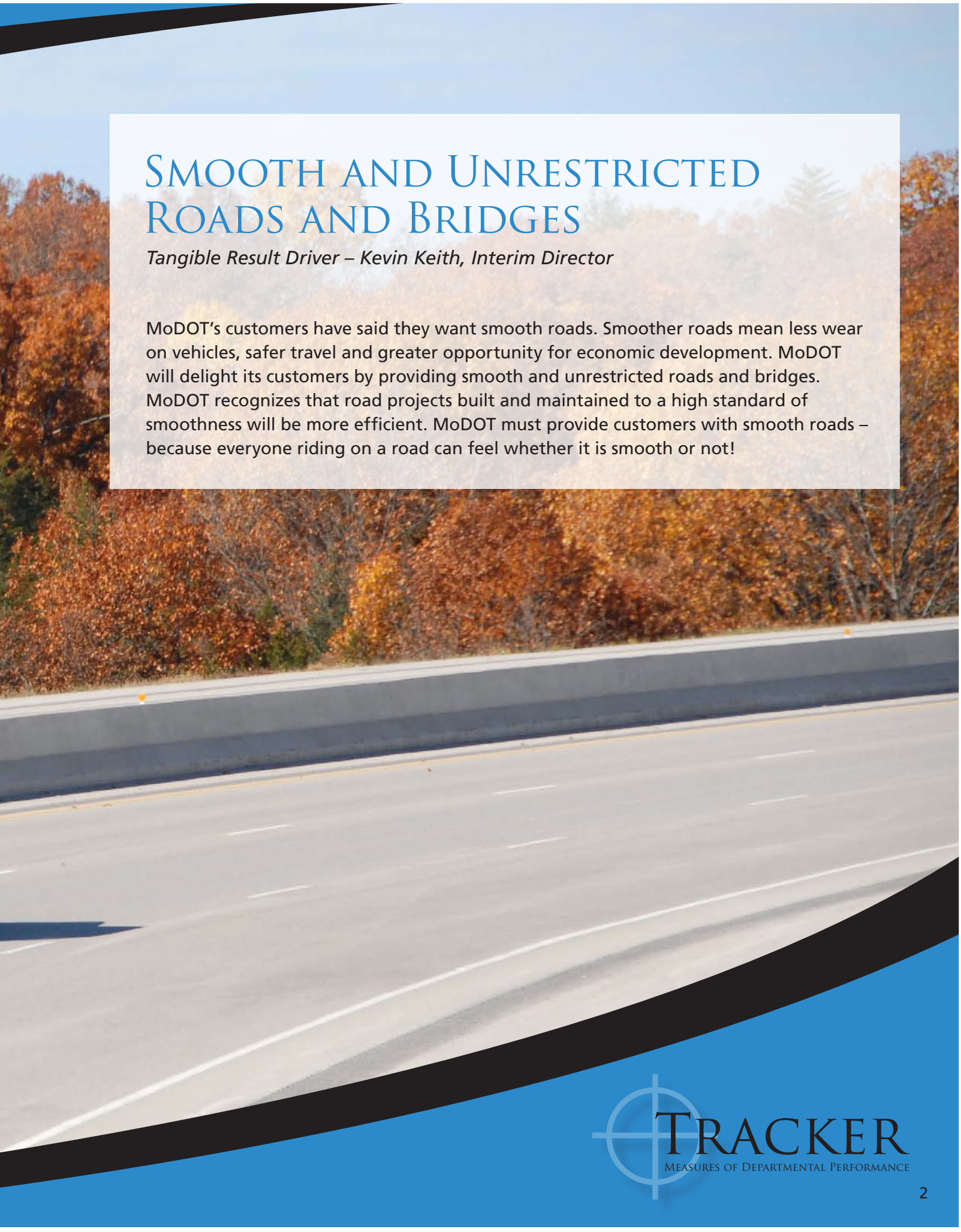


Smooth and Unrestricted Roads and Bridges

Tangible Result Driver – Kevin Keith, Interim Director

MoDOT's customers have said they want smooth roads. Smoother roads mean less wear on vehicles, safer travel and greater opportunity for economic development. MoDOT will delight its customers by providing smooth and unrestricted roads and bridges. MoDOT recognizes that road projects built and maintained to a high standard of smoothness will be more efficient. MoDOT must provide customers with smooth roads – because everyone riding on a road can feel whether it is smooth or not!

Percent of major highways in good condition-2a

Result Driver: Kevin Keith, Interim Director
Measurement Driver: Jay Bledsoe, Transportation System Analysis Engineer

Purpose of the Measure:

This measure tracks the condition of Missouri's major highway road surfaces. The public has indicated the condition of Missouri's existing state roadway system should be one of the state's highest priorities. MoDOT places a high priority on improving the condition of state highways.

Measurement and Data Collection:

The major highway system is defined as all routes functionally classified as principal arterials. By definition, the principal arterial system provides for statewide or interstate movement of traffic. Examples include the Interstate System and most U.S. routes such as 63, 54 or 36.

