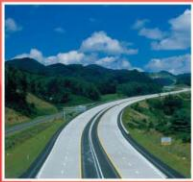


# N.C. Department of Transportation

## Condition Assessment and Funding Needs for North Carolina's Highway System



Report to the  
Joint Legislative Transportation  
Oversight Committee

December 7, 2012  
Terry Gibson, PE



# Biennial Report on Maintenance Requirements

G.S. 136-44.3

Requires NCDOT to:

- Establish Performance Standards
- Project an annual cost to meet and sustain the performance standards for routine maintenance and operations
- Develop a cost for Pavement and Bridge Preservation
- Develop a cost for Pavement and Bridge Rehabilitation
- Project System Condition at optimal funding for 7 years





# North Carolina State Highway System 2012

- 79,478 road miles
- 170,947 paved lane miles
- 4,358 miles of unpaved roads
- 18,265 structures
- 81.4 M square feet bridge deck area
- 9,000 signals





## System Breakdown

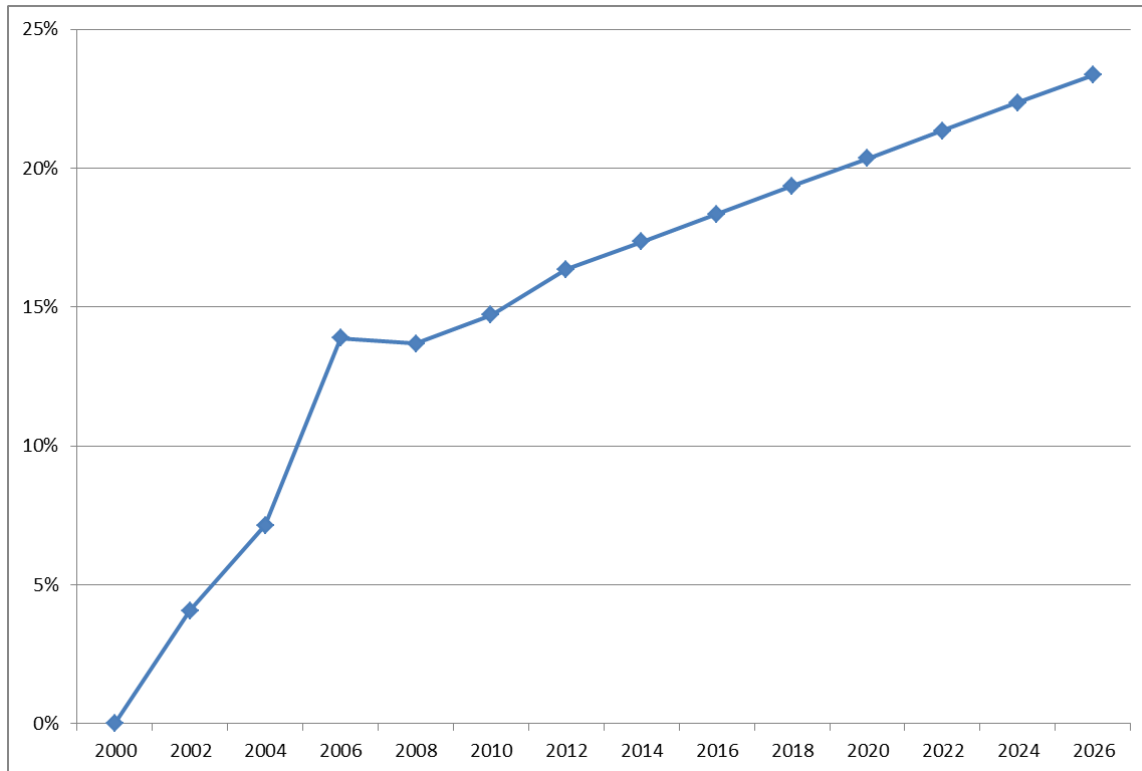
System	Mileage	Examples
Interstates (I)	1,299 RM	I-40, I-85, I-77
Primary (US & NC)	13,754 RM	US 29, US 64, NC 210, NC 42
Secondary (Paved)	60,068 RM	SR 1001, SR 2049, SR 3010
Secondary (Unpaved)	4,357 RM	SR 1825, SR 2256, SR 1705







# Highway System Usage (Vehicle Miles Traveled)





# State Budget Allocation FY 2013 (Millions)

Highway Maintenance	\$ 385
Contract Resurfacing	\$ 427
System Preservation	\$ 235
General Maintenance Reserves	\$ 140
HB 1825 Secondary Road Improvement (Paved)	\$ 66
HB 1825 Secondary Road Improvement (Unpaved)	\$ 12

**Total**

**\$ 1,265 Million**





# Federal TIP Funding Federal Fiscal 2013 (Millions)

ITS Traffic Operations	\$ 13
Positive Guidance Program	\$ 4
Traffic Systems Operations Program	\$ 26
Bridge Preventative Maintenance Program	\$ 5
Low Impact Bridge Replacement	\$ 28
Interstate Maintenance Preservation Program	\$ 10

