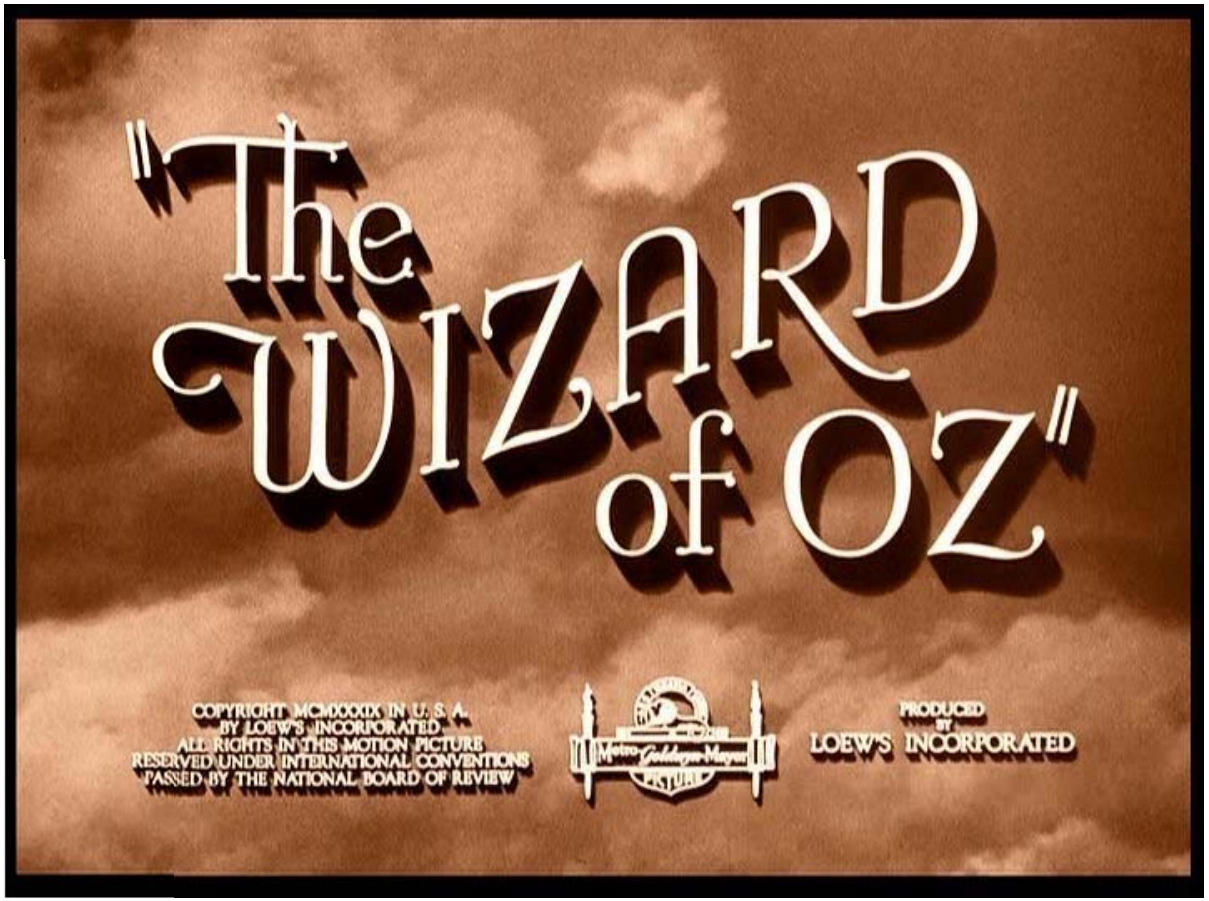
North Carolina
DEPARTMENT OF TRANSPORTATION