In urban areas, principal arterials carry traffic entering or leaving the urban area and serve movement of vehicles between central business districts and suburban residential areas. Examples include Business 50 (Missouri Blvd.) in Jefferson City, MO, 740 (Stadium Blvd.) in Columbia, and Route D (Page Ave.) in St. Louis.

The major roads in Missouri total approximately 5,573 centerline miles. This figure reflects mileage based on statewide review of the highway system. Good condition is defined using a combination of criteria. On high-speed routes (speed limits greater than 50 mph), the International Roughness Index (IRI) is used. For lower-speed routes (mostly urban areas) where smoothness is less critical, a Present Serviceability Rating (PSR) is used. While smoothness is a factor in PSR, physical condition is also a factor.

Direct comparison to other states is difficult because of differences in measurement methodologies. However, a general order-of-magnitude comparison is possible given certain assumptions. For example, there are five states that report mileage for major highways within 10 percent of that maintained by MoDOT. Of these five, Georgia, with 5,875 miles, currently has the highest percentage of these highways classified in good condition based on smoothness only. The Missouri definition of good uses smoothness as one factor; however, it also includes other condition factors such as physical distress to determine quality. While the comparison is not exact, it does indicate the level of performance possible on a system of Missouri's size. This is an annual measure. Missouri data is updated in January to reflect prior calendar-year ratings.

Improvement Status:

At the beginning of Better Roads, Brighter Futures (BRBF) in January 2007, 74 percent of major highways were in good condition. By January 1, 2010, one full year ahead of schedule, the goal of 85 percent of major roads in good condition had been achieved. More than 86 percent of major highways are currently rated in good condition.

The ability to reach this goal ahead of schedule is largely due to the unexpected influx of funds through the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA projects totaled about $595 million with approximately $200 million being dedicated to rehabilitation work on the major highways.

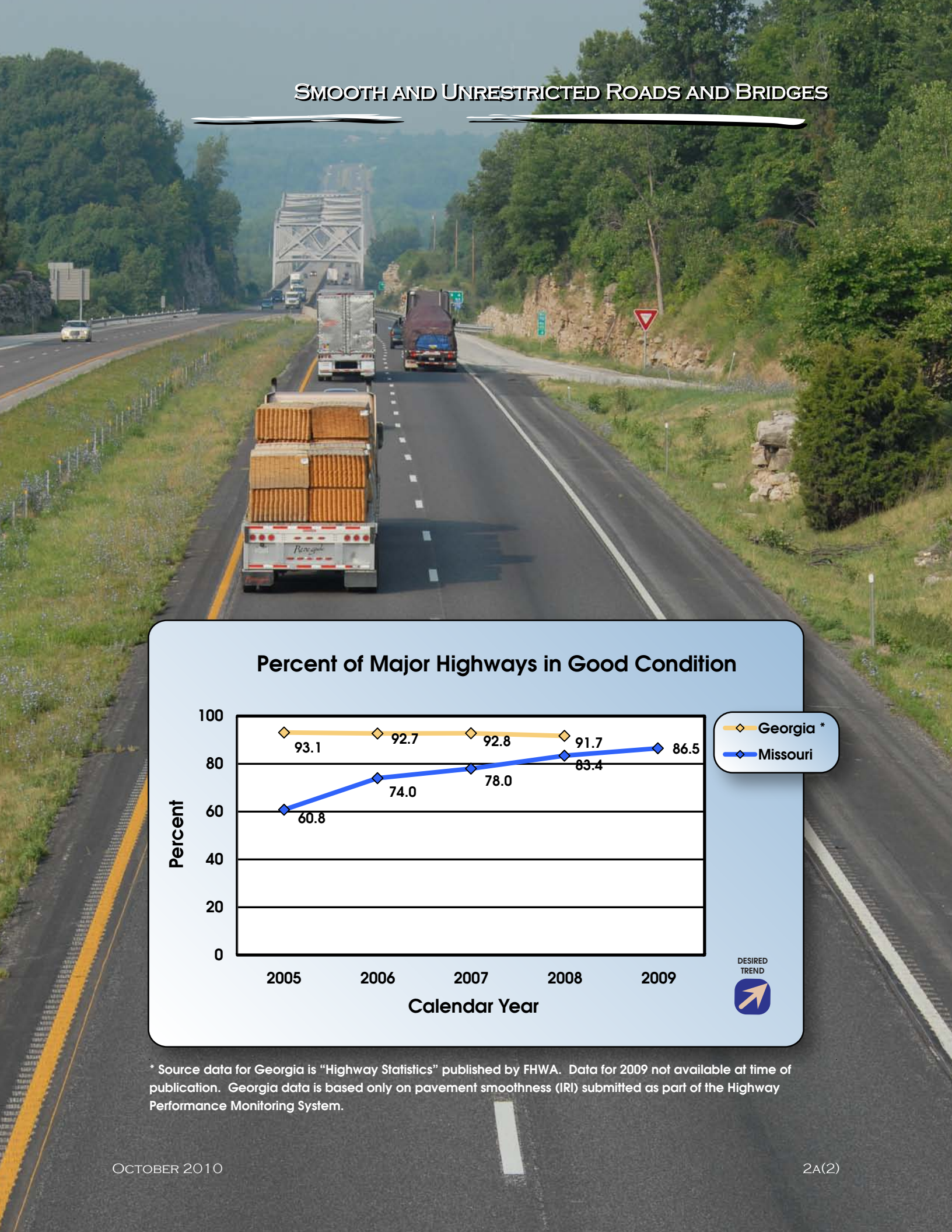
MoDOT will continue to emphasize maintenance of the miles improved through the Smooth Roads Initiative and BRBF. Over time, all 5,573 miles will benefit from improved safety features such as shouldering, wider striping and brighter signing. There are currently more than 150 BRBF projects in the 2010-2014 STIP that will address nearly 1,300 major highway miles.

