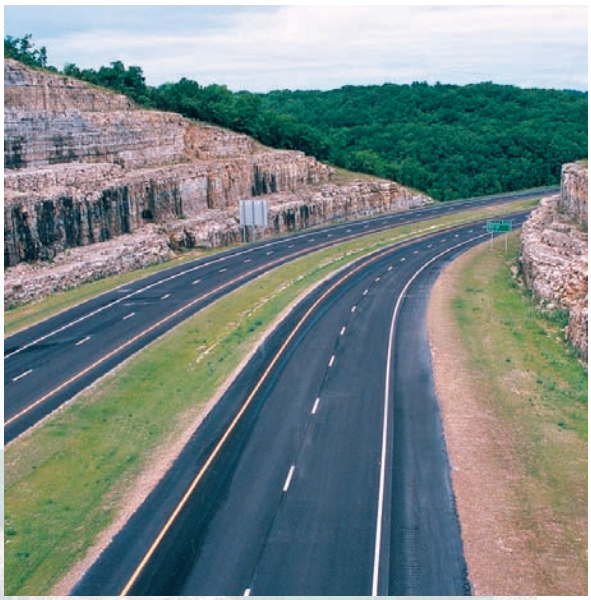
Roadway Visibility

Tangible Result Driver – Don Hillis, Director of System Management

Good roadway visibility in all weather and light conditions is critical to safe and efficient travel. MoDOT will delight its customers by using top-quality and highly visible stripes and signs.



Roadway Visibility

Rate of nighttime crashes

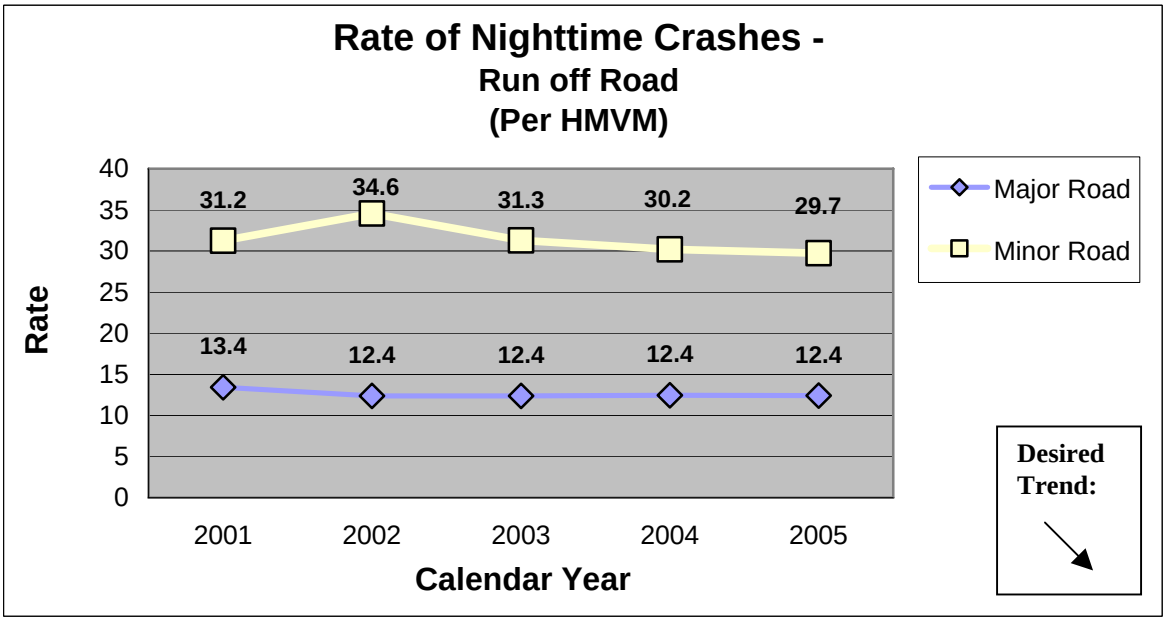
Result Driver: Don Hillis, Director of System Management
Measurement Driver: Mike Curtit, Assistant State Traffic Engineer