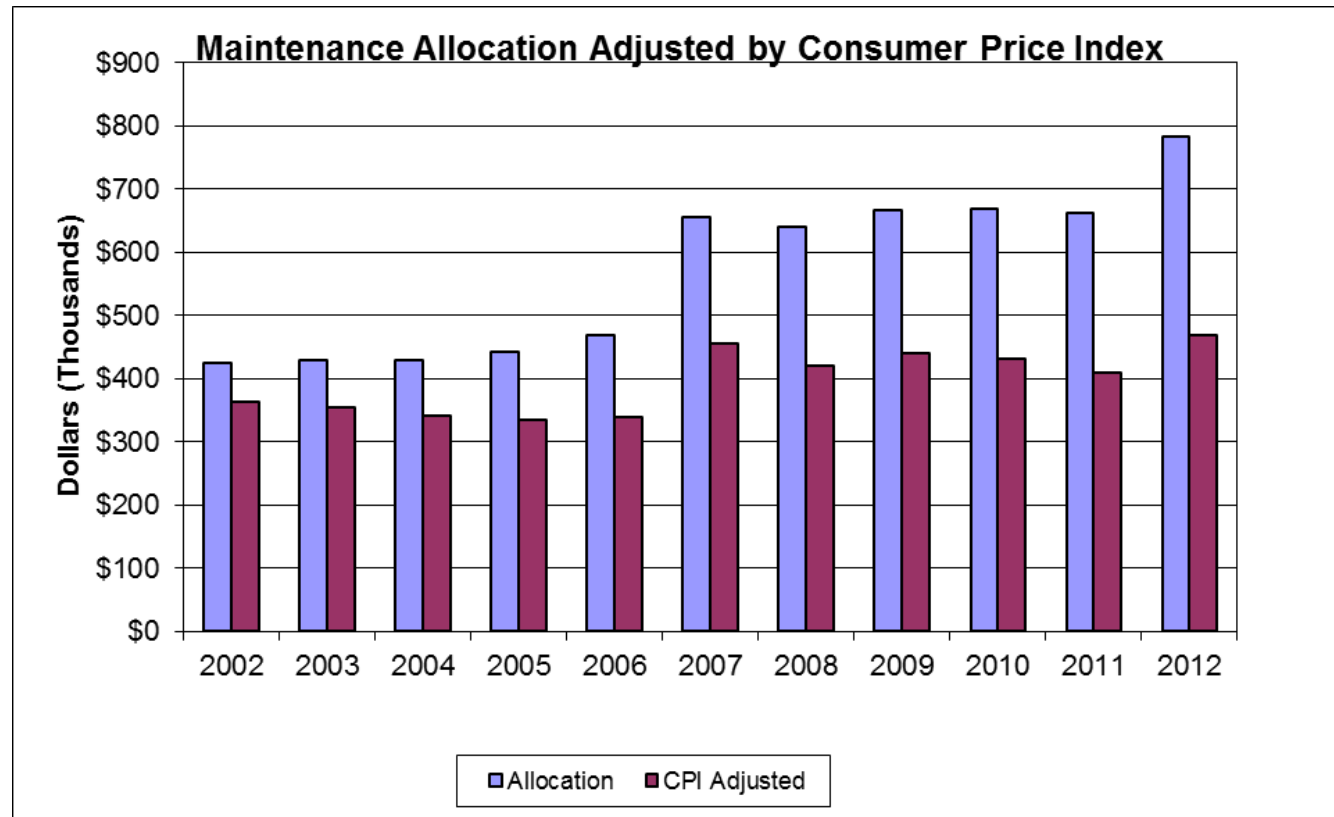
**Total**

**\$ 86 Million**





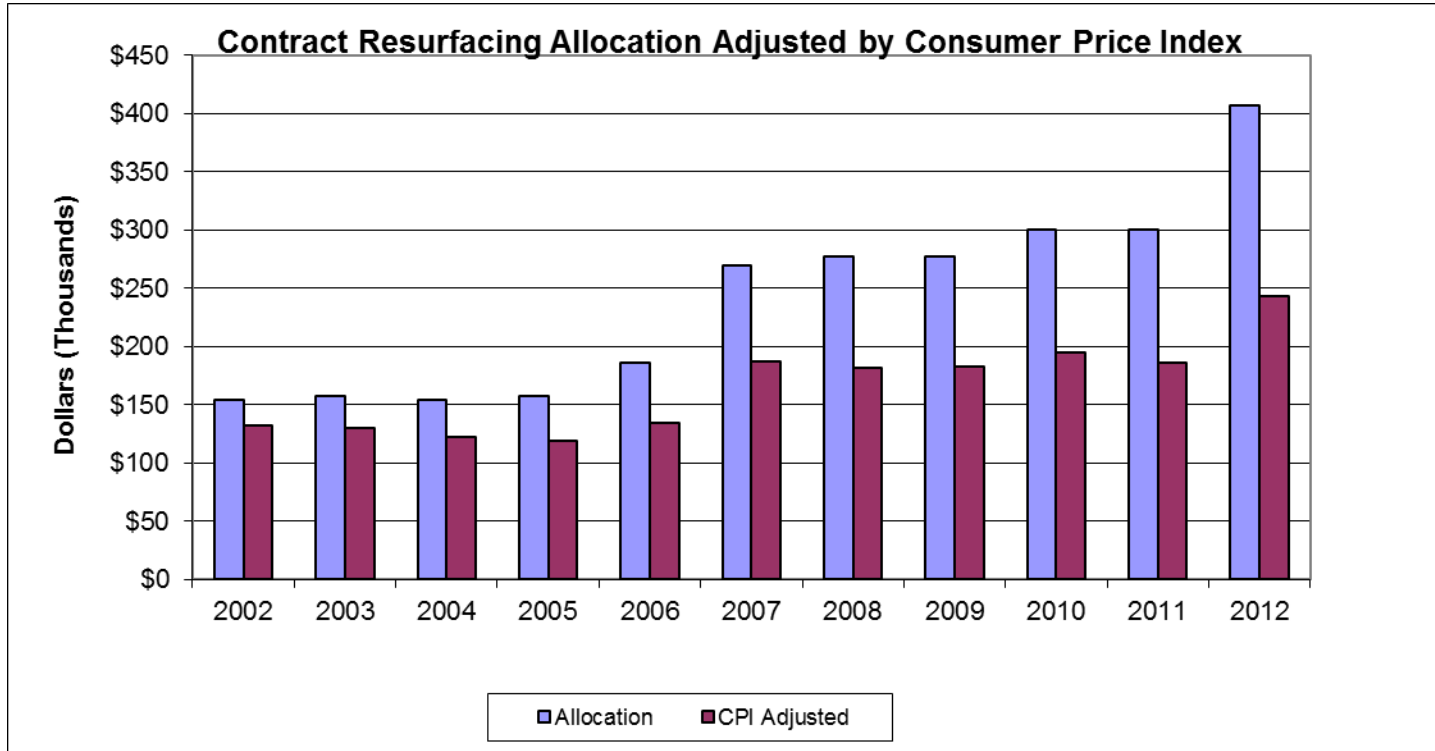
# History of Routine Maintenance Funding







# History of Resurfacing Funding





# Performance Based Management

## Benefits include:

- Moving towards uniformly constructed, maintained and operated Highway System
- Data driven decision making
- Increased focus on preventive maintenance
- Targeting Level Of Service by system
- Highest and best use of resources
- Accountability