NCDOT's Yellow Brick Road
Experience with Performance Based Budgeting

Jennifer Brandenburg, PE
State Asset Manager

August 26, 2014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Outline

NCDOT: Surveying the Land of Oz

Building the Yellow Brick Road

Assessing the Yellow Brick Road

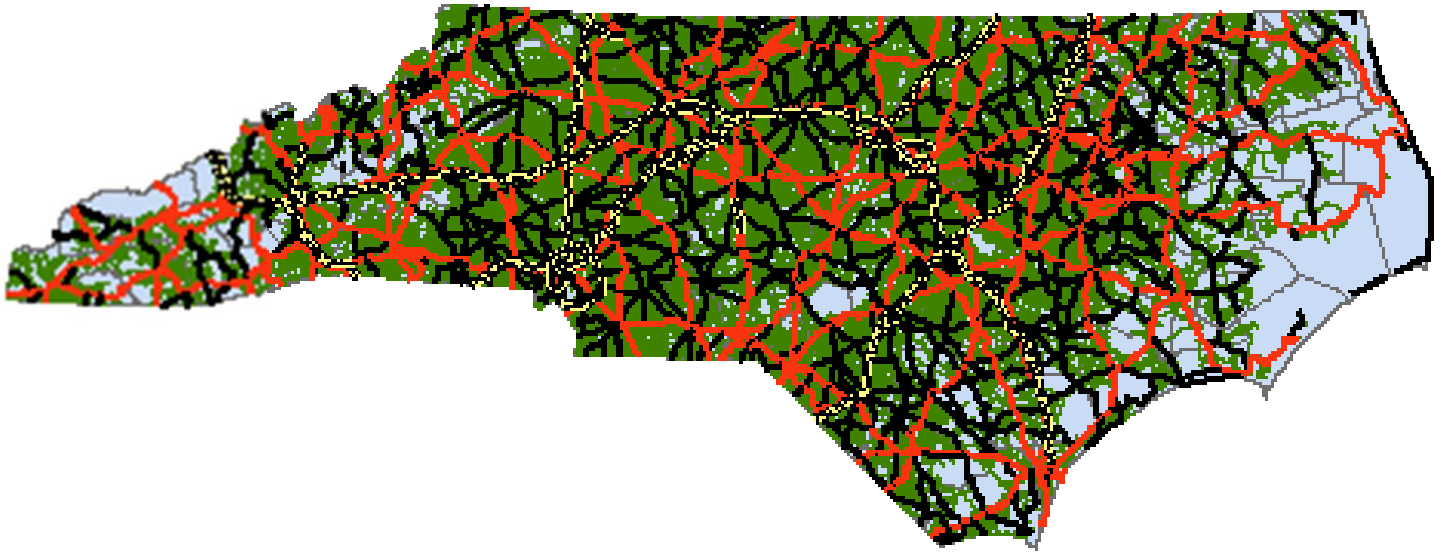
Managing the Yellow Brick Road

Convincing the Wizard to Help

NC State Highway System

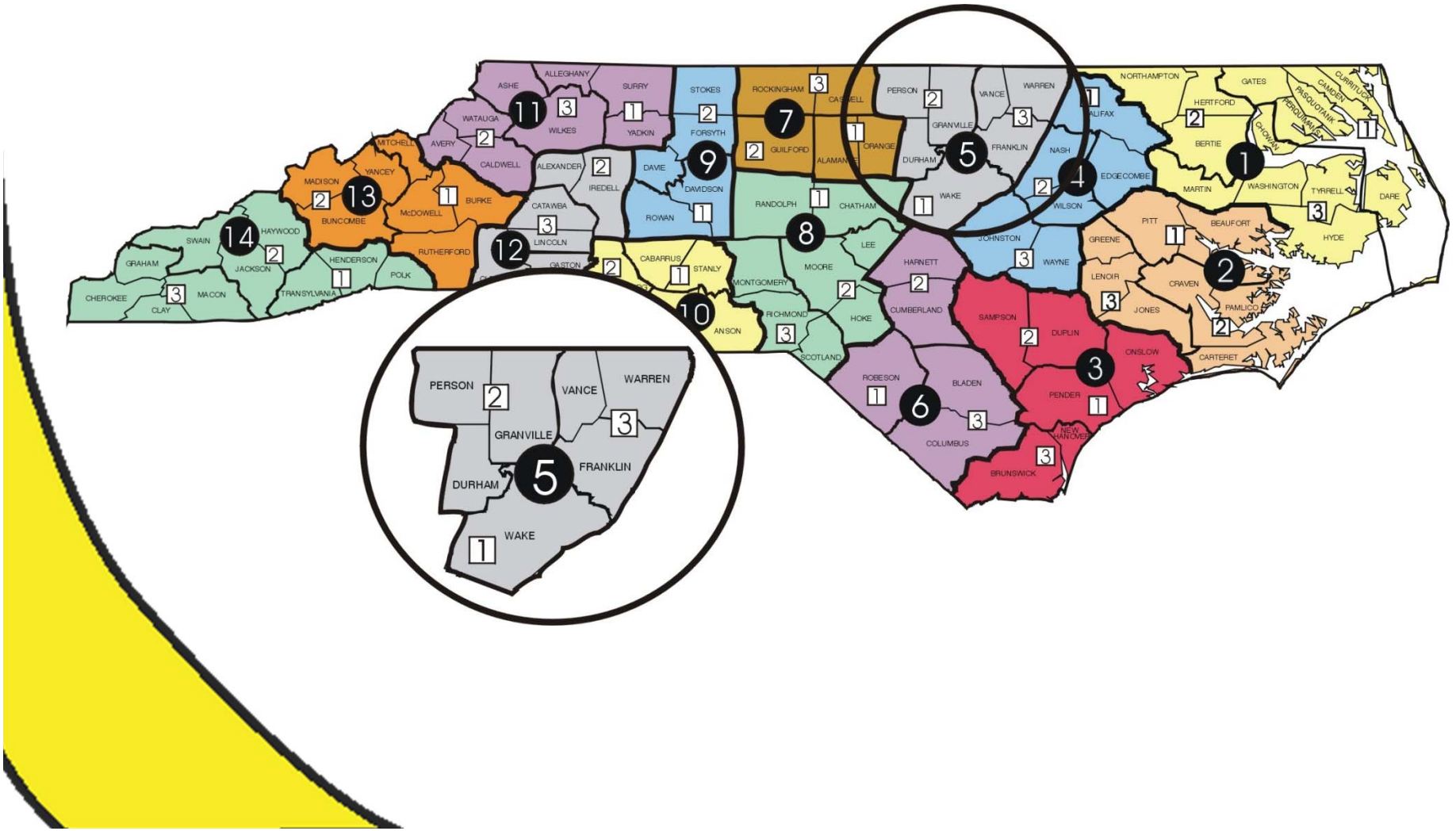
- 79,578 road miles
- 163,176 paved lane miles
- 4,251 miles of unpaved roads
- 18,048 structures
- 95.1 M sf bridge deck area

