



Florida Department of
TRANSPORTATION

FDOT's Pavement Management System

Southeastern States Pavement Conference

Charleston, WV

October 24th – 26th, 2018

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Today's Presentation

- Florida's Pavement Condition Survey Overview
- Florida's Pavement Management System
 - Overview
 - Resurfacing Program Management
 - Allocations for the future and predicted pavement conditions

A Little Background

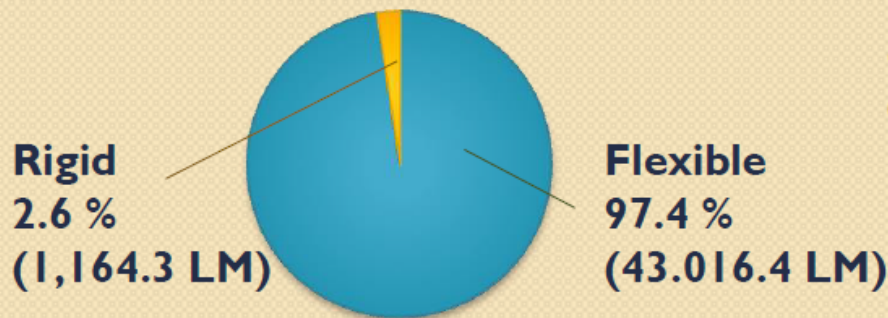
- Florida has a Highway Trust Fund and a Statutory requirement
 - Ensure 80% of pavement on the SHS meets department standards
- Internal objectives (policy)
 - Ensure 85% of pavement on the SHS meets department standards
 - Ensure 90% of pavement on the Interstate and Turnpike meets department standards

Resurfacing Program Overview

2018 State Highway System

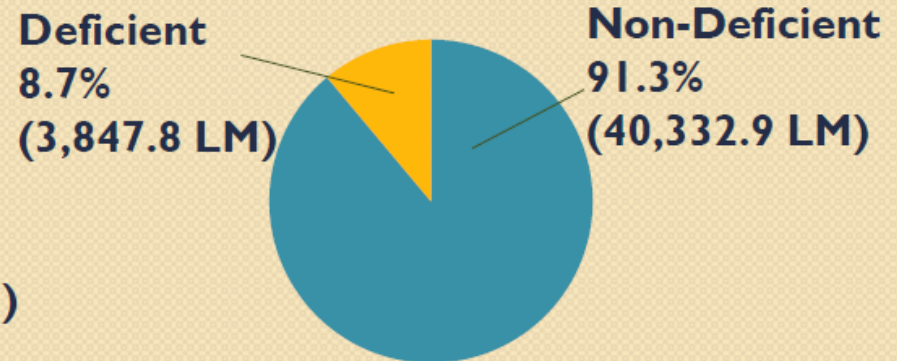
Arterials* = 33,585.1 LM
Interstate = 8,364.6 LM
Turnpike = 2,231.0 LM

Total Lane Miles: 44,180.7
(Flexible and Rigid Combined)



Deficient Pavements

Based on 2018 Pavement Condition Survey



There is \$3.6 Billion in the current 5-year Resurfacing Program.

*Includes MDX and CFEA

2018 Condition

- The 2018 condition survey shows 91.3% of pavement on the State Highway System meet department standards.
- At current planned resurfacing levels, pavement condition is predicted to remain above 85% through FY 2030.

Pavement Condition Survey Overview

- Quantity of Data: over 9200 rated historical dynamic pavement sections
- The PCS Data is integrated with:
 - Roadway Characteristic Inventory (RCI):
 - Traffic, number of lanes, on/off system, etc.
 - Work Program:
 - Past and future pavement improvement projects
 - Construction pay items
 - Surface type
 - Etc.
- Published March 1st every year

Pavement Condition Survey Overview



- The PCS rates pavements using three indices:

CRACK

RUT

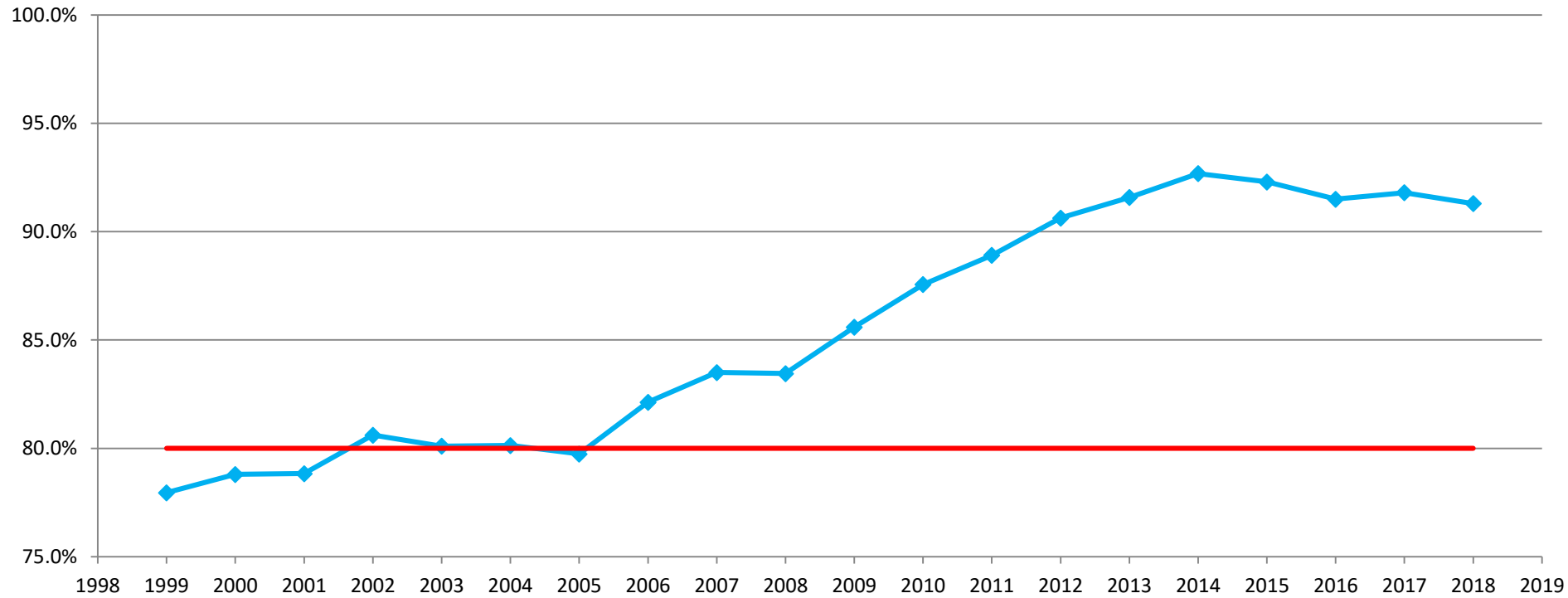
RIDE

- The rating scale for the PCS is from 0 (worst) to 10 (best).
- A rating under 6.5 in most cases is considered deficient.
- A collective analysis of all pavement segments demonstrates if the Department is meeting standards.
- Interstate and Turnpike are held to a higher standards than the 80% as an internal policy.

Pavement Condition Survey (PCS)

- PCS data has been collected since 1976.
- Since 2006 the department has surpassed the 80 % performance standard per FL Statute.

Percent of State Highway System Meeting Standards



PCS Collection

- April 1 – December 31 annually.
- State Materials Office collects the Data.
- 5 Primary Vans and 4 Full Time Raters.
 - High speed profiler.
 - Calibrated daily.
 - Same personnel per District.
- [FDOT PCS COLLECTION HANDBOOK](#)



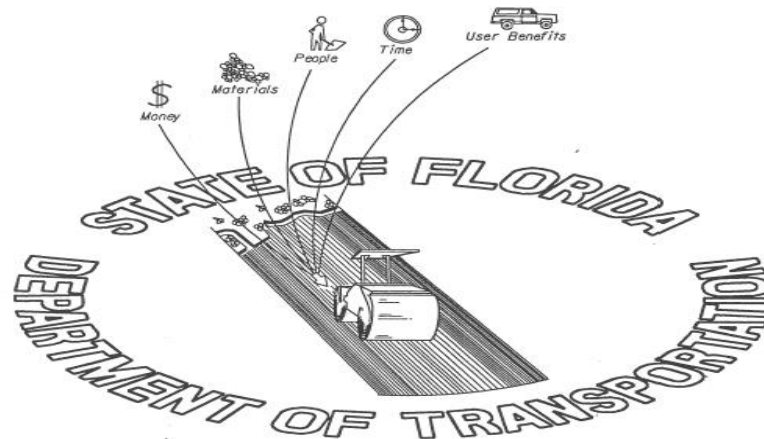
Pavement Management Data

- Maintain accountability of the Department's pavement assets.
- Forecast pavement section, District, and Statewide deterioration.
- Develop a Resurfacing Program that meets a pavement performance goal.
- System Behavioral analysis.



