Smooth and Unrestricted Roads and Bridges

Tangible Result Driver – Kevin Keith, Chief Engineer

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!

Smooth and Unrestricted Roads and Bridges

Percent of major highways that are in good condition

Result Driver: Kevin Keith, Chief Engineer
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 revised figure reflects additional 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.

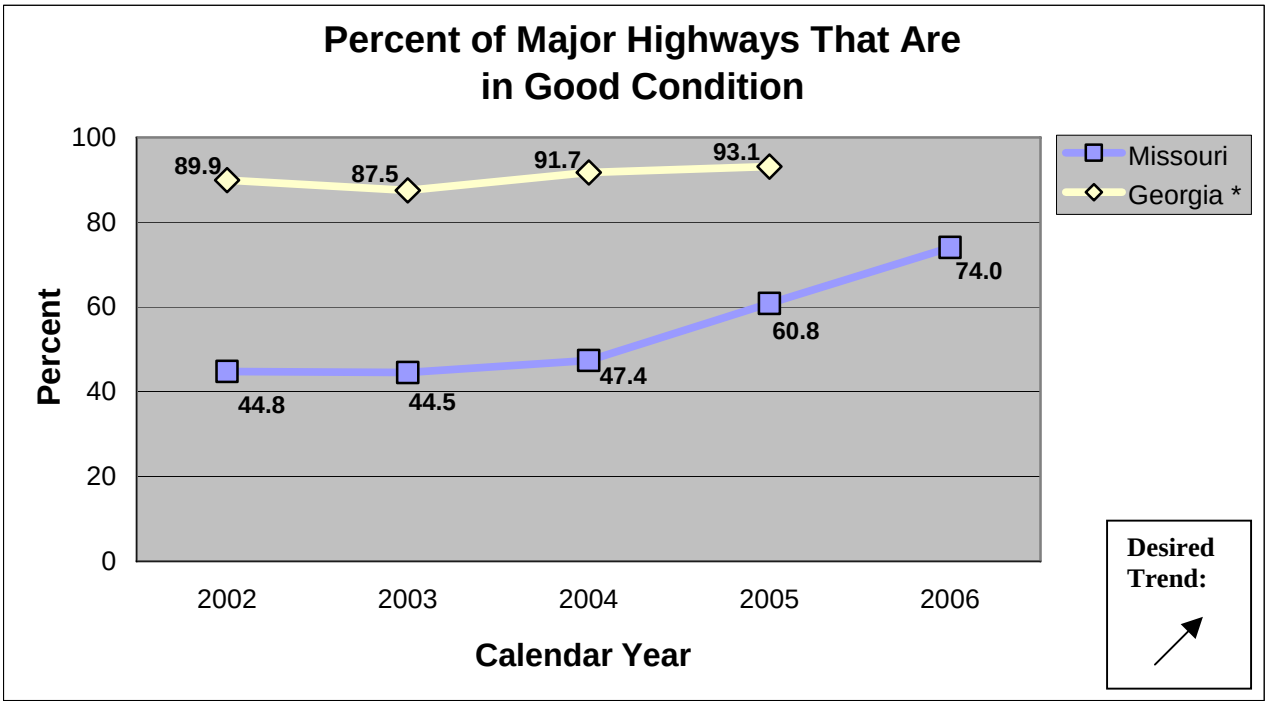
This is an annual measure. Missouri data is updated in January to reflect prior calendar-year ratings.

Improvement Status:
More than $430 million per year is dedicated to taking care of the existing highway system. An additional $359 million available from Amendment 3 (approved by Missouri voters in November 2004) was added to this sum as part of MoDOT's Smooth Roads Initiative (SRI).

Completion of the SRI has resulted in a significant improvement in pavement condition. Currently, 74 percent of the major highways are in good condition, up from 46 percent at the beginning of the SRI.