All NCDOT Maintained

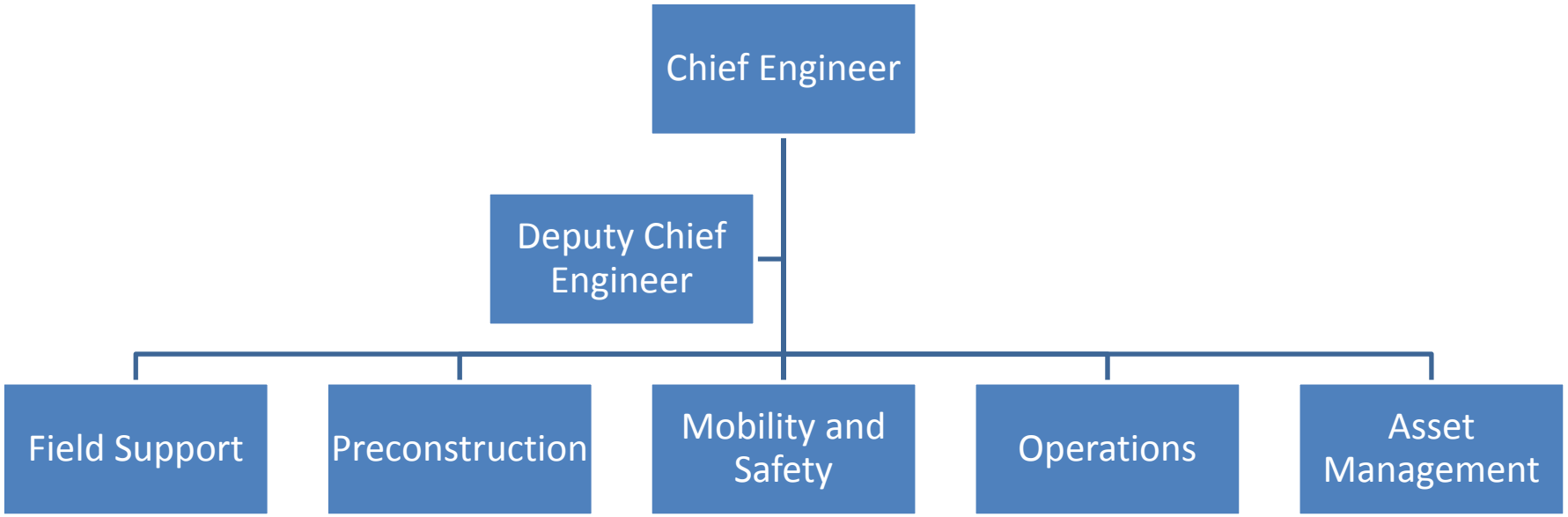


79,578 Road Miles

NCDOT Field Organization



NCDOT Central Organization



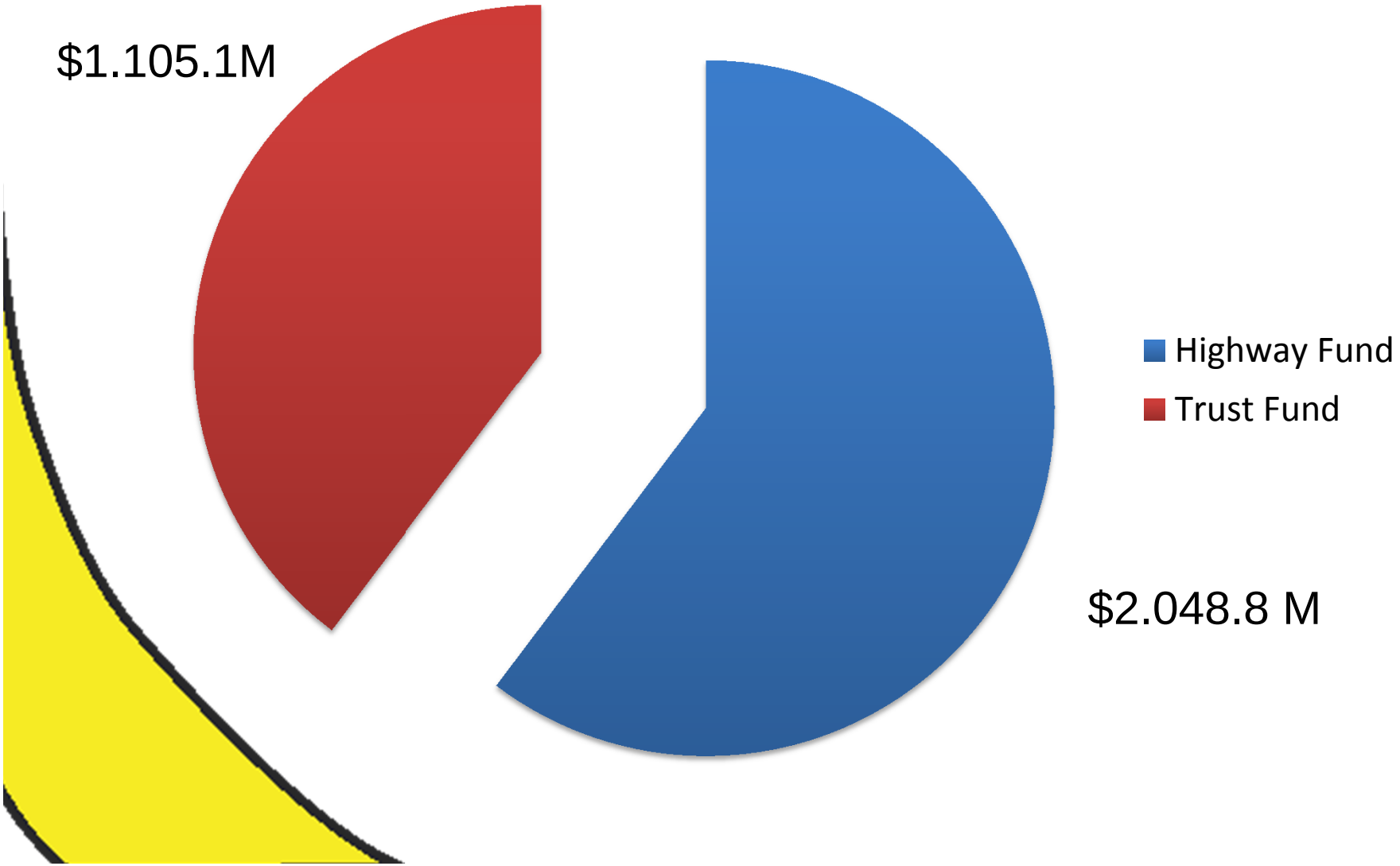
NCDOT Central Organization

- Asset Management Division
  - Fleet and Materials Management
  - Management Systems and Assessments
  - Pavement Management
  - State Maintenance Operations
- Purpose
  - Assist Central HQ in the oversight and implementation of statewide programs
  - Provide technical support for the 14 divisions in their daily operations
  - Guide the Agency in the implementation of asset management principles

Outline

Building
the
Yellow
Brick
Road

Total Funding Distribution



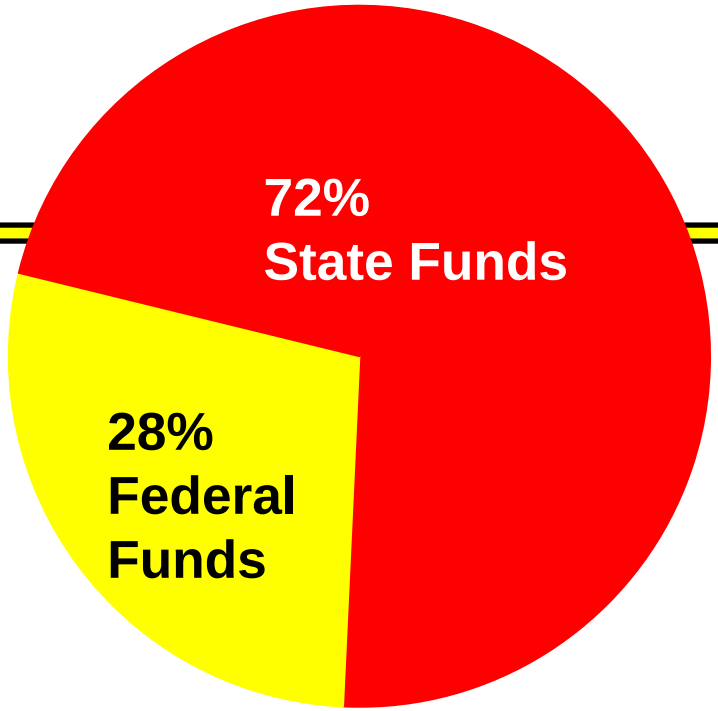
NCDOT Funding

Motor Fuel Tax 60%

Highway Use Tax 15%

Fees 25%

State Funding



Federal Funding

Motor Fuel Tax 92%

Fees 8%

Strategic Transportation Framework

40% of Funds = $6B	30% of Funds = $4.5B	30% of Funds = $4.5B

Estimated $15B in Funds for SFY 2016-2025

Statewide Mobility

Focus → Address Significant Congestion and Bottlenecks

Eligible Projects
- Statewide type Projects (such as Interstates)

- Selection based on 100% Data
- Projects Programmed prior to Local Input Ranking

Regional Impact

Focus → Improve Connectivity within Regions

Eligible Projects
- Projects Not Selected in Statewide Mobility Category
- Regional Projects

- Selection based on 70% Data & 30% Local Input
- Funding based on population within Region

Division Needs

Focus → Address Local Needs

Eligible Projects
- Projects Not Selected in Statewide or Regional Categories
- Division Projects

- Selection based on 50% Data & 50% Local Input
- Funding based on equal share for each Division = ~$32M per yr.

