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 14, 2010
Lacy D. Love, 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 2009

- 79,185 road miles
- 160,630 paved lane miles
- 4,592 miles of unpaved roads
- 18,205 structures
- 88.1 M square feet bridge deck area
- 8,900 signals

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North Carolina Freight Movement

In 2007:

- 281 million tons moved across N.C. annually
- 770,000 tons per day

In 2030:

- Expect more than 324 million tons to be moved across N.C. annually
- 15% increase

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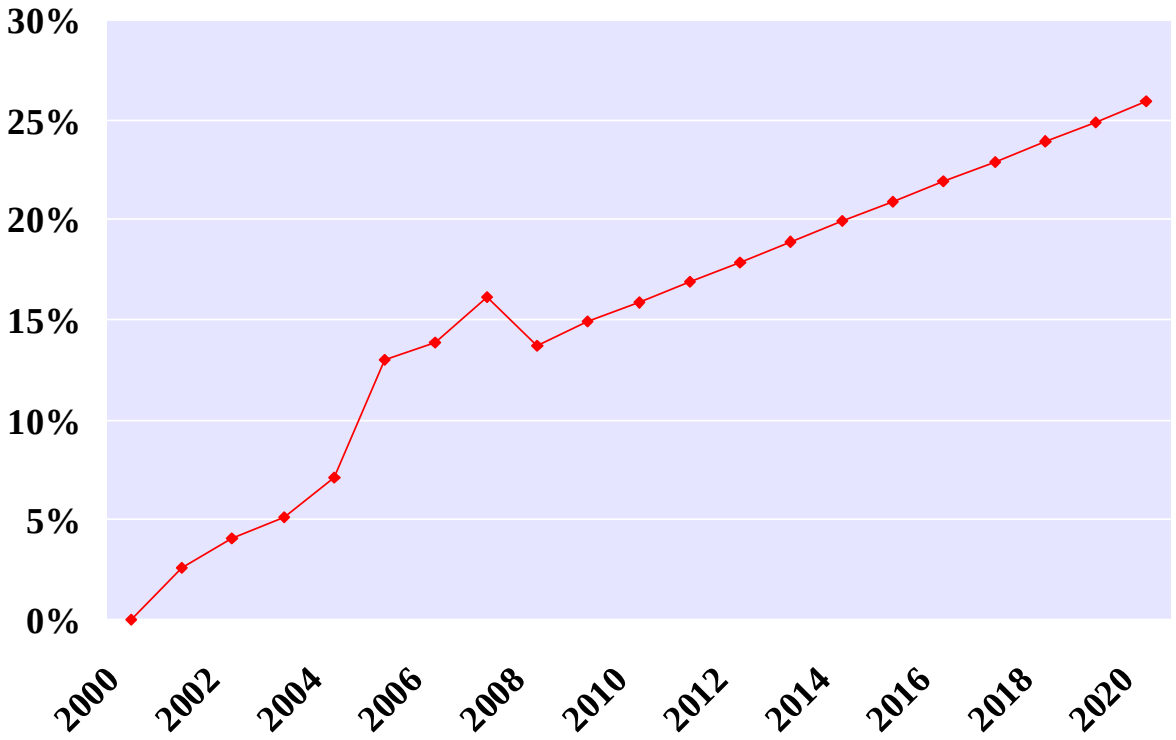
Highway System Usage
(Vehicle Miles Traveled)



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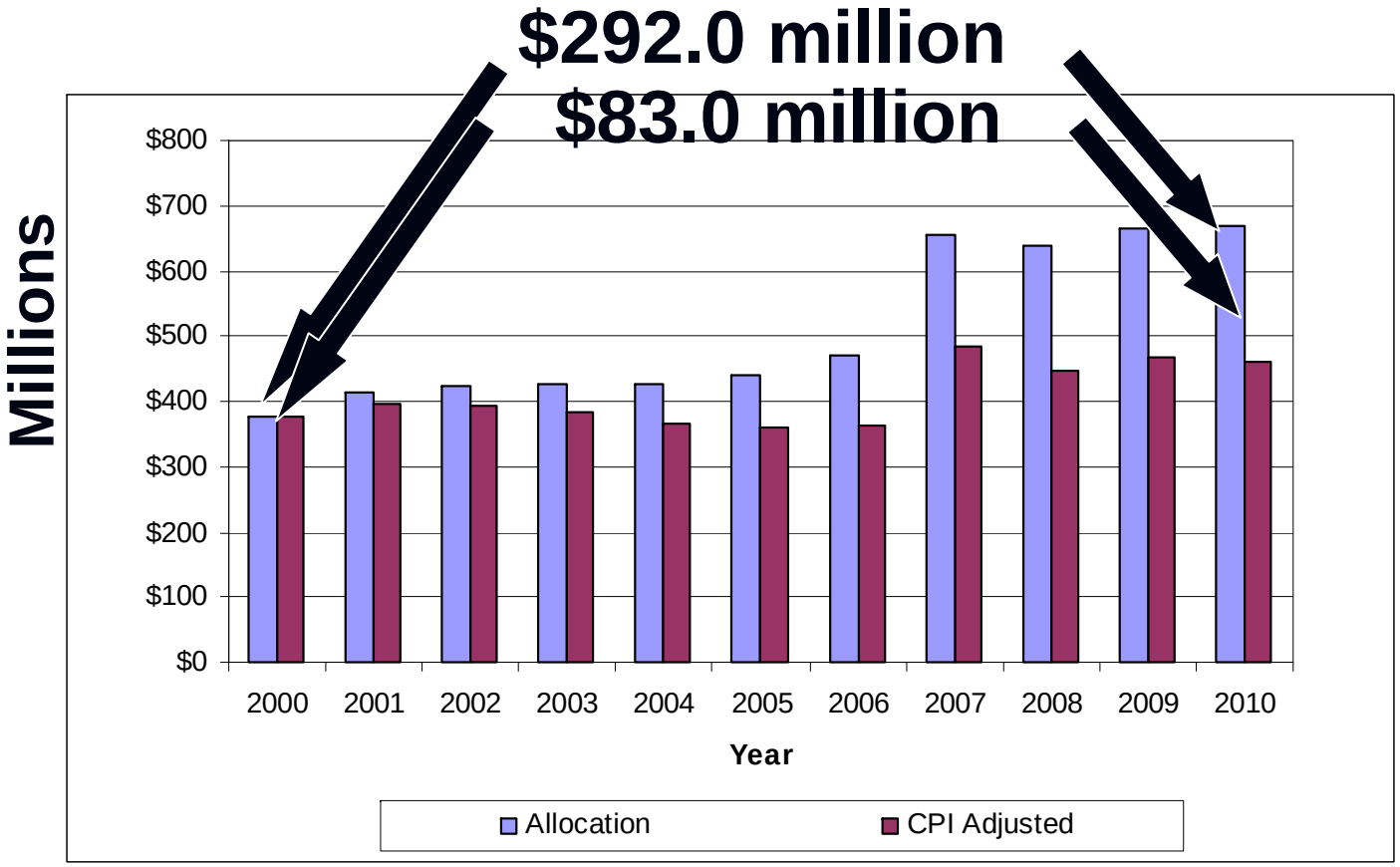
History of Routine Maintenance Funding