Funding for the BRBF program will come from existing Taking Care of System funds in accordance with the current funding allocation directed by the Missouri Highways and Transportation Commission.

The Interstate System is the backbone of the major highway network. While it includes only about seven percent of the state highway mileage, it accounts for more than half the total state vehicles miles traveled. The increased emphasis on maintenance and operation of interstate highways that began in 2008 will continue into 2010. The Interstate Maintenance Plan sets specific goals, standards and responsibilities for the condition of these vital highways.

More than $430 million per year is dedicated to taking care of the existing highway system. Of this total, $125 million is reserved for work on the Interstate System and major bridges.

Smooth and Unrestricted Roads and Bridges



Percent of Major Highways in Good Condition

* Source data for Georgia is "Highway Statistics" published by FHWA. Data for 2009 not available at time of publication. Georgia data is based only on pavement smoothness (IRI) submitted as part of the Highway Performance Monitoring System.

Percent of minor highways in good condition-2b

Result Driver: Kevin Keith, Interim Director
Measurement Driver: Jay Bledsoe, Transportation System Analysis Engineer

Purpose of the Measure:

This measure tracks the condition of Missouri's minor highway road surfaces. The public has indicated the condition of Missouri's existing state roadway system should be one of the state's highest priorities. MoDOT places a high priority on improving the condition of highways in the state system.

Measurement and Data Collection:

The minor highway system consists of all routes functionally classified as minor arterials or collectors. These routes mainly serve local transportation needs and include highways commonly referred to as lettered routes, such as Route A, Route C and Route DD. The public sometimes refers to these routes as farm-to-market roads. The minor roads in Missouri total approximately 27,000 centerline miles.

Good condition is defined using a combination of criteria. Smoothness is evaluated using the International Roughness Index (IRI). Pavements below the prescribed threshold are considered good. However, public surveys have shown that physical condition is more important than ride on lower speed, lower volume roadways. Condition index, a measure of visual distress, is also evaluated and if those criteria are met, the roadway is considered good, regardless of the smoothness component.

Direct comparison to other states is difficult because of differences in measurement methodologies. However, a general order-of-magnitude comparison is possible given certain assumptions. For example, there are six states that report mileage for minor highways within 10 percent of that maintained by MoDOT. Of these six, Georgia, with 24,707 miles, currently has the highest percentage of these highways classified in good condition. The ratings reported by states as part of the Highway Performance Monitoring System for roads classified as minor more closely relate to Missouri's rating system. The Federal Highway Administration allows conditions on minor highways to be reported on either IRI or Present Serviceability Index (PSI). PSI includes an assessment of physical distress similar to Missouri's definition. The Missouri definition of good uses smoothness as one factor. However, it also includes other condition factors such as physical distress to determine quality. This is an annual measure. Missouri data is updated in January to reflect prior calendar-year ratings.

