Description

- There are 19,175 National Highway System (NHS) lane miles (5,024 centerline miles) in the State of Tennessee, of which 18,449 lane miles (4,857 centerline miles) are maintained by TDOT, 709 lane miles (163 centerline miles) are maintained by the local governments and 17 lane miles (4 centerline miles) are maintained by the federal government.
- Out of the 18,449 NHS lane miles that are maintained by TDOT, 5,813 lane miles (1,201 centerline miles) are on the interstate and 12,636 lane miles (3,656 centerline miles) are on the state routes.
- There are another 19,213 Non-NHS lane miles (9,016 centerline miles) that are maintained by TDOT.
- 98.9% of TDOT maintained pavements are flexible (asphalt) pavements, and 1.1% are rigid (concrete) pavements.
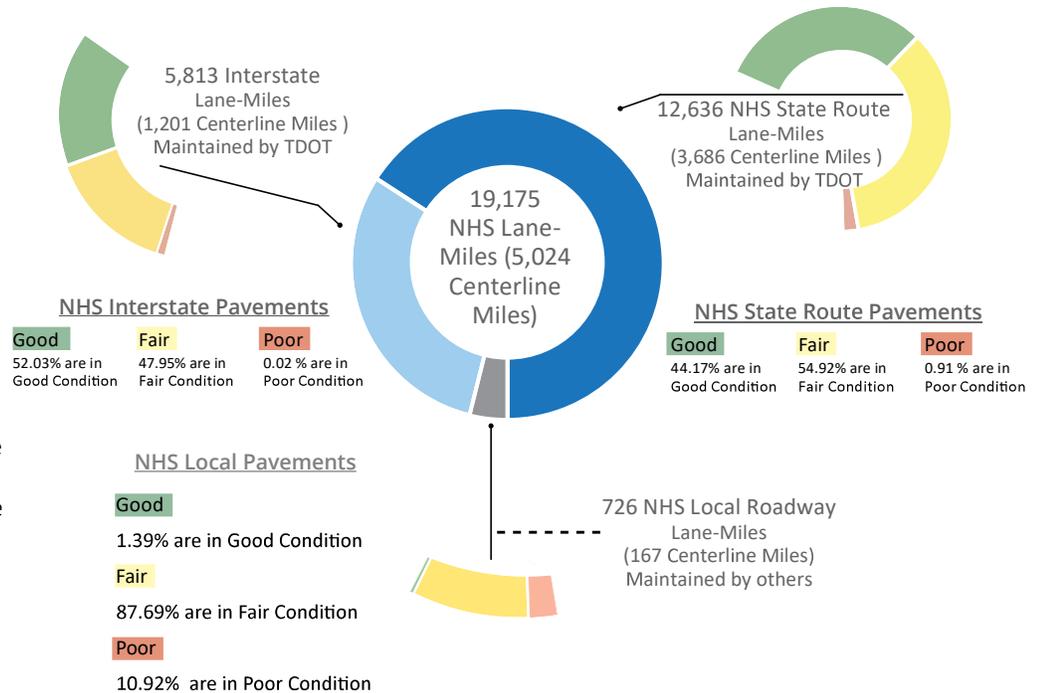
State of Good Repair (SOGR)

To help identify the roadways needing rehabilitation or maintenance, TDOT collects pavement condition data and calculates a Pavement Quality Index (PQI) for the Interstate, NHS State Routes, and Non-NHS State Routes.