Outline

Assessing the Yellow Brick Road

Counting the Bricks

Inventory

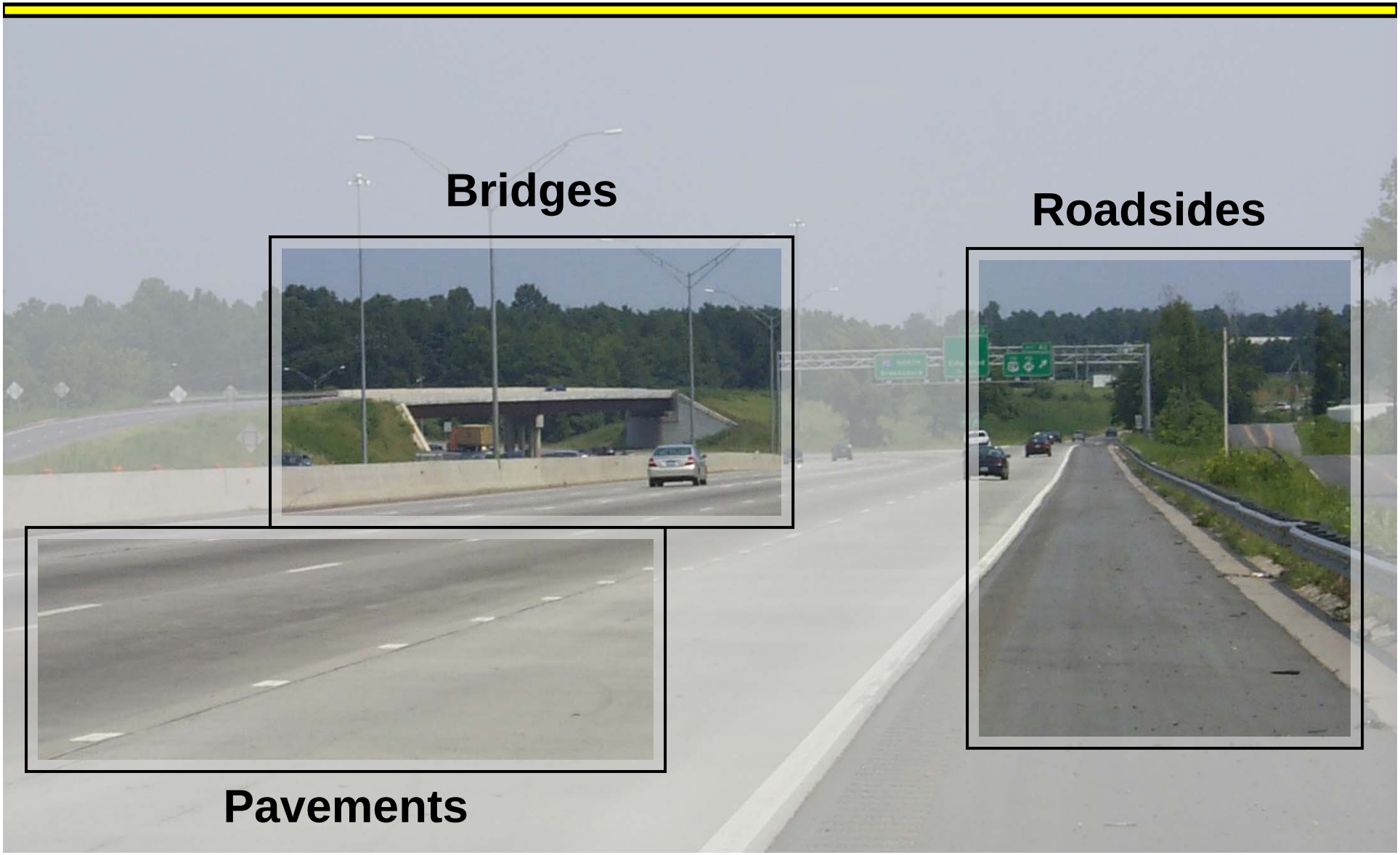
- Pavements
- Bridges

Survey

- Roadside appurtenances
- Safety features
- Drainage elements

One…Two…Three…

Measuring Performance

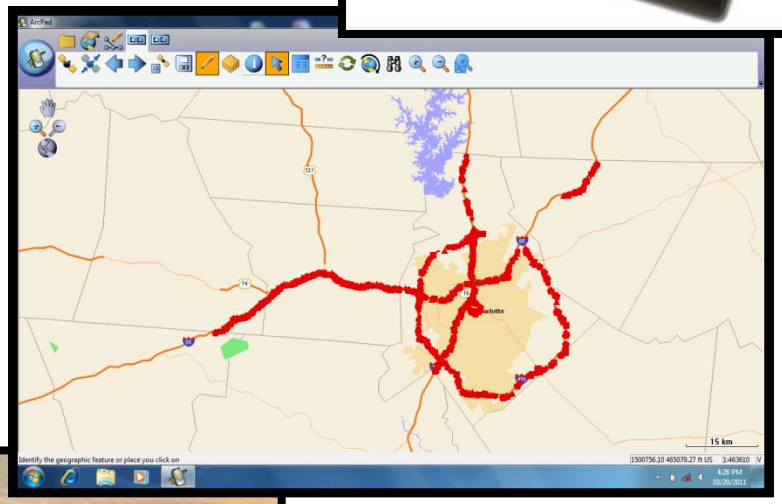


What We Don’t Measure

- Mowing
- Litter
- Fences
- Incident Response
- Snow & Ice

