

# 2017 Pavement Condition Report

## Keeping New York Moving

Daily, people travel more than 330 million miles on roads and highways in New York State; more than 200 million of those miles are on New York State owned highways. This includes trips to the grocery store, to the doctor, to the park and to work. It includes trucks carrying goods from farm to market and from Albany to Seattle. New York State owned highways are critical to everything we do and integral to our way of life. The highways support our health, education, leisure, and economy.

The New York State Department of Transportation (NYSDOT) is responsible for maintaining and operating the 38,654 lane miles of state owned highways in New York State. (A lane mile is the centerline length of a highway section multiplied by its number of lanes.) By using advanced asset management strategies, modern data collection technologies, and sophisticated modeling techniques, NYSDOT staff optimizes investments to best maintain this pavement network and to satisfy the many transportation needs.

Within an overarching emphasis on safety and accessibility, NYSDOT's pavement management strategy is guided by four key principles.

- First, preserve existing infrastructure by using low-cost treatments that slow the rate of deterioration and push the need for more expensive repairs into the future.
- Second, consider impacts to the overall transportation system to ensure that work done on individual projects is coordinated with work done elsewhere.
- Third, maximize the benefit of every investment by ensuring that the right treatment is performed at the right time and by emphasizing work that benefits the most travelers at the lowest cost.
- Fourth, consider and include the environment and social benefits of the work when developing projects in a manner that will enhance the economy and quality of life for all New Yorkers.

### Pavement Condition Highlights

This report includes 2017 pavement program funding, construction accomplishments, and pavement conditions on the NYSDOT-Maintained System.

Nearly **63%** of the state highway system is in excellent or good condition.

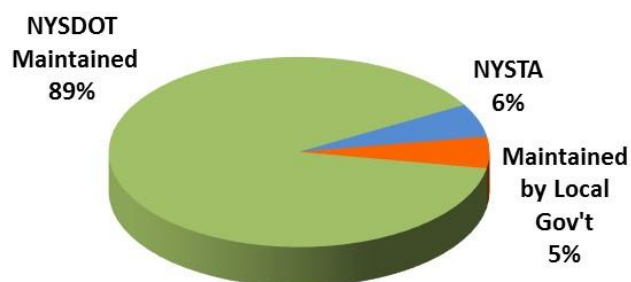
**65%** of vehicle travel was on smooth pavement.

More than **1,815 lane miles** of pavement were improved.



## Highways in New York

The highways in New York State are grouped into categories based on how each highway serves its users. The broadest category of highways is the NYS Touring Route System, which includes 43,443 lane miles of the approximately 239,000 total lane miles of roads in New York State. These roads include Interstates, US Routes, NY State Routes, most Parkways and some local roads. Many entities contribute to the maintenance of the NYS Touring Route System including NYSDOT; the New State Thruway Authority (NYSTA); county, town, and village governments; and other independent authorities. As shown in *Chart 1* below, NYSDOT maintains approximately 89 percent of the NYS Touring Route System, or 38,654 lane miles, and others are responsible for the remaining 4,789 lane miles. The 38,654 lane miles of the NYS Touring Route System maintained by NYSDOT is referred to as the NYSDOT-Maintained System for the remainder of this report. The NYS Touring Route System connects the cities, towns, and villages in the state with other regions of the state and with other states.



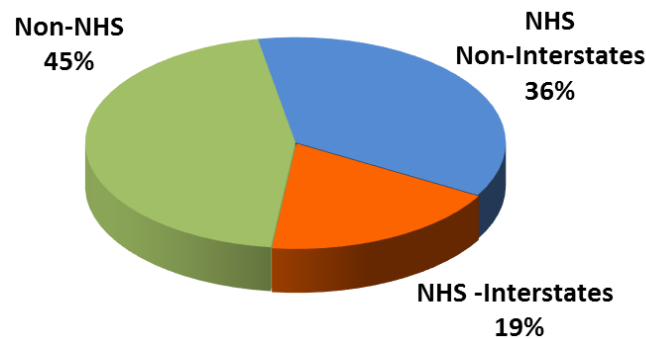
**Chart 1 - NYS Touring Route System by Jurisdiction (43,443 Lane Miles)**

## The National Highway System

A subset of the NYS Touring Route System, known as the National Highway System (NHS), has the most important roads for interregional travel and for access to other transportation facilities, such as airports, train stations, and shipping ports. The Federal Highway Administration (FHWA) is particularly interested in roads designated with a NHS classification because those roads have

high national significance for the nation's economy, mobility and are a critical part of the national defense system.