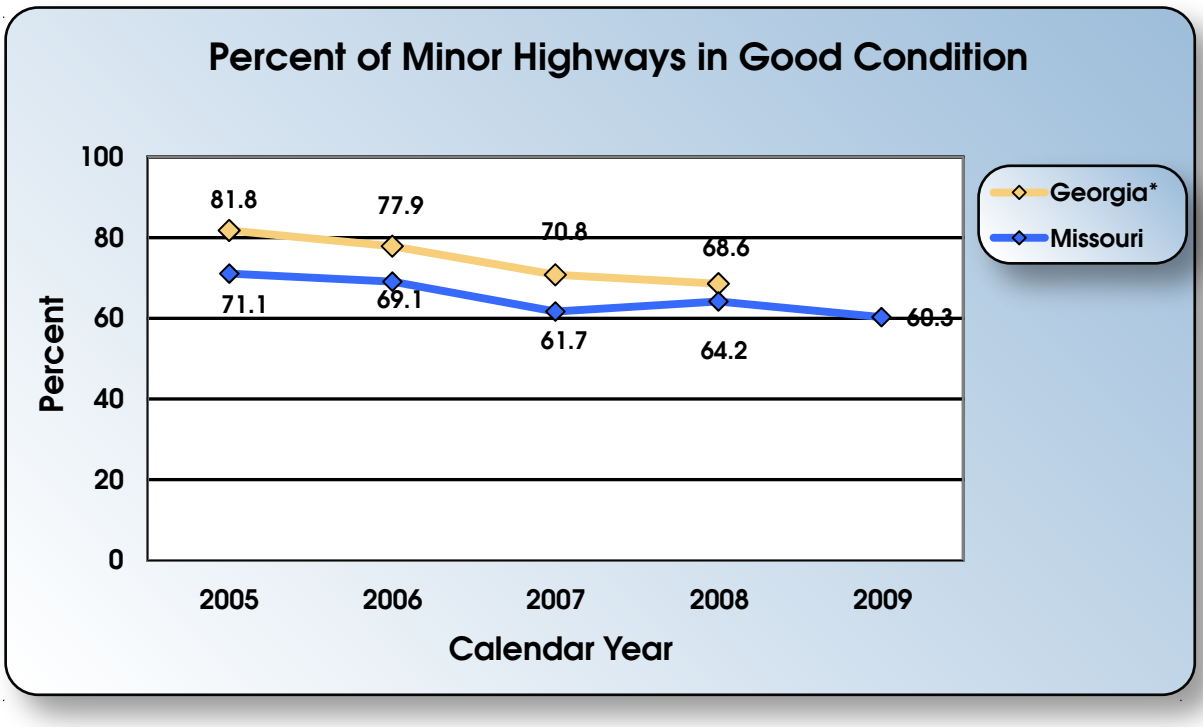
Improvement Status:

The Better Roads, Brighter Future program identified Missouri's major highways as a priority for the next five years, while efforts on the minor highways will remain at or near the current levels. Work on minor highways will emphasize the use of MoDOT maintenance forces and will consist of treatments that include routine patching, crack sealing and chip seals.

However, 2009 did see an increased effort on minor highways. The American Recovery and Reinvestment Act (ARRA) allowed additional funds to be applied to "Taking Care of the System" (TCOS) activities. More than $121 million was spent on improvements to the minor roads in 2009 from this program. In addition, approximately $30 million was applied to minor roads from internal operational savings. An additional $34 million is proposed from savings to be applied to minor roads in 2010. Despite this increase, the following graph still shows a decrease in minor highway conditions in 2009.

The increase shown in 2008 was due to a change in rating methods. Without this change, we have seen a steady decrease in good pavement for several years. It should be noted that not all the ARRA funding was directed to pavement. Only about 1,000 miles of minor road pavement was addressed with these funds.

MoDOT is positioned to react quickly to a second federal economic stimulus package should it become a reality. A portion of these funds will be applied to minor road improvements that include a mix of thin overlays and recycling to be done by contract. In addition, some funds will be used to upgrade select corridors with surface improvements, shoulders and other safety improvements. While the plan was developed using a specific funding amount, it can be easily scaled to take advantage of whatever amount is ultimately available.



* Source data for Georgia is "Highway Statistics" published by the Federal Highway Administration. Georgia data for 2009 was not available at time of publication. Data is based on a combination of pavement smoothness – IRI or PSR – as submitted as part of the Highway Performance Monitoring System.

Percent of vehicle miles traveled on major highways in good condition-2c

Result Driver: Kevin Keith, Interim Director
Measurement Driver: Jay Bledsoe, Transportation System Analysis Engineer

Purpose of the Measure:

This measure tracks the percent of vehicle miles traveled (VMT) on Missouri's major highway system that take place on highways in good condition. The public has indicated the condition of Missouri's existing state roadway system should be one of the state's highest priorities. Emphasizing work on the major highway system insures that the majority of travel takes place on highways in good condition.

Measurement and Data Collection:

The major highway system is defined as all routes functionally classified as principal arterials. By definition, the principal arterial system provides for statewide or interstate movement of traffic. Examples include the interstate system and most U.S. routes such as 63, 54 or 36.

In urban areas, principal arterials carry traffic entering or leaving the urban area and serve movement of vehicles between central business districts and suburban residential areas. Examples include Business 50 (Missouri Blvd.) in Jefferson City, MO, 740 (Stadium Blvd.) in Columbia, and Route D (Page Ave.) in St. Louis.

The major roads in Missouri total approximately 5,573 centerline miles. Good condition is defined using a combination of criteria. On high-speed routes (speed limits greater than 50 mph) the International Roughness Index (IRI) is used. For lower-speed routes (mostly urban areas) where smoothness is less critical, a Present Serviceability Rating (PSR) is used. While smoothness is a factor in PSR, physical condition is also a factor.

VMT is determined by multiplying the traffic volume on a given route by the route length. For this measure, the VMT is calculated on those routes in good condition and then divided by the total VMT for major routes to determine the percentage shown below. While the system of major highways in Missouri comprises only about 17 percent of the total system mileage, it carries more than 75 percent of all traffic on the state highway system. This is an annual measure updated each January.