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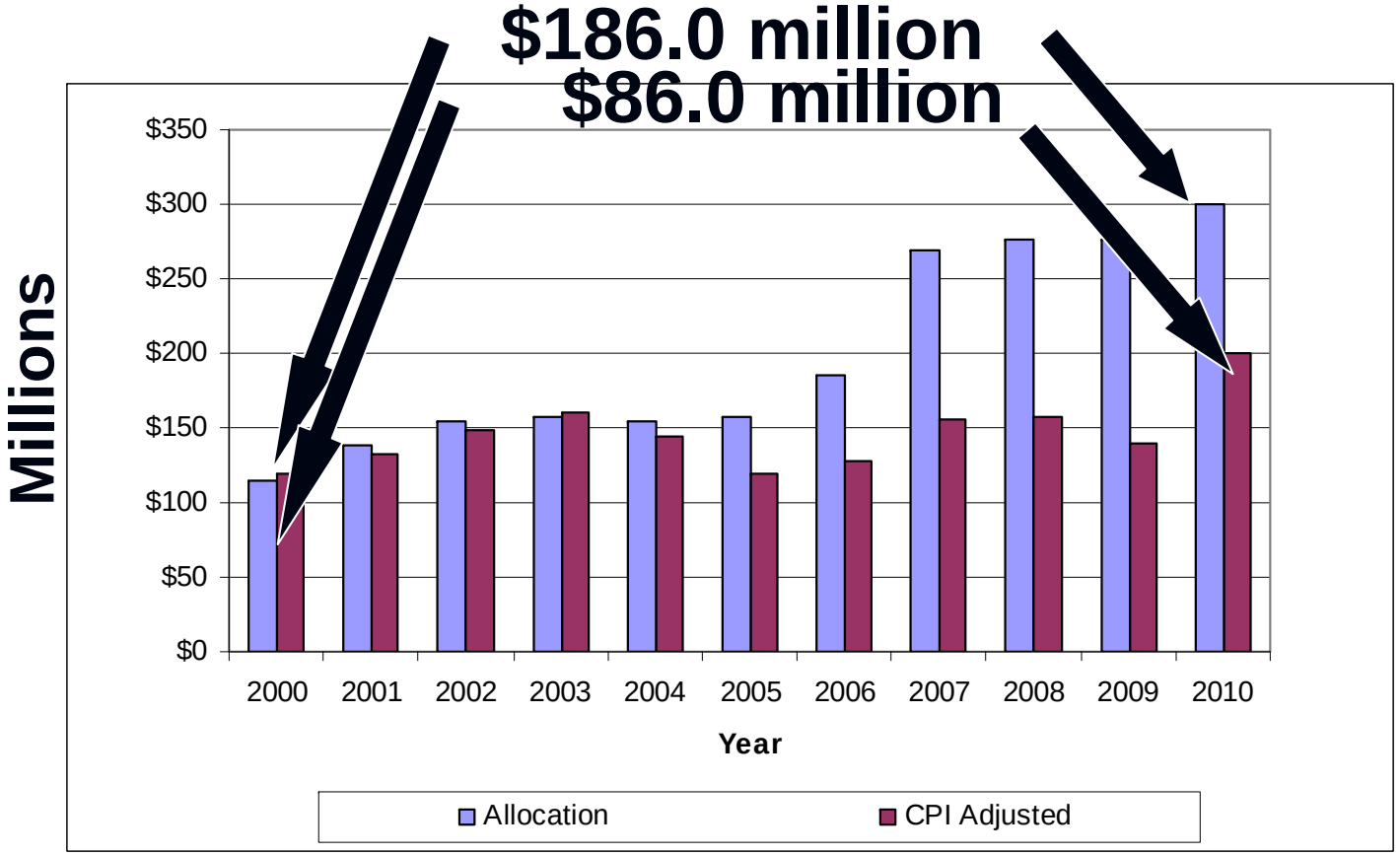
History of Resurfacing Funding



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Policy to Projects Framework

N.C. Transportation Plan (20 Year)

- Documents mission, goals, objectives, and strategies
- Guides investment decisions

NCDOT Program and Resource Plan (10 Year)

- Allocates funds for all programs (Highway, Rail, Aviation, Public Transportation, Ferry, Bicycle and Pedestrian, etc.)
- Projects ranked (prioritized) based on data
- Includes realistic STIP

NCDOT Work Program (5 Year)

- Comprehensive list of projects, programs and services
- Reliable and fiscally constrained
- 95% delivery rate

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Performance Based Management

Benefits include:

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

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Performance Measures

Sets clearly defined outcomes such as:

- No unsealed cracks in pavements
- Bridge decks rating in good condition
- No pipes blocked or damaged
- Pavement markings visible at night

Since 2008:

- Reviewed targets to ensure accuracy
- Made modifications as necessary
- Simplified and streamlined