The PQI is a composite index number based primarily on the ride quality of the pavement, (Pavement Smoothness Index), and the condition of the pavement, (Pavement Distress Index), and is measured on a 0 to 5 scale.
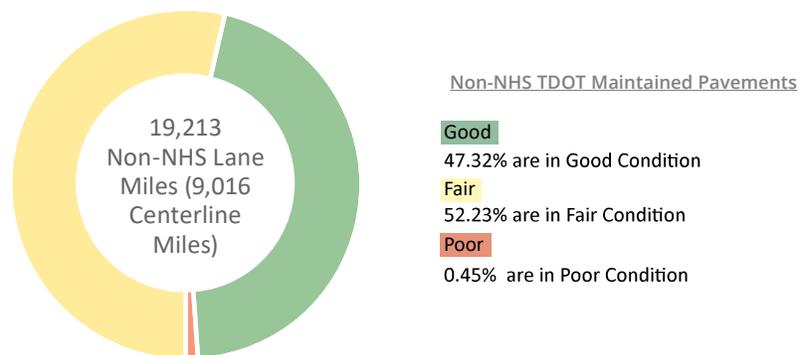
TDOT also tracks several pavement metrics to determine the condition of the roadways including:

- Roughness
- Rutting
- Fatigue Cracking
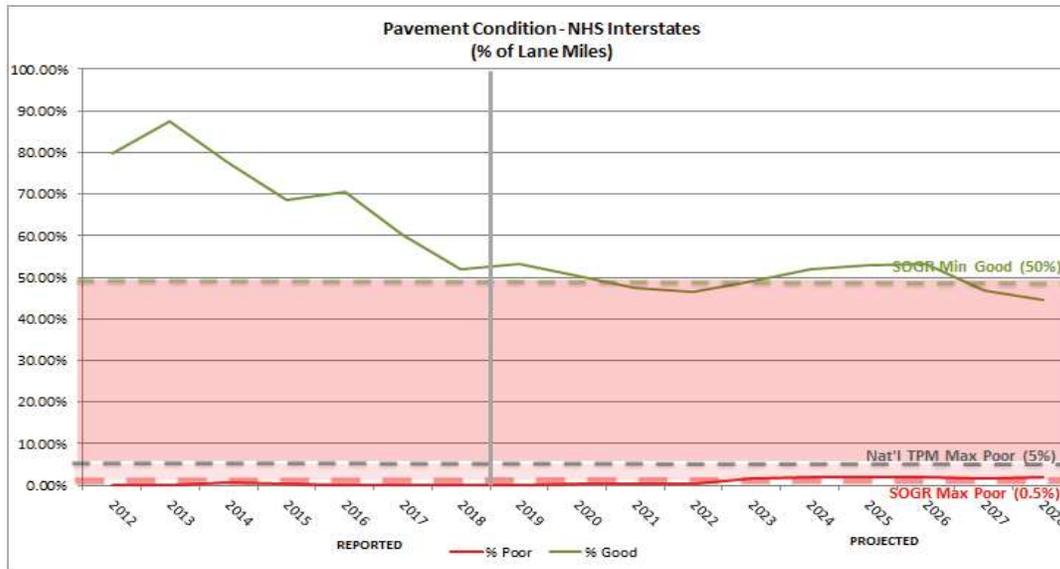- Faulting

NHS Roadways Inventory and Condition

19,175 NHS Lane-Miles (5,024 Centerline Miles)

5,813 Interstate Lane-Miles (1,201 Centerline Miles) Maintained by TDOT

12,636 NHS State Route Lane-Miles (3,686 Centerline Miles) Maintained by TDOT

726 NHS Local Roadway Lane-Miles (167 Centerline Miles) Maintained by others

NHS Interstate Pavements

- Good: 52.03% are in Good Condition
- Fair: 47.95% are in Fair Condition
- Poor: 0.02 % are in Poor Condition

NHS State Route Pavements

- Good: 44.17% are in Good Condition
- Fair: 54.92% are in Fair Condition
- Poor: 0.91 % are in Poor Condition

NHS Local Pavements

- Good: 1.39% are in Good Condition
- Fair: 87.69% are in Fair Condition
- Poor: 10.92% are in Poor Condition

Non-NHS State Routes Inventory and Condition

19,213 Non-NHS Lane Miles (9,016 Centerline Miles)

Non-NHS TDOT Maintained Pavements

- Good: 47.32% are in Good Condition
- Fair: 52.23% are in Fair Condition
- Poor: 0.45% are in Poor Condition