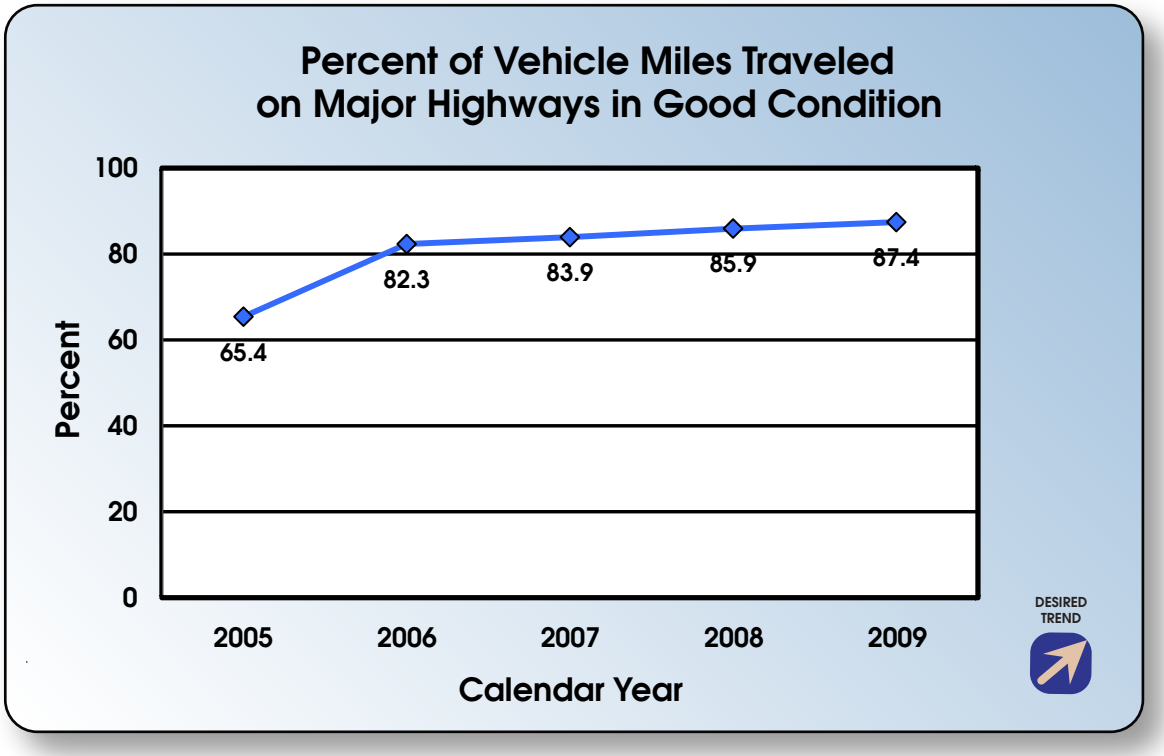
Improvement Status:

Completion of the Smooth Roads Initiative resulted in a significant improvement in pavement condition. At the beginning of Better Roads, Brighter Futures (BRBF) in January 2007, 74 percent of major highways were in good condition (as shown in 2b: Percent of major highways that are in good condition). By January 1, 2010, one full year ahead of schedule, the goal of 85 percent of major roads in good condition had been achieved. More than 86 percent of major highways are currently rated in good condition.

The ability to reach this goal ahead of schedule is largely due to the unexpected influx of funds through the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA projects totaled about $595 million with approximately $200 million being dedicated to rehabilitation work on the major highways.

Funding for BRBF will come from existing Taking Care of System (TCOS) funds in accordance with the current funding allocation directed by the Missouri Highways and Transportation Commission.

More than $430 million per year is dedicated to taking care of the existing highway system. Funding for the BRBF program will come from existing TCOS funds in accordance with the current funding allocation directed by the Commission.


Percent of Vehicle Miles Traveled
on Major Highways in Good Condition
100
80
60
40
20
0
Percent
65.4
82.3
83.9
85.9
87.4
2005
2006
2007
2008
2009
Calendar Year
DESIRED
TREND

Percent of bridges on major highways in good condition-2d

Result Driver: Kevin Keith, Interim Director
Measurement Driver: Dennis Heckman, State Bridge Engineer

Purpose of the Measure:

This measure tracks progress toward improving the condition of Missouri's bridges on major highways. The public has indicated the condition of Missouri's existing roadway system should be one of the state's highest priorities. MoDOT places a priority on increasing the quality of bridges on the state system.

Measurement and Data Collection:

The major highway system is defined as all routes functionally classified as principal arterials. By definition, the principal arterial system provides for statewide or interstate movement of traffic. Examples include the Interstate System and most U.S. routes such as 63, 54 or 36.