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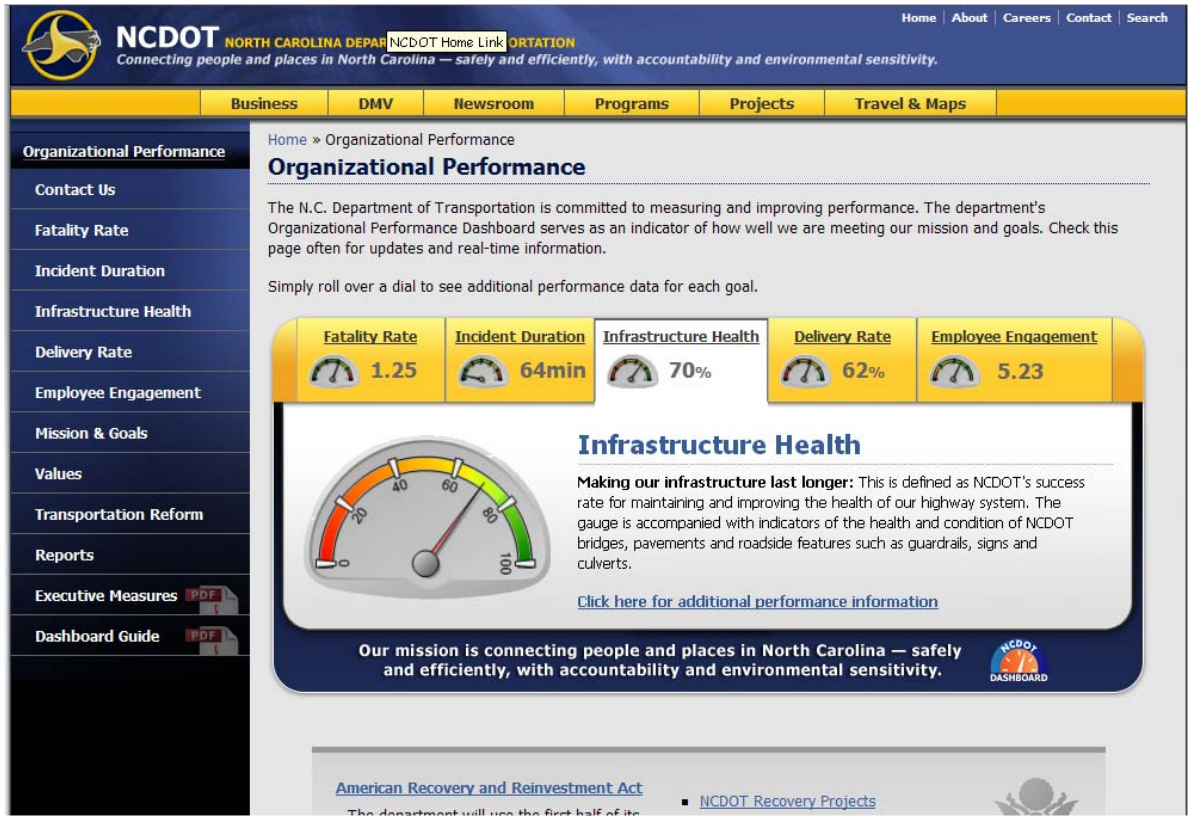
Transportation Reform:
Measuring Performance



Rating the Condition of the Highway System

Maintenance Condition Survey

Bridge Condition Survey

Pavement Condition Survey

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Maintenance Condition Survey Results

Roadway			Interstate		Primary		Secondary	
			2010	State Average	2010	State Average	2010	State Average
FEATURE	ELEMENT	PERFORMANCE MEASURE	Target	Score	Target	Score	Target	Score
DRAINAGE	Unpaved Shoulders	No drop-offs greater than 3" and no shoulder higher than 2"	95	91	90	89	85	91
	Ditches	No blocked or eroded ditches	95	98	90	94	85	94
	Crossline Pipe (Blocked)	Greater than 50% diameter open	95	87	90	78	85	74
	Crossline Pipe (Damaged)	No damage or structural deficiency	95	93	90	95	85	91
	Curb & Gutter (Blocked)	No obstruction > 2" for 2 feet	95	97	90	96	85	96
	Boxes (Blocked or Damaged)	Not blocked > 50%, damaged or broken	95	82	90	87	85	85
ROADSIDE	Vegetation (Brush & Tree)	Cleared to Freeway and Non-Freeway standards	90	90	85	85	80	80
	Vegetation (Turf Condition)	Areas free of erosion	95	84	90	83	85	86
	Stormwater Devices (NPDES)	Functioning as designed	90	94	90	94	90	94
	Landscape Plant Beds	Minimum condition score of 2	90	90	80	90	N/A	N/A
	Rest Areas & Welcome Ctrs	Condition rating of 90	90	96	90	95	N/A	N/A
TRAFFIC	Long Line Pavement Markings	Present, visible	90	93	85	90	80	81
	Words and Symbols	Present, visible	90	73	85	85	80	77
	Pavement Markers	Present and reflective	90	84	85	59	N/A	N/A
	Ground Mounted Signs	Visible and legible	90	94	85	91	85	85
	Overhead Signs	Visible and legible	92	93	85	80	85	100
BRIDGE	NBIS Culverts	Condition rating ≥ 6	85	86	85	86	85	89
	Non-NBIS Culverts	Condition rating = Good	80	84	80	74	80	56
	Overhead Sign Structure	Condition rating = Good	95	95	95	93	95	88
	Totals		91.27	89.79	87.28	86.04	84.49	85.04