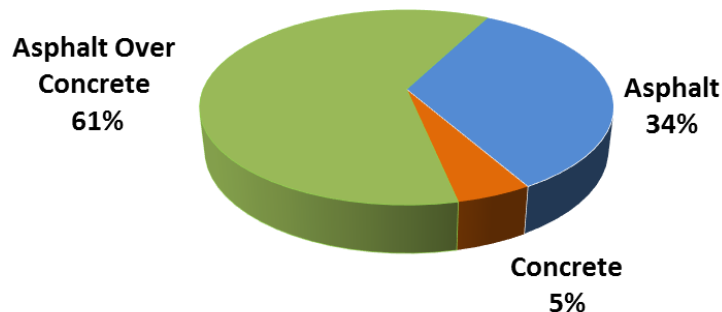
Per congressional directive, highways on the NHS typically receive higher priority for maintenance and repair. As shown in *Chart 2* below, about 55 percent of the entire NYS Touring Route System is part of the NHS. This includes Interstates, US Routes, NY State Routes, most Parkways and some local roads.



**Chart 2 - NYS Touring Route System by NHS Classification (43,443 Lane Miles)**

## Type of Pavement

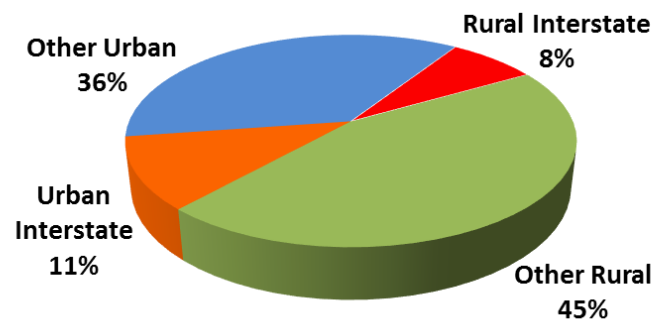
There are three primary types of pavement on the NYS Touring Route System: asphalt, concrete, and asphalt over concrete (also called "composite" pavement). There are no unpaved or gravel roads on the NYS Touring Route System. Today, most roadways on the NYS Touring Route System are composite pavements as illustrated in *Chart 3*.



**Chart 3 - NYS Touring Route System by Type of Pavement (43,443 Lane Miles)**

## Functional Class

Functional Class is another way to group or categorize roads and highways, in this case by the type of service and access that they are intended to provide. Examples include interstates, arterials, collectors, and local roads; distinguished between urban and rural environments as illustrated by *Chart 4*. About 47 percent of the NYS Touring Route System has an urban functional class and about 53 percent a rural functional classification.



**Chart 4 - NYS Touring Route System by Functional Class (43,443 Lane Miles)**

## NYSDOT Maintained Pavement Program and Funding

As mentioned earlier in this report, NYSDOT is responsible for maintaining 38,654 lane miles of the 43,443 total lane miles of the NYS Touring Route System. Maintenance improvements are grouped into three primary categories of work treatments:

- *Preventive Maintenance Treatments* – These are the least expensive treatments and can cover more lane miles of pavement for the money spent than other treatments. These include several types of thin overlay treatments typically placed on pavements in Good condition with only minor amounts of cracking. Preventive treatment at this stage extends the life of the pavement by keeping water out, refreshing the riding surface, and slowing the rate of deterioration. Much like seal-coating your driveway, they help the pavement last longer for relatively little cost.
- *Corrective Maintenance Treatments* – These are used to address more significant pavement distresses, such as moderate cracking or rutting, and are typically costlier than preventive maintenance treatments. Treatment usually involves removing the top layer of the pavement and replacing it with new material.
- *Renewal Treatments* – These projects usually involve major rehabilitation or reconstruction of the pavement and may include improvements to enhance safety and mobility. Renewal projects are typically the most expensive and address fewer lane miles of pavement for the

investment made, but are necessary to address more serious pavement distresses as a pavement ages.

