



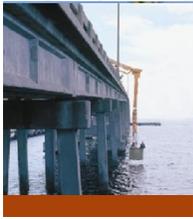
Performance Briefs

# Maintenance and Preservation

October 2010

*This Performance Brief provides performance information used by the Florida Department of Transportation and others to guide the development and investment decisions for Florida's transportation systems. Additional Briefs and related information on transportation performance reporting in Florida are available at <http://www.dot.state.fl.us/planning/performance>.*

This Performance Brief is reporting on one of the five goals of the 2025 Florida Transportation Plan (FTP). A new 2060 Florida Transportation Plan is being developed and expected to be completed by December 2010. The 2011 Performance Briefs will be revised to align with the goals of the 2060 FTP.



## **Our Goal:** **Adequate and Cost-Efficient Maintenance and Preservation of Transportation Assets**

Florida has invested billions of dollars in roads, rail networks, airports, transit facilities and services, seaports and other elements of the transportation system. Regular maintenance and improvements keep these assets operating efficiently, extend their useful life and can delay the substantial cost of reconstructing or replacing them.

The department will continue to make substantial investments in meeting established standards for routine maintenance and the condition of state highway pavement and bridges. Roadways owned by local governments – and other transportation facilities such as bus systems, airports, seaports and railroads which are primarily owned by local governments, public authorities and private companies – are maintained by their owners. The department helps fund some of these facilities, but does not directly build, operate or maintain them.

Managing the transportation system also means making sure the existing system efficiently carries more people and goods to keep up with the demand of population growth, an expanding economy, and ever-increasing travel. The department will increase use of Intelligent Transportation Systems, demand management, access management, incident management and other techniques to maximize the operational efficiency and safety of the system.

The department has primary jurisdiction over the State Highway System. Although this system consists of approximately 12,000 (10 percent) of the 121,000 public road centerline miles in the state, it carries 53 percent of the traffic. One of the department's main responsibilities is keeping the State Highway System in acceptable physical condition. To achieve this, the department resurfaces roads, repairs or replaces bridges and conducts routine maintenance activities such as mowing, litter removal and sign replacement.

Keeping the other facilities which are part of Florida's transportation system in acceptable physical condition is the responsibility of the local governments, authorities and private sector companies which own and operate them. The department will continue to compile available information on condition issues for these facilities and, where authorized, make safety-related inspections.

## **Our Long-Range Objectives:**

The 2025 Florida Transportation Plan identifies three long-range maintenance and preservation objectives:

- Maintain all elements of the transportation system to protect the public's investment for the future.
- Eliminate the illegal operation of commercial motor vehicles exceeding weight limits on Florida's public roads and bridges.

- Maximize the use of alternative, non-roadway modes to transport overweight and oversize loads.