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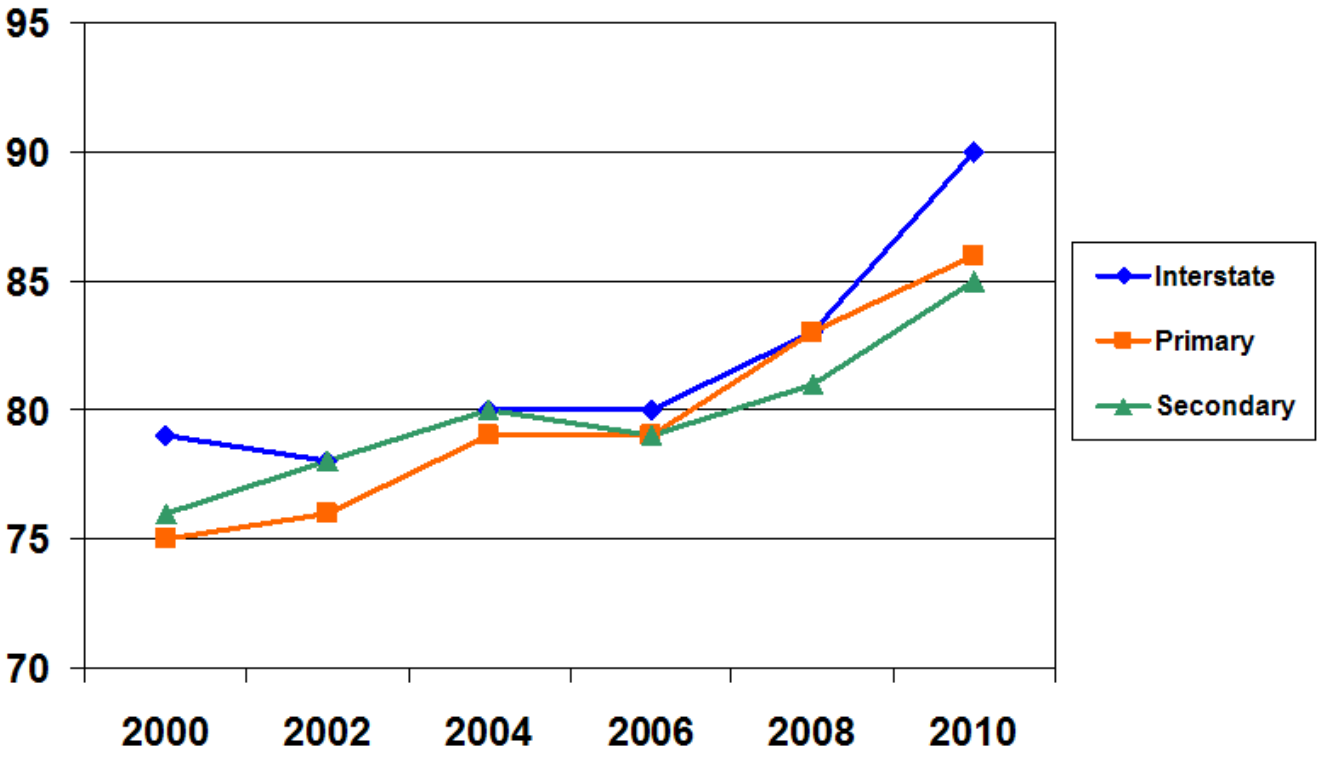
Performance Measure Trends
(Maintenance Condition Survey Results)



Pavements

Pavement Preservation

- Seals off pavement surface
- Reconditions underlying asphalt
- Refreshes driving surface

Treatments include:

- Crack sealing
- Chip seals
- Slurry pavement
- Micro-surfacing

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Contract Resurfacing

- Provides renewed driving surface
- Improves ride quality
- Reduces patching and frequent maintenance

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Pavement Rehabilitation

- Restores pavement condition
- Increases pavement structure

Treatments include:

- Mill and replace
- Overlay with thicker lifts

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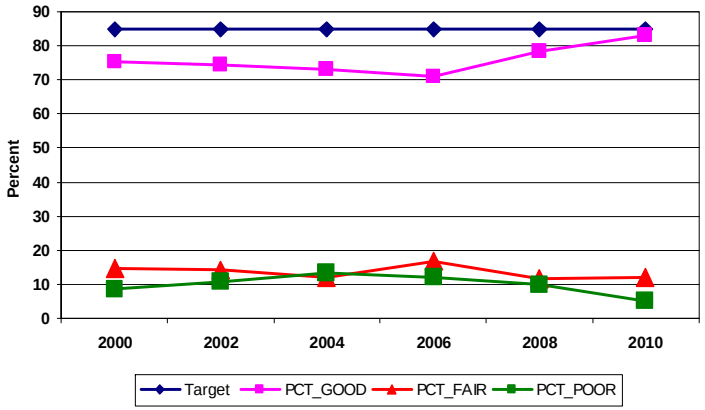
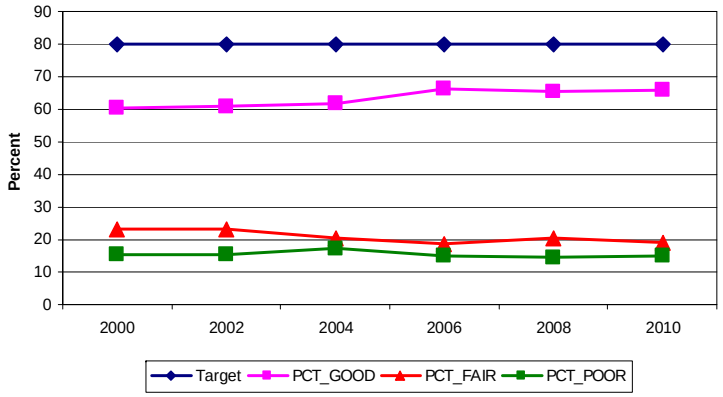
Pavement Condition
2000 - 2010

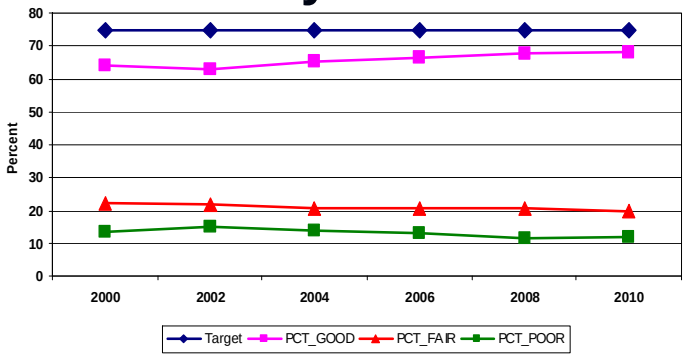
Interstate



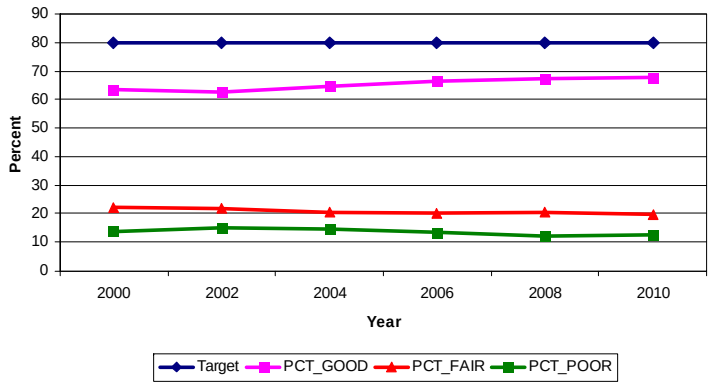
Primary



Secondary



Total



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Bridges

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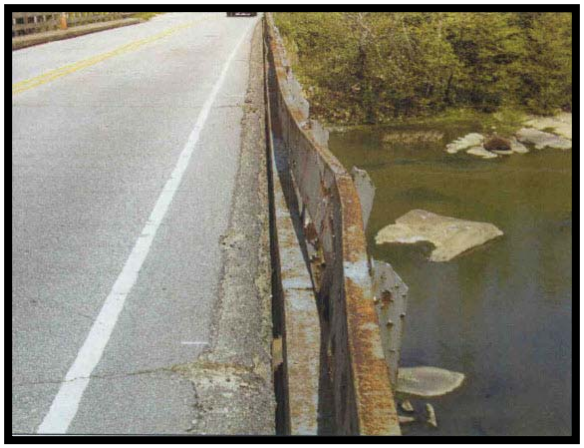
Bridge Management Comprehensive Strategy