NHS Pavement Condition Projections

NHS Interstate Condition Projections by Lane Miles

Year	2019	2020	2021	2022	2023	Goal
% Good	53.4%	50.3%	47.3%	46.5%	48.9%	>50%
% Poor	0.2%	0.2%	0.3%	0.4%	0.4%	<0.5%
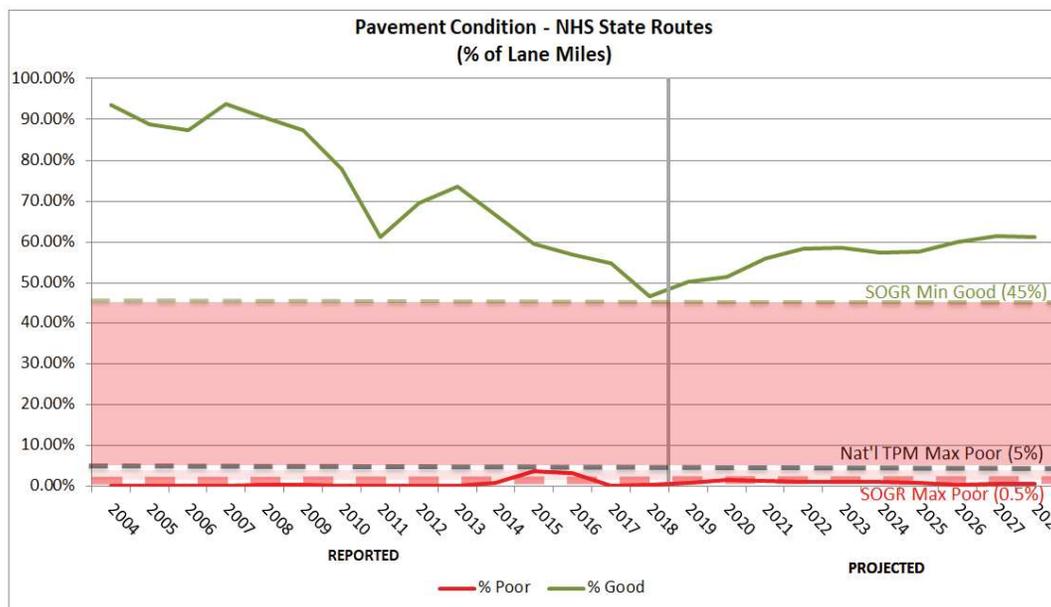
NHS State Route Condition Projections by Lane Miles

Year	2019	2020	2021	2022	2023	Goal
% Good	50.2%	51.5%	55.9%	58.4%	58.5%	>45%
% Poor	0.7%	1.4%	1.3%	0.9%	0.9%	<0.5%

Performance Projections

The charts on the left depict pavement condition for the current funding level of approximately $230M/year. These were developed through an analysis program using TDOT pavement deterioration curves as of May 2019.

Asset Valuation

$10,000,400,000

Maintenance values were depreciated using the Governmental Accounting Standards Board (GASB) depreciation model, which depreciates based on the "Life Ratio". The Life Ratio is calculated by dividing the predicted remaining service life by the total surface life.

Using the GASB methodology, it is estimated that the current value of all TDOT pavements are as follows:

- NHS Interstate: $3.91B
- NHS State Route: $6.09B
- Total NHS System: $10B

Measures & Targets

TDOT has set the following pavement condition goals (which is more stringent than the federal require-ments that were established by 23 CFR Part 490.313(c) and 23CFR Part 490.315(a)):
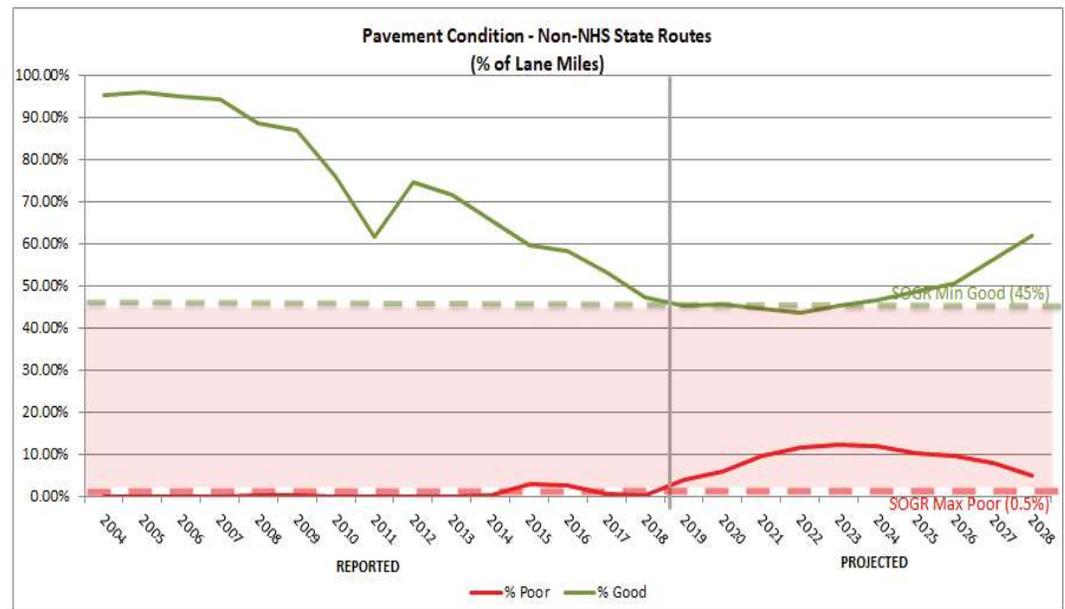
State Goal
- Interstate: >50% good condition and less than 0.5% poor condition.
- Non-Interstate NHS: >45%good and less than 0.5%poor condition.
- Non-NHS State: >45% good and less than 0.5% poor condition.

Non-NHS State Route Pavement Condition Projections

Non-NHS State Route Condition Projections by Lane Miles

Year	2019	2020	2021	2022	2023	Goal
% Good	45.2%	45.5%	44.6%	43.6%	45.4%	>45%
% Poor	4.1%	5.9%	9.5%	11.6%	12.2%	<0.5%

Growth Rate Projections

These growth rate factors can be applied to each area of Tennessee using the PMS and BMS to help with the future analysis of the pave-ment and bridge conditions. The department can use this analysis to plan for maint-enance and repair of the pavement and bridges over the next ten years.

Growth Rate Projections utilized in Pavement Management System (PMS) and Bridge Management System (BMS)

Area	10 Year Growth Rate (Statewide Model)
Greater Chattanooga	0.9%
Greater Knoxville	1.1%
Jackson	1.0%
Memphis	0.9%
Middle TN	1.5%
Tri-Cities	0.8%
Areas Outside MPO's	1.1%

Description

- TDOT inspects over 20,000 roadway bridges, 8,393 of these bridges are state maintained.