Pavement Management Section History

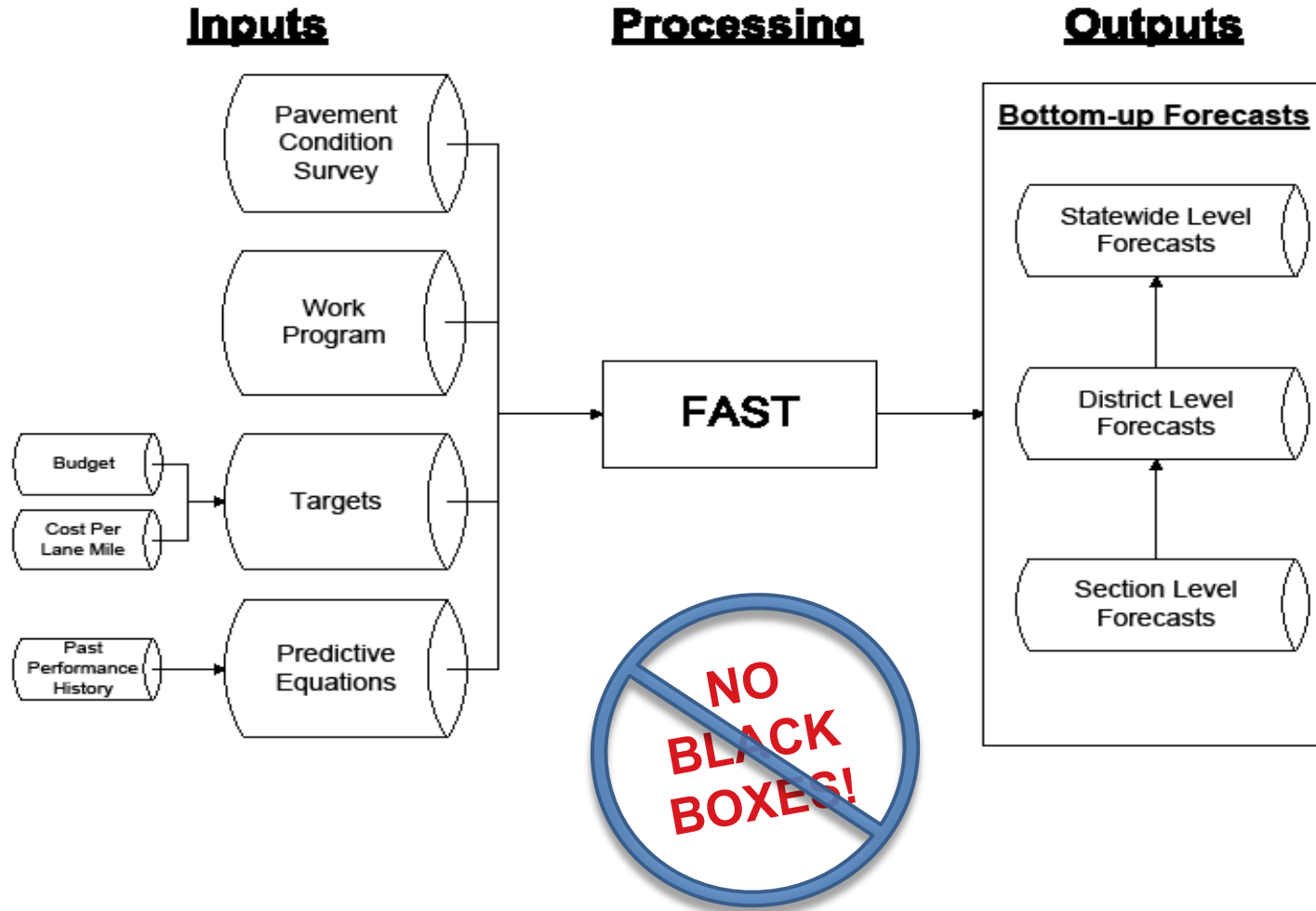
August 1989 – the Pavement Condition Survey Subcommittee recommended that *“the Office of Design be responsible for the administration of the pavement program to generate and be responsible for the system’s reporting pavement information and data.”*



PAVEMENT MANAGEMENT IMPLEMENTATION PLAN

FEBRUARY 14, 1990

FDOT's Homegrown PMS – 28 Years



Forecast Analysis

- **Florida's Analysis System for Targets (FAST)**
 - Forecast of the total system allows analysis of lane mile target allocation scenarios designed to meet desired goals using the most recent PCS data.
 - System, District, and Section Analysis.
- Focused on the **new outer year of the five-year Work Program.**

FAST

- Improved section level condition forecasts.
- The ability to calculate future resurfacing allocations based on forecasted conditions.
- Prioritized list of candidate resurfacing projects (utilizes B/C analysis).
- Impact analysis for different funding scenarios and policy decisions.
- Predictive equations based on the historical performance of pavements in each District are used to predict the performance of pavements within that District.