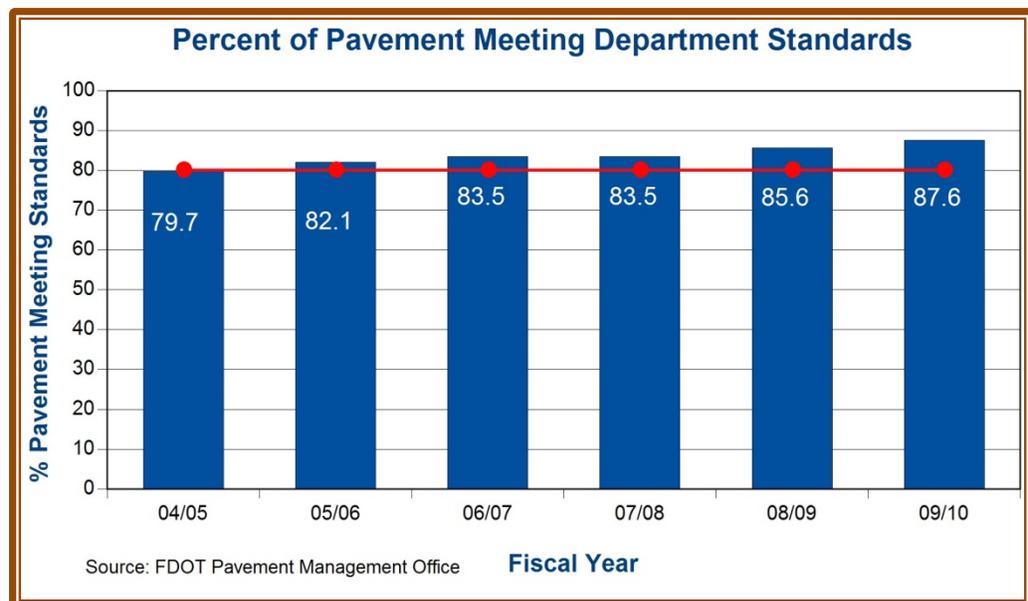
### **Our Short-Range Objectives:**

The Florida Department of Transportation sets short-term objectives and strategies to implement the long-term goals and objectives of the Florida Transportation Plan. They provide the policy framework for the department's budget and work program.

- Through 2015, ensure that 80 percent of pavement on the State Highway System meets department standards.
- Through 2015, ensure that 90 percent of FDOT-maintained bridges meet department standards while keeping all FDOT-maintained bridges open to the public safe.
- Through 2015, achieve 100 percent of the acceptable maintenance standard on the State Highway System.

### **Pavement Condition**

The department has a long-standing commitment to keeping the pavement on state highways in acceptable condition. The State Highway System has remained at or near the target of 80 percent non-deficient throughout the last decade. This percentage is forecast to remain above the 80 percent objective through FY 2014/2015.



Pavement on the State Highway System is in excellent condition, with 88 percent of the pavement currently meeting department standards. The 12 percent deficiency means 5,302 lane-miles of pavement either currently are or will soon be in need of rehabilitation. While the department has continued to find sufficient funds to meet

the pavement condition objectives, the amount of funding needed for pavement rehabilitation is reevaluated annually.

State roads needing resurfacing are identified through the department's annual pavement condition survey. This survey evaluates pavement conditions using three factors: ride quality, crack severity and average depth of wheel-path ruts.

"Ride quality" is what the motorist experiences (the smoothness of the ride). It directly affects motor vehicle operating costs. Crack severity, or "cracking," refers to the structural deterioration of the pavement, which leads to loss of smoothness and deterioration of the road base by water seepage, if not corrected. Wheel-path ruts, or "rutting," are depressions in pavement caused by heavy use. These depressions can collect water, creating a safety hazard.

Truck traffic contributes to wear on roadways, because of the force exerted on the pavement and the way pavement reacts to it. A five-axle, 80,000 pound semi-trailer truck causes pavement distress equivalent to that caused by about 9,600 cars. The department enforces legal weight limits because increases in weight have enormous impacts on pavement wear. Even the arrangement of truck axles or factors as simple as tire pressure can have a significant impact on pavement wear.

It is important to keep pavement in good shape. When roadway surfaces are not maintained, the roadway must be rebuilt – literally – from the ground up. It is more economical to systematically maintain roadways than to rebuild them.

### **Strategies for Pavement Condition**

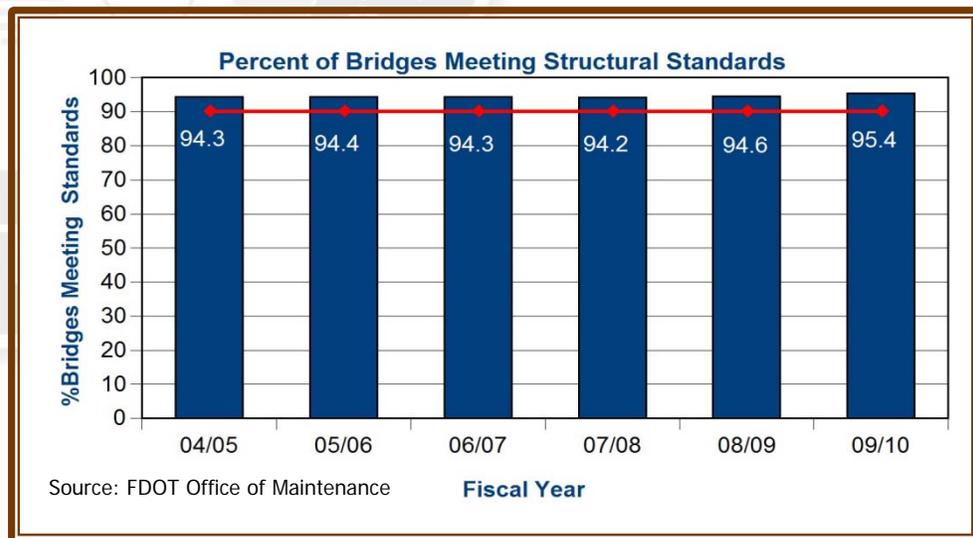
The department will help ensure the short-range objective is achieved through these actions:

- Resurface at least 5 percent of the State Highway System annually;
- Eliminate the illegal operation of commercial motor vehicles exceeding weight limits on Florida's public roads and bridges; and
- Facilitate training and technical assistance, and maintain current data systems to assist local governments in conducting pavement condition surveys and ratings.

### **Bridge Condition**

The department has also reconfirmed its long-standing commitment to keeping the bridges on state highways in good, safe condition. The department's primary measure is to have 90 percent of its bridges achieve a National Bridge Inventory (NBI) rating of 6 or higher. The NBI is a Federal Highway Administration requirement used to evaluate the condition of bridges, based on a scale of 0 to 9 with 0 meaning failed condition and 9 meaning excellent condition. An NBI rating of 6 means a bridge is in satisfactory condition and a rating of 7 refers to a bridge in good condition. Ninety percent or more of the bridges on the State Highway System have met department standards since the baseline fiscal year 1995/96. It is anticipated the Florida Department of Transportation will meet the bridge objective through FY 2014/15.

Currently, over 95 percent of all FDOT-maintained bridges meet department standards, which means the bridges do not show evidence of structural deterioration and are not limited by weight restrictions. The department takes a proactive approach towards bridge maintenance, which has proven cost effective, as preventative maintenance and repairs are performed prior to the bridge deteriorating to a level where the cost of the repair is much higher. This proactive approach ensures FDOT bridges meet or exceed their life expectancy, which results in a lower frequency of the large capital cost of replacement. All bridges maintained by the department which are open to the public are safe.



The department maintains 6,222 bridges and also performed in FY 2009/2010 the inspection of 3,252 other bridges owned by other state and local government jurisdictions. For each bridge inspection, the current condition of a bridge is compared with the bridge condition from the previous inspection. If the structural capacity has been affected, the bridge is re-load rated to determine its current structural capacity. Each bridge is inspected at least once every two years to assess bridge condition and identify which bridges need routine or periodic maintenance, rehabilitation, or replacement. Special inspections are conducted after major weather events, such as floods and hurricanes.

Repairs help a bridge last longer. But, at a certain point, it becomes more cost effective to replace a structure than repair it. Since the department's bridge inspection program began in 1970 there has been a steady improvement in bridge condition on the State Highway System due to an aggressive maintenance and construction program. The department also administers federal programs which help fund repairs and replacements for locally maintained bridges.

Bridges are designed to tolerate a certain amount of structural deterioration and still support legal weight loads. If a bridge is unable to support all legal loads, weight limits are posted or the bridge is closed to traffic until the deficiency can be corrected. Because bridges are actually flexible, vehicles moving across the bridge cause some vertical movement in the bridge structure. Over time, this structural

flexing causes deterioration. Another reason bridges wear out is stress caused by saltwater, rain, freezing temperatures and wind. Impacts from colliding motor vehicles, barges and ships also exact their toll.

Most of the damage, though, comes simply from the bridges being used. As on roadways, heavy trucks contribute to wear-and-tear on bridges. So, like pavement, bridges must be designed to take into account how many trucks will pass over them during their design lives.

### **Strategies for Bridge Condition**

The department will help ensure the short-range objective is achieved through these actions:

- Enter project into the Work Program to replace or repair department-maintained bridges within 12 months of deficiency identification.
- Replace or repair all structurally deficient department-maintained bridges and bridges posted for weight restriction within six years of deficiency identification.
- Replace all other department-maintained bridges designated for replacement within nine years of deficiency identification.
- Reduce the illegal operation of commercial motor vehicles exceeding weight limits on Florida's public roads and bridges.
- Continue to monitor bridges scheduled to be replaced and make interim repairs, if necessary, to safeguard the traveling public.