# Rating the Condition of the Highway System

## Pavement Condition Survey



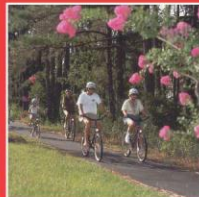
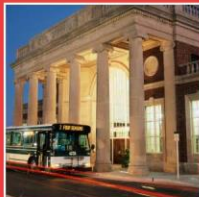
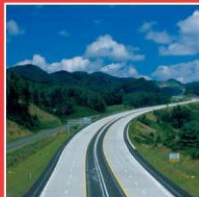
Maintenance  
Condition Survey



## Bridge Condition Survey







# Maintenance Condition Survey Results

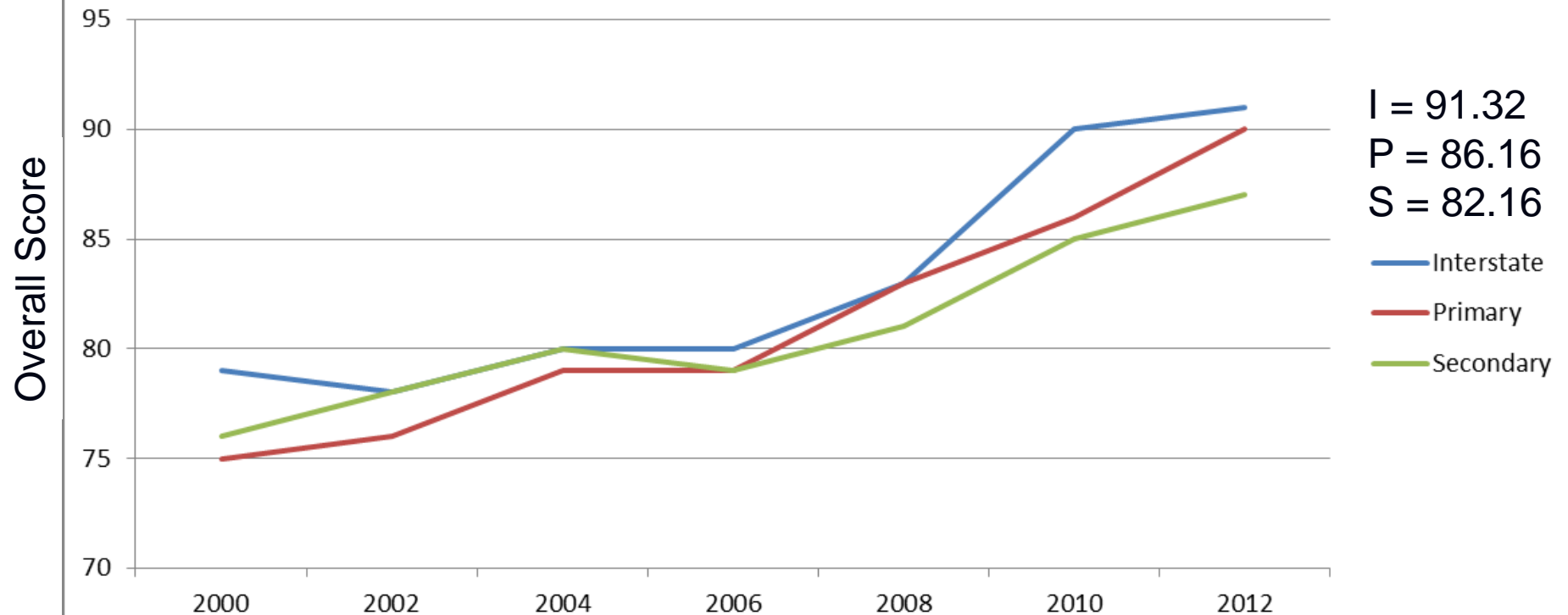
Roadway			Interstate		Primary		Secondary	
			2012	State Average	2012	State Average	2012	State Average
	ELEMENT	PERFORMANCE MEASURE	Target	Score	Target	Score	Target	Score
DRAINAGE	Unpaved Shoulders	No dropoffs greater than 3 inches and no shoulders higher than 2 inches	95	92	90	92	85	93
	Ditches (Lateral Ditches)	No blocked, eroded, or nonfunctioning ditches	95	99	90	97	85	96
	Crossline Pipe (Blocked)	Greater than 50% diameter open	95	87	90	81	85	82
	Crossline Pipe (Damaged)	No damage or structural deficiency effecting functionality	95	91	90	97	85	96
	Curb & Gutter (Blocked)	No obstruction greater than 2 inches for 2 feet	95	96	90	97	85	97
	Boxes (Blocked or Damaged)	Grates and outlet pipes of boxes blocked <50%. Inlets and outlets of boxes are not damaged, and grates are present and not broken.	95	84	90	90	85	92
ROADSIDE		Freeways: 45' from travelway, 5' behind guardrail, not blocking signs; Non-Freeways: Vertical clearance of 15' over roadway and 10' back of ditch centerline or shoulder point	90	92	85	90	80	86
	Vegetation (Brush & Tree)	Areas free of erosion	95	91	90	94	85	94
	Stormwater Devices (NPDES)	Functioning as designed	90	94	90	94	90	94
	Landscape Plant Beds	Achieving a score of 2 or higher on the inspection form	90	90	80	90	N/A	N/A
	Rest Areas & Welcome Centers	Condition Rating of 90	90	96	90	93	N/A	N/A
TRAFFIC	Long Line Pavement Markings	Present, visible	90	96	85	94	80	88
	Words and Symbols	Present, visible	N/A	N/A	85	87	80	85
	Pavement Markers	Present and reflective	90	91	85	81	N/A	N/A
	Ground Mounted Signs	Visible and legible	90	94	85	94	85	89
	Overhead Signs	Visible and legible	92	99	85	97	N/A	N/A
BRIDGE	NBIS Culverts	Condition Rating $\geq 6$	85	86	80	87	75	89
	Non-NBIS Culverts	Condition Rating = Good	80	81	70	72	60	56
	Overhead Sign Structures	Condition Rating = Good	95	88	92	93	92	84
Totals			91.32	91.43	86.16	90.27	82.16	87.43