- Of the state maintained bridges, 4,061 are structures on the National Highway System (NHS); there are an additional 106 NHS bridges that are maintained by federal and local agencies.
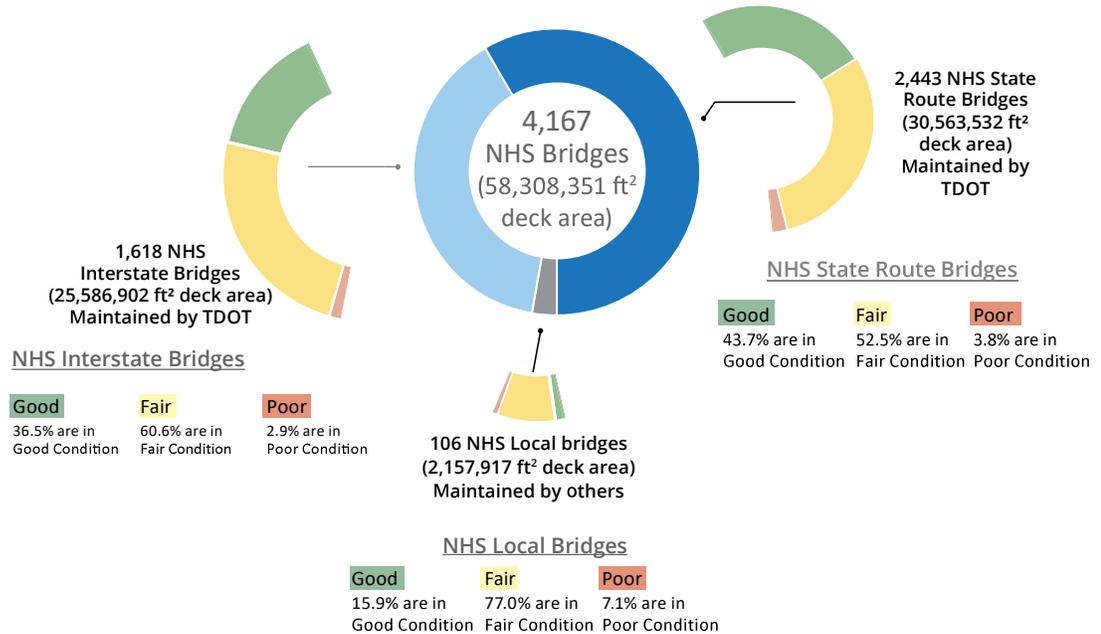
State of Good Repair (SOGR)

A bridge for which the condition rating for each of the three major components for a span bridge (Substructure, Deck, and Superstructure) or the structural condition of a culvert is rated at least a 7 on a 0-9 condition scale is classified as being in a Good condition.
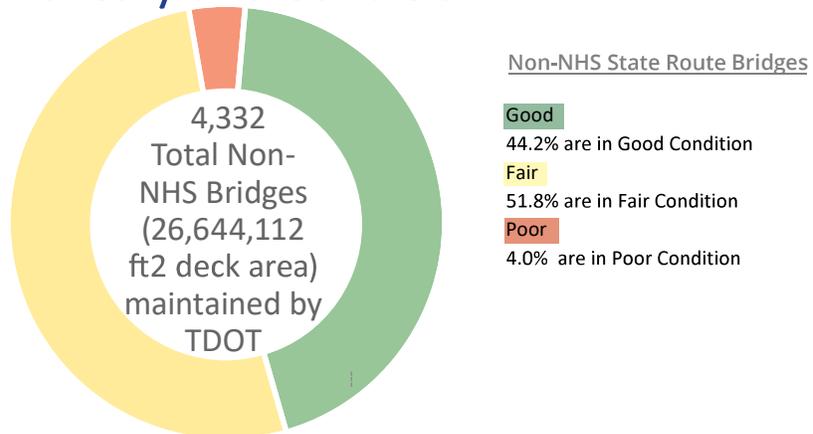
Bridge Age

The average age of all Tennessee highway bridges is 42 years old. This is slightly less than the National Average which is 44 years old based upon a 2018 analysis of National Bridge Inventory data. Bridges on the State Highway System (On-System) tend to be larger and slightly older than those on local highways. The percentage of Structurally Deficient Highway Bridges has been reduced from about 20%, in 1992, to less than 5% in 2018.
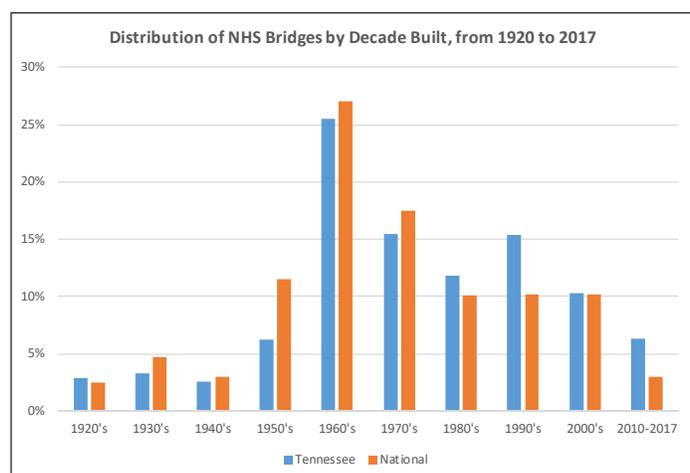
NHS Bridge Inventory and Condition