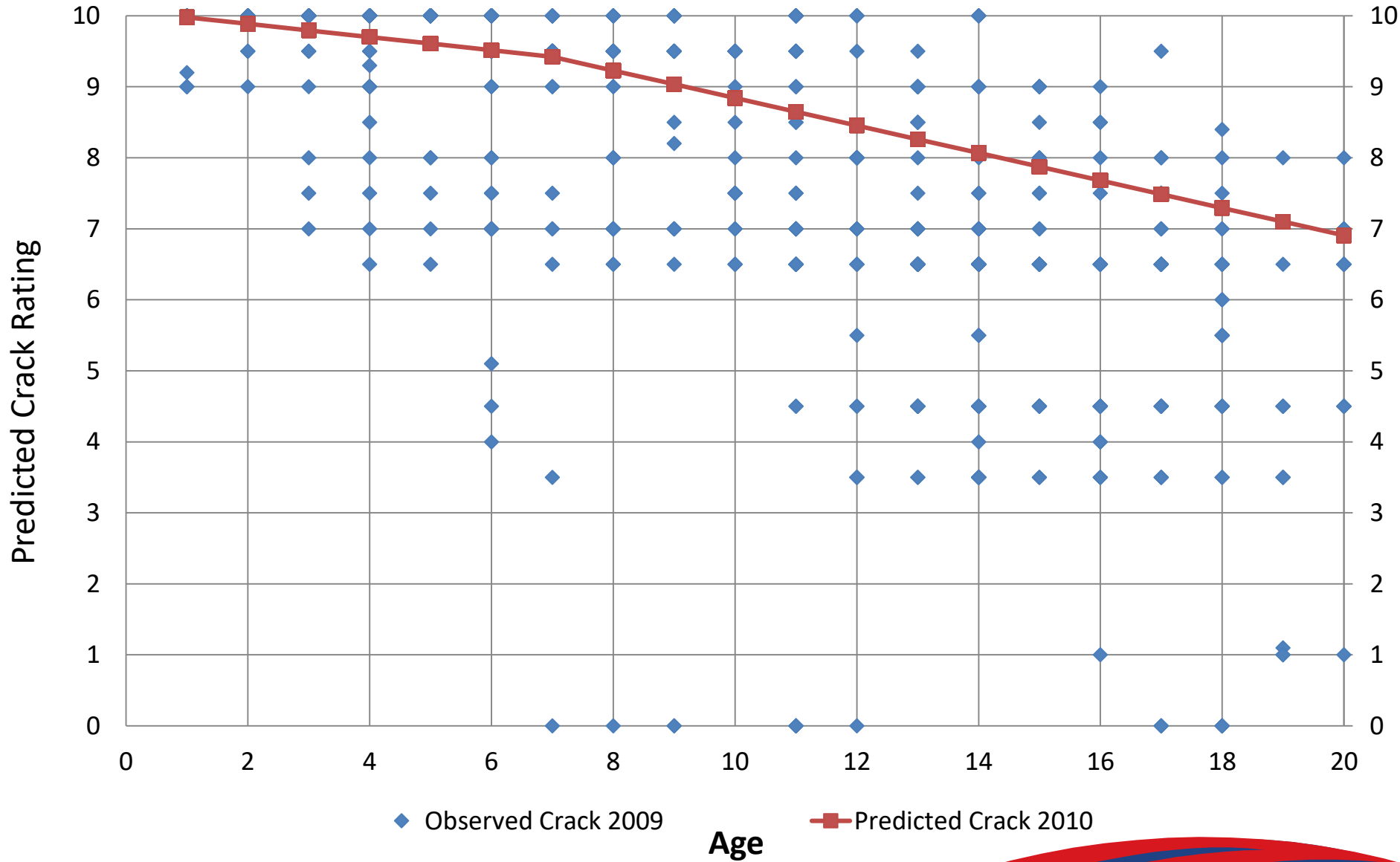
Forecasting: Regression Equations

- Cracking was chosen to be the primary predictive variable.
- Logically subdivide the data.
- Develop the prediction equations (coefficients) for each segment of road on the system.
- Calibrate the equations each year with new condition data points.

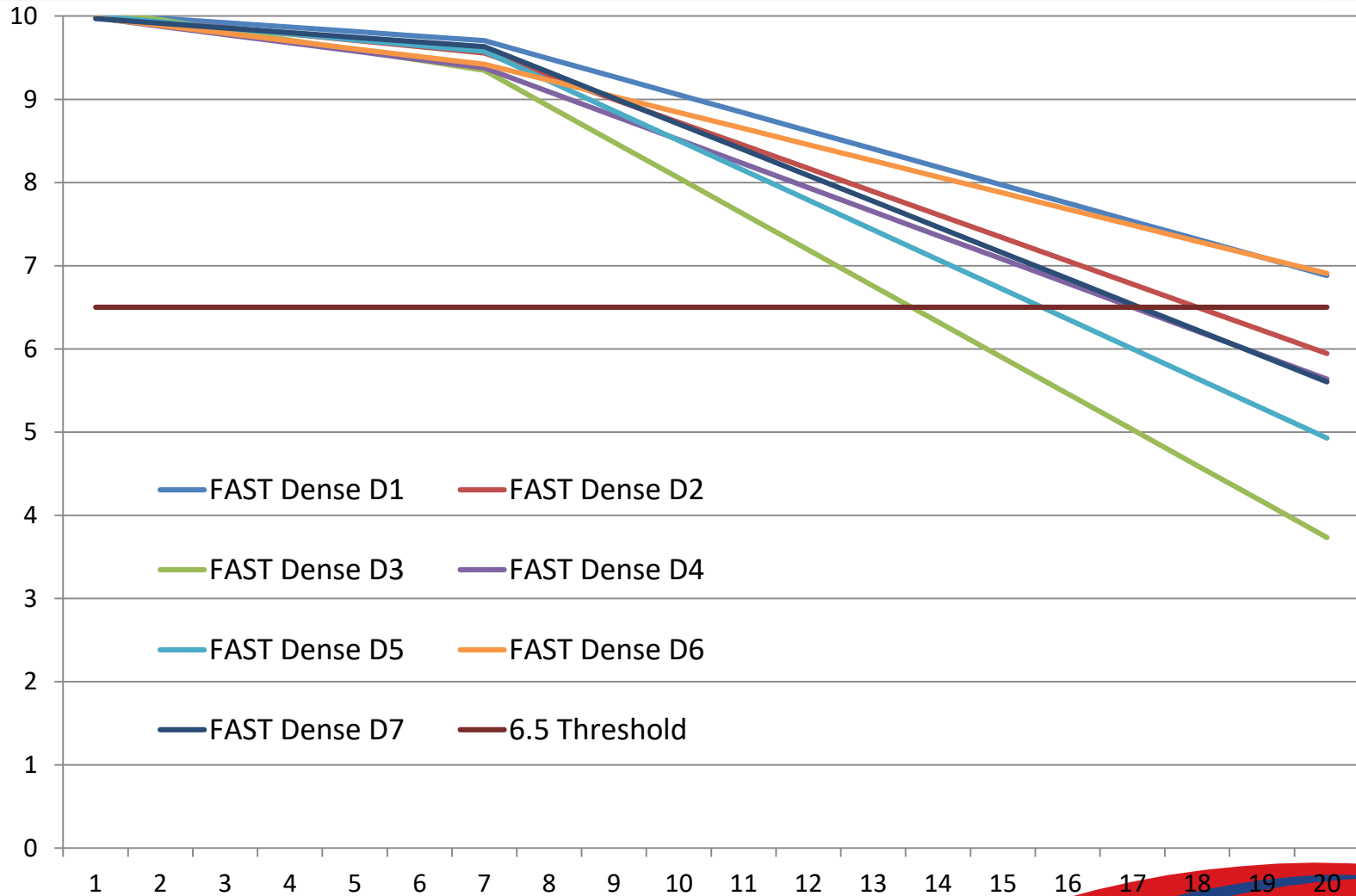
What if?

- Answer frequently asked questions from the Executive Level as well as the Districts:
 - What have been the impacts of previous decisions?
 - Were the underlying assumptions valid?
 - If we take a specific action - what is the expected impact?
- Examples:
 - Reducing or increasing percent of resurfacing Statewide.
 - Changes in materials and overall impacts.
 - Changes of how contracts are administered and overall impacts.

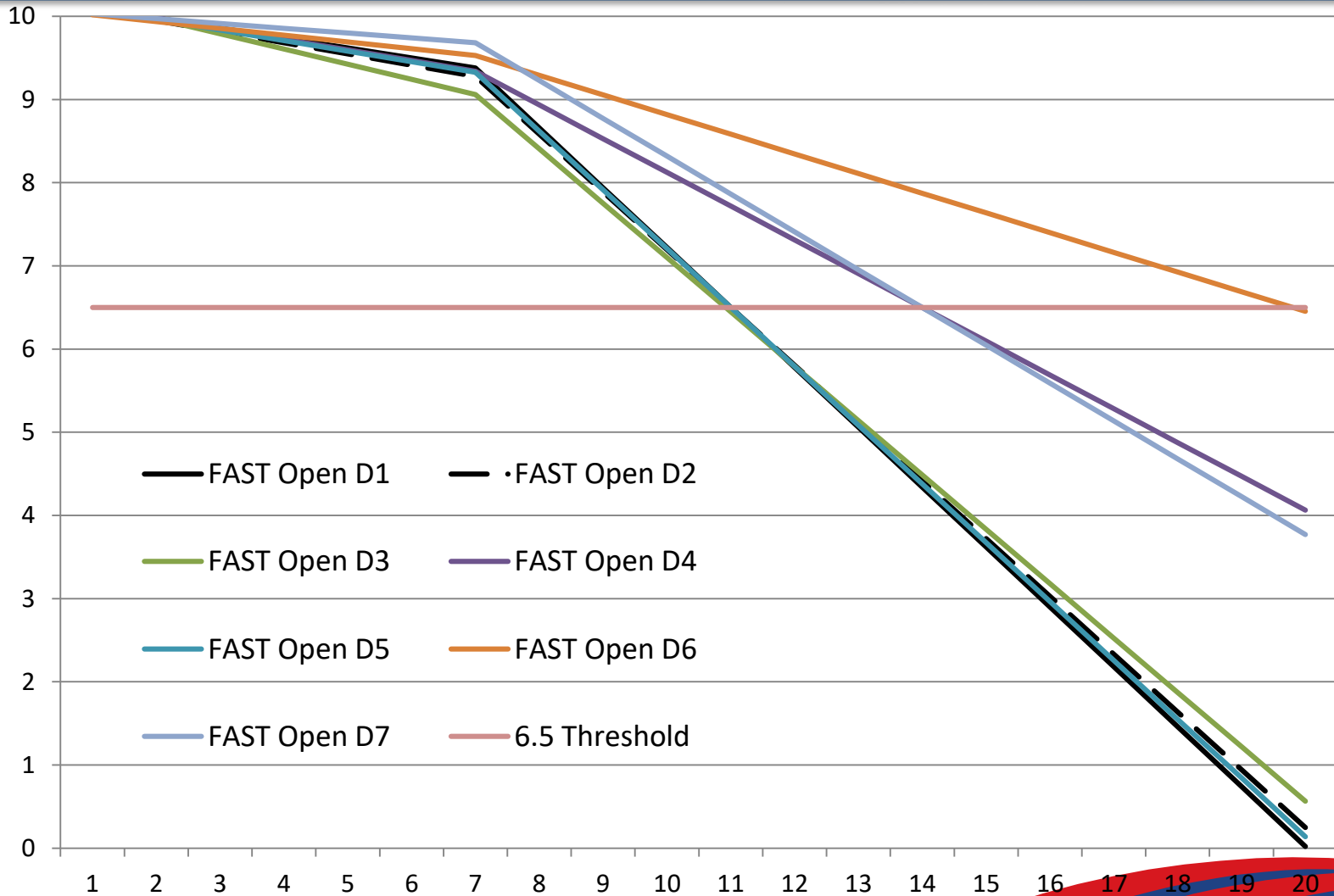
Plot of Predicted Equation vs. Observed Crack Ratings for D6 Dense