Technology

- Mobile data collection
- GIS enabled database
- Handheld devices
- ArcMap routing
- Cameras

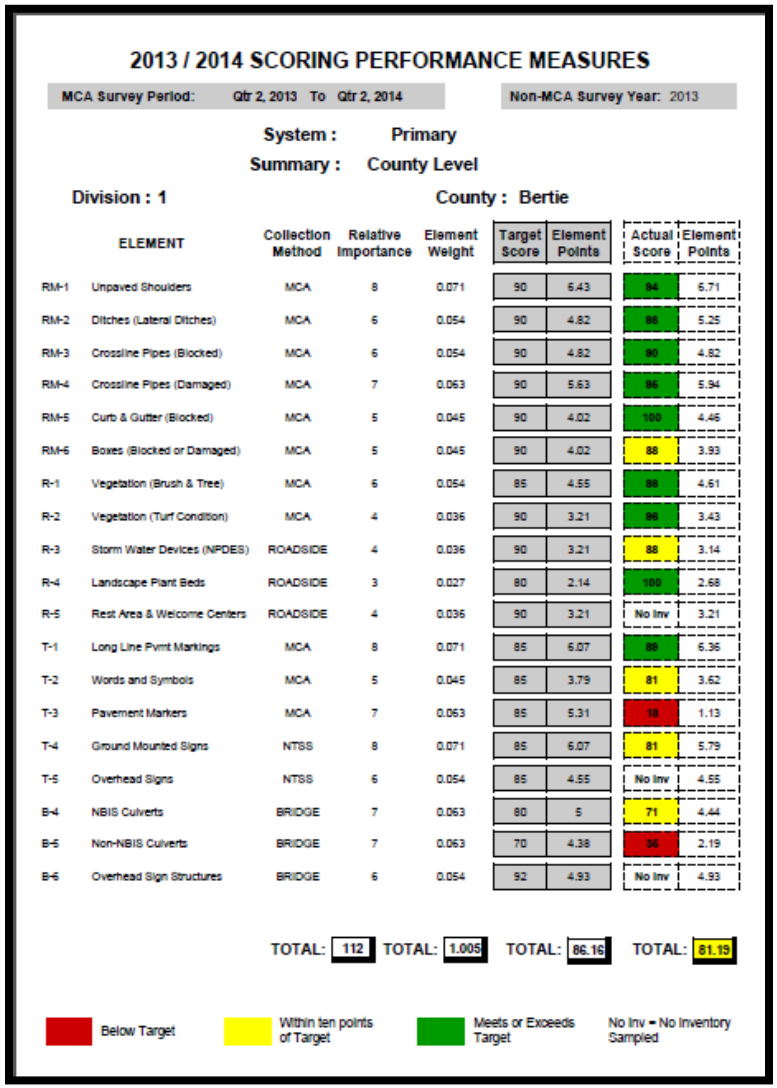


Outline

Managing the Yellow Brick Road

Reporting The Data (Scorecards)

- Statewide for all three systems
- Division level for interstate
- County level for primary and secondary
- Produced by the maintenance management system