Under the Better Roads, Brighter Future program, MoDOT will emphasize maintenance of the miles improved under the SRI while making major improvements to the remainder of the 5,573 miles in the major highway system. By the end of 2011, a total of 85 percent of the major highways will have improved surfaces along with new or improved shoulders and rumble stripes. However, all 5,573 miles will benefit from safety features such as wider striping and brighter signing.

Funding for the Better Roads, Brighter Future program will come from existing Taking Care of System (TCOS) funds in accordance with the current funding allocation method directed by the Missouri Highways and Transportation Commission.



* Source data for Georgia is "Highway Statistics " published by FHWA. Data for 2006 not available at time of publication. Georgia data is based only on pavement smoothness (IRI) submitted as part of the Highway Performance Monitoring System.

Smooth and Unrestricted Roads and Bridges

Percent of minor highways that are in good condition

Result Driver: Kevin Keith, Chief Engineer
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.

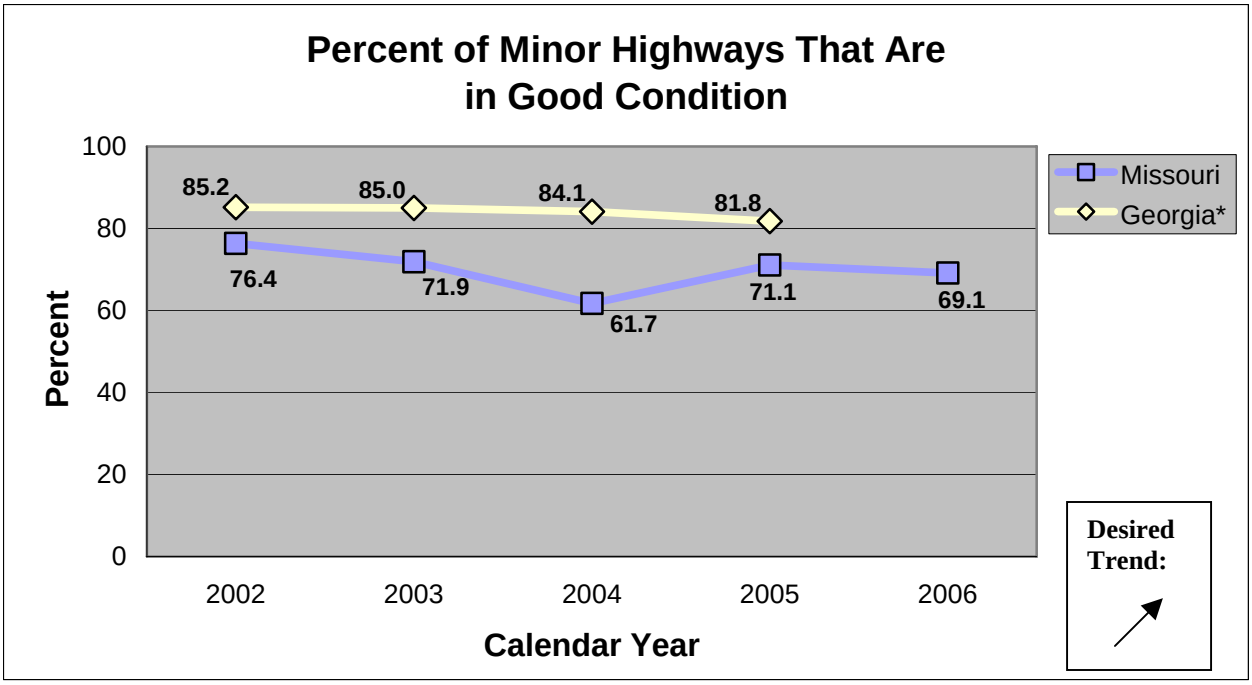
Good condition is defined using a combination of criteria. Where available, on high-speed routes (speed limits greater than 50 mph) the International Roughness Index (IRI) is used. For lower-speed routes where smoothness is less critical, a Present Serviceability Rating (PSR) or IRI is used. While smoothness 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 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.

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.