Plot of Predicted Crack Rating vs Age by District for Dense Graded Surfaces



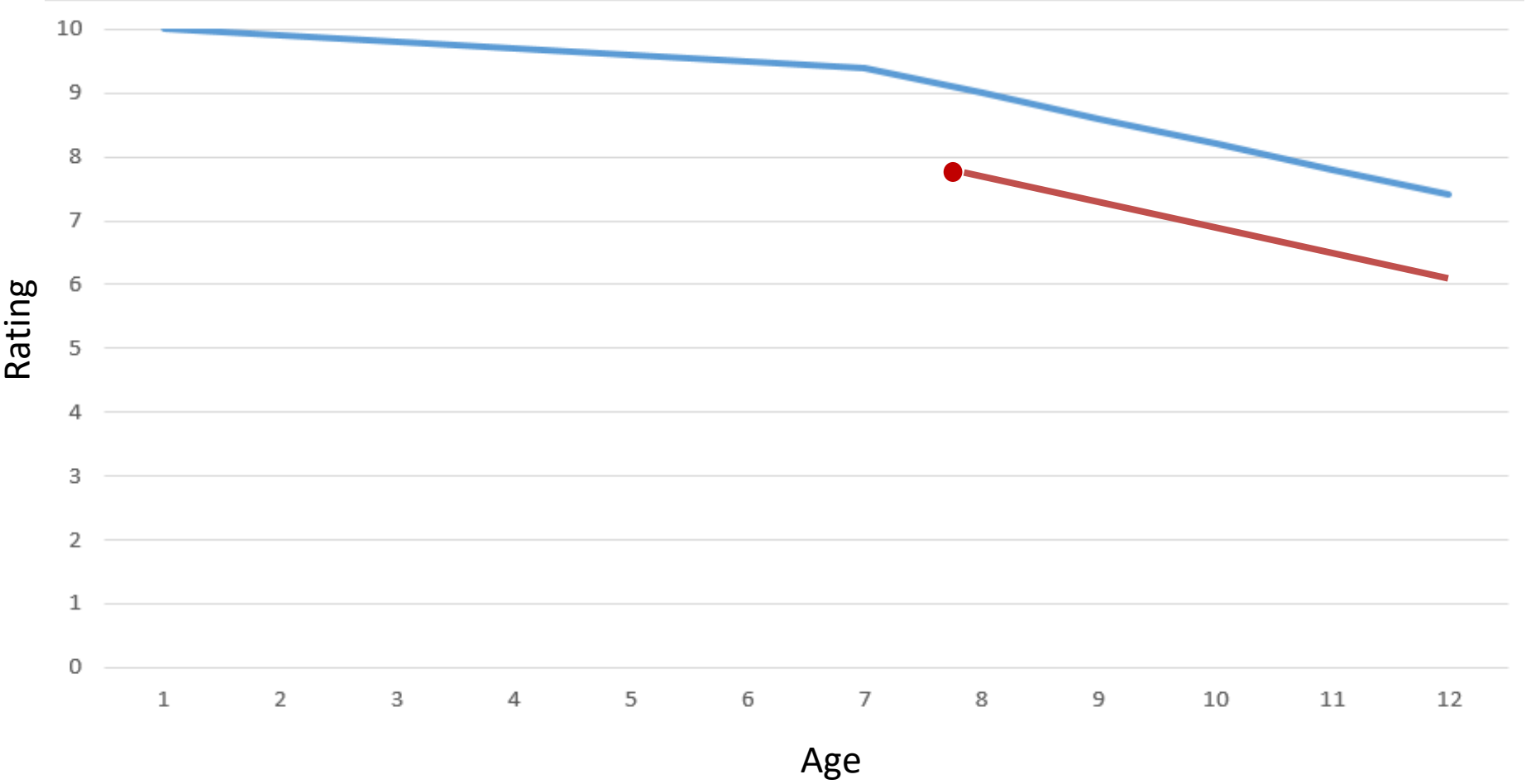
Plot of Predicted Crack Rating vs Age by District for Open Graded Surfaces



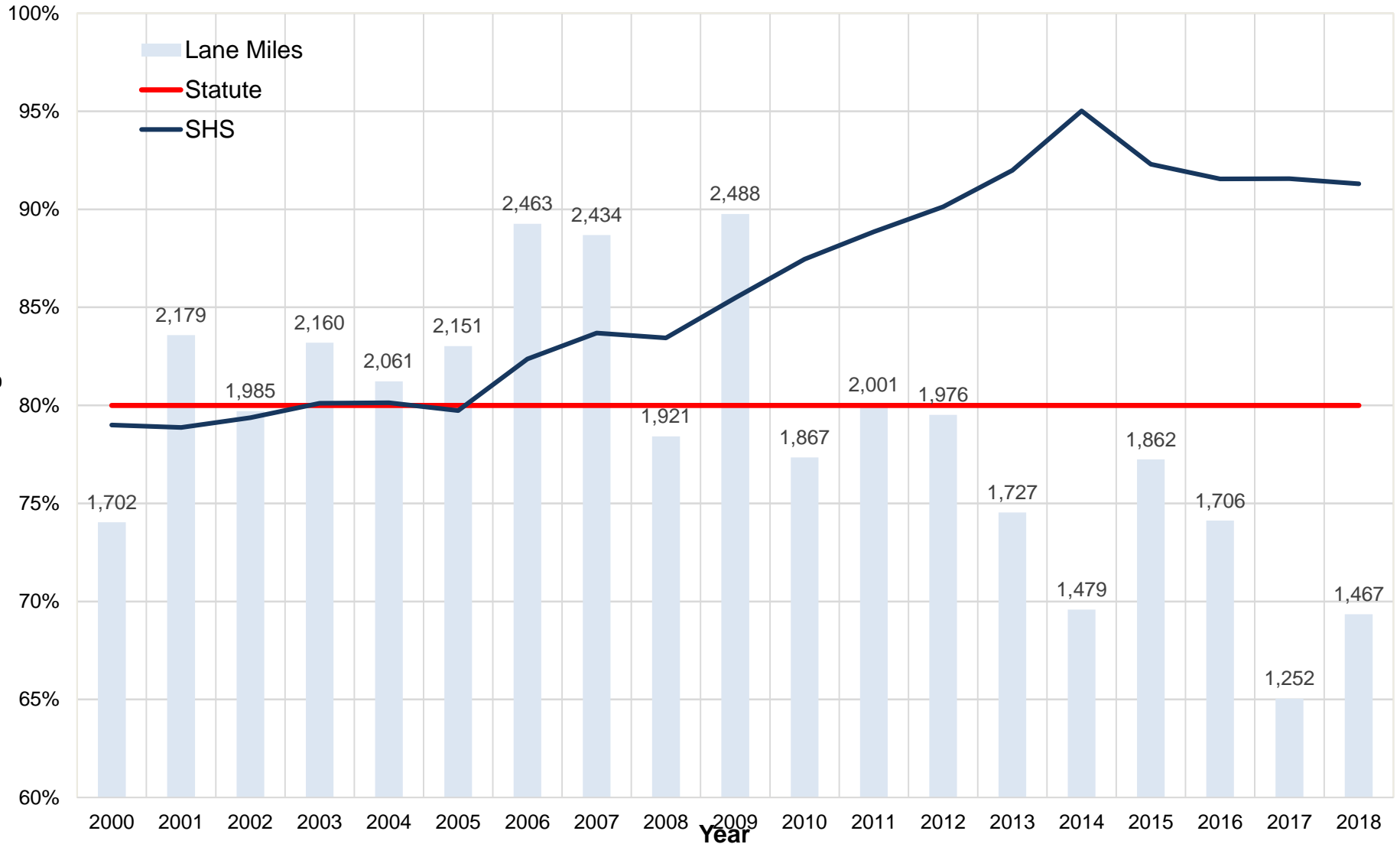
Prediction Model Implementation

- Surface type material categories
- Low, medium, and high performer categories
- Programmed pavement improvement projects
- District specific deterioration curve and construction lag
- Piece-wise prediction curves
- Annually calibrated – observed condition offset resets prediction curve