2013 / 2014 SCORING PERFORMANCE MEASURES

MCA Survey Period: Qtr 2, 2013 To Qtr 2, 2014 — Non-MCA Survey Year: 2013

System : Primary
Summary : County Level

Division : 1 — County : Bertie

	ELEMENT	Collection Method	Relative Importance	Element Weight	Target Score	Element Points	Actual Score	Element Points
RM-1	Unpaved Shoulders	MCA	8	0.071	90	6.43	94	6.71
RM-2	Ditches (Lateral Ditches)	MCA	6	0.054	90	4.82	98	5.25
RM-3	Crossline Pipes (Blocked)	MCA	6	0.054	90	4.82	90	4.82
RM-4	Crossline Pipes (Damaged)	MCA	7	0.063	90	5.63	95	5.94
RM-5	Curb & Gutter (Blocked)	MCA	5	0.045	90	4.02	100	4.46
RM-6	Boxes (Blocked or Damaged)	MCA	5	0.045	90	4.02	88	3.93
R-1	Vegetation (Brush & Tree)	MCA	6	0.054	85	4.55	86	4.61
R-2	Vegetation (Turf Condition)	MCA	4	0.036	90	3.21	96	3.43
R-3	Storm Water Devices (NPDES)	ROADSIDE	4	0.036	90	3.21	88	3.14
R-4	Landscape Plant Beds	ROADSIDE	3	0.027	80	2.14	100	2.68
R-5	Rest Area & Welcome Centers	ROADSIDE	4	0.036	90	3.21	No Inv	3.21
T-1	Long Line Pvmt Markings	MCA	8	0.071	85	6.07	88	6.36
T-2	Words and Symbols	MCA	5	0.045	85	3.79	81	3.62
T-3	Pavement Markers	MCA	7	0.063	85	5.31	18	1.13
T-4	Ground Mounted Signs	NTSS	8	0.071	85	6.07	81	5.79
T-5	Overhead Signs	NTSS	6	0.054	85	4.55	No Inv	4.55
B-4	NBIS Culverts	BRIDGE	7	0.063	80	5	71	4.44
B-5	Non-NBIS Culverts	BRIDGE	7	0.063	70	4.38	35	2.19
B-6	Overhead Sign Structures	BRIDGE	6	0.054	92	4.93	No Inv	4.93

TOTAL: 112 TOTAL: 1.005 TOTAL: 86.16 TOTAL: 81.19

Below Target — Within ten points of Target — Meets or Exceeds Target — No Inv = No Inventory Sampled

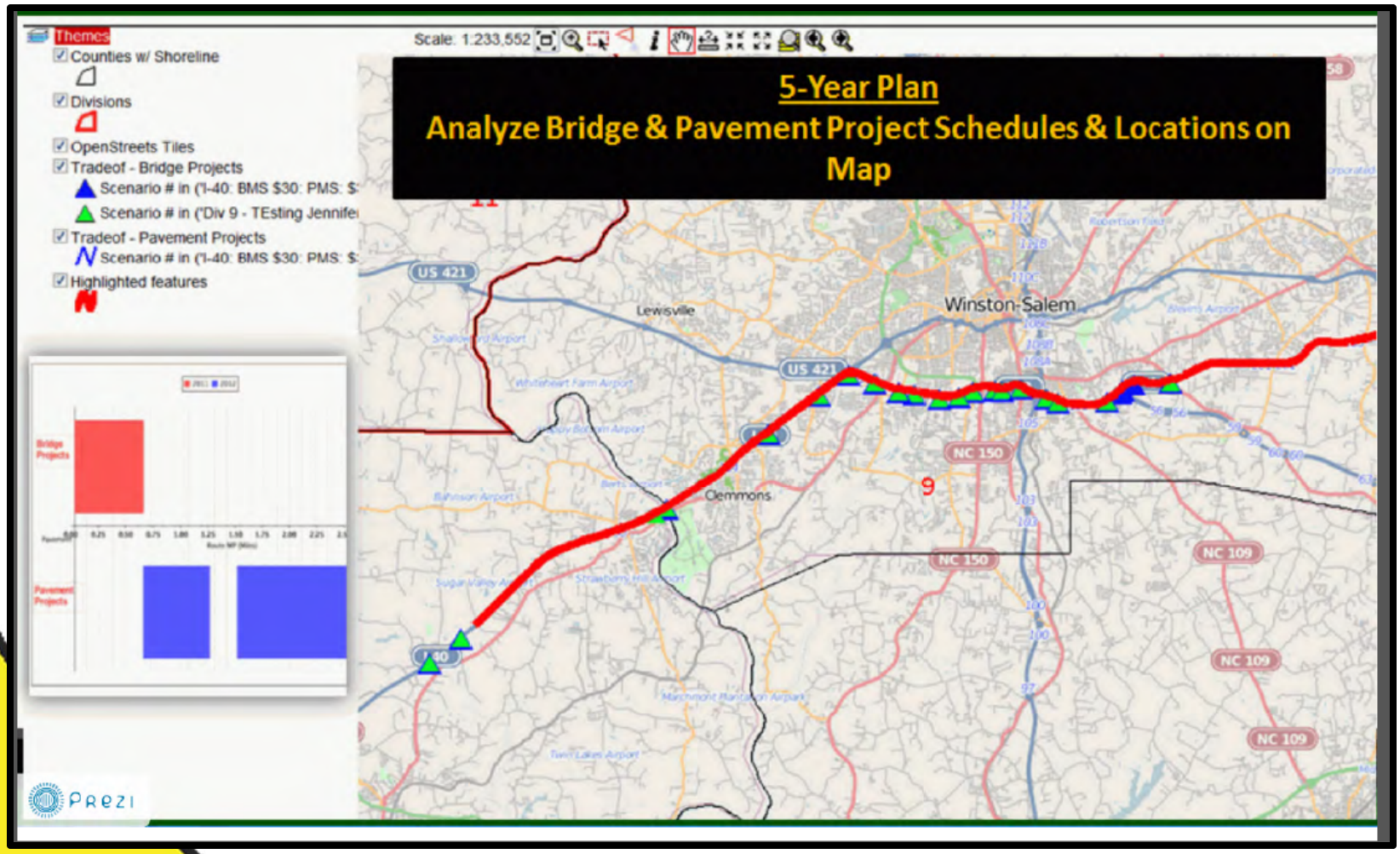
Reporting The Data

(Infrastructure Health Index)