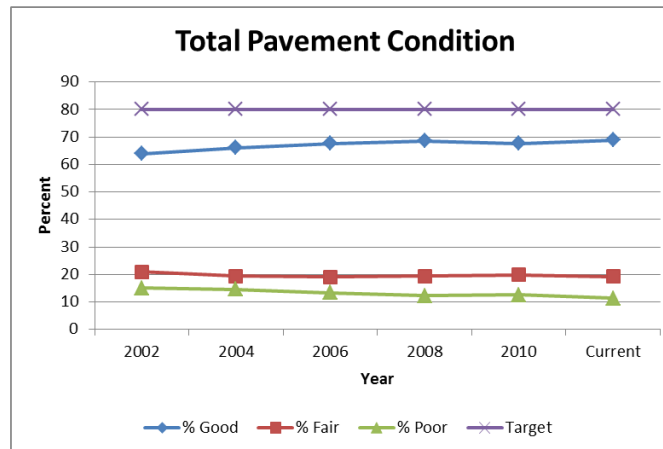
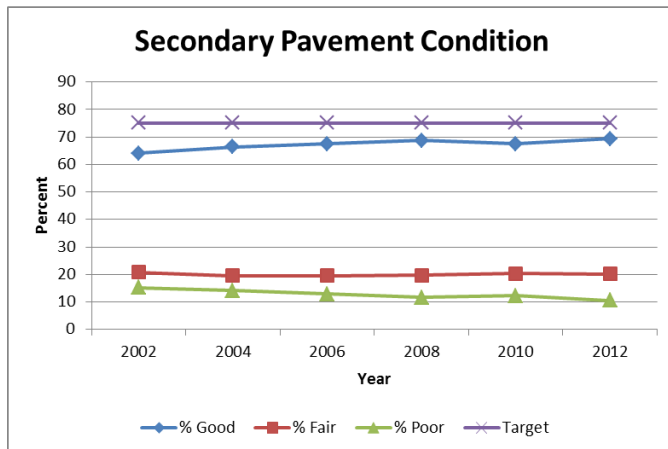
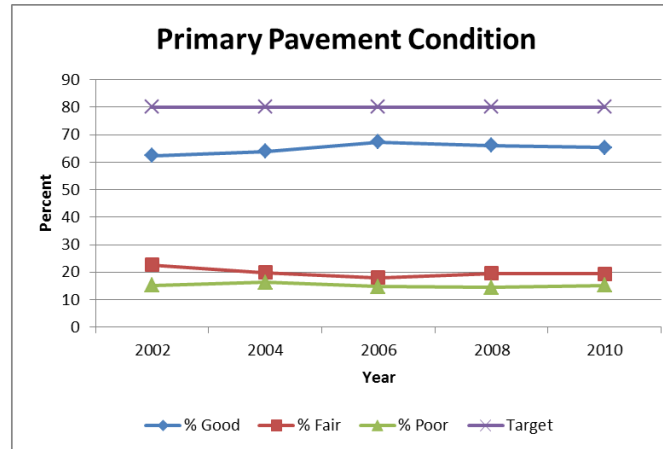
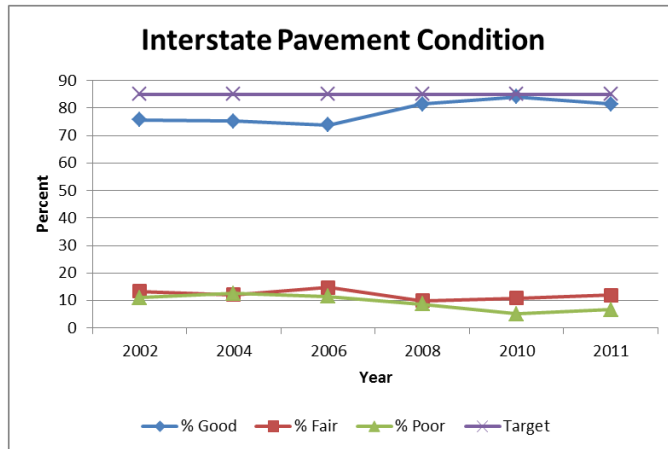


## Performance Measure Trends (Maintenance Condition Survey Results)





# Pavement Condition





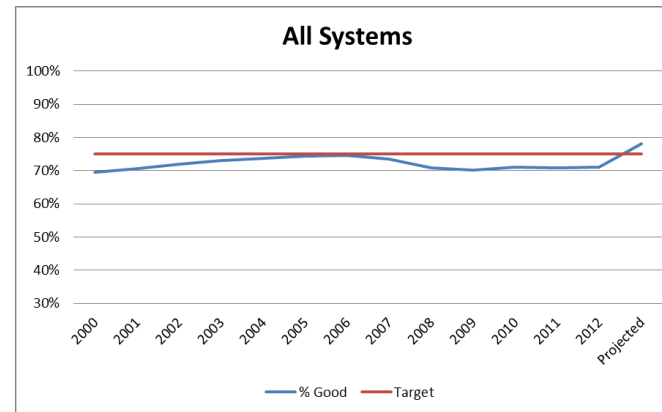
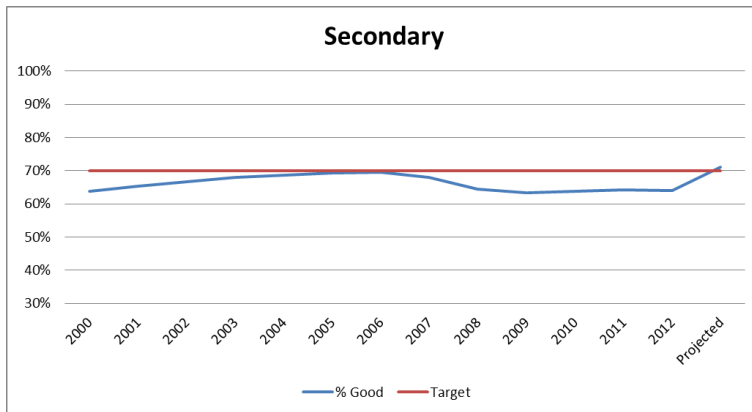
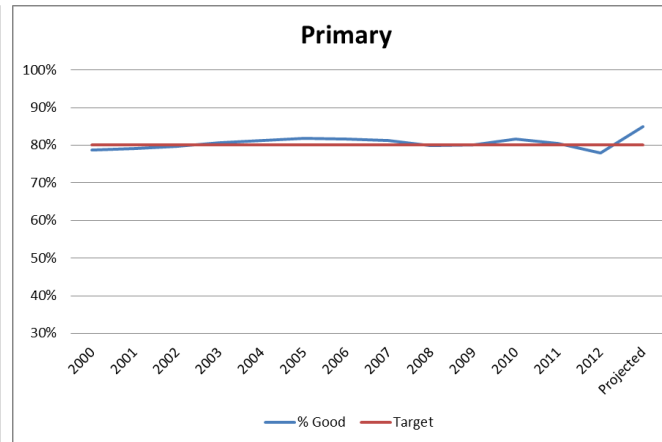
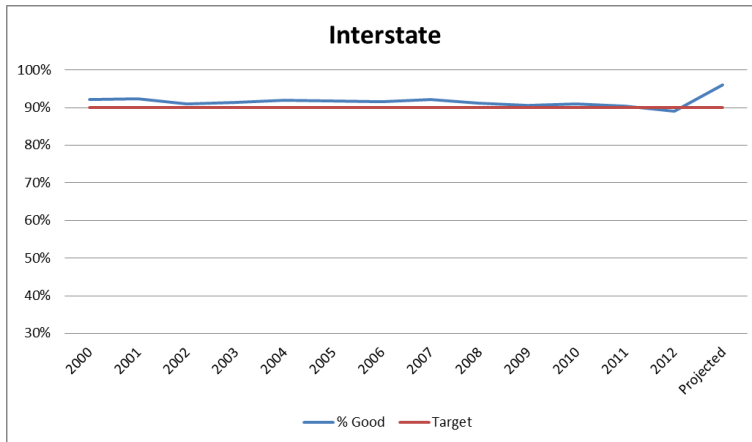
# Bridge Condition Survey Results