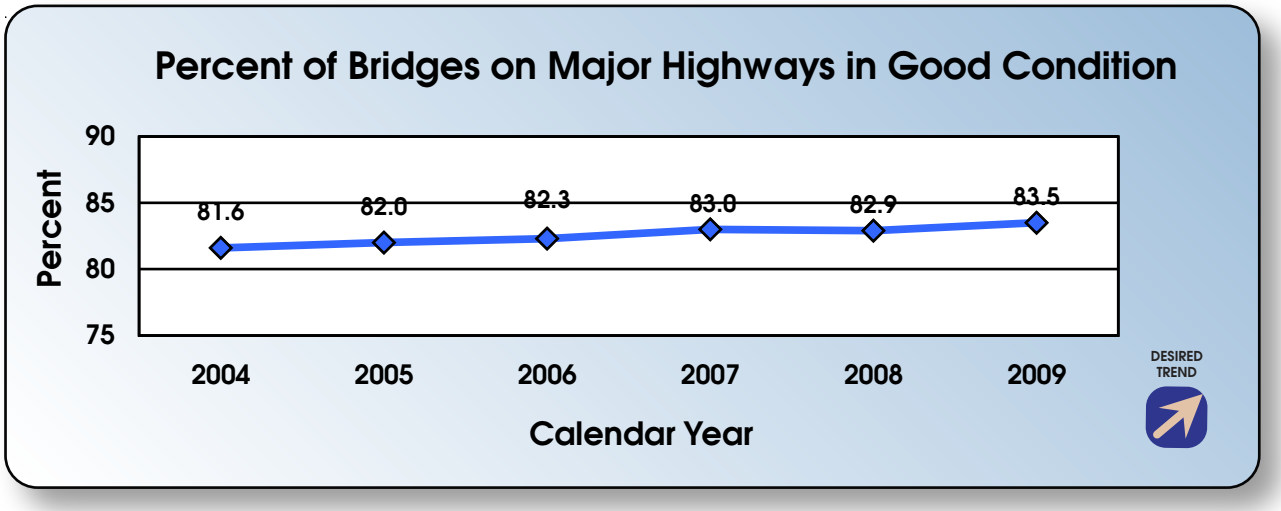
In urban areas, major highways carry traffic entering or leaving the urban area and serve the movement of vehicles between central business districts and suburban residential areas. Examples include Business Route 50 (Missouri Blvd.) in Jefferson City, Route 740 (Stadium Blvd.) in Columbia, and Route D (Page Ave.) in St. Louis.

A bridge is considered "good" if it is not deficient Deficient means it is either structurally deficient (SD) or functionally obsolete (FO) as defined using Federal Highway Administration criteria. A SD bridge is in poor condition or has insufficient load capacity when compared to modern design standards. A FO bridge has poor roadway alignment or has clearance or width restrictions that no longer meet the usual criteria for the system it serves. MoDOT staff inspects all state-owned bridges. There are currently 3,595 bridges on major highways. This is an annual measure and data is updated each April based on the prior year's inspections.

Improvement Status:

Bridge conditions on major highways have taken a solid step forward from 2008 to 2009. Half of the improvement in this measure is attributable to STIP work that has been awarded in the last year while a third of the improvement is attributable to structure improvements from the Safe & Sound program.

The Safe & Sound Bridge Improvement Program will address more than 800 of the state's most critical structures over five years, with the majority of the structures being on the minor highway system. With the small number of major highway system structures remaining on the Safe & Sound program and the work planned in the STIP, it is anticipated that this percentage will level off for a couple of years and then start decreasing beyond that.



Percent of bridges on minor highways in good condition-2e

Result Driver: Kevin Keith, Interim Director
Measurement Driver: Dennis Heckman, State Bridge Engineer

Purpose of the Measure:

This measure tracks progress toward improving the condition of Missouri's bridges on minor highways. The public has indicated the condition of Missouri's existing roadway system should be one of the state's highest priorities. MoDOT places a priority on increasing the quality of bridges on the state system.

Measurement and Data Collection:

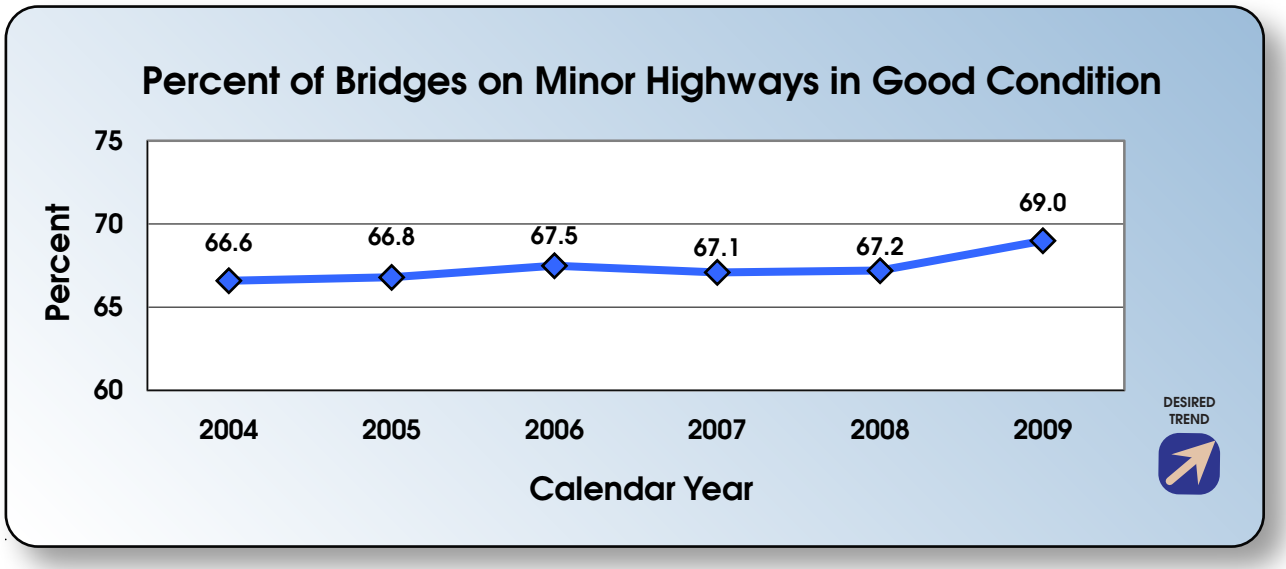
The minor highway system consists of all routes functionally classified as minor arterials or collectors. These routes serve more local transportation needs and include highways commonly referred to as lettered routes, such as Route A, Route C and Route DD. The public sometimes refers to these routes as farm-to-market roads.