### **Roadway Maintenance**

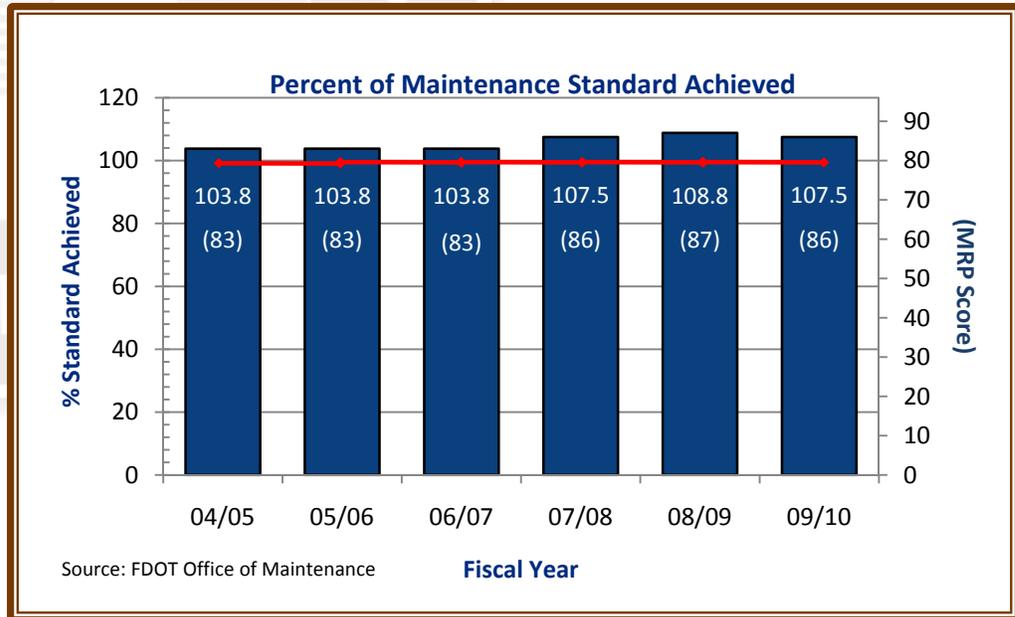
As an integral part of preserving state highways, the department has reconfirmed its long-standing commitment to "achieve 100 percent of the acceptable maintenance standard on the State Highway System (SHS)." The department's primary measure is to achieve a Maintenance Rating Program (MRP) of at least 80 on the SHS. The MRP is based on an evaluation of the SHS, which grades five maintenance elements and arrives at a composite score based on a scale of 1 to 100. The department has met or exceeded the acceptable maintenance standard since 1994. It is anticipated the Florida Department of Transportation will meet this objective through FY 2014/15.

Field conditions are evaluated using the Maintenance Rating Program. Each part of the highway environment is rated and the overall maintenance condition is calculated. The conditions are compared to department standards and a composite state score is calculated. The maintenance condition rating system looks at five parts of the highway environment:

- Roadway - potholes, pavement joints, paved shoulders and pavement distress;
- Traffic services - signs, lighting, guardrails, striping, attenuators, handrail and pavement markers;
- Roadside - unpaved shoulders, slopes, sidewalks, and fences;
- Drainage - storm drains, ditches, roadway sweeping, inlets; and

- Vegetation/aesthetics – landscaping, mowing, litter removal, turf condition, tree trimming.

It is important to maintain roads at an optimal level, both for driver safety and comfort, as well as to allow the agency or local government responsible for them to plan a stable program of roadway repair or resurfacing. The department is responsible for scheduling and performing routine maintenance on the State Highway System to help preserve its condition.



Through routine maintenance, highway rest stops are kept clean and attractive, wildflowers are planted along roadsides, roadway striping is reflective for safe nighttime travel, guardrails are repaired, signs are kept clean and visible and potholes are filled. Department staff and contractors also mow the grass, remove litter, perform bridge inspections, make bridge repairs, clean out ditches and storm drains and do many other jobs needed to make highway travel easier and safer.

### **Strategies for Roadway Maintenance**

The department will help ensure the short-range objective is achieved through these actions:

- Continue to identify and implement practices which reduce the time and cost of preserving the State Highway System.
- Emphasize use of state-of-the-art technologies and innovative contracting methods to increase the efficiency of system maintenance.
- Continue to monitor and adjust maintenance standards to preserve our investment and provide safe roadways for Florida motorists, including special population groups.