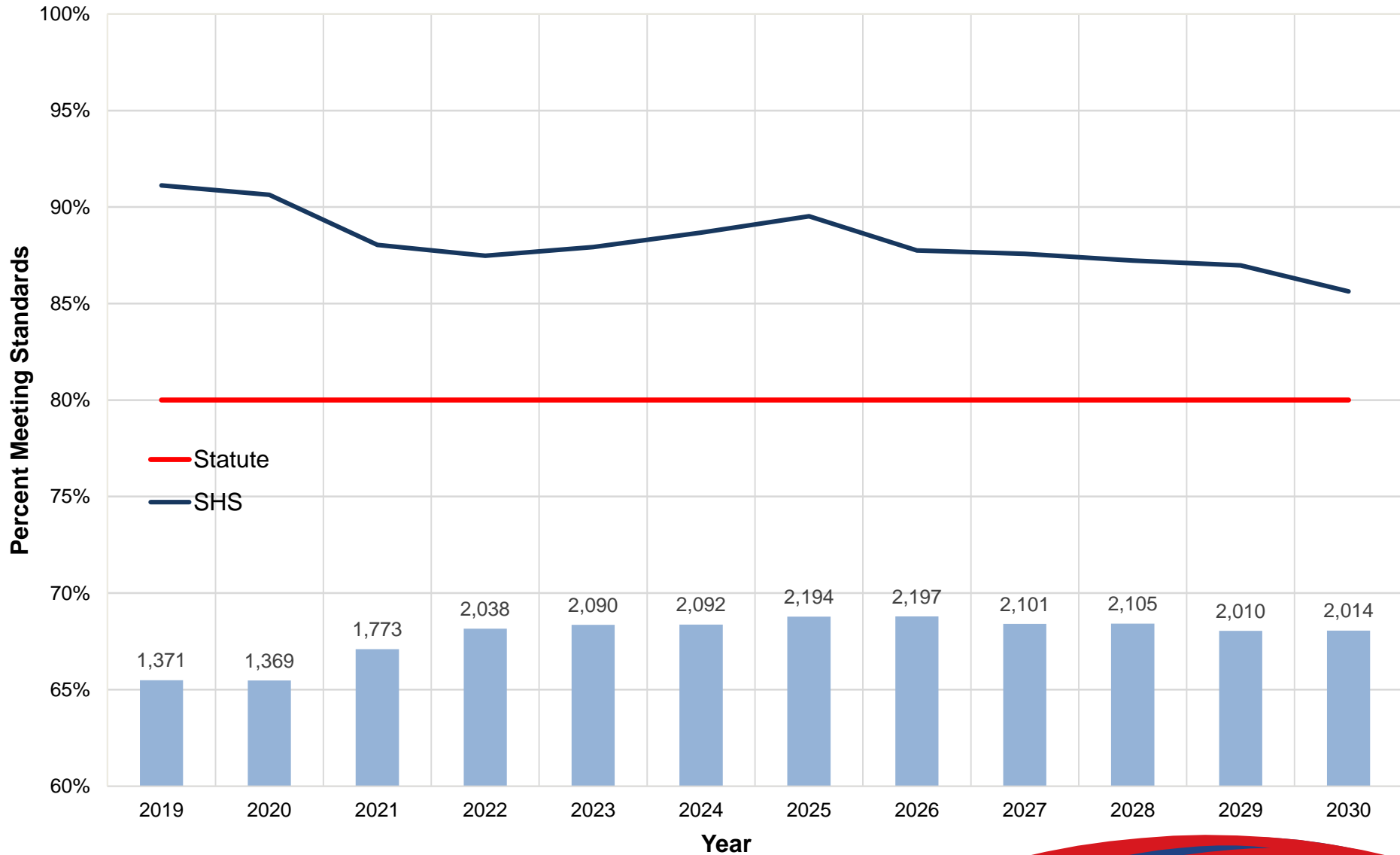
Forecasting from the Master Curve



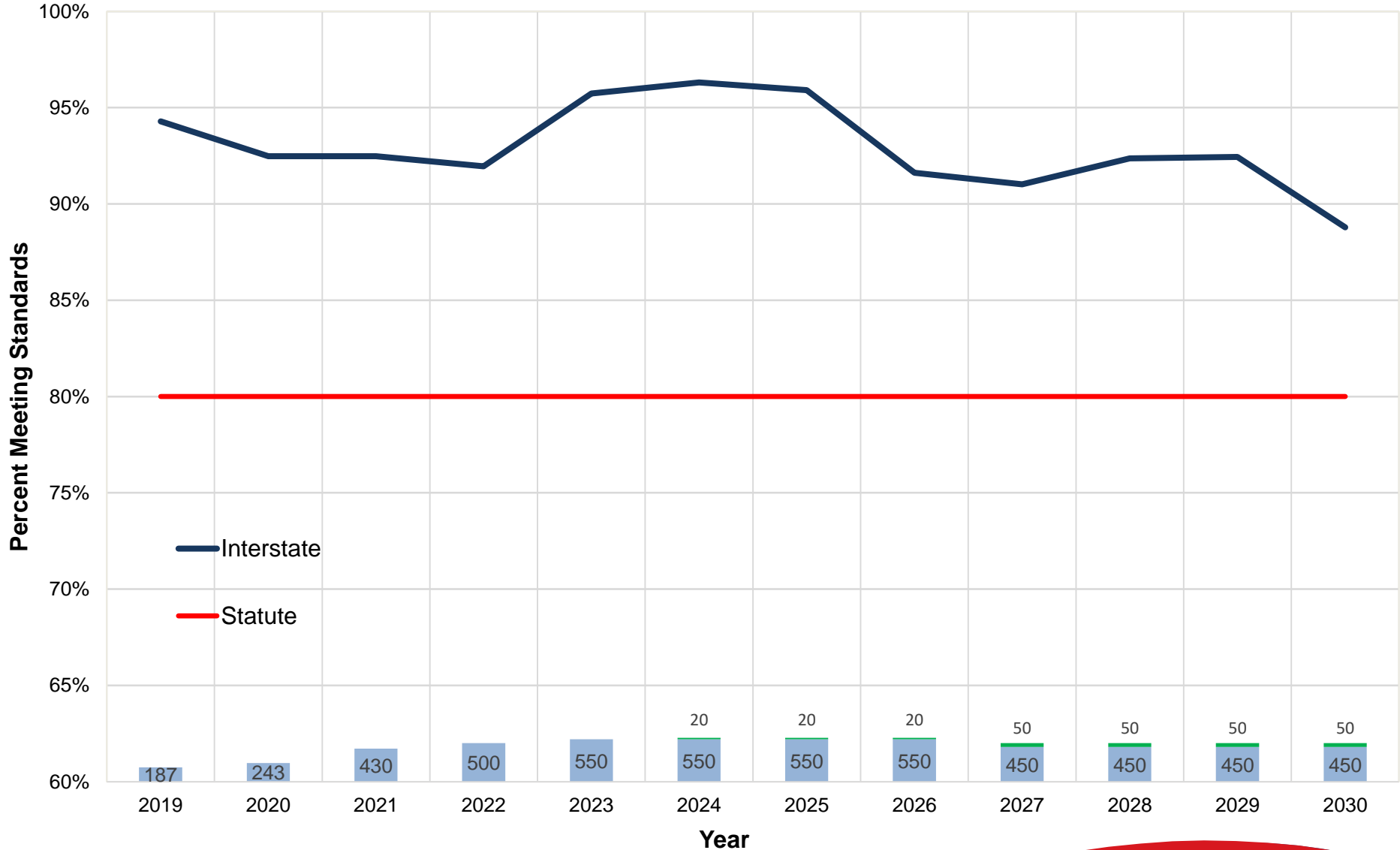
State Highway System Lane Miles Resurfaced and Percent Meeting Standards