Bridges			Interstate		Primary		Secondary		Statewide
	ELEMENT	PERFORMANCE MEASURE	2012 Target	State Average Score	2002 Target	State Average Score	2012 Target	State Average Score	State Average Score
Bridge Deck	Concrete	% of decks rating less than or equal to 6	85	84	80	80	75	84	82
	Timber		85	N/A	80	79	75	89	89
	Steel Planks		85	N/A	80	67	75	84	83
	Open Grid Steel		85	N/A	80	58	75	0	50
Superstructure	Concrete	% of superstructure rating less than or equal to 6	90	80	85	59	80	65	61
	Steel Planks		90	88	85	82	80	79	81
	P/S Concrete		90	96	85	96	80	94	95
	Timber		90	N/A	85	49	80	70	70
Substructure	Timber	% of substructure rating less than or equal to 6	90	N/A	85	44	80	46	46
	Concrete Pile		90	78	85	75	80	87	82
	Steel Pile		90	88	85	85	80	83	84
	Concrete Piers		90	91	85	83	80	77	80





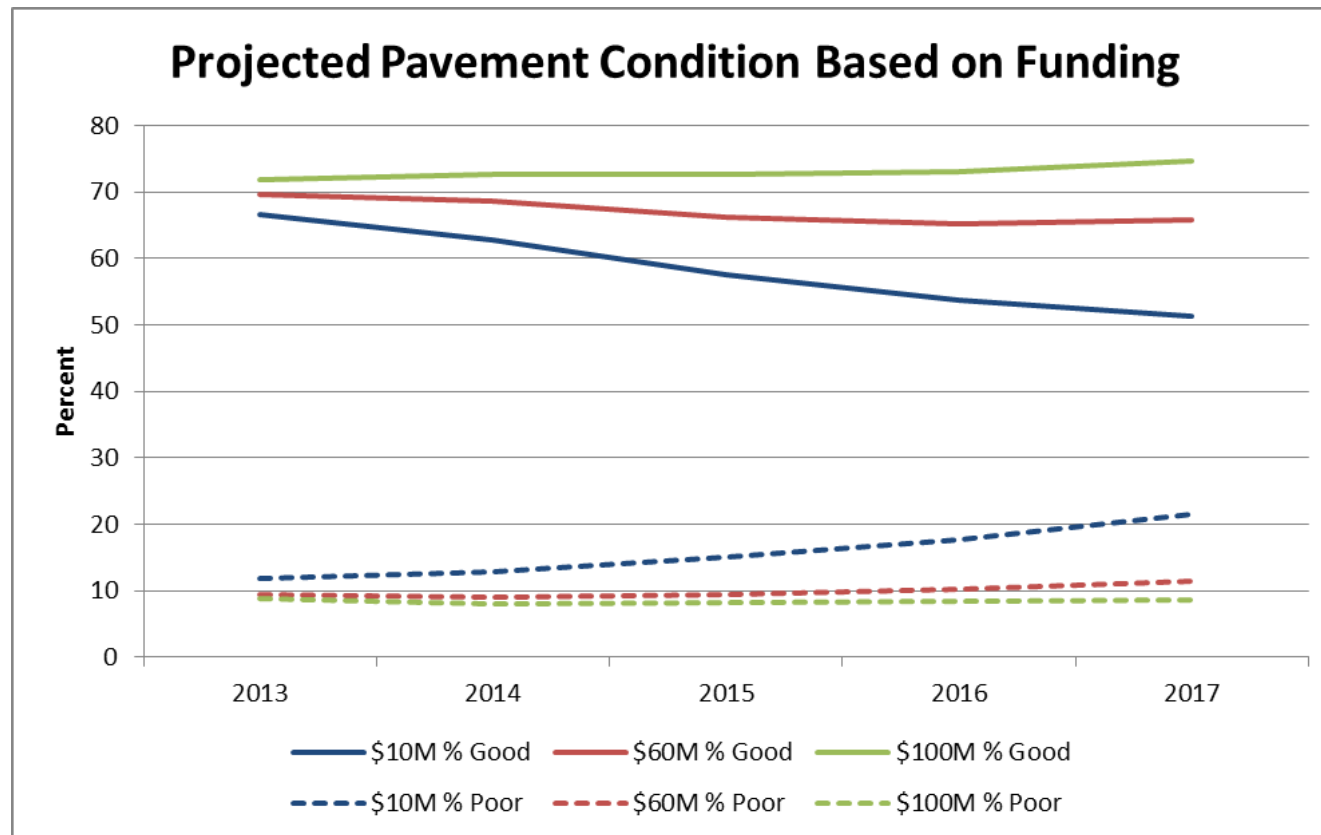
# Bridge Condition







# Effect of Lack of System Preservation Funds on Pavements





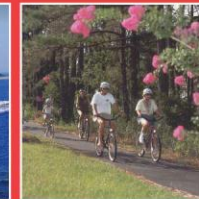
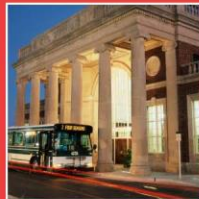
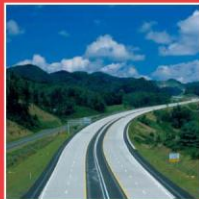
# Infrastructure Health Index