Improvement Status:
Prior to 2005, pavement conditions on minor highways had shown a steady decrease. The pavement condition increase in 2005 is due primarily to modification of the rating method. Prior to 2005, ratings used a combination of automated methods and MoDOT district manual ratings. More than 60 percent of minor roads were surveyed using automated methods by MoDOT Transportation Planning staff in 2006. The acquisition of additional equipment in 2007 should allow virtually all state system routes to be rated annually.

Through the Better Roads, Brighter Future program, MoDOT has identified the major highway system as a priority in the next five years. Efforts on the minor highways will emphasize maintenance of this system 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.



* Source data for Georgia is "Highway Statistics" published by the Federal Highway Administration. Georgia data for 2006 was not available at time of publication. Data is based on a combination of pavement smoothness – IRI or PSI – as submitted as part of the Highway Performance Monitoring System.

.

Smooth and Unrestricted Roads and Bridges

Percent of vehicle miles traveled on major highways in good condition

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

Purpose of the Measure:
This measure tracks the percent of vehicle miles traveled 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 comprise only about 17 percent of the total system mileage, it carries more than 75 percent of all traffic on the state highway system.

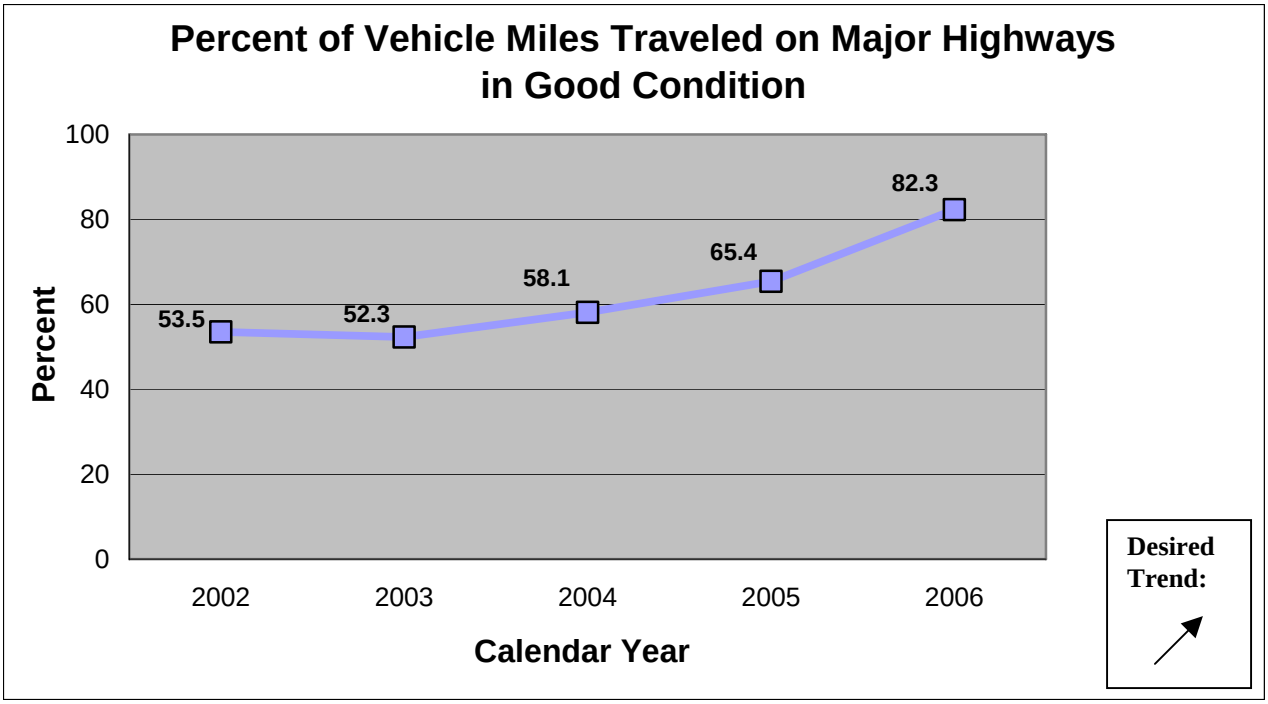
This is an annual measure. While pavement data is available in January, year-end processing of traffic data will delay update of this measure until July of each year.

