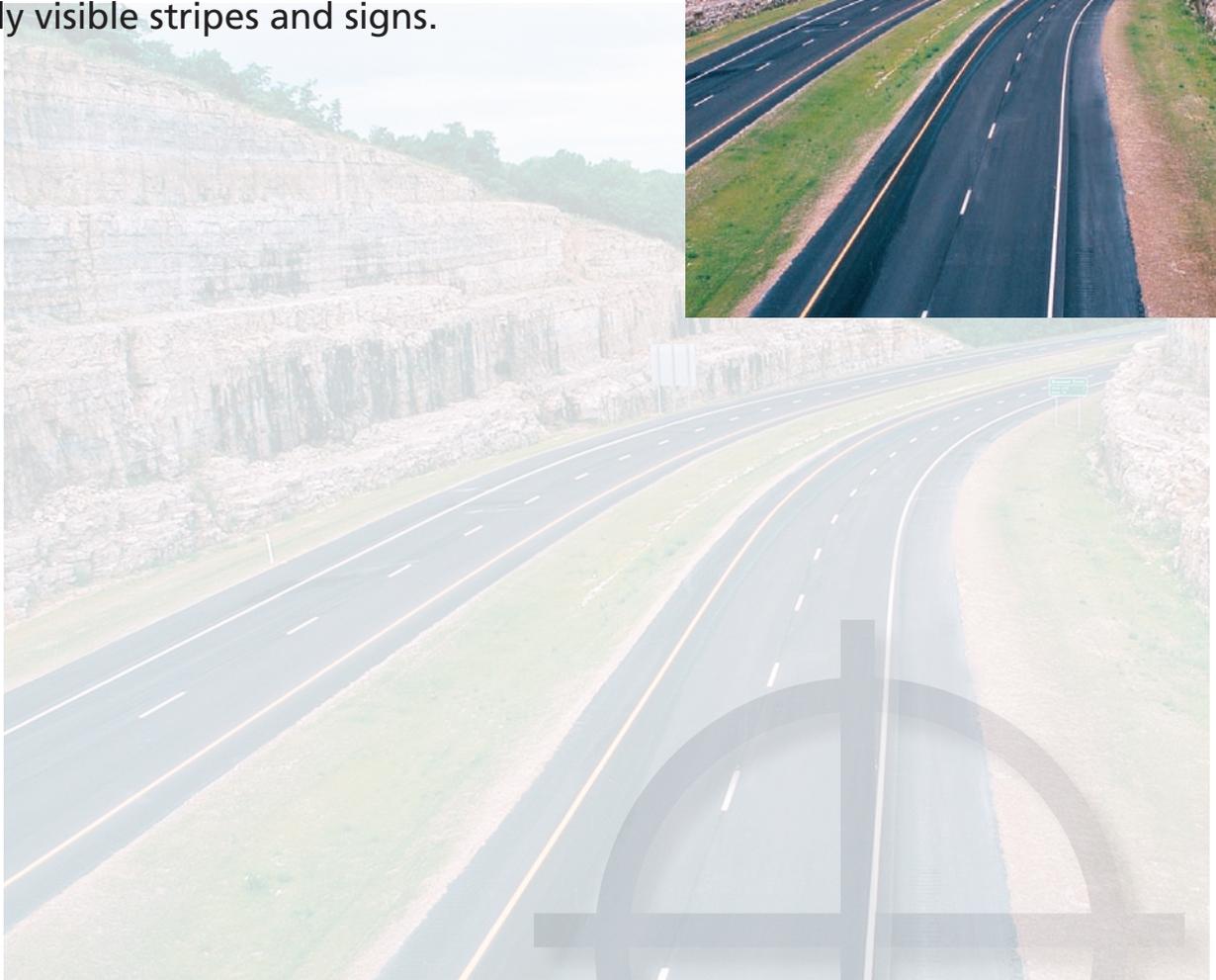
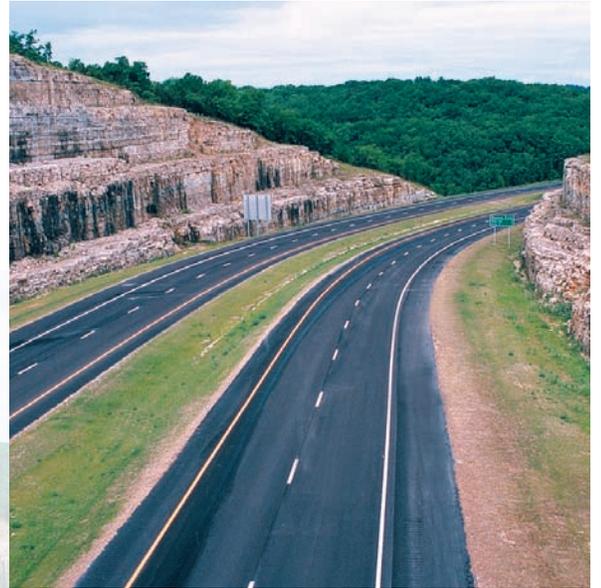