- Bridge Preservation
  - For bridges in good to fair condition
- Bridge Rehabilitation
  - For bridges in fair to poor condition



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Bridge Preservation

- Painting Structural Steel
- Cleaning Bearings
- Repair and Replace Expansion Joints
- Apply Material to Slow Corrosion
- Waterproofing and Resurfacing Decks

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Bridge Rehabilitation

- Restore Bridge Components
- More Expensive than Preservation
- Cost Effective on some bridges

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Bridge Condition Survey Results

Bridges			Interstate		Primary		Secondary	
	ELEMENT	PERFORMANCE MEASURE	2010 Target	State Average Score	2010 Target	State Average Score	2010 Target	State Average Score
Bridge Deck	Concrete	% of decks rated greater than or equal to 6	**85**	85	**80**	79	**75**	84
	Timber		**85**	NA	**80**	86	**75**	88
	Steel Planks		**85**	NA	**80**	71	**75**	84
	Open Grid Steel		**85**	NA	**80**	50	**75**	33
Superstructure	Concrete	% of superstructure rated greater than or equal to 6	**90**	81	**85**	60	**80**	65
	Steel		**90**	89	**85**	82	**80**	81
	P/S Concrete		**90**	96	**85**	95	**80**	94
	Timber		**90**	NA	**85**	43	**80**	69
Substructure	Timber	% of substructure rated greater than or equal to 6	**90**	NA	**85**	40	**80**	42
	Concrete Pile		**90**	80	**85**	75	**80**	81
	Steel Pile		**90**	91	**85**	84	**80**	81
	Concrete Piers		**90**	91	**85**	81	**80**	82

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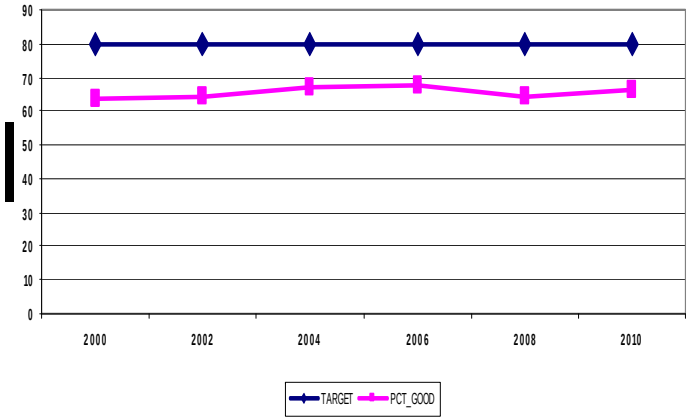
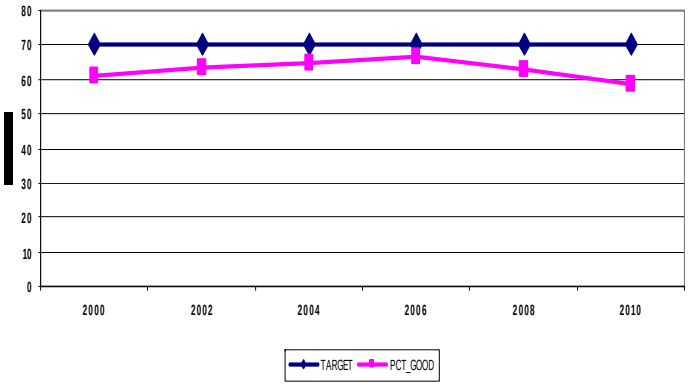
Bridge Condition 2000 – 2010

Interstate

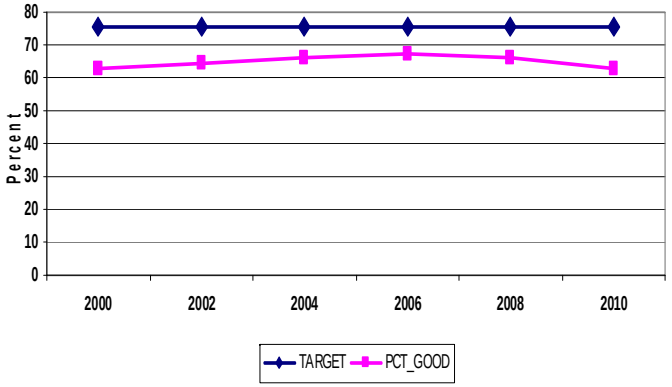
Primary



Secondary



All Systems



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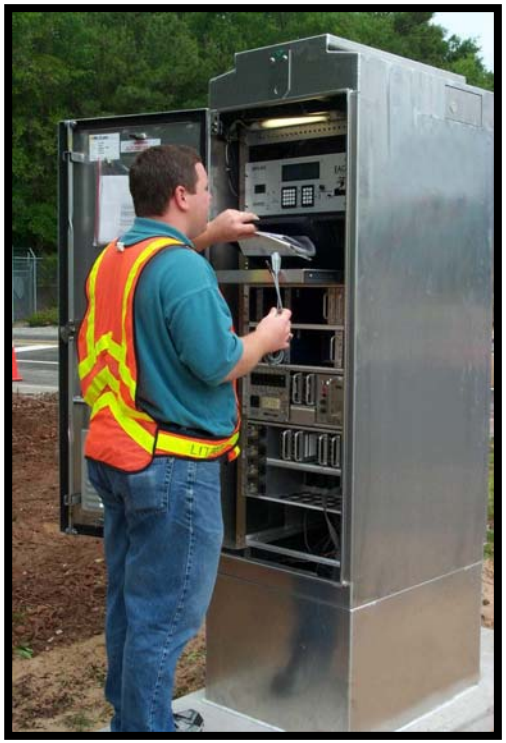
Highway Operations