4,167 NHS Bridges (58,308,351 ft² deck area)

2,443 NHS State Route Bridges (30,563,532 ft² deck area) Maintained by TDOT

1,618 NHS Interstate Bridges (25,586,902 ft² deck area) Maintained by TDOT

106 NHS Local bridges (2,157,917 ft² deck area) Maintained by others

NHS Interstate Bridges

Good	Fair	Poor
36.5% are in Good Condition	60.6% are in Fair Condition	2.9% are in Poor Condition

NHS State Route Bridges

Good	Fair	Poor
43.7% are in Good Condition	52.5% are in Fair Condition	3.8% are in Poor Condition

NHS Local Bridges

Good	Fair	Poor
15.9% are in Good Condition	77.0% are in Fair Condition	7.1% are in Poor Condition

Non-NHS State Route Bridge Inventory and Condition

4,332 Total Non-NHS Bridges (26,644,112 ft2 deck area) maintained by TDOT

Non-NHS State Route Bridges

Good
44.2% are in Good Condition

Fair
51.8% are in Fair Condition

Poor
4.0% are in Poor Condition

History

Distribution of NHS Bridges by Decade Built, from 1920 to 2017

Legend: Tennessee, National (bar chart showing percentages from 0% to 30% across decades 1920's through 2010-2017)

NHS Bridge Condition Projections
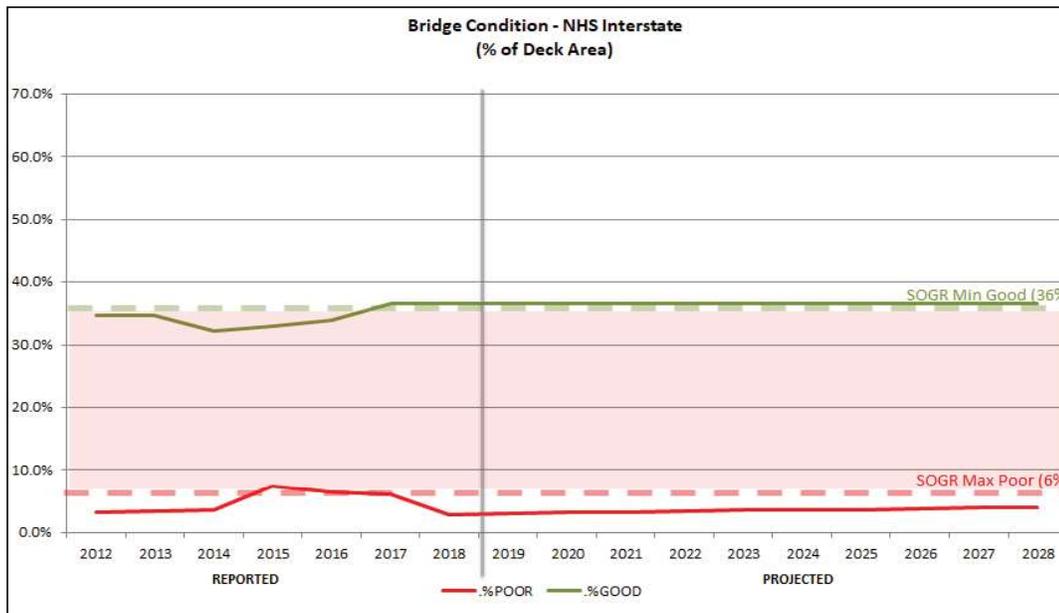
NHS Interstate Condition Projections by Deck Area