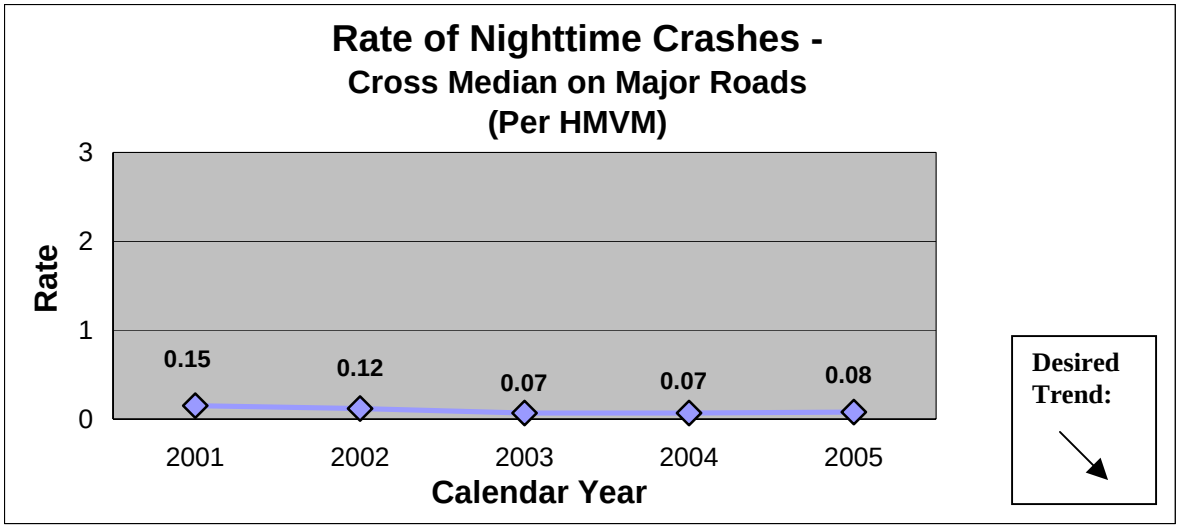
Purpose of the Measure:
This measure tracks the types of crashes where visibility of stripes and signs may be a contributing factor.

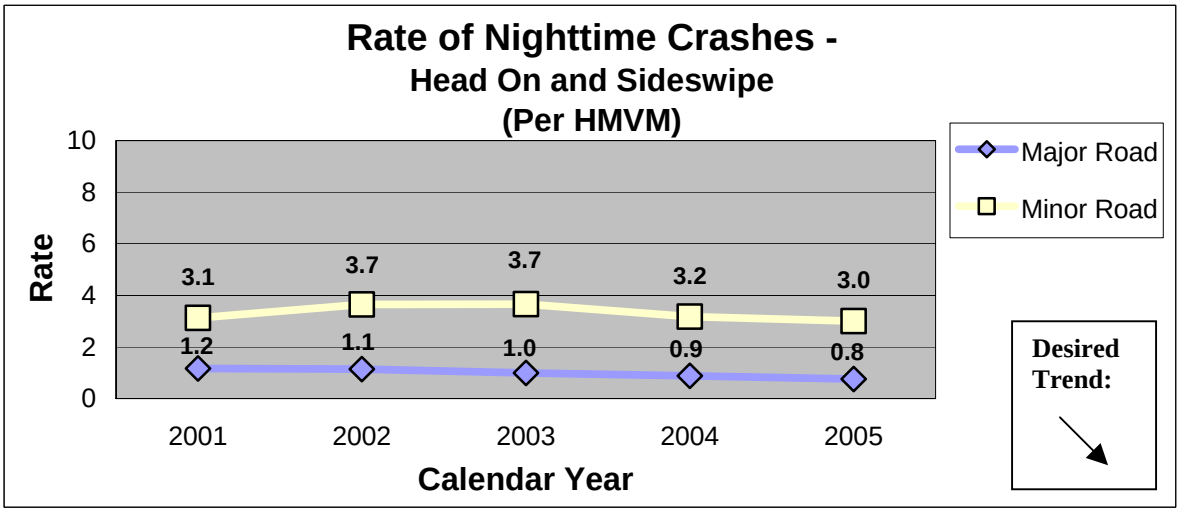
Measurement and Data Collection:
To measure the rate of nighttime crashes, data is collected from the statewide crash database and crashes that occur during night conditions are identified. Further filtering of the data divides these night crashes by major and minor roadways. Major roadways are generally used for statewide or interstate travel and minor roadways are generally used for local traffic needs. Crash rates are calculated using the Average Annual Daily Traffic counts and are expressed in the unit, per 100 million vehicle miles (HMVM), which is the national standard for expressing crash rates.