- ❖ *Rehabilitation* – Treatments are applied to pavements in Fair or Poor condition. These treatments usually involve adding multiple layers to the existing pavement structure to increase the strength.
- ❖ *Reconstruction* – Typically done to pavements that have deteriorated to Poor condition where the structure of the pavement is damaged beyond repair due to the infiltration of water. Pavement reconstruction is the most expensive.

In addition to these three primary categories of work treatments, NYSDOT uses two other strategies when developing its pavement program. Neither of these addresses improving pavement condition, but are an integral part of the pavement program:

- *Crack Sealing* – Crack sealing is a cost-effective strategy for pavements with infrequent to occasional, well defined cracks. Surface water infiltrating through cracks can penetrate the base and subbase materials causing a loss of strength in these materials. Sealing cracks slows the rate of deterioration by reducing the amount of surface water entering the pavement. Crack sealing does not improve the pavement condition.
- *Defer Treatment* – Work is deferred when a pavement enters a condition window that can last for several years and the treatment to correct would remain the same. The pavement is monitored until the optimal time to apply the treatment. Pavements relatively free of cracking that do not require work today also fall into this category.

A consistent, well-funded preventive and corrective maintenance program can significantly delay the need for expensive renewal projects. In calendar year 2017, approximately \$701 million was allocated for NYSDOT pavement projects. \$431 million of that funding was expended primarily on preventive maintenance, corrective maintenance, and renewal treatments as shown in *Chart 5*. The other \$270 million was primarily for safety and mobility enhancement projects, such as interchange improvements, drainage improvements, and retaining wall projects that have a small secondary paving component. The paving accomplishments, as measured by lane miles improved, shown in *Chart 6* reflect the work completed in 2017 for preventive maintenance, corrective maintenance, and renewal treatments. Safety and mobility projects are not included in Charts 5 and 6.

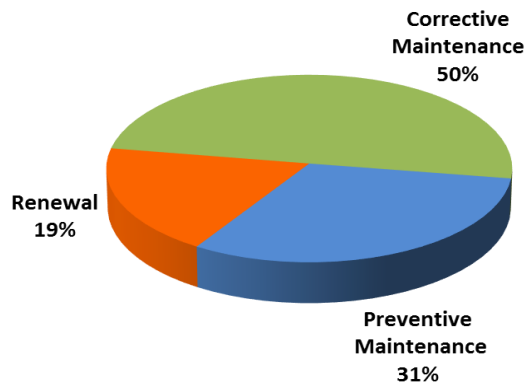


Chart 5 - 2017 NYSDOT Paving Program (\$431M)

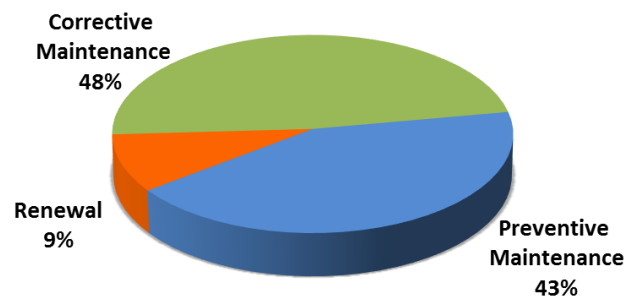


Chart 6 - 2017 NYSDOT Paving Accomplishments (1,815 Lane Miles)

## Pavement Condition Measures

NYSDOT identifies the locations where work is needed on pavements and what type of work should be done based on a surface rating system that describes the frequency (amount), severity, and type of cracks on the surface of the pavement. *Chart 7* gives the percentages of the 2017 pavement conditions for the NYSDOT-Maintained System. The pictures following Chart 7 give a visual representation of excellent, good, fair, and poor pavement.

