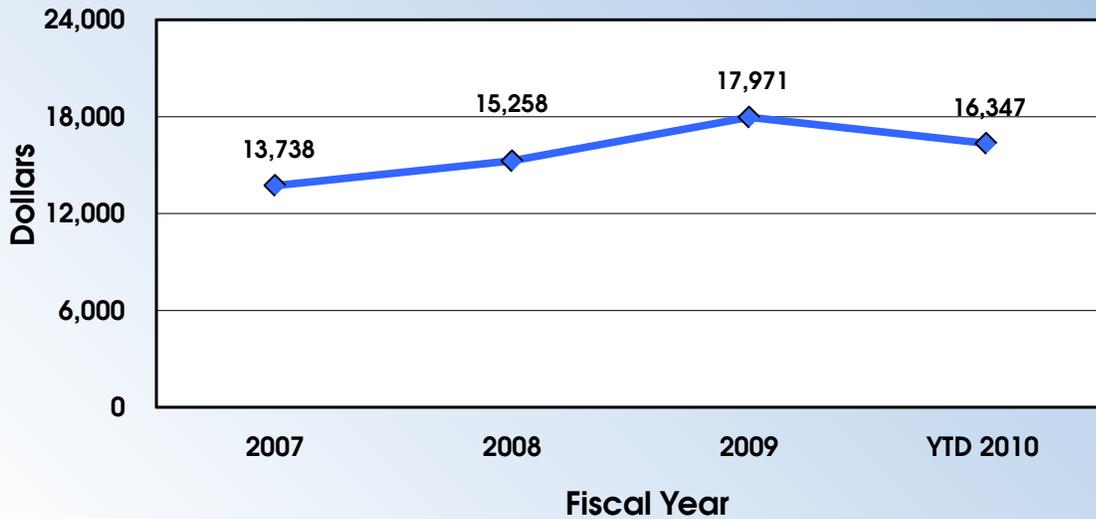
### Improvement Status:

The greater use of A+B and calendar-day contracts resulted in a larger amount paid per calendar day in the first two quarters of fiscal year 2010. The I-64, kcICON and Safe & Sound design-build projects are included in the A+B category. Total payments for these three projects were over \$159 million during this period. 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.