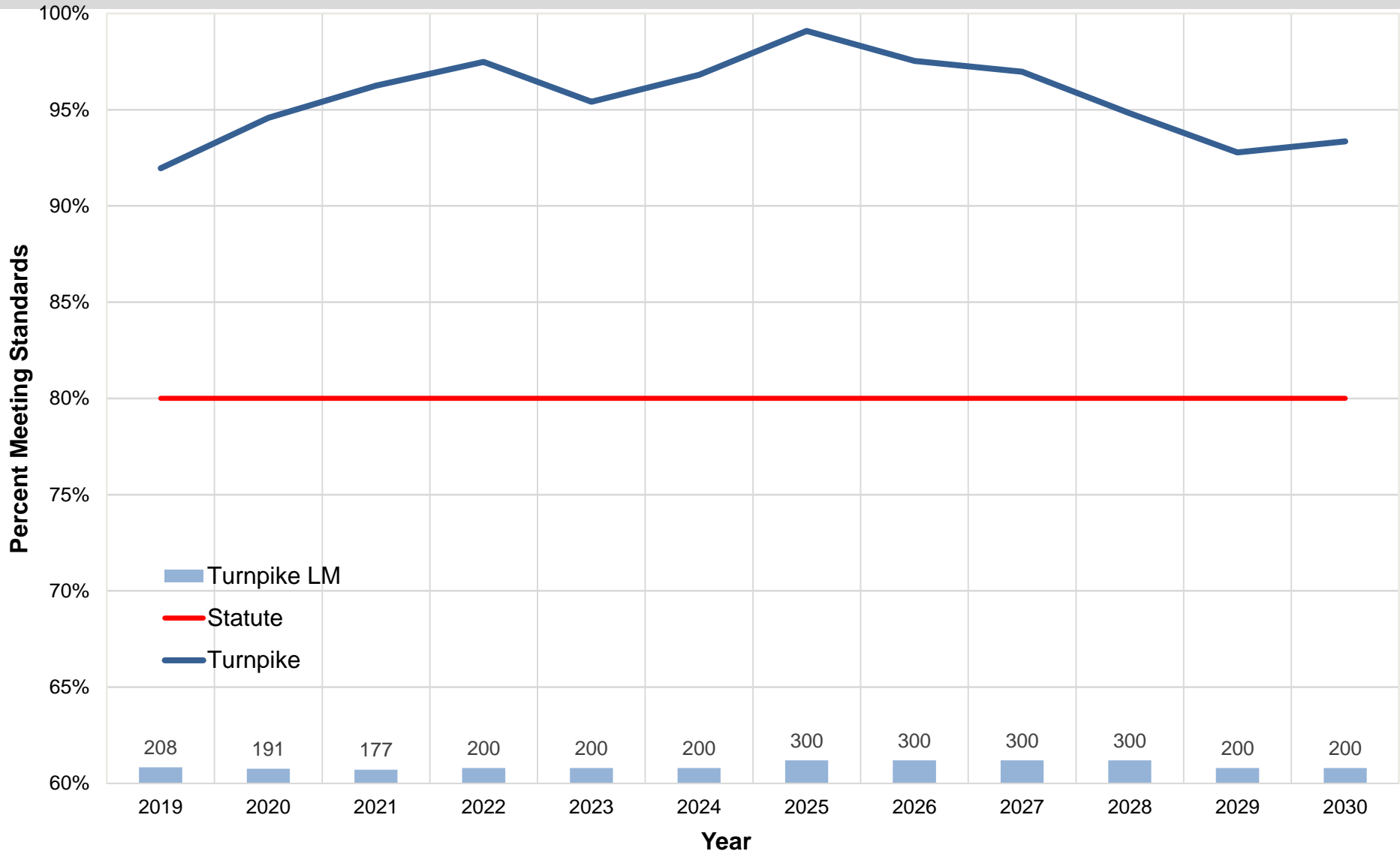
State Highway System Predicted Percent of Lane Miles Meeting Standards



Interstate Predicted Percent of Lane Miles Meeting Standards



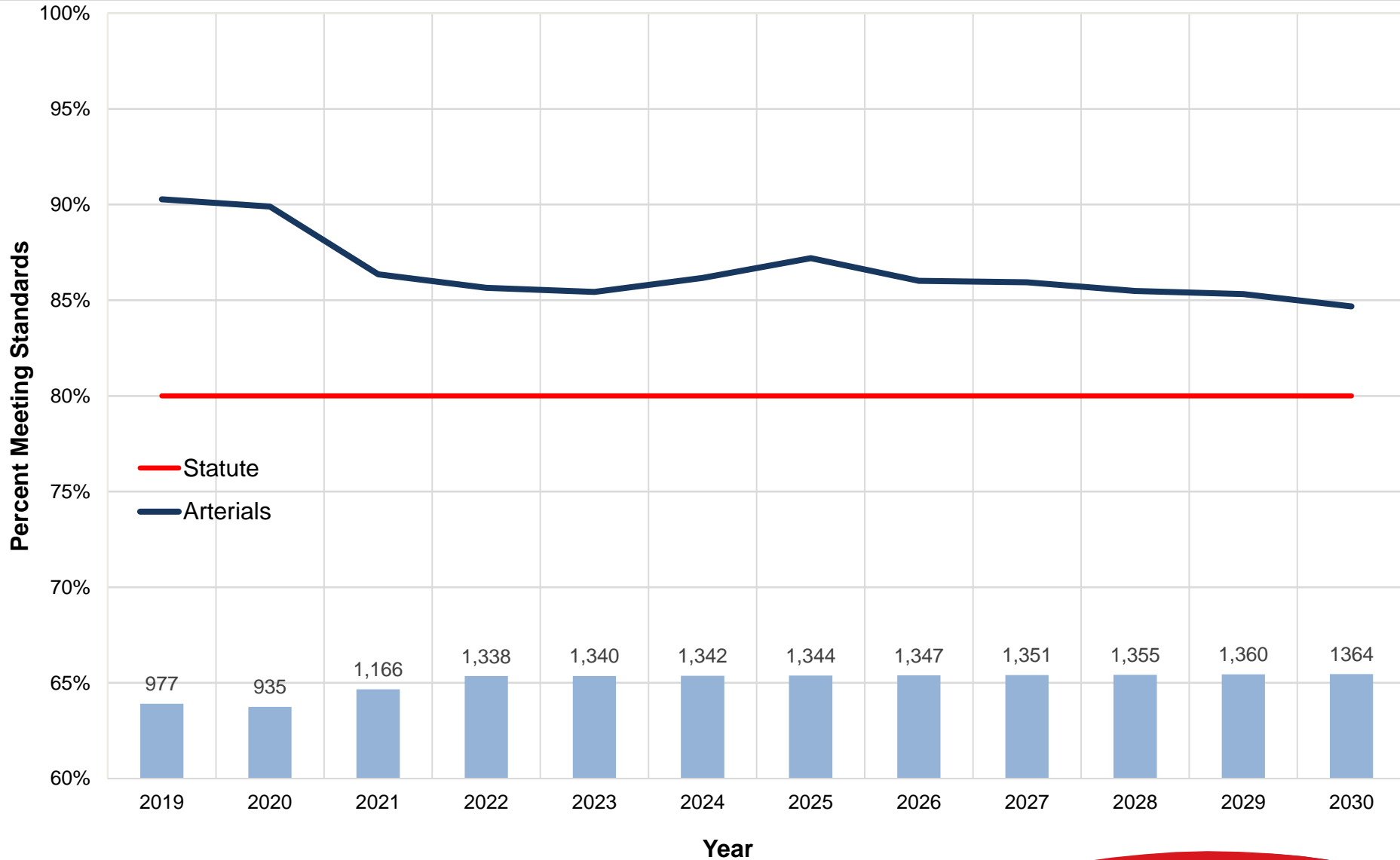
Turnpike Predicted Percent of Lane Miles Meeting Standards