A bridge is considered "good" if it is not deficient. Deficient means it is either structurally deficient (SD) or functionally obsolete (FO) as defined using Federal Highway Administration criteria. A SD bridge is in poor condition or has insufficient load capacity when compared to modern design standards. A FO bridge has poor roadway alignment or has clearance or width restrictions that no longer meet the usual criteria for the system it serves. MoDOT staff inspects all state-owned bridges. There are currently 6,740 bridges on minor highways. This is an annual measure and data is updated each April based on the prior year's inspections.

Improvement Status:

Bridge conditions on minor highways have shown a significant improvement from 2008 to 2009. Approximately 50 percent of this improvement is attributable to structure improvements from the Safe & Sound program while another 15 percent results from STIP work that has been awarded in the last year. Over the last six years, the percentage of good bridges has increased from 66.6 percent to 69.0 percent.

The Safe & Sound Bridge Improvement Program will address more than 800 of the state's most critical structures over five years, with the majority of the structures being on the minor highway system. With upcoming Safe & Sound work as well as STIP projects, it is anticipated that this percentage will continue to increase and approach 72 percent over the next four years. Once the Safe & Sound program is completed, it is anticipated that this percentage will start to decrease again.



Number of deficient bridges on the state system (major and minor highways)-2f

Result Driver: Kevin Keith, Interim Director
Measurement Driver: Dennis Heckman, State Bridge Engineer

Purpose of the Measure:

This measure tracks progress toward improving the condition of Missouri's bridges. The public has indicated the condition of Missouri's existing roadway system should be one of the state's highest priorities. MoDOT places a high priority on increasing the quality of bridges on the state system.

Measurement and Data Collection:

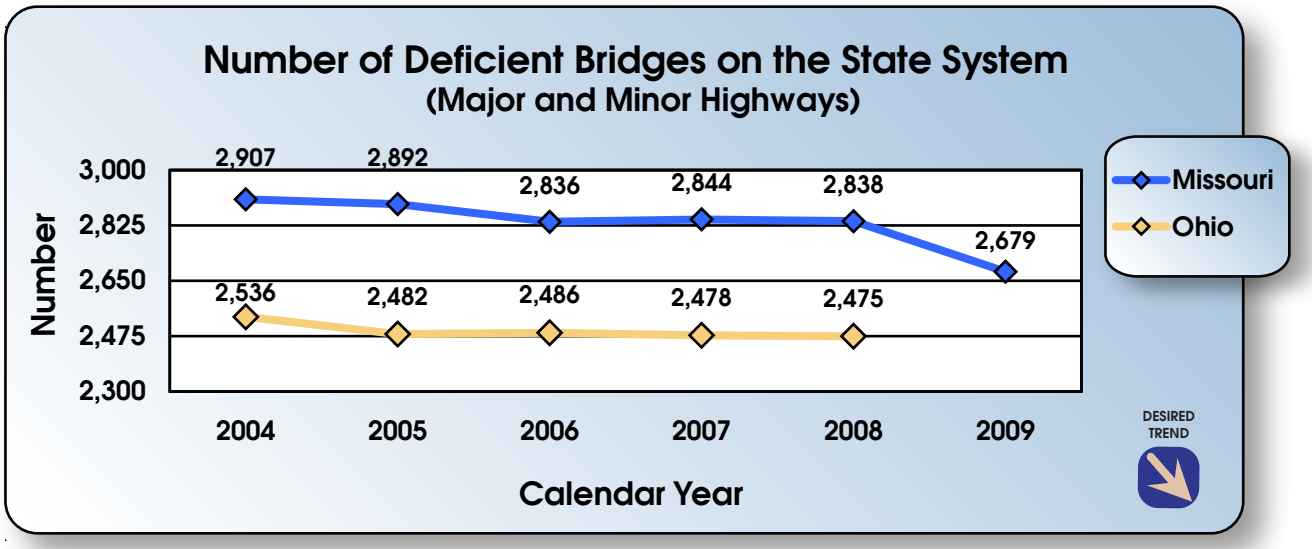
A bridge is considered deficient if it is either structurally deficient (SD) or functionally obsolete (FO) as defined using Federal Highway Administration criteria. A SD bridge is in poor condition or has insufficient load capacity when compared to modern design standards. A FO bridge has poor roadway alignment or has clearance or width restrictions that no longer meet the usual criteria for the system it serves. MoDOT staff inspect all state-owned bridges. There are currently a total of 10,335 bridges on the state highway system.