8900 Traffic Signals Statewide

- Signal maintenance provides:
  - Improved safety
  - Reduction in delays
  - Reduced fuel consumption
  - Improved air quality



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Highway Operations

- Overhead dynamic message boards
- Camera systems
- Speed detection devices
- Motorist Assistance Patrol

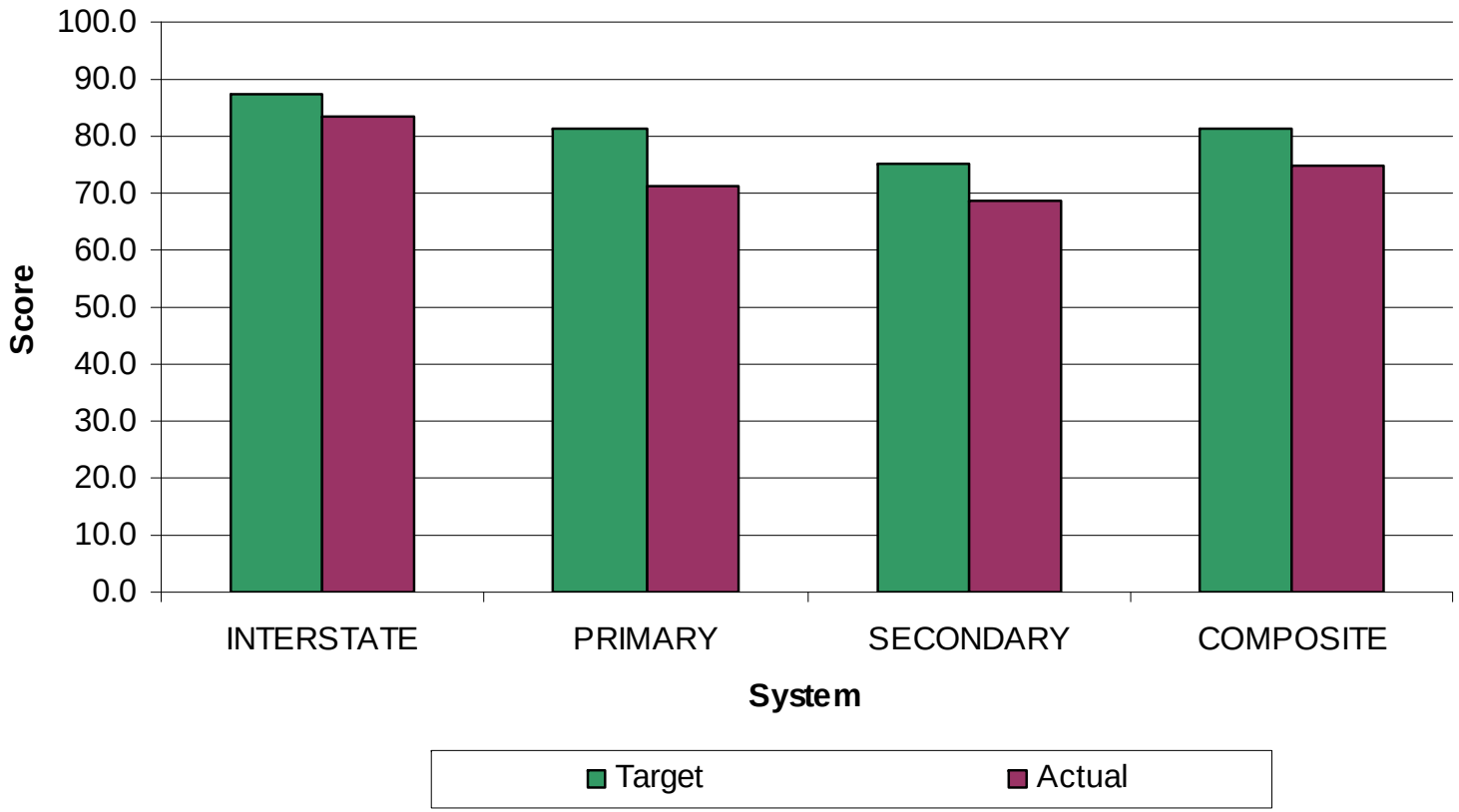
Infrastructure Health Index

- 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

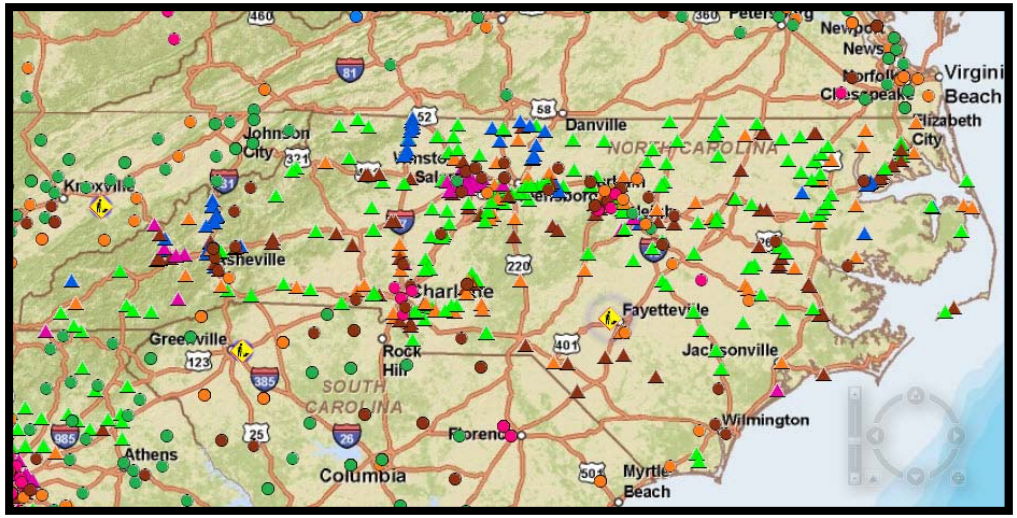
Infrastructure Health Index



American Reinvestment & Recovery Act of 2009 (ARRA)

- $735 million for North Carolina Highways and bridges
- Required to obligate 50% of funds within 120 days
- Required to obligate remainder of funds within 1 year
- $584 million of projects affect roadway and bridge maintenance

Expended $393 million to date



Interstate Maintenance Preservation Program (IMPP)