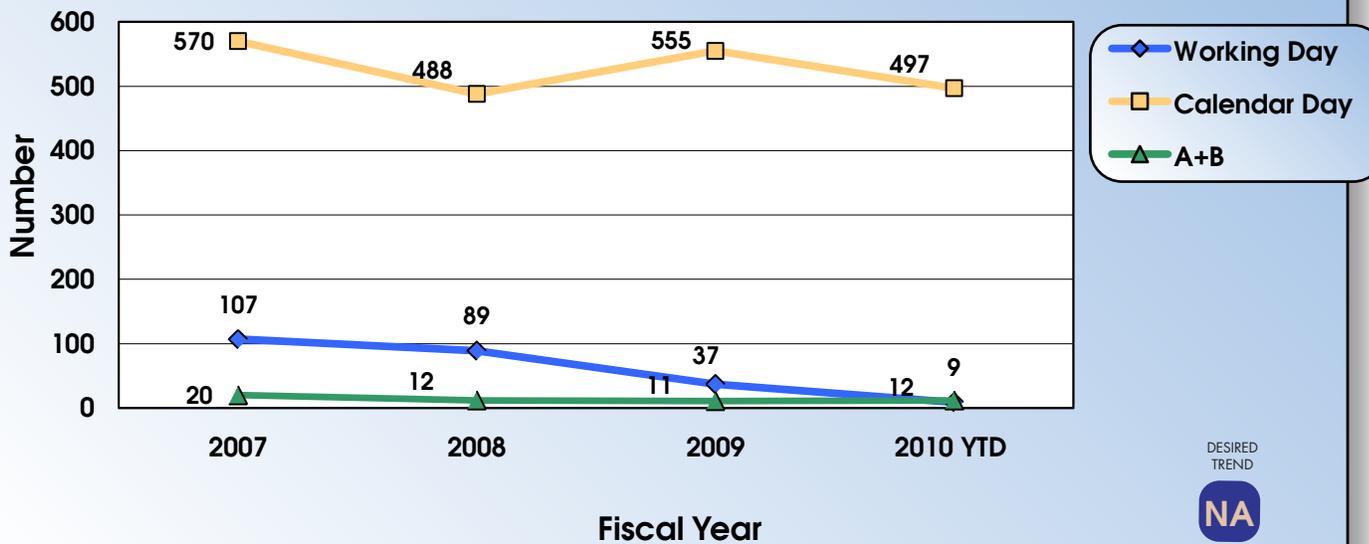


## FAST PROJECTS THAT ARE OF GREAT VALUE

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



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



## 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.

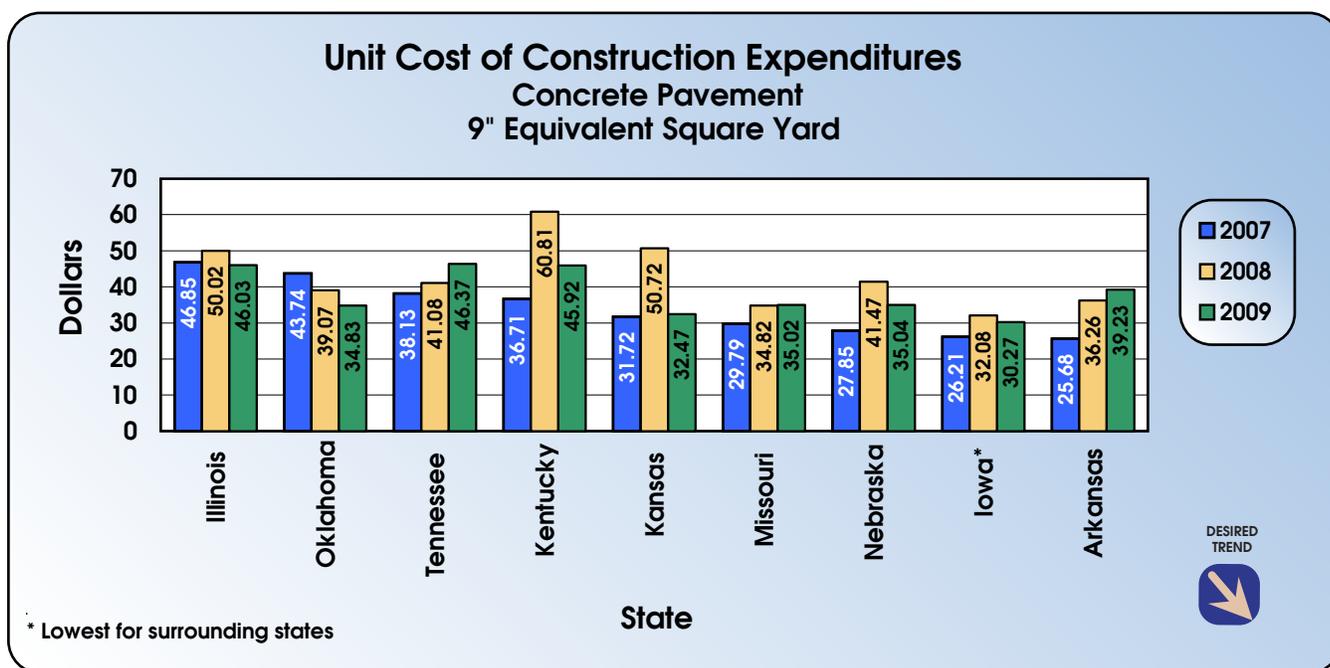
### Measurement and Data Collection:

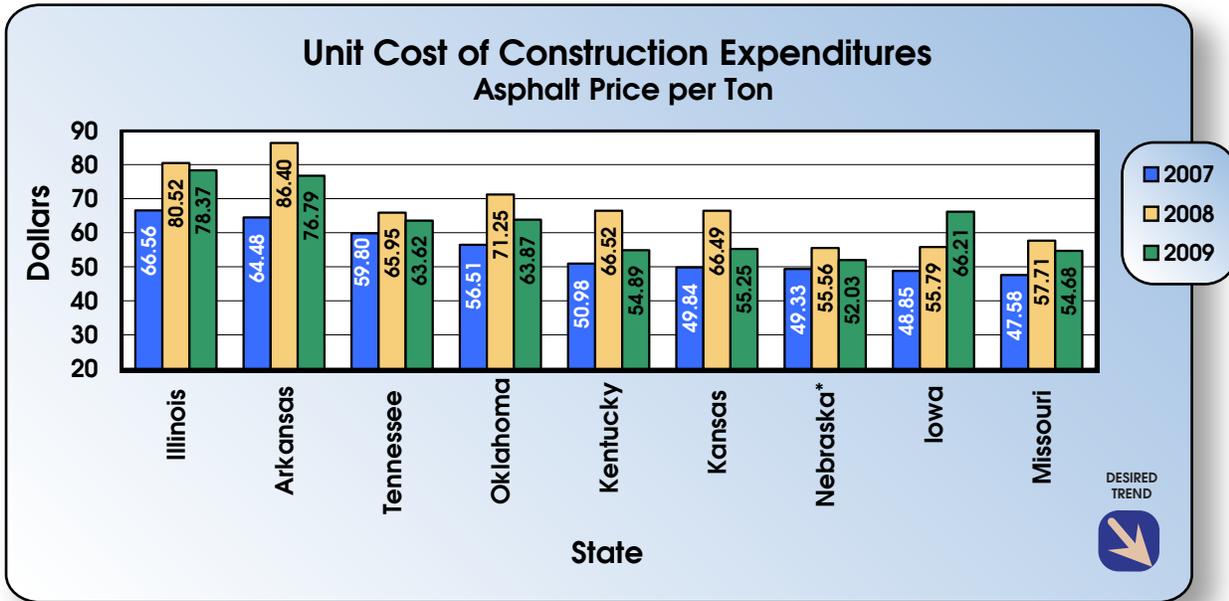
Value in this measure has simply been related back to dollars per unit of measure. MoDOT staff categorizes raw data from an outside vendor for the unit cost from surrounding states. In the past, FHWA has been the source for determining the “lowest in the U.S.” FHWA is currently retooling its method of determining state price indexes and is expected to have this complete in Spring 2010. This is a success for DOTs since FHWA’s old method produced

numerous pieces of erroneous data. This is an annual measure updated each January.

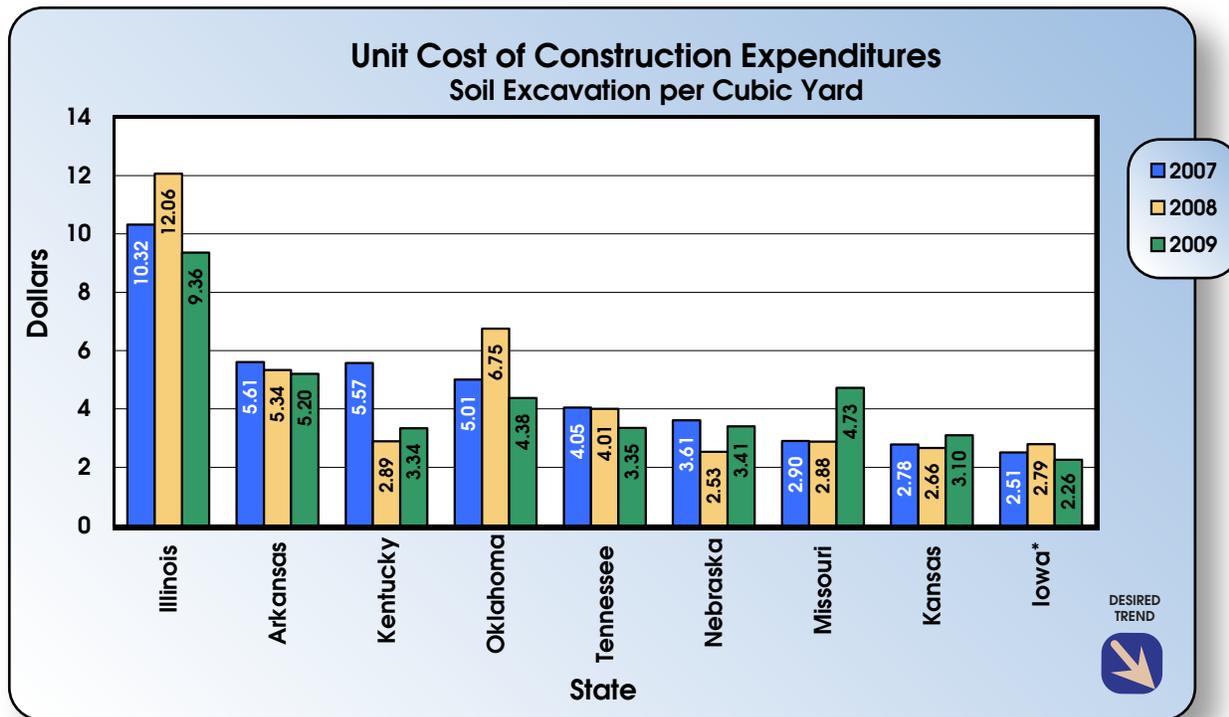
### Improvement Status:

Excellent competition in the past year has enabled MoDOT to realize a minimal 5 percent increase in unit prices for bridge construction – the lowest percentage increase in this area among Missouri’s surrounding states. MoDOT was also below the surrounding states average unit prices for concrete and asphalt paving. The 64 percent increase in unit prices for soil excavation is due to an increased number of urban grading projects. In the past six months, MoDOT had an average of more than 6.1 bidders per proposal as compared to fewer than 3.5 bidders per proposal just a couple of years ago. Projects less than \$500k are receiving an average of more than seven bids per proposal which can be attributed to smaller programs in cities and counties. 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

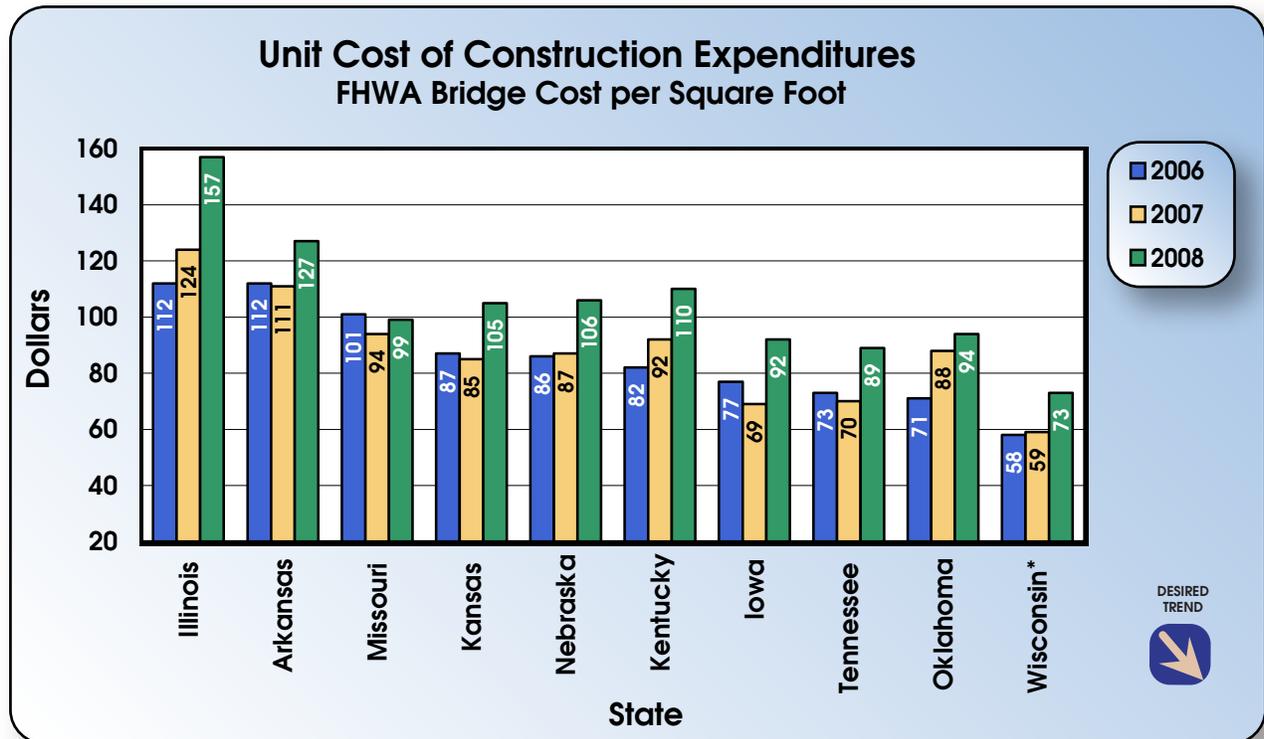


\* Lowest for surrounding states

Footnote for the charts above:

Source data for states other than Missouri from Oman Systems Bid Tabs Professional latest data available as of January 2010. Items include common excavation items paid for by the cubic yard. Missouri data from MoDOT bid history.

## FAST PROJECTS THAT ARE OF GREAT VALUE



\*Lowest in U.S.

Source data from FHWA memo "Bridge Construction Unit Cost" dated January 2010.



### Annual dollar amount saved by implementing value engineering-9h

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

**Measurement Driver:** Joe Jones, Engineering Policy Administrator

#### 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 \$500 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 two 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 2008. For design phase savings, Florida is the best in the nation showing \$480 million implemented. For construction phase savings, Rhode Island is the best in the nation showing \$15 million implemented. When compared to states surrounding Missouri, Kentucky reported \$34 million saved during design and Illinois reported \$5.98 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 2009 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:

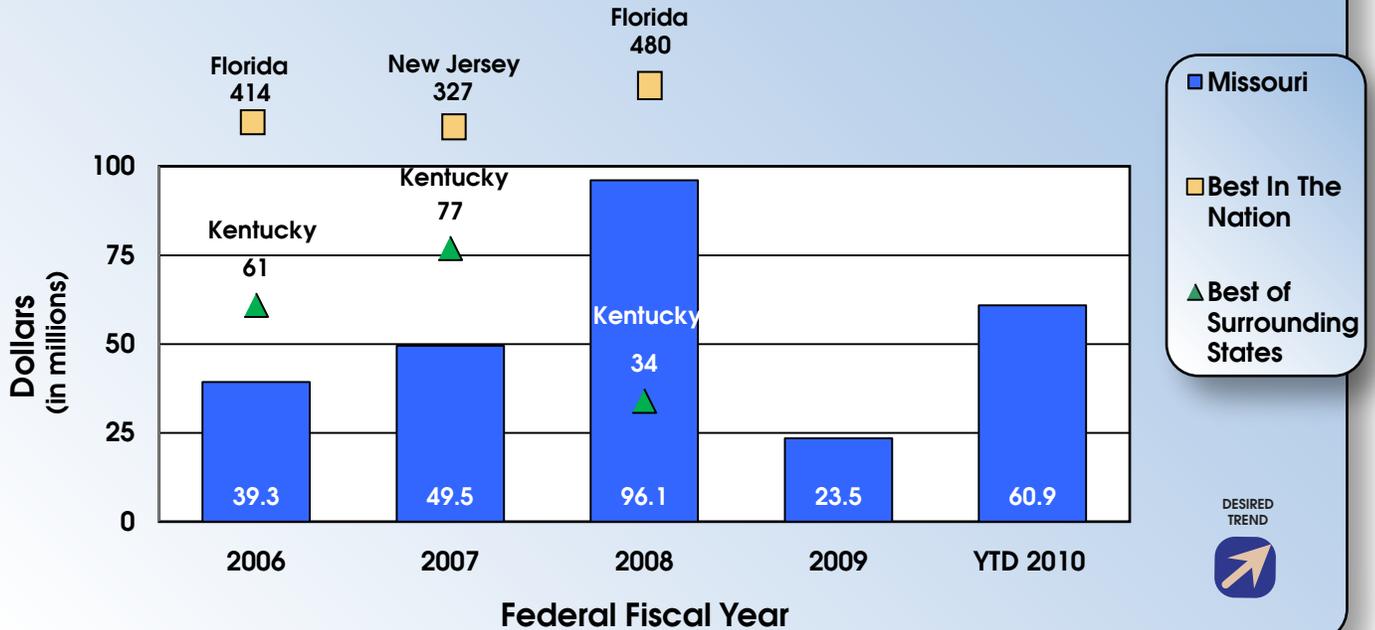
For federal fiscal year 2009, MoDOT design savings were \$23.5 million. So far for federal fiscal year 2010, design savings are \$60.9 million.