Improvement Status:
More than $430 million per year is dedicated to taking care of the existing highway system. An additional $359 million available from Amendment 3 (approved by Missouri voters in November 2004) was added to this sum as part of MoDOT's Smooth Roads Initiative (SRI).

Completion of the SRI has resulted in a significant improvement in pavement condition. Under the Better Roads, Brighter Future program, MoDOT will continue maintenance of the miles improved under the SRI while making major improvements to the remainder of the 5,573 miles in the major highway system. Continuing to emphasize work on the major highway system insures that the majority of travel by the public takes place on highways in good condition.

Currently, more than 82 percent of all travel on major highways takes place on highways in good condition.

Funding for the Better Roads, Brighter Future program will come from existing Taking Care of System (TCOS) funds in accordance with the current funding allocation method directed by the Missouri Highways and Transportation Commission.


Percent of Vehicle Miles Traveled on Major Highways in Good Condition
100
80
60
40
20
0
Percent
53.5
52.3
58.1
65.4
82.3
2002
2003
2004
2005
2006
Calendar Year
Desired Trend:

Smooth and Unrestricted Roads and Bridges

Percent of deficient bridges on major highways

Result Driver: Kevin Keith, Chief Engineer
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 high 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 or most U.S. routes such as 63, 54 or 36.

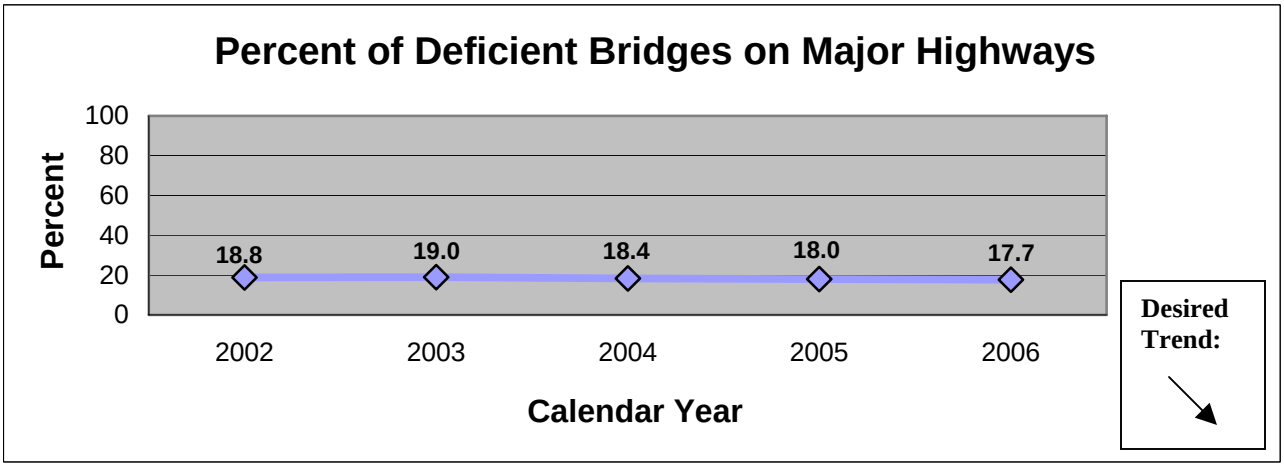
In urban areas, principal arterials carry traffic entering or leaving the urban area and serve movement of vehicles between central business districts and suburban residential areas. Examples include Business 50 (Missouri Blvd.) in Jefferson City, MO 740 (Stadium Blvd.) in Columbia and Route D (Page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

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 inspects all state-owned bridges. There are currently 3,317 bridges on major highways.

This is an annual measure. Data is updated each April based on the prior year's inspections.

Improvement Status:
Bridge conditions on major highways have shown a moderate improvement. The percent of deficient bridges has been reduced to 17.7 percent over the last five years as a result of increasing funds directed to care for the existing highway system. A minimum of $10 million per year is dedicated to preventive maintenance activities on major river crossings and other structures more than 1,000 feet in length.