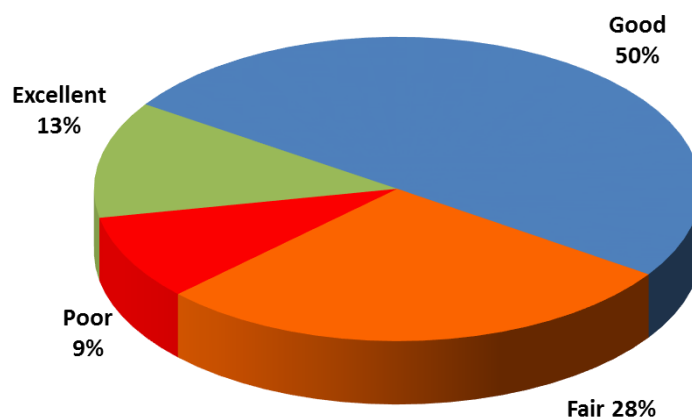


Chart 7 - 2017 Surface Condition by Lane Miles  
NYSDOT Maintained

## Surface Condition:



**Excellent**  
No Cracking



**Good**  
Infrequent  
Minor Cracking



**Fair**  
Frequent  
Minor Cracking



**Poor**  
Very Frequent  
Severe Cracking

It is important to know how much of the system is in Fair and Poor condition because it is an indication that the costs to improve those pavements will require a more significant investment than a pavement in Good condition. In 2017, 63 percent of the NYSDOT-Maintained System was in Good (50%) or Excellent (13%) condition as shown in *Chart 8*. Those Good to Excellent pavements carried approximately 74 percent of the vehicle miles traveled as shown in *Chart 9*.



These percentages were significantly different depending on whether the pavements were part of the NHS as shown in *Charts 10 through 12* below.