For federal fiscal year 2009, MoDOT construction savings from VECP were \$3.10 million and 81 out of 96 proposals submitted were approved. For the first two quarters of federal fiscal year 2010, MoDOT construction savings from VECP are \$6.82 million and 38 out of 47 proposals were approved.

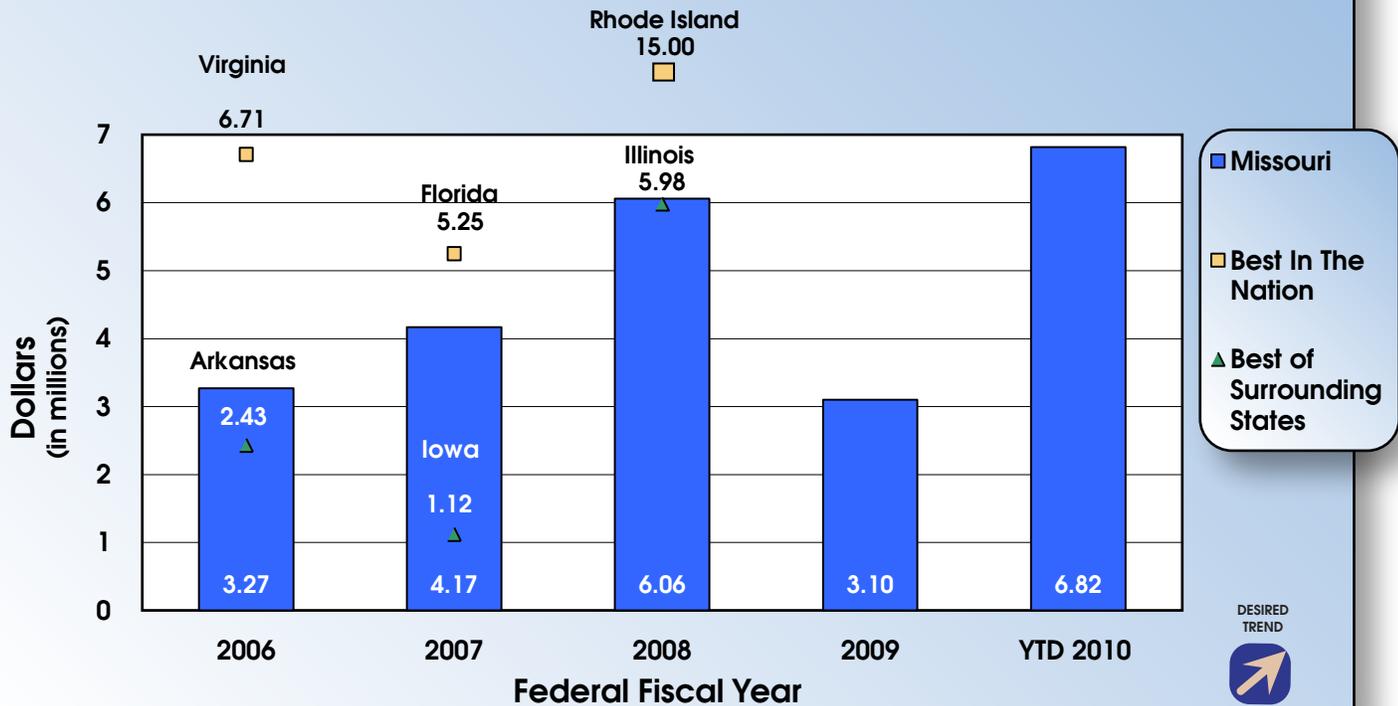


# FAST PROJECTS THAT ARE OF GREAT VALUE

## Annual Dollar Amount Saved by Implementing Value Engineering Design Phase



## Annual Dollar Amount Saved by Implementing Value Engineering Construction Phase



## 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 (11,600 in 2007 when there were 29 projects included). Nearly 2,900 surveys were returned in the initial survey, followed by 2,300 (2007), 2,697 (2008), and 2,461 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.