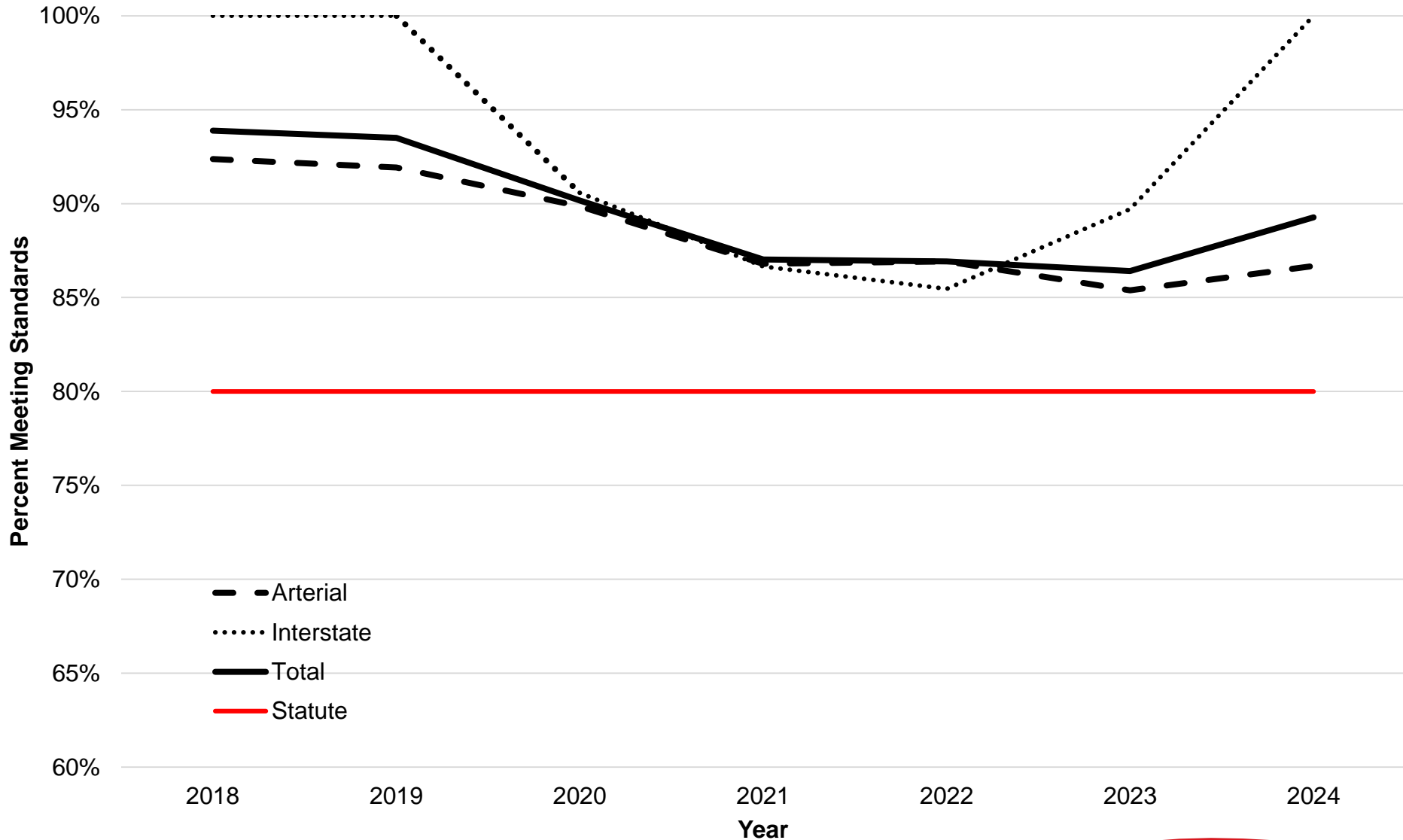
Arterial Resurfacing Policies

- 33,585 lane miles
- Lane mile allocations had been reduced:
 - Fluctuated: 4.0% - 5.8% target allocation between FY 2001 - FY 2013
 - 4.0% FY 2014 - FY 2016
 - 3.0% FY 2017 - FY 2020
 - 3.5% FY 2021
- Last year lane mile allocations
 - FY 2022+ 4.0%

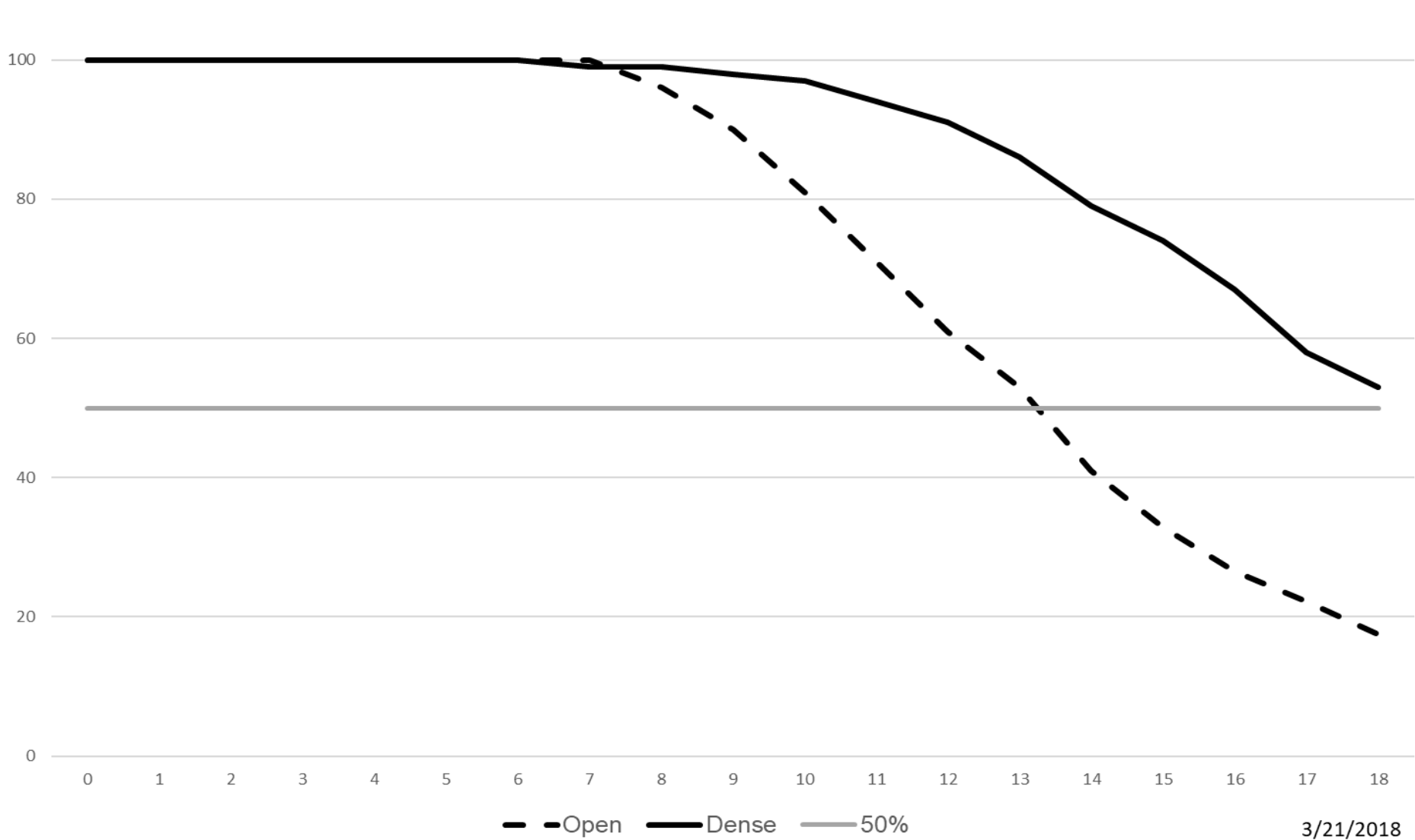
Arterial System Predicted Percent of Lane Miles Meeting Standards