Roadway Visibility

*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:

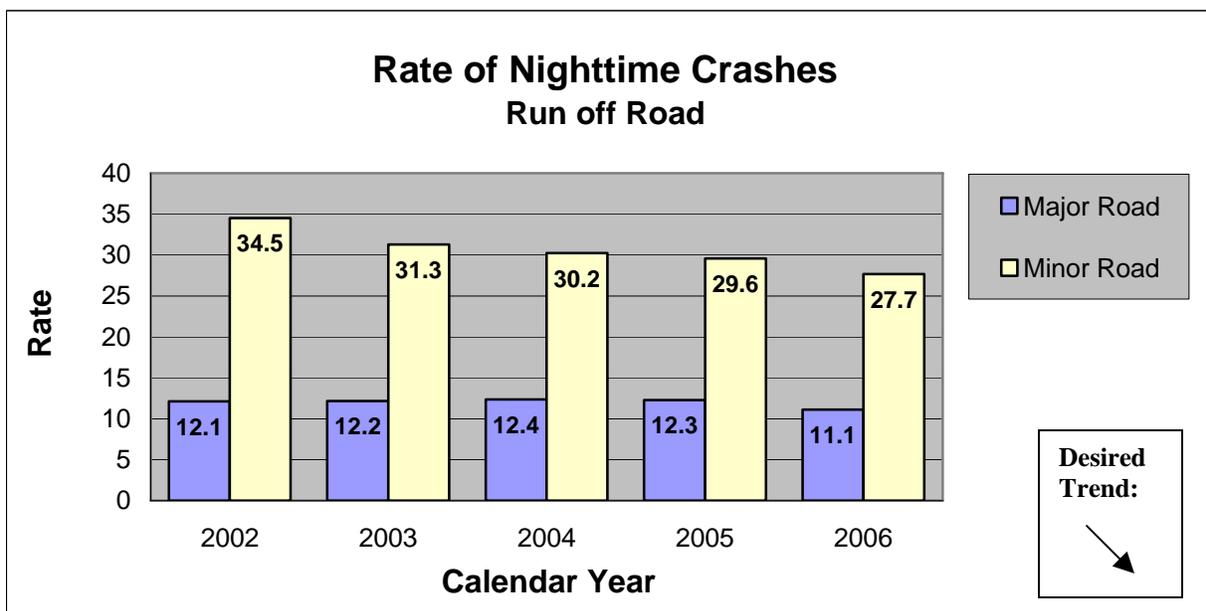
To measure the rate of nighttime crashes, data is collected from the statewide crash database and crashes that occur during night conditions are identified. Further filtering of the data divides these night crashes by major and minor roadways. Major roadways are generally used for statewide or interstate 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. This is an annual measure with the data updated each April.