This is an annual measure and data is taken from FHWA's National Bridge Inventory. Missouri data is available in April of each calendar year and is updated in the April Tracker. The data for other states is not published until the following year.

Improvement Status:

Bridge conditions on Missouri highways took a big step forward in 2009. The long term trend on this measure has been a steady downward reduction with the number leveling off from 2006 thru 2008. Now, as a result of the Safe & Sound program as well as some STIP investment in bridges, improvement can be seen. Of the 2,679 deficient bridges, 1,051 are functionally obsolete and 1,628 are structurally deficient.

The strategy to improve this measure is the Safe & Sound Bridge Improvement Program that will repair or replace more than 800 of the state's most critical structures in five years. A decrease in the number of deficient bridges is expected with the completion of this program. However, due to the accelerating rate of bridges becoming deficient, there will still be a sizable number of deficient bridges on the system. It is projected that this measure will drop to about 2,500 at the completion of the Safe & Sound Bridge Improvement Program.



* Source for Ohio, "Better Bridges" November 2009, for data collected in calendar year 2008.

Percent of major bridges in good condition-2g

Result Driver: Kevin Keith, Interim Director
Measurement Driver: Dennis Heckman, State Bridge Engineer

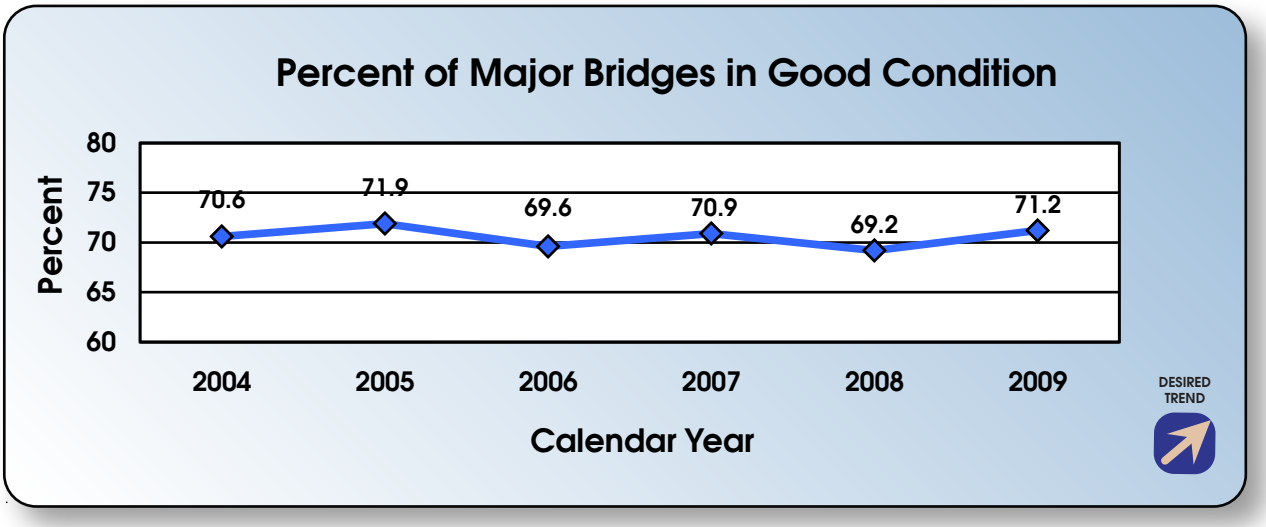
Purpose of the Measure:

This measure tracks the percent of major bridges that are in good condition. The public has indicated the condition of Missouri's existing roadway system should be one of the state's highest priorities. MoDOT places a priority on increasing the quality of bridges on the state system.

Measurement and Data Collection:

A major bridge is defined as any structure with a length greater than 1,000 feet. There are currently 212 such structures on the MoDOT system. While they make up only about 3 percent of the number of span-type bridges, they represent 27 percent of our bridge deck area.

A bridge is considered in good condition if it is not deficient. Deficient means it is either structurally deficient (SD) or functionally obsolete (FO) as defined using Federal Highway Administration criteria. A SD bridge is in poor condition or has insufficient load capacity when compared to modern design standards. A FO bridge has poor roadway alignment or has clearance or width restrictions that no longer meet the usual criteria for the system it serves. This is an annual measure and data is updated each April based on the prior year's inspections.

Improvement Status:

Major bridges in good condition increased 2 percent in 2009. This was primarily due to a one- time infusion of $26.4 million in special money from Congress.