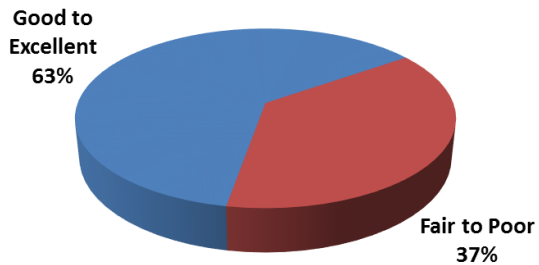


Chart 8 - 2017 Surface Condition by Lane Miles NYSDOT Maintained

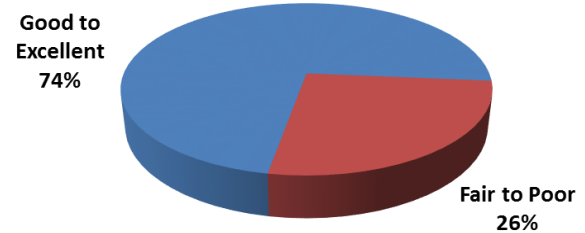


Chart 9 - 2017 Surface Condition by Vehicle Miles Travel NYSDOT Maintained

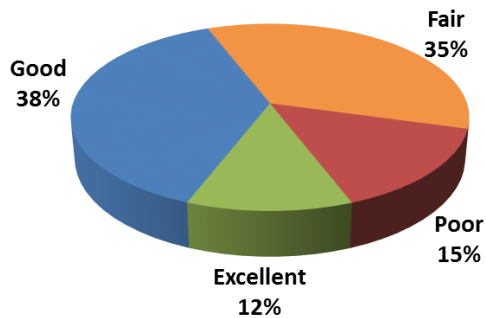


Chart 10 - 2017 Surface Condition by LM Non-NHS

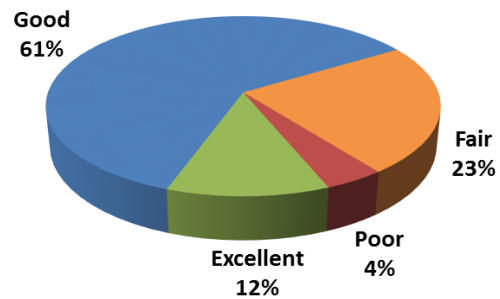


Chart 11 - 2017 Surface Condition by LM NHS - Non-Interstates

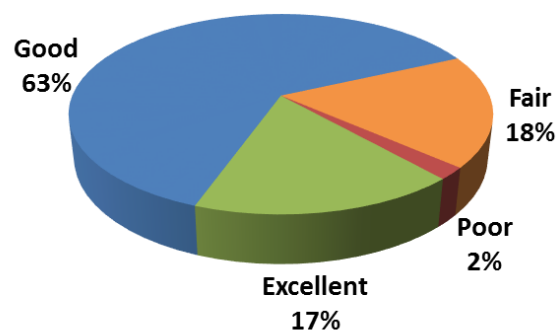


Chart 12 - 2017 Surface Condition by LM NHS - Interstates

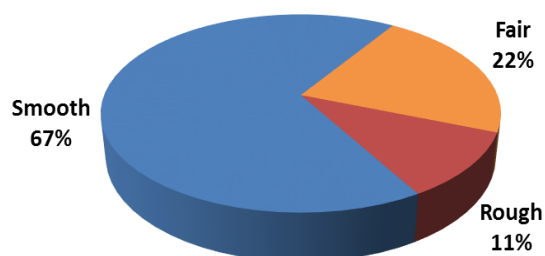


## Ride Quality

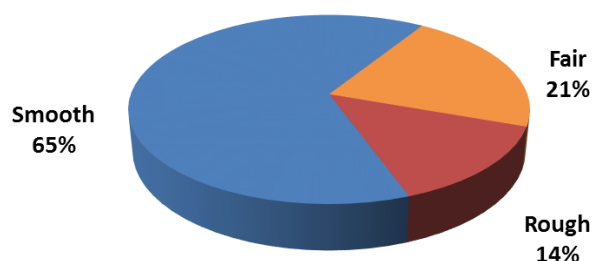
Pavement ride quality is an indicator of customer satisfaction with the quality and performance of a pavement. This is because most travelers will notice how rough or smooth a pavement is to ride on and not necessarily the number of cracks on the surface. The “Pavement Ride Quality” graphic below gives an indication of how the road feels to an operator of a vehicle at different roughness ratings.



The ride quality of the NYSDOT-Maintained System is evaluated regularly so NYSDOT can serve its customers with the best experience when traveling the highway system. *Chart 13* shows the percentage of lane miles for smooth, fair, and rough pavements on the NYSDOT-Maintained System. In 2017, the percentage of the NYSDOT-Maintained System lane miles that were rated rough was 11%, which is a reduction of 1% from 2016. Those same pavements carry about 14% of the total vehicles miles traveled as shown on *Chart 14*. The total vehicle miles traveled that are affected by rough pavements was reduced by 2% from 2016.



**Chart 13 - 2017 Ride Quality by Lane Miles  
NYSDOT Maintained**



**Chart 14 - 2017 Ride Quality by Vehicle Miles Traveled  
NYSDOT Maintained**

## What happens if roads are not maintained?

If a pavement is left untreated, it will deteriorate to a point where normal travel is impaired. The pavement surface will become so rough that vehicles will be forced to travel at slower speeds. Snowplows can have difficulty effectively clearing the pavement of snow and ice.



The pavement structure shown here is so badly damaged that it needs major rehabilitation work or complete reconstruction. This costs at least twice as much to keep it in good condition over the life of the pavement when compared to regular preventive maintenance. Currently, there are 238 lane miles maintained by NYSDOT that are beyond repair and require reconstruction, a decrease of 31 lane miles from 2016.

## NYSDOT Maintained Pavement Needs

The work needed to bring a pavement back to a State of Good Repair depends on the types and severity of cracking and other distresses in a pavement. A pavement with little cracking requires maintenance work, while a pavement with potholes and large cracks may require costly reconstruction. Based on the definitions given on pages 4 and 5 of this report, *Chart 15* shows the percent of lane miles for each of the general categories of treatments that is required to address the current pavement needs on the NYSDOT-Maintained System. The cost to bring the system into a state of good repair is \$5.7 billion.

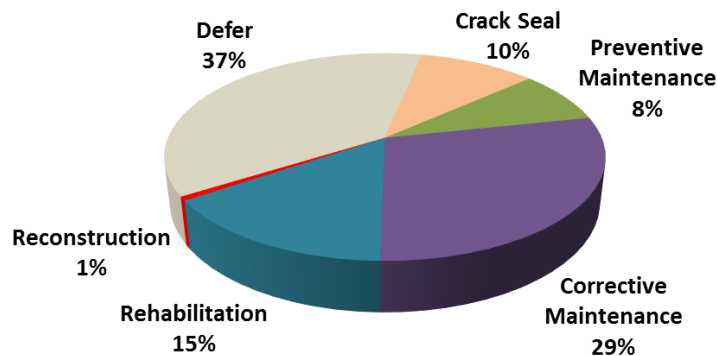


Chart 15 - 2017 NYSDOT-Maintained Treatment Needs by Category of Work

## Conclusion

New York State highways are a valuable asset and are an integral part of every New Yorker's way of life. They provide a safe and efficient passage to goods and services that are expected every day. The total value for the NYSDOT-Maintained System portion of this valuable asset is estimated at \$38 Billion. The NYSDOT will continue to manage this valuable asset to best serve its residents and all travelers within New York State.