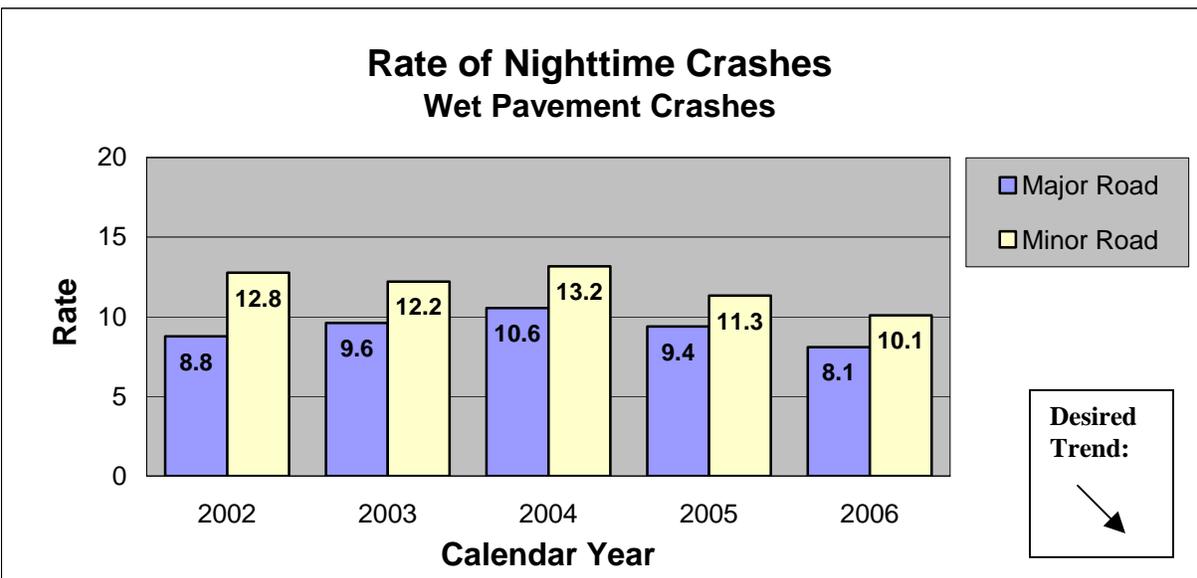
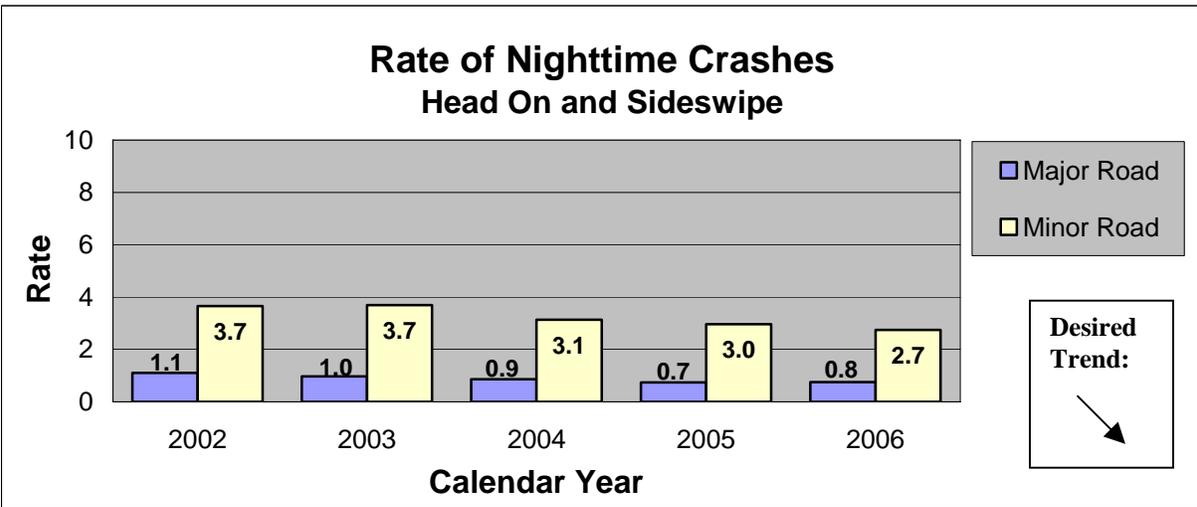
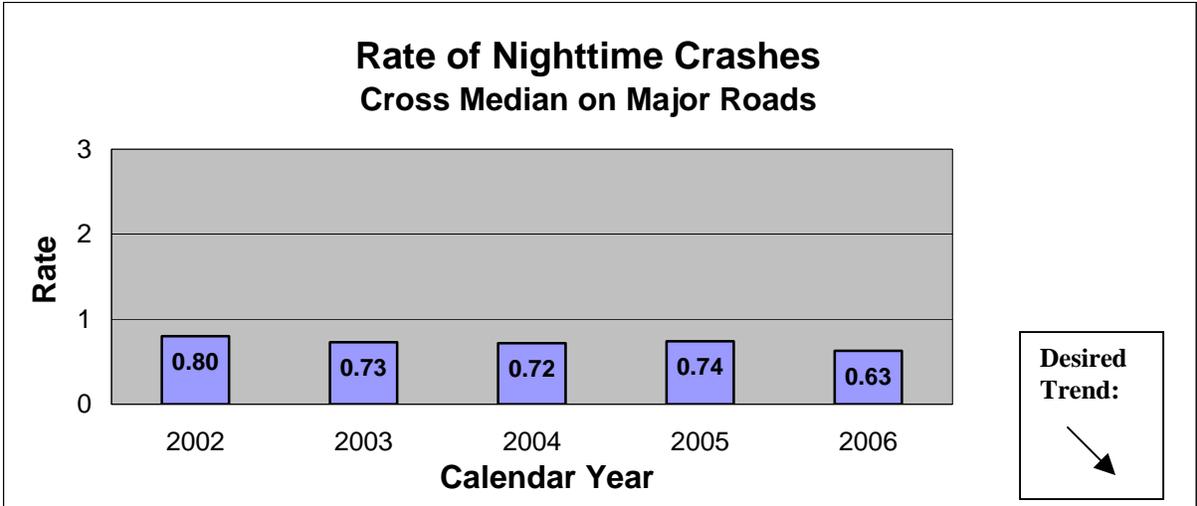
Improvement Status:

The rate of nighttime crashes on major and minor roads has decreased for each measure except for head on and sideswipe crashes on major roads. The rate of head-on and sideswipe crashes on major roads has remained virtually flat from 2002 to 2006. The previous years' rates were also updated with current crash data.

As part of the recently completed Smooth Roads Initiative (SRI), over 188,000 new signs, over 12,000 new emergency reference markers on interstates, over 150,000 delineators on guardrail and guardcable, and approximately 3 million feet of highly reflective pavement tape were installed. In addition, edgeline rumble stripes are being installed on SRI routes.

The guidelines for the Better Roads, Brighter Future program include upgrading the signing, continuing to implement the new pavement marking system, adding edgeline rumble stripes, and including centerline rumble stripes on two lane roadways. The pavement tape that will be used as a part of Better Roads, Brighter Future program will be a "wet reflective" tape that has improved visibility during wet pavement conditions.





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 are resulting in visible signs that meet customers' expectations.

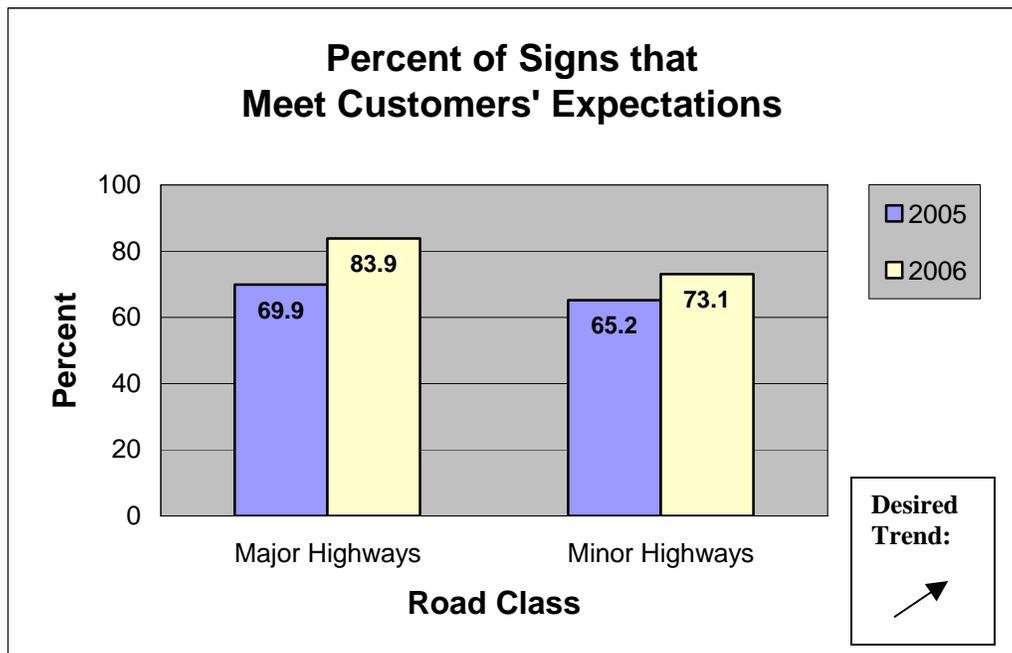
Measurement and Data Collection:

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. MoDOT employees collect the data annually in the fall, and update it each October.

Improvement Status:

The data shows a 14 percent increase in the percent of signs on the major highways that are meeting customer expectations. Through the Smooth Roads Initiative, MoDOT replaced many of the signs on the major roads. Results should continue to improve with the continued emphasis on improving the major roads within the next five years and the proposed 10-year replacement program for signs on major roads.