The Safe & Sound bridge improvement program will address more than 800 of the state's most critical structures. This program will repair or replace these bridges over a five-year period and emphasize their maintenance at an acceptable level for an additional 25 years. While most of these bridges are located on the minor highway system, a benefit to bridges on major highways is also anticipated.



Smooth and Unrestricted Roads and Bridges

Percent of deficient bridges on minor highways

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

Purpose of the Measure:
This measure tracks progress toward improving the condition of Missouri's minor highway 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.

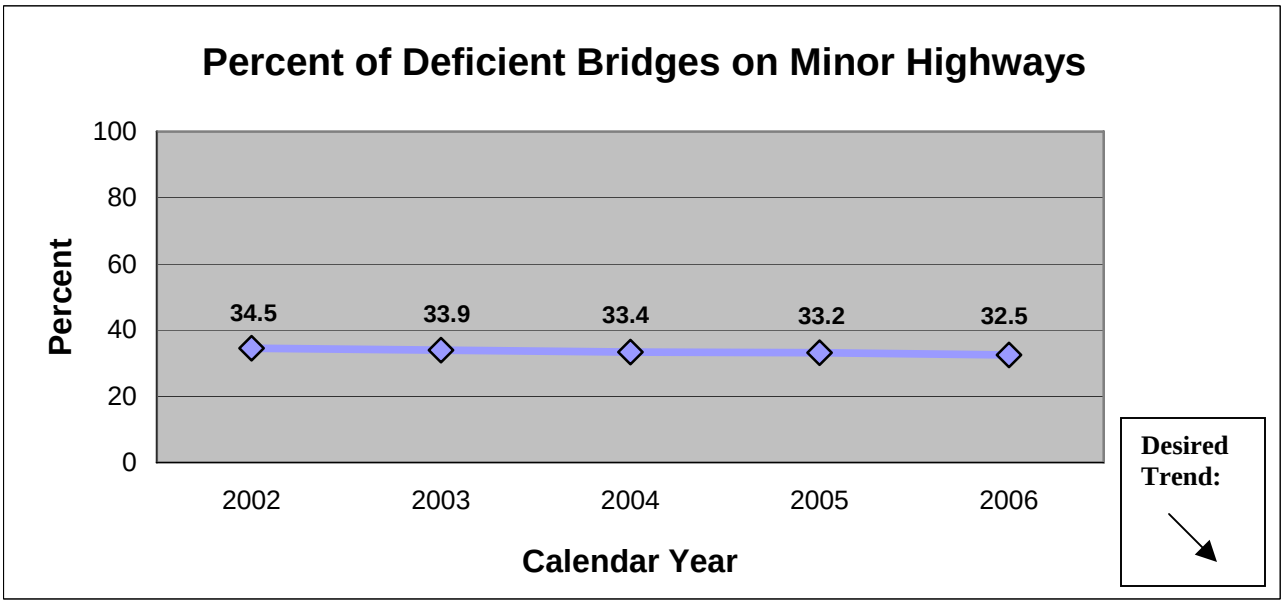
Measurement and Data Collection:
The minor highway system consists of all routes functionally classified as minor arterials or collectors. These routes serve more local transportation needs and include highways commonly referred to as lettered routes, such as Route A, Route C and Route DD. The public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

A bridge is considered 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 inspects all state-owned bridges. There are currently 6,923 bridges on minor highways.

This is an annual measure. Data is updated each April based on the prior year's inspections.

Improvement Status:
Bridge conditions on minor highways have shown a moderate improvement. The percent of deficient bridges has been reduced to 32.5 percent over the last five years as a result of increasing funds directed to care for the existing highway system. A minimum of $10 million per year is dedicated to preventive maintenance activities on major river crossings and other structures more than 1,000 feet in length.