- Strategy of cost effective treatments
- Designed to extend the life of bridges, pavements, and roadside features

Not intended to increase structural or traffic capacity $10 million per year

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Alternate Funding (millions)

TIP Funds

•Signal Preventive Maint. Program	$ 20.0
•Intelligent Trans. Sys./Incident Resp.	$ 18.0
•Positive Guidance	$ 6.0
•Bridge Preventive Maint. Program	$ 5.0
•Interstate Maintenance	$ 10.0
HB 1825 (Secondary Roads) estimate	$ 70.0
Total	**$ 129.0**

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Maintenance Operational Improvements

- 47% of M&O Expenditures spent in the private sector
- LED replacement for signal bulbs
- Signal preventive maintenance
- ITS (IMAP) initiatives
- DOC litter pickup program
- Winter anti-icing operations
- Low growing turf

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Maintenance Funding Needs
FY 2011-2012 (millions)

	Needs
• Maintenance Operations	$ 814.6
• Disasters	$ 15.0
• Contract Resurfacing	$ 330.0
• Pavement and Bridge Preservation	$ 233.2
Total Maintenance and Preserv. Needs	**$1,392.9**
Alternate Maintenance Funds	- $ 129.0
Adjusted Maintenance Funding Needs	**$1,263.9**
System Rehabilitation Needs	**$ 340.0**

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Statewide Annual Maintenance Funding Plan

Fiscal Year ($ millions)					
Maintenance Programs	**2011-2012**	**2012-2013**	**2013-2014**	**2014-2015**	**2015-2016**
Maintenance and Operations	814.61	845.67	880.15	916.01	953.41
Disasters/Emergencies	15.00	15.00	15.00	15.00	15.00
Contract Resurfacing	330.00	343.86	358.30	373.35	389.03
Pavement and Bridge Preserv	233.24	243.04	253.24	263.88	274.96
Total Maint. Funding Needed	**1,392.85**	**1,447.57**	**1,506.69**	**1,568.24**	**1,632.40**
Supplemental Maint. Funds	129.00	129.00	129.00	129.00	129.00
Estimated Maint. Fund Allocation	933.55	933.55	933.55	933.55	933.55
Shortfall	***(330.30)***	***(385.02)***	***(444.14)***	***(505.69)***	***(569.85)***

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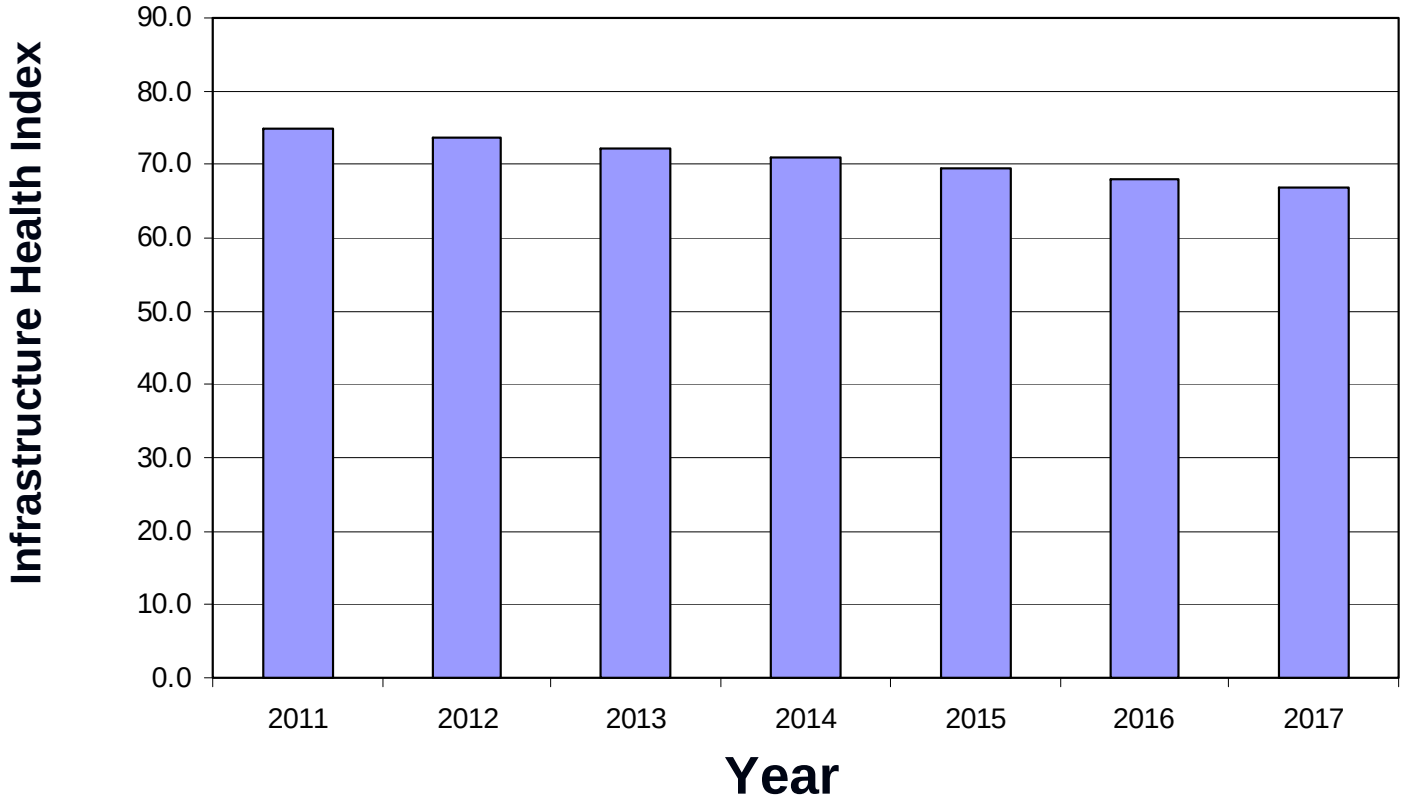
LOS at Current Funding Level