District One FAST Pavement Condition Forecast

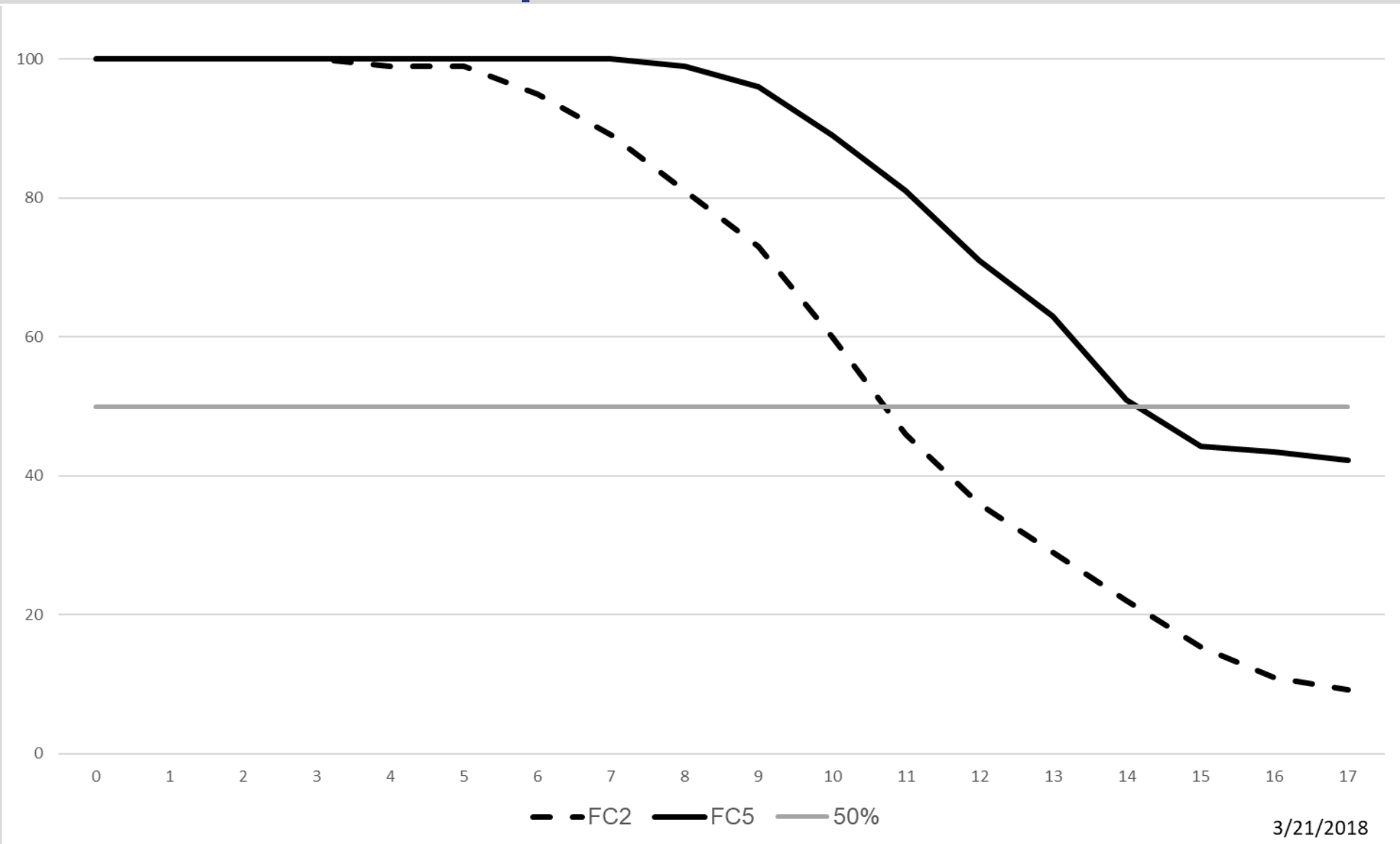


Survival Curves for Open & Dense Graded Friction Courses

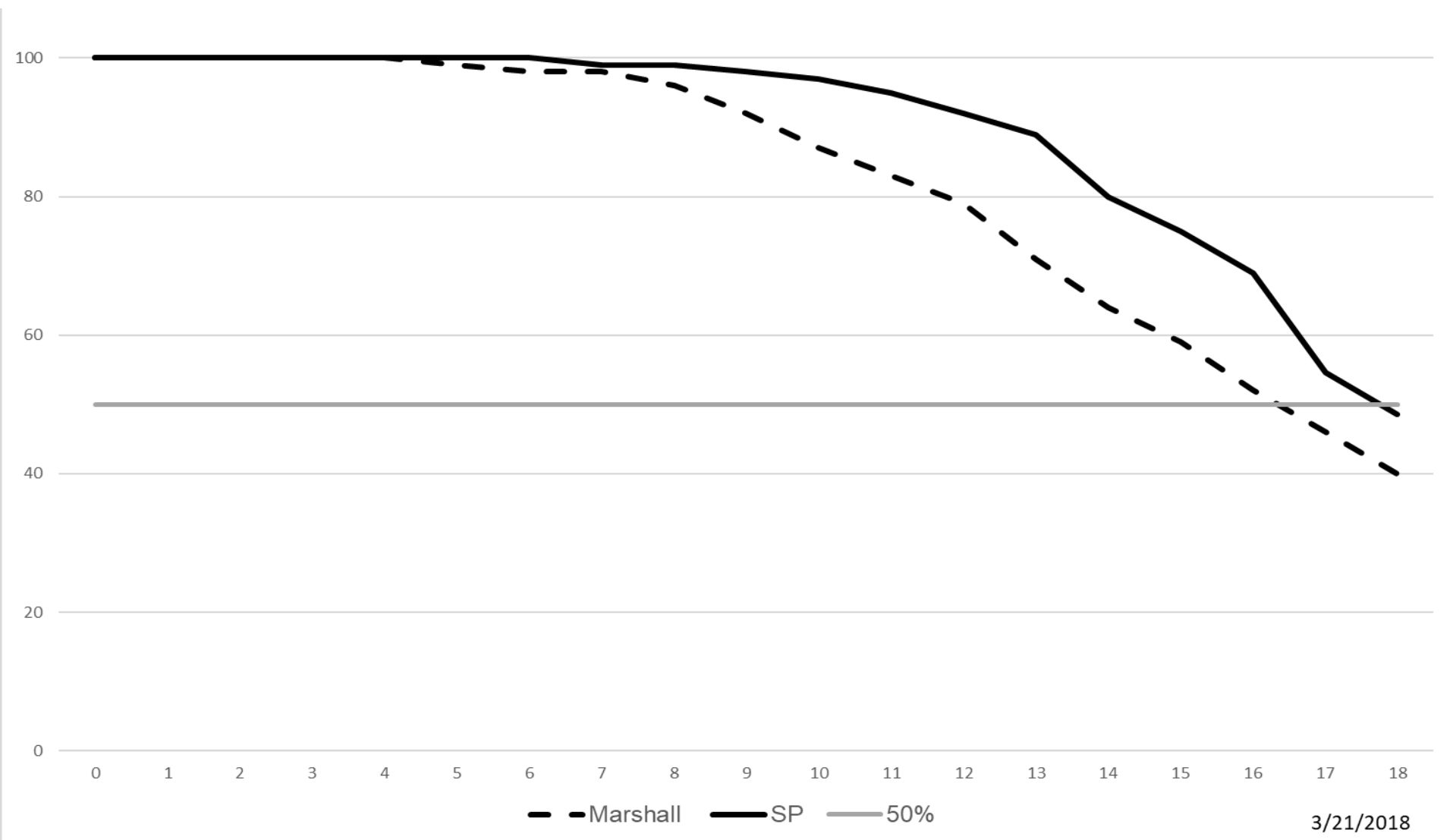


3/21/2018

Survival Curves for FC2 vs FC5 Open Graded Friction Course



Survival Curves for Superpave vs Marshall Mixes



3/21/2018



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Questions?