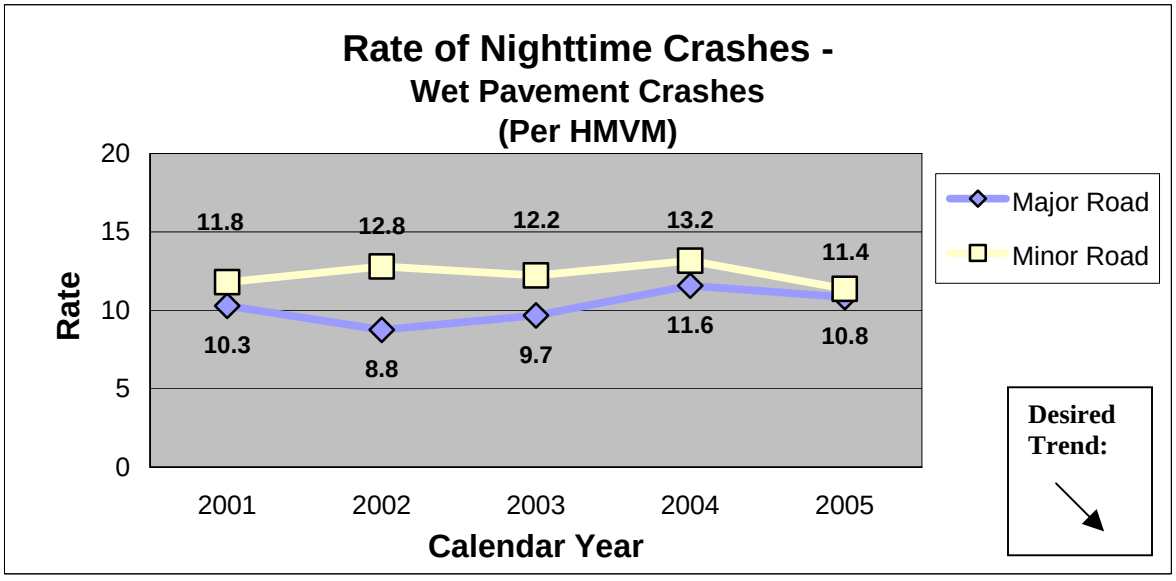
Improvement Status:
Major and minor road crashes have decreased slightly since 2001, except wet pavement crashes. Wet pavement crashes increased slightly for major roads and remained virtually flat for minor roads from 2001 to 2004. However, the recent trend for wet pavement-related crashes on both major and minor roads has decreased.

In 2005, MoDOT implemented a new pavement marking system to improve nighttime and wet pavement visibility. On major roads this new system includes highly reflective pavement marking tape, edgeline rumble stripes and delineation of guard cable and guardrail. Last year, almost 500,000 feet of highly reflective pavement tape was installed on Smooth Road Initiative routes. Contracts for the delineation of guard cable and guard rail on SRI routes have all been awarded.




Rate of Nighttime Crashes -
Cross Median on Major Roads
(Per HMVM)
Rate
3
2
1
0
0.15
0.12
0.07
0.07
0.08
2001
2002
2003
2004
2005
Calendar Year
Desired Trend:


Rate of Nighttime Crashes -
Head On and Sideswipe
(Per HMVM)
Rate
10
8
6
4
2
0
3.1
3.7
3.7
3.2
3.0
1.2
1.1
1.0
0.9
0.8
2001
2002
2003
2004
2005
Calendar Year
Major Road
Minor Road
Desired Trend:


Rate of Nighttime Crashes -
Wet Pavement Crashes
(Per HMVM)
Rate
20
15
10
5
0
11.8
12.8
12.2
13.2
11.4
10.3
8.8
9.7
11.6
10.8
2001
2002
2003
2004
2005
Calendar Year
Major Road
Minor Road
Desired Trend:

Roadway Visibility

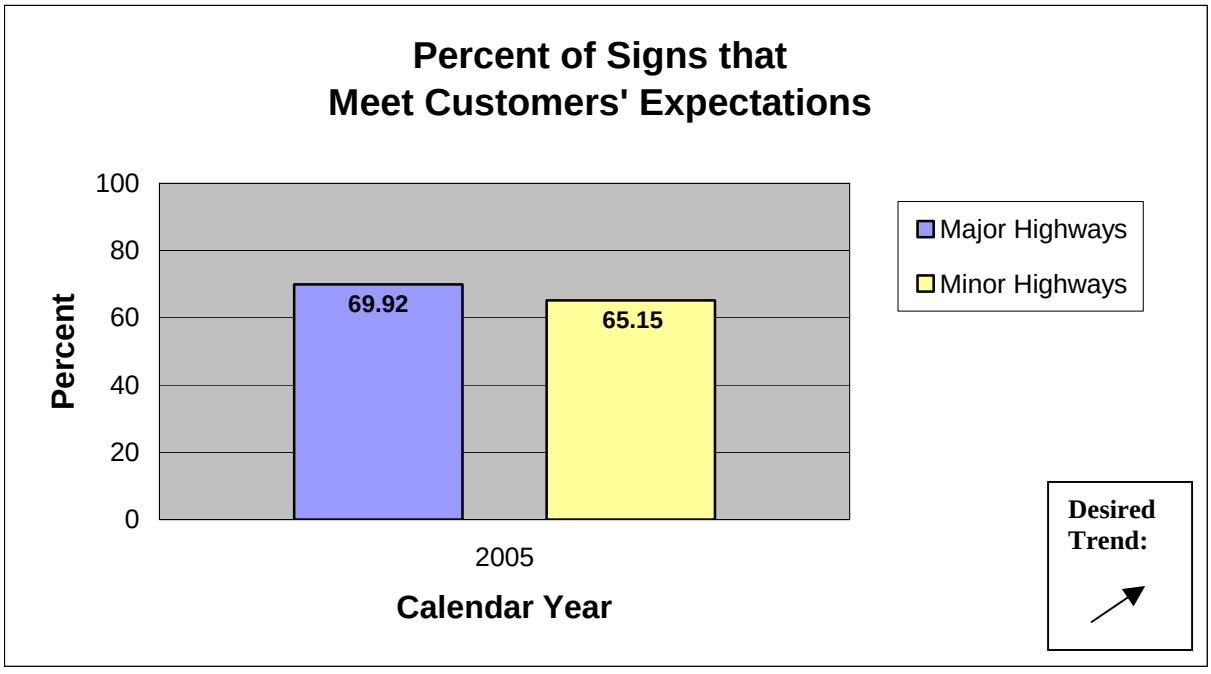
Percent of signs that meet customers' expectations

Result Driver: Don Hillis, Director of System Management
Measurement Driver: Mike Curtit, Assistant State Traffic Engineer

Purpose of the Measure:
This measure will track whether the department's sign policy and the design standards, and sign replacement policy is resulting in visible signs that meet customers' expectations.

Measurement and Data Collection:
Sign-quality attributes that define user expectations have been developed based on an industry-wide literature review. The attributes selected for this measure are those that can be captured during a night sign log. A night sign log is conducted by MoDOT employees driving a road at night, recording the location and condition of the signs, particularly how visible the signs are with headlights. Data for this measure is collected by doing night sign logs on randomly generated road segments. The data collection is done annually in the fall by MoDOT employees.

Improvement Status:
The data shows that almost 70 percent of the signs on the major highways and 65 percent on the minor highways are meeting customer expectations. The majority of sign problems indicate the need for new signs that are more visible at night. Through the Smooth Roads Initiative, MoDOT is replacing many of the signs on the major roads, which should lead to an improvement in the results on the major highways. On minor roads, MoDOT will need to make greater efforts to maintain signs. With the 10-year replacement program that MoDOT has proposed, results on both the major and minor roads should improve.