Year	2019	2020	2021	2022	2023	Goal
% Good	36.5%	36.5%	36.6%	36.6%	36.6%	>36%
% Poor	3.1%	3.2%	3.3%	3.5%	3.6%	<6%
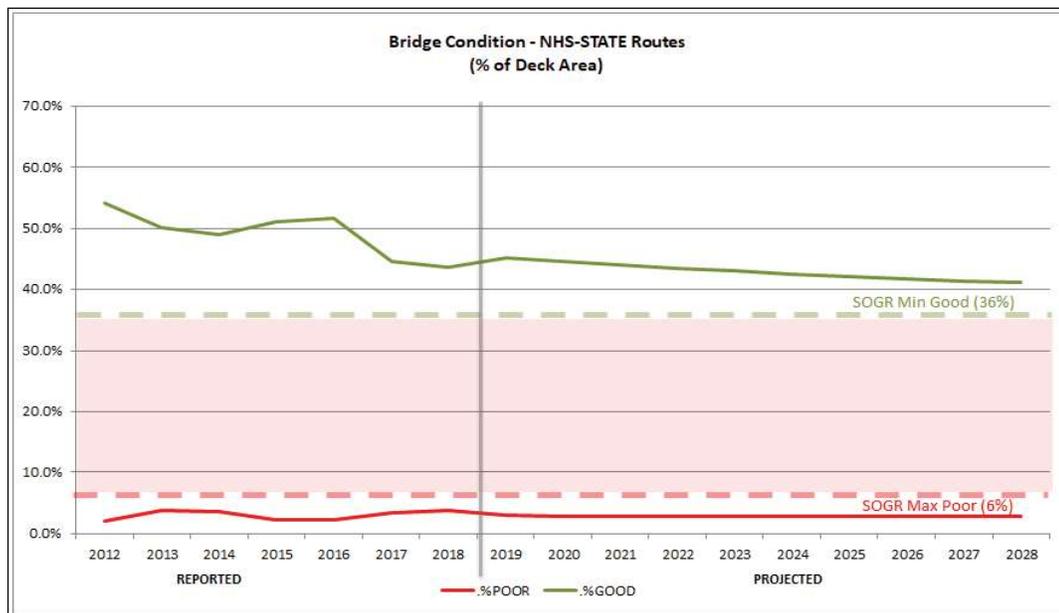
NHS State Route Condition Projections by Deck Area

Year	2019	2020	2021	2022	2023	Goal
% Good	45.2%	44.6%	44.0%	43.5%	43.0%	>36%
% Poor	3.0%	2.9%	2.9%	2.9%	2.9%	<6%

Performance Projections

The chart to the left depicts bridge condition for the current funding level of approximately $122M/year. These were developed through an analysis using TDOT bridge condition data as of May, 2019.

Asset Valuation

$7,822,000,000

The value of TDOT's bridge is determined based on the replacement value in current dollars then discounted using the bridge's condition rating.

Measures & Targets

TDOT has set the following bridge condition goal:

- 36% or more Good by deck area on NHS bridges
- Less than 6% poor

NHS Local Route Bridge Condition Projection

NHS Local Route Condition Projections by Deck Area

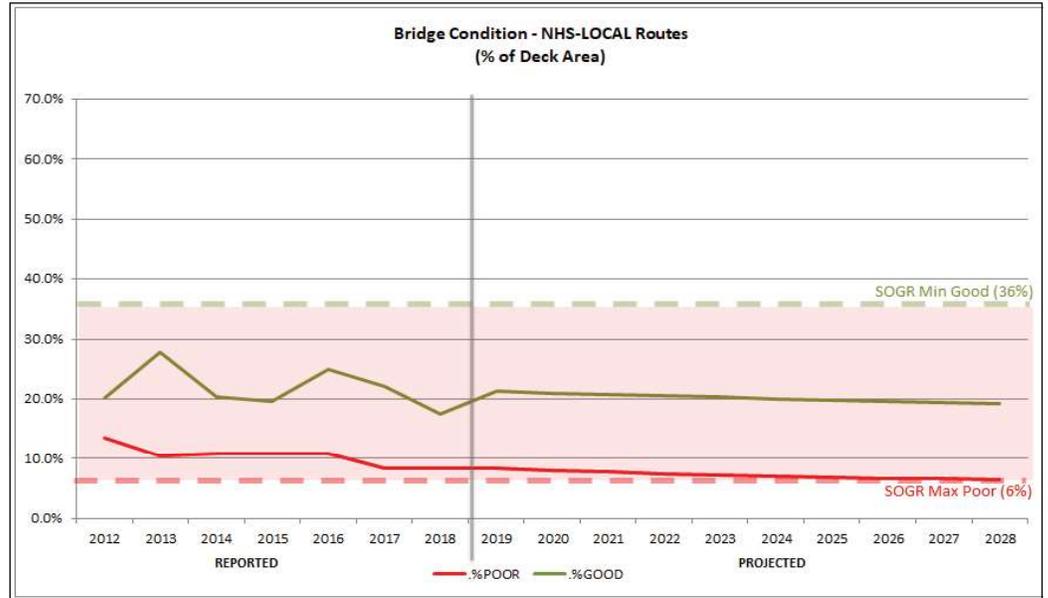| Year	2019	2020	2021	2022	2023	Goal
% Good	21.3%	21.0%	20.7%	20.5%	20.3%	**>36%**
% Poor	8.3%	8.0%	7.8%	7.5%	7.3%	**<6%**

Predicted Bridge Condition

Currently, TDOT's BMS does not yet have the capability of forecasting bridge condition as the BrM software is relatively new. The department has chosen to predict the condition of the bridges, from 2019 to 2028, using a straight-line projection. TDOT will continue to refine the condition forecasting capabilities of its bridge management system to improve our ability to predict the condition of the bridges over time, based on various funding scenarios.
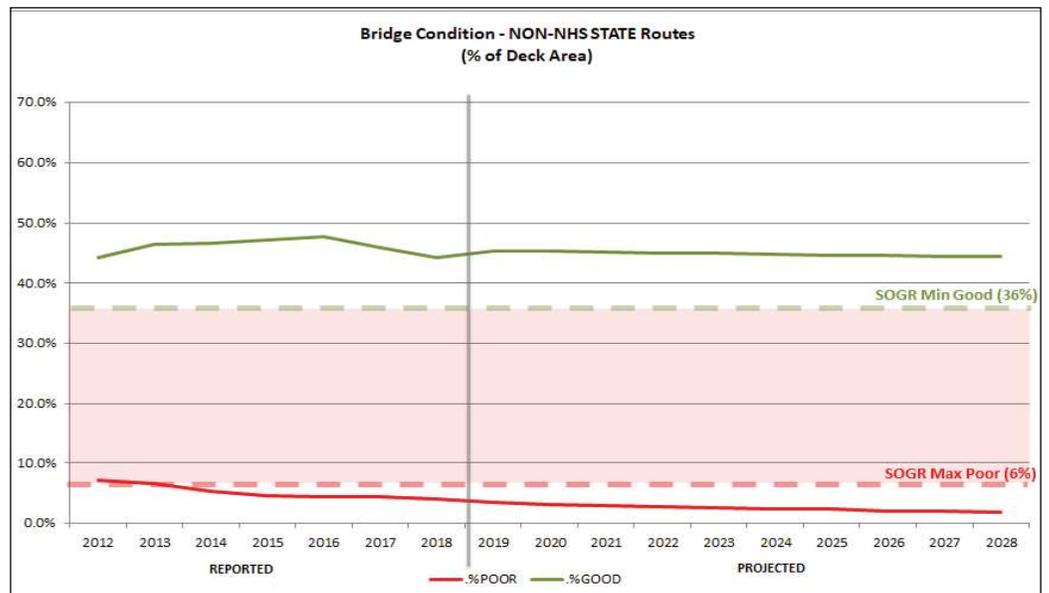
Non-NHS State Route Bridge Condition Projection

Non-NHS State Route Condition Projections by Deck Area

Year	2019	2020	2021	2022	2023	Goal
% Good	45.4%	45.3%	45.1%	45.0%	44.9%	**>36%**
% Poor	3.5%	3.2%	3.0%	2.8%	2.6%	**<6%**