- Calculates an overall system score
- Measures NCDOT's success for maintaining and improving the health of the highway network

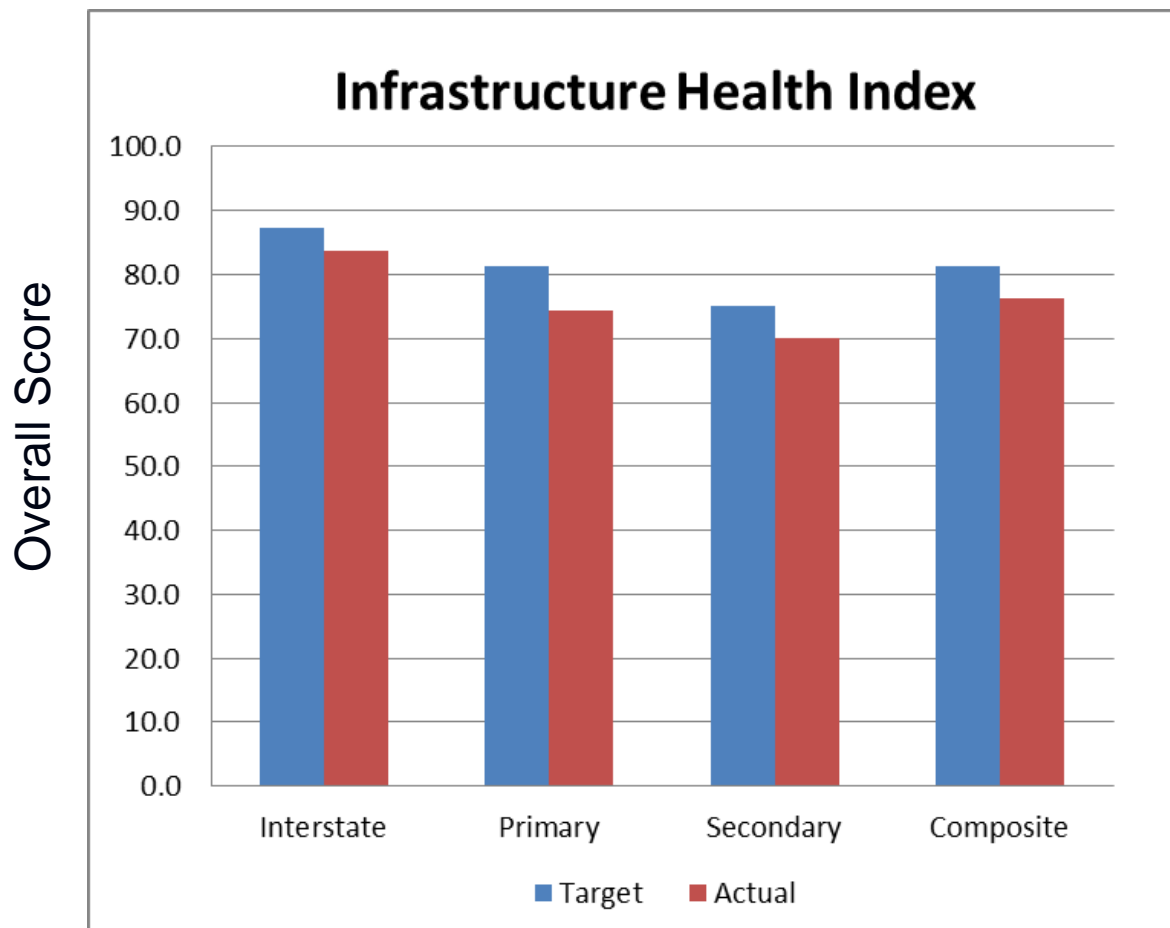
## Weights asset categories:

- 25% for roadsides features
- 35% for bridges
- 40% for pavements





# Infrastructure Health Index



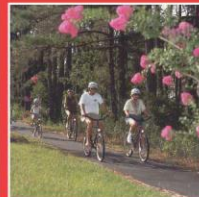
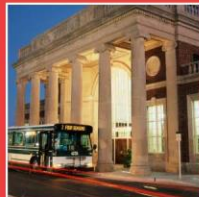
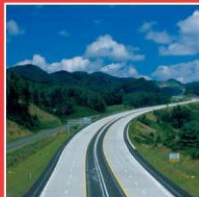


# Validating Performance Measures

- Public told us:
  - Interstate: Meeting expectations with no areas of concern
  - Primary: Meeting expectations and identified shoulders as an area of concern
  - Paved Secondary: Slightly below expectation and focus areas include pavement condition, smoothness, width of travel lanes, roadway striping and markers







# Maintenance Funding Needs FY 2013-2014 (Millions)

	Needs
• Maintenance Operations	\$ 765.97
• Disasters	\$ 15.00
• Contract Resurfacing	\$ 427.16
• <u>Pavement and Bridge Preservation</u>	\$ 195.59
<b>Total Maintenance and Preservation Needs</b>	<b>\$ 1,403.72</b>