The data also shows an 8 percent increase for signs on minor highways meeting customer expectations. MoDOT has implemented a program to upgrade curve signing. This program has improved and will continue to improve a significant portion of the signs on minor roads. In addition, the proposed 12-year replacement program for signs on minor roads should continue to improve the results.



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.

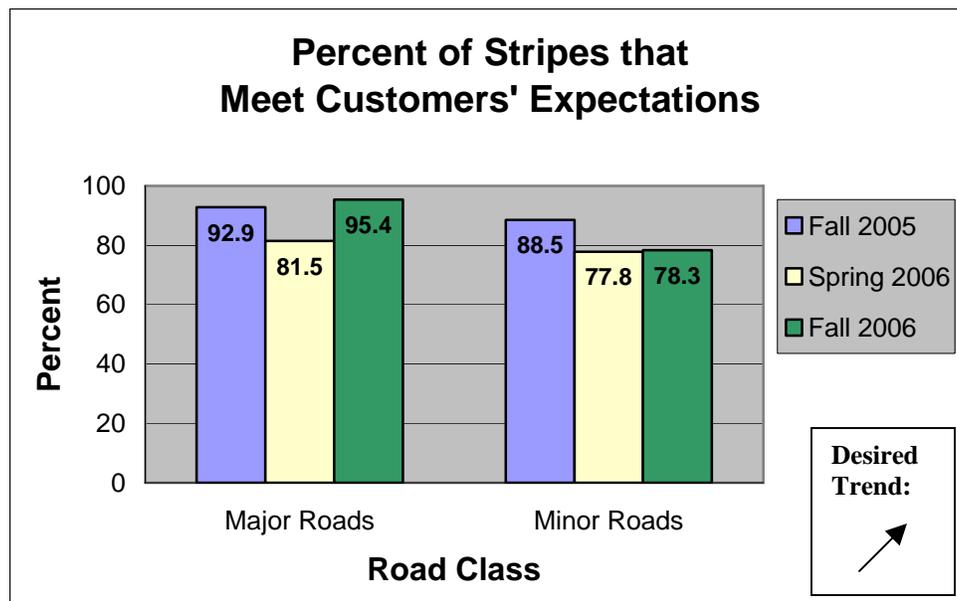
Measurement and Data Collection:

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 is 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 in the fall and spring of each year. This data is then compared to our benchmarks of 150 for white and 125 for yellow. The benchmarks have been established at the high end of what research and other states consider minimum acceptable levels. The measurement unit for retroreflectivity is millicandellas per meter squared per lux (mcd/m²/lux).

Improvement Status:

The data was analyzed in respect to the above benchmarks MoDOT set as the minimum acceptable level of retroreflectivity. The fall 2005 readings were taken before the end of the 2005 striping season. Spring 2006 readings were taken in May 2006 to reflect the condition of the markings coming out of the winter when they are typically the poorest. Fall 2006 readings were taken in October and November. On the major roads, there has been improvement over the spring readings and even the readings from the fall 2005. This reflects the completion of the SRI program and the emphasis on the major roads. Minor roads however show almost no change from the spring readings. This is primarily a result of reduced striping efforts by some of the districts due to increased material costs, as well as the high build paint and the conversion to a two-year striping cycle on the minor roads.

The roadway visibility plan as it is being implemented on the major roads definitely is showing improvements. As MoDOT enters the second year of implementing high build paint on the minor roads, improvements due to the longer life expectancy of the paint will be realized. Also, implementation of the recommendations of the Striping Quick Action Team will provide for better utilization of both equipment and funding for striping.



Roadway Visibility

Percent of work zones meeting expectations for visibility

Result Driver: Don Hillis, Director of System Management

Measurement Driver: Scott Stotlemeyer, Traffic Liaison 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 motorists in our work zones. This measure tracks how well the department meets customer expectations of visibility in work zones on state highways.

Measurement and Data Collection:

Using a formal inspection worksheet, Construction and Materials, Maintenance, Traffic, and district employees 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: This inspection program began in June 2005.

Improvement Status:

Compilation of the 357 evaluations performed by MoDOT staff between January and March of this calendar year resulted in a 90 percent satisfaction rating for work zone visibility (i.e., a negative perception of visibility was recorded in 9.8 percent of the evaluations). This rating is within one-half a percentage point of last calendar year's first quarter and 4 percent lower than the 2006 year-end ratings – a year the department showed a 7.3 percent improvement in work zone traffic visibility when compared to the previous year's inspection results.

Despite the lower satisfaction rating reflecting seasonal influences on operations during the first quarter, our overall progress over the past 21 months 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.