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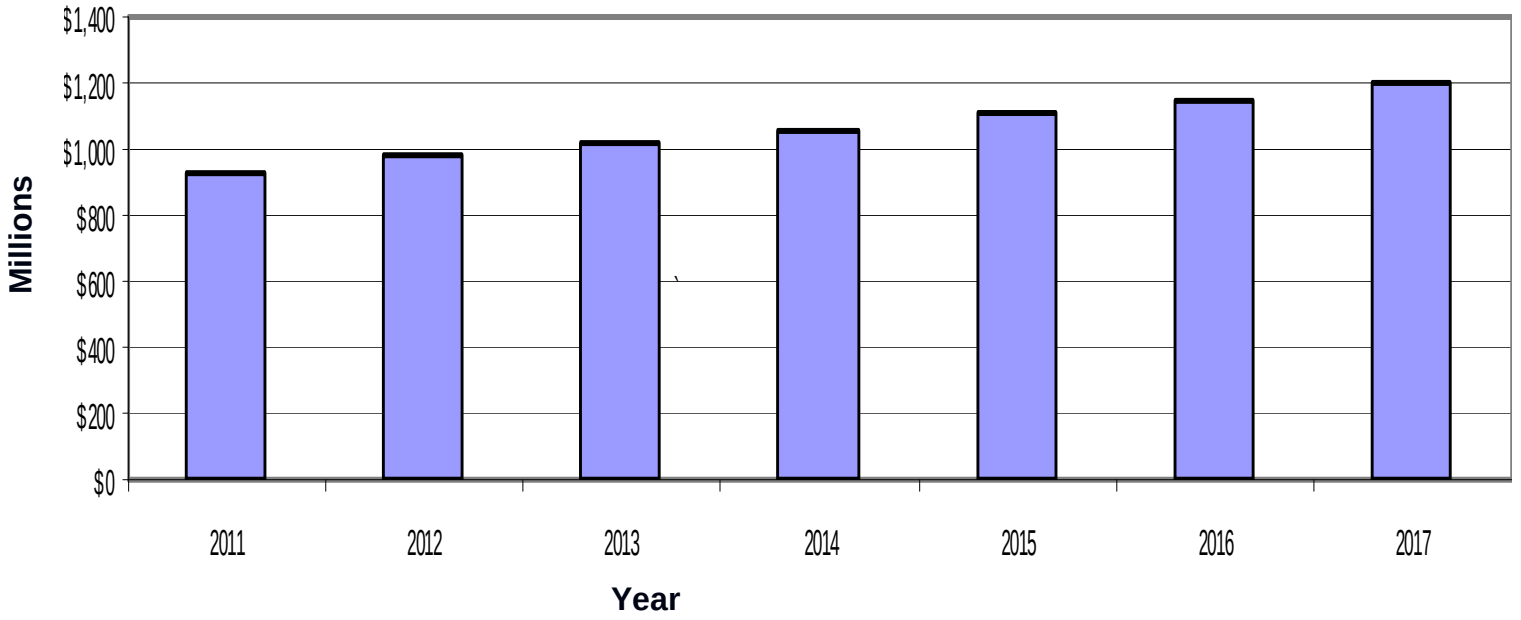
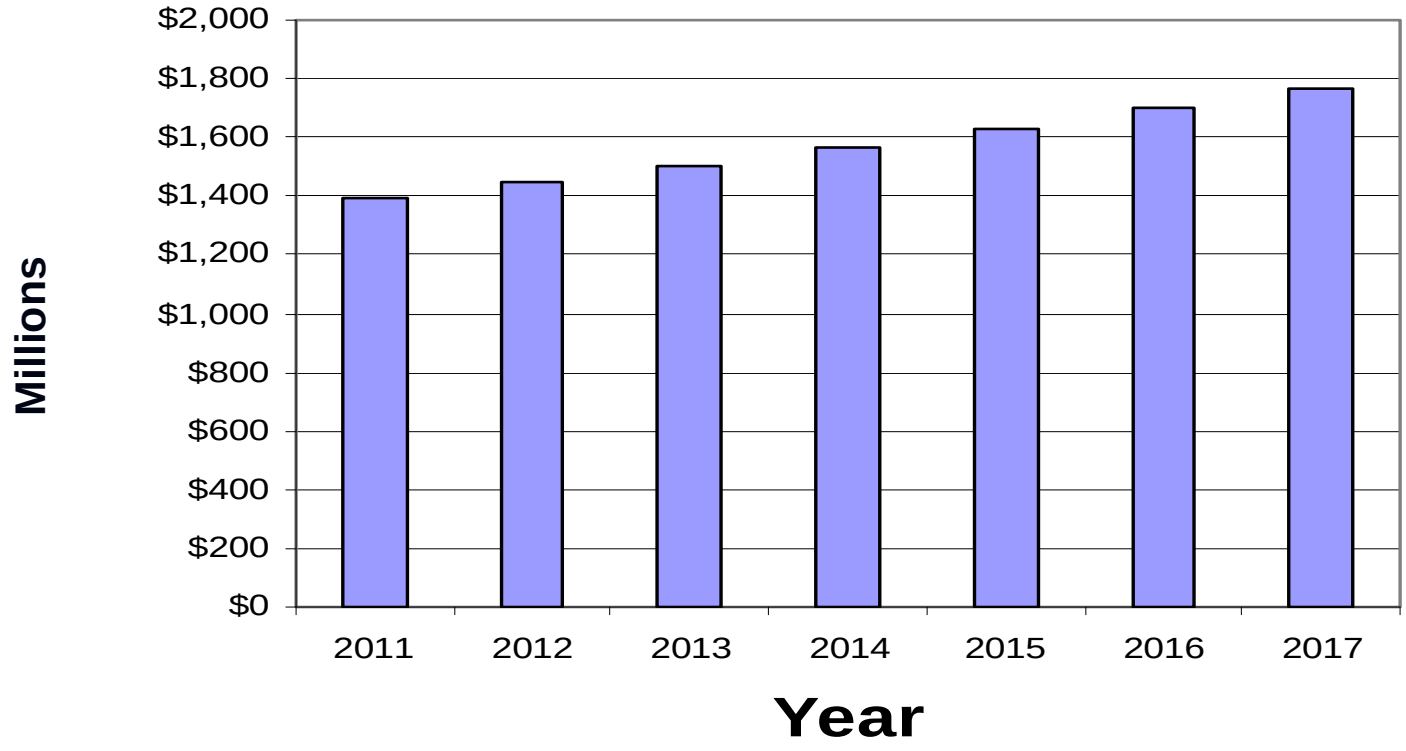
Estimated Dollars to Maintain Current LOS



Funding Needed to Meet Target LOS



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Questions?