All of the key measures were statistically similar to last year's high ratings, but the fact that all measures went up suggests a slight improvement overall. The results show that most Missourians are very satisfied with their local project and generally believe that MoDOT provides the right transportation solution. 89.9 percent of the respondents were either "very" or "fairly" familiar with the project roadway, and 67.9 percent of the respondents were regular users of the affected roadway.

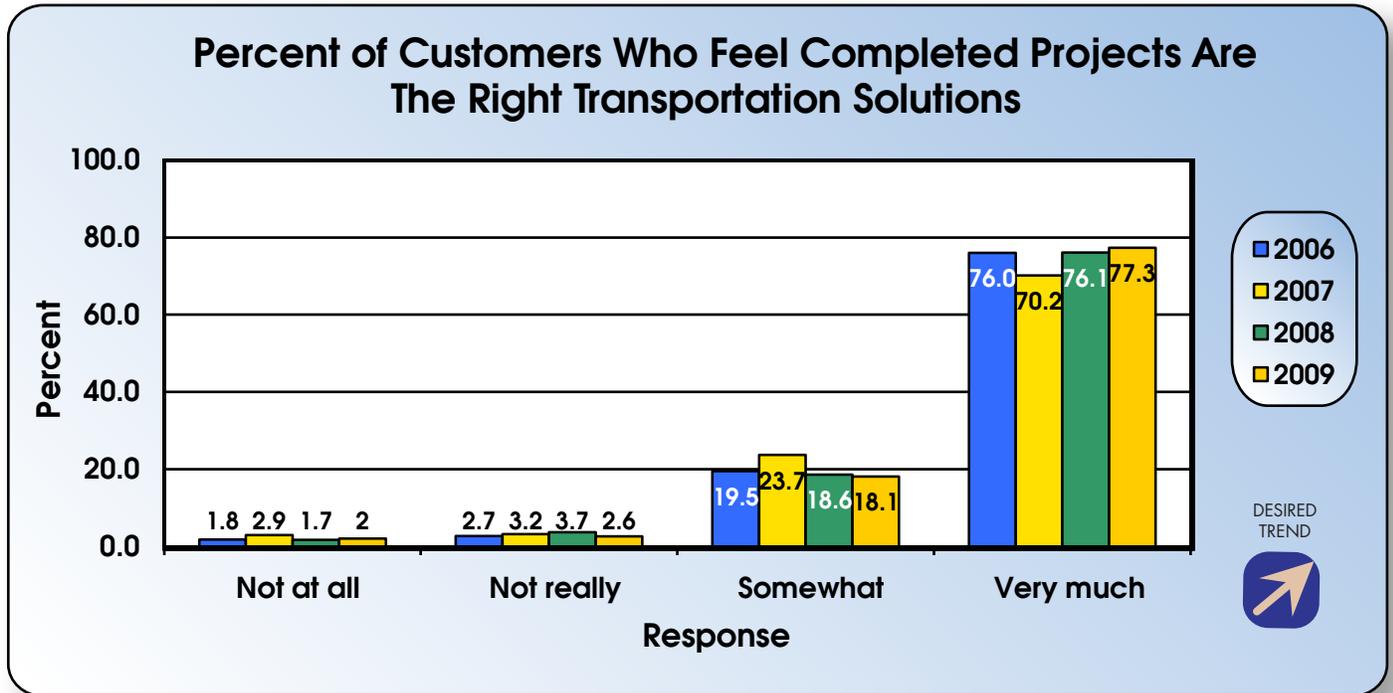
The majority of respondents thought that the project made the roadway:

- safer (95.7 percent),
- more convenient (94.0 percent),
- less congested (84.4 percent),
- easier to drive (95.2 percent),
- better marked (92.9 percent), and
- was the right transportation solution (95.4 percent).

As part of the questionnaire, each respondent had the opportunity to provide comments about why their local project was – or was not – the right transportation solution. Each comment that was provided has been shared with the districts for their evaluation and guidance for future projects.



## FAST PROJECTS THAT ARE OF GREAT VALUE



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