Alternate Maintenance Funds - \$ 152.00

**Adjusted Maintenance Funding Needs \$ 1,251.72**

**System Rehabilitation Needs \$ 320.81**





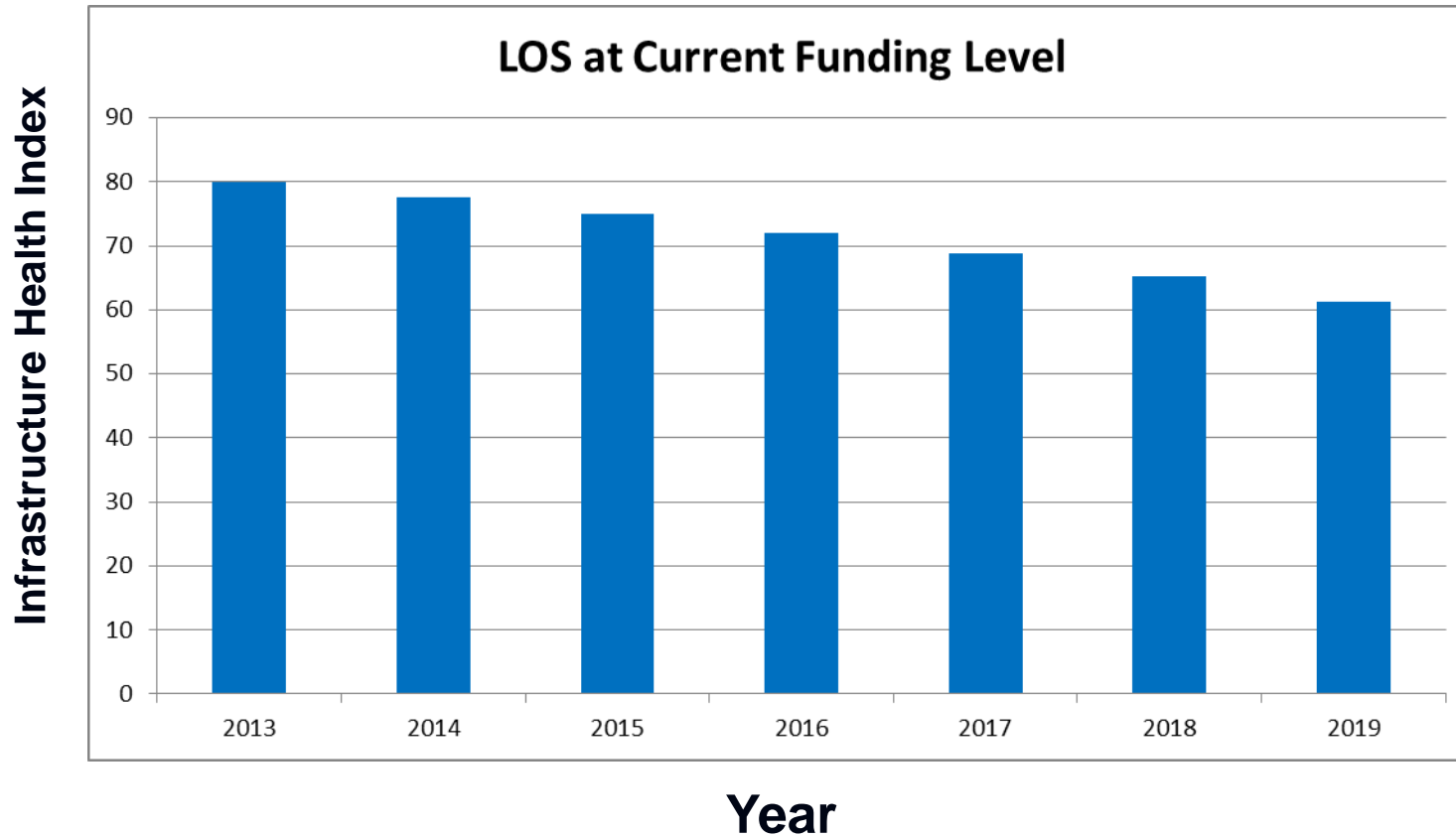
# Statewide Annual Maintenance Funding Plan

Fiscal Year (\$ millions)					
Maintenance Programs	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Maintenance and Operations	765.97	792.01	818.94	846.79	875.58
Disasters/Emergencies	15.00	15.00	15.00	15.00	15.00
Contract Resurfacing	427.16	441.68	456.70	472.23	488.28
Pavement and Bridge Preserv	195.59	202.24	209.12	216.23	223.58
Total Maint. Funding Needed	<b>1,403.72</b>	<b>1,450.35</b>	<b>1,498.55</b>	<b>1,548.40</b>	<b>1,599.94</b>
Supplemental Maint. Funds	152.00	152.00	152.00	152.00	152.00
Estimated Maint. Fund Allocation	<b>\$ 1,188.18</b>	<b>\$ 1,248.90</b>	<b>\$ 1,309.59</b>	<b>\$ 1,317.58</b>	<b>\$ 1,413.24</b>
<b>Shortfall</b>	<b>(63.54)</b>	<b>(49.45)</b>	<b>(36.96)</b>	<b>(78.82)</b>	<b>(34.70)</b>