Roadway Visibility

Percent of stripes that meet customers' expectations

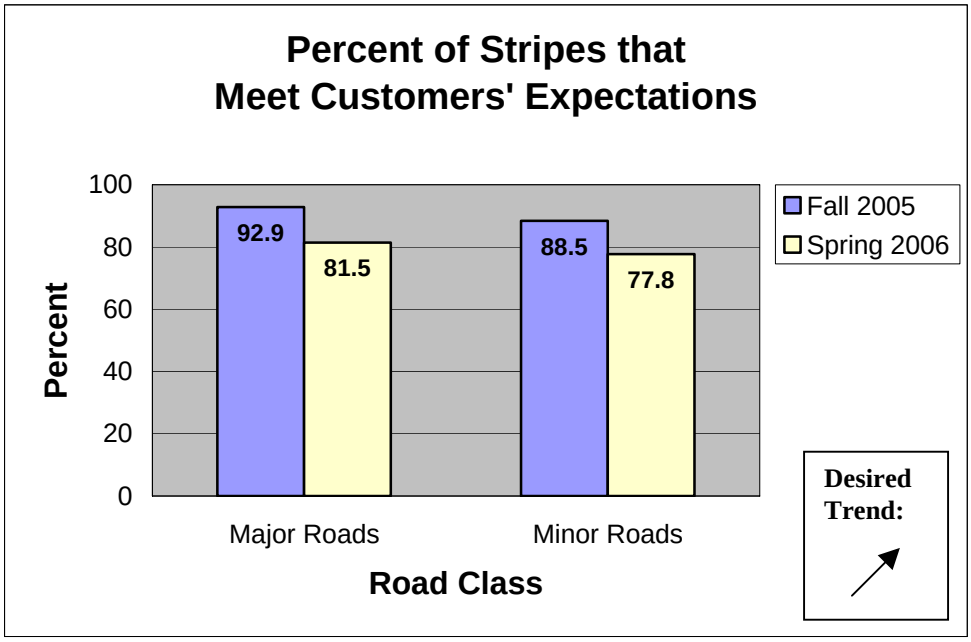
Result Driver: Don Hillis, Director of System Management
Measurement Driver: Jim Brocksmith, Technical Support Engineer

Purpose of the Measure:
This measure tracks whether MoDOT's striping policy, processes and materials used are resulting in visible stripes that meet customers' expectations.

Measurement and Data Collection:
Striping quality attributes that define user expectations have been developed based on an industry-wide literature review. The attribute selected for this measure is the retroreflectivity of the striping or the visibility of the striping at night. Retroreflectivity measured by the amount of light from vehicle headlights that is returned to the driver. Data is collected by taking retroreflectivity readings on random road segments. MoDOT has a contractor collecting this data in the fall and spring of each year.

Improvement Status:
The data collected from the contractor was analyzed in respect to the benchmarks MoDOT set as the minimum acceptable level of retroreflectivity. The fall readings were taken before the end of the 2005 striping season. Spring readings were taken in May, early in the striping season, to reflect the condition of the markings coming out of the winter when they are typically the poorest. There was an average 12 percent reduction in the stripes meeting customer expectations. Reduced striping performance after winter is typical, due to the effects of snowplowing scraping the surface. The winter of 2005-2006 was relatively mild with fewer than normal snowplowing events, the leading cause of wear on striping.

MoDOT has implemented a new plan for striping to improve visibility, which increases the stripe width on major roads from four to six inches. The plan also includes using more-reflective tape on the skips of major divided highways and longer-lasting materials, which will improve the life and appearance of the striping. As the plan is fully implemented during the 2006 striping season, the results should improve.



Roadway Visibility

Percent of work zones meeting expectations for visibility

Result Driver: Don Hillis, Director of System Management
Measurement Driver: Scott Stotlemeyer, Technical Support Engineer

Purpose of the Measure:
An important factor in evaluating the department's performance in temporary traffic control design, deployment, operation, and maintenance is the measurement of the effectiveness of the visual guidance provided to the highway user traveling through our work zones. This measure tracks how well the department meets its customer expectations of visibility in work zones on state highways.

Measurement and Data Collection:
Using a formal inspection worksheet, staff from Construction and Materials, Maintenance, Traffic, and the districts evaluate visibility of construction, MoDOT, and permit work zones across the state. Each evaluation consists of a subjective assessment of engineered and operational factors affecting visibility. The evaluator assigns a pass, fail, or n/a rating to each of these individual factors and a pass or fail rating for their overall perception of the work zone visibility. The overall perception ratings are compiled quarterly and reported via this measurement.
Note: The inspection program began in June 2005.

Improvement Status:
The results of the 942 inspections this calendar year (227 in first quarter and 715 in second quarter) show significant progress in this measurement, as the percent of work zones meeting visibility expectations rose by 5.1 percent over calendar year 2005 results. The higher percentage is attributable to the greater emphasis MoDOT has placed on providing quality temporary traffic control installations that effectively direct, guide, and inform users through and around construction and maintenance work zones on the state highway system.