The Safe & Sound bridge improvement program will address more than 800 of the state's most critical structures. This program will repair or replace these bridges over a five-year period and emphasize their maintenance at an acceptable level for an additional 25 years. Most of these bridges are located on the minor highway system. A substantial decrease in the number of deficient bridges is expected to occur with the completion of this program.



Smooth and Unrestricted Roads and Bridges

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

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

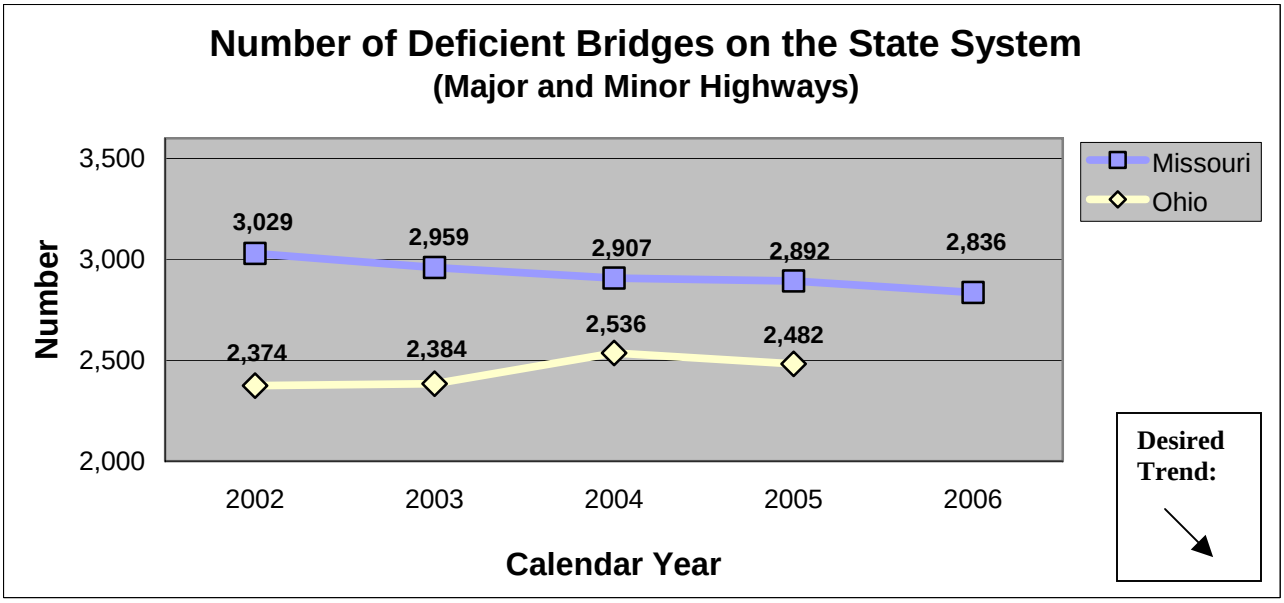
Purpose of the Measure:
This measure tracks progress toward improving the condition of Missouri's bridges. The public has indicated the condition of Missouri's existing roadway system should be one of the state's highest priorities. MoDOT places a high priority on increasing the quality of bridges on 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 inspects all state-owned bridges. There are currently a total of 10,240 bridges on the state highway system.

This is an annual measure. Data is taken from the National Bridge Inventory. Missouri data is available in April of each calendar year and is updated at that time. However, the data for other states is not published until the following year.

Improvement Status:
Bridge conditions on Missouri highways have shown a moderate improvement in the last five years as a result of increasing funds directed to care for the existing highway system. Currently, 2,836 bridges are considered deficient on the state highway system. A minimum of $10 million per year is dedicated to preventive maintenance activities on major river crossings and other structures more than 1,000 feet in length.

The Safe & Sound bridge improvement program will address more than 800 of the state's most critical structures. This program will repair or replace these bridges over a five-year period and emphasize their maintenance at an acceptable level for an additional 25 years. A marked improvement in the number of deficient bridges will occur with the completion of this program.



* Source for Ohio, "Better Bridges" November 2006, for data collected in calendar year 2005.