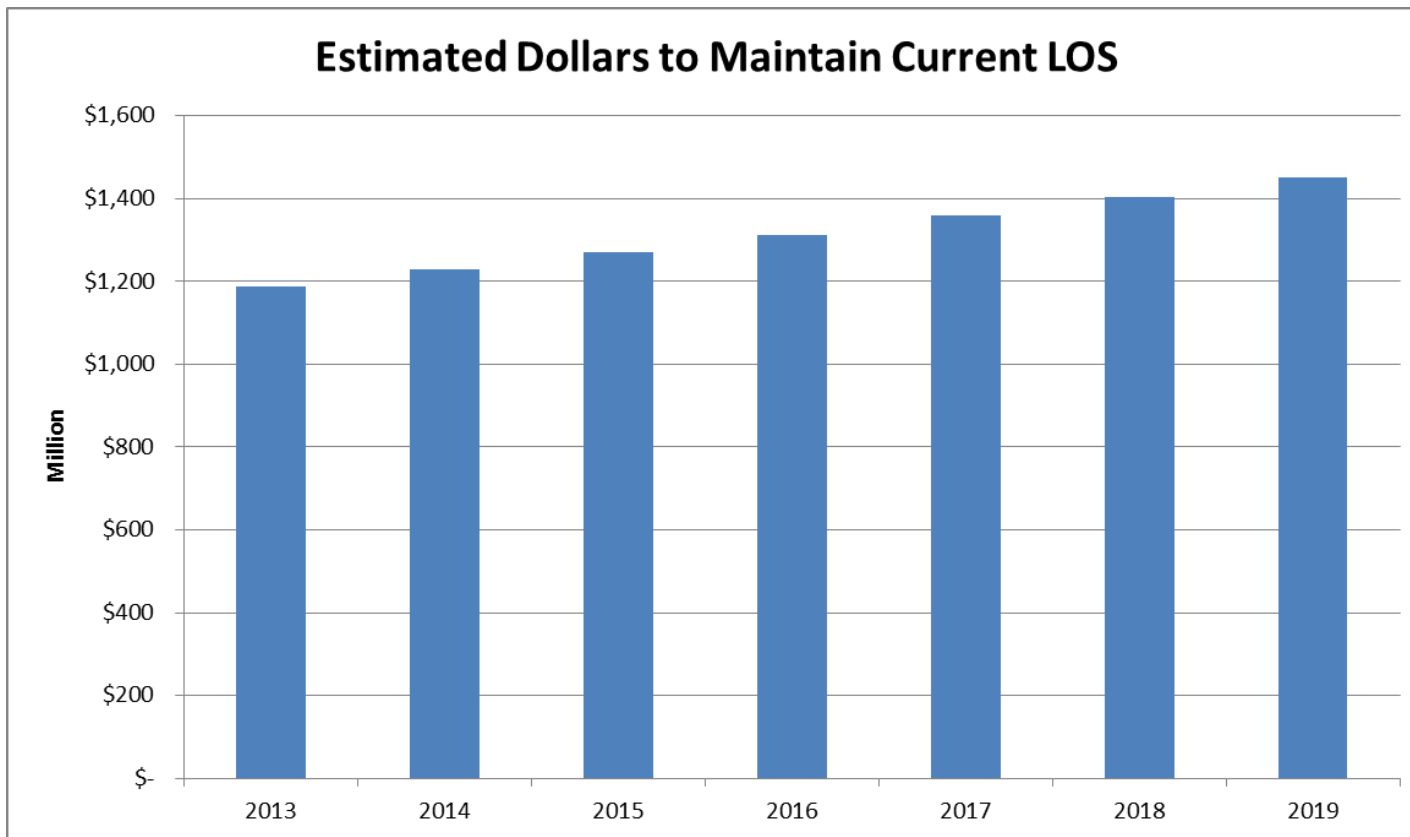


# LOS at Current Funding Level





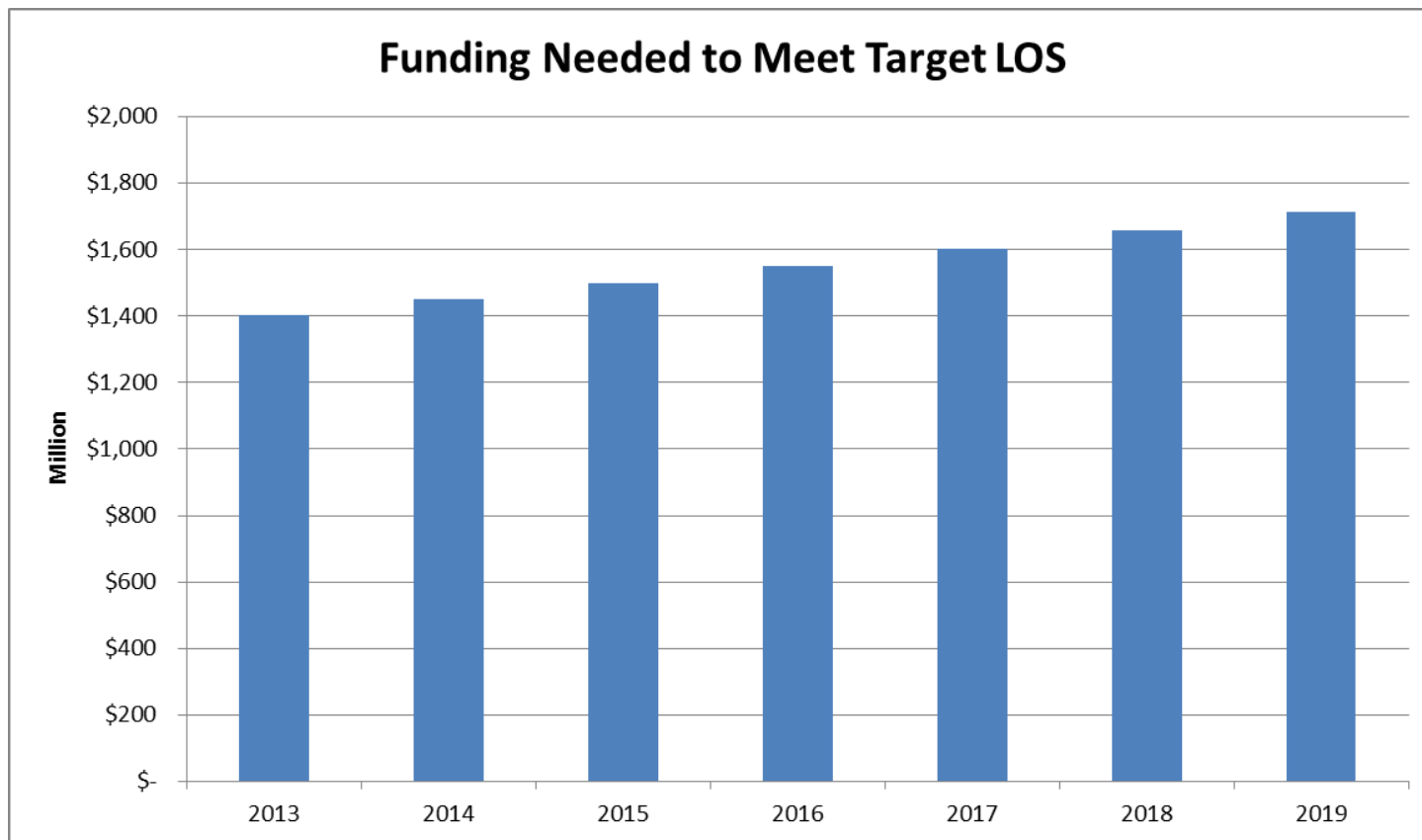
# Estimated Dollars to Maintain Current LOS







# Funding Needed to Meet Target LOS

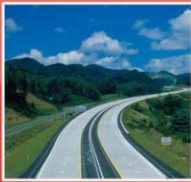




## Summary

- Meeting targets on roadside features
- Pavements and bridges are trending in the right direction
- Public validation of targets
- Funding only slightly below need
- Need more flexibility in funding





# Questions?