STATEWIDE – ALL SYSTEMS
EXISTING INFRASTRUCTURE HEALTH WEIGHTED BY VMT (80% AND LM (20%)

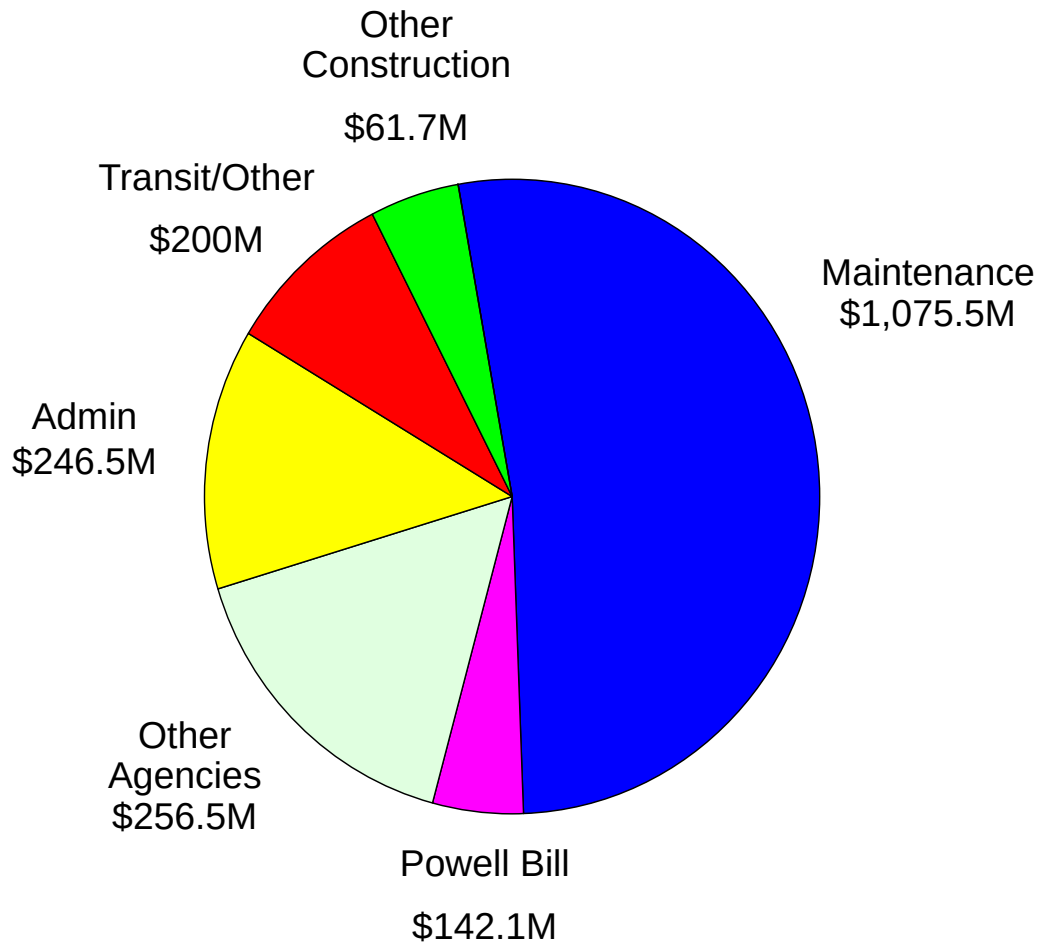
				PAVEMENTS			MCA			BRIDGE HEALTH INDEX				TOTAL IHCS EXISTING	
				WEIGHT VALUE		40	WEIGHT VALUE		25	WEIGHT VALUE			35		
	80%	20%	WEIGHTED			OVERALL			OVERALL	ALL	EXIST		OVERALL		
SYSTEM	VMT %	LANE MI	FACTOR	% GOOD	LMG	SCORE	SCORE	LMS	SCORE	# BRIDGES	CR>=6	BHCI	SCORE	LOS	SCORE
INTERSTATE	45	5,038	36.59	84.9%	4,277	31.06	89.79	4,524	32.85	909	723	79.5%	29.10	B	**84.2**
PRIMARY	30	35,640	28.15	66.1%	23,558	18.61	86.41	30,797	24.32	4,199	2,796	66.6%	18.74	D	**71.3**
SECONDARY	25	131,074	35.26	67.5%	88,475	23.80	85.04	111,466	29.99	8,490	4,989	58.8%	20.72	D	**68.8**
TOTAL		171,752				**73.47**			**87.17**	13,598	8,508	**62.6%**	68.57		
COMPOSITE VALUES						**29.4**			**21.8**				**24.0**	C	**75.2**

Comparative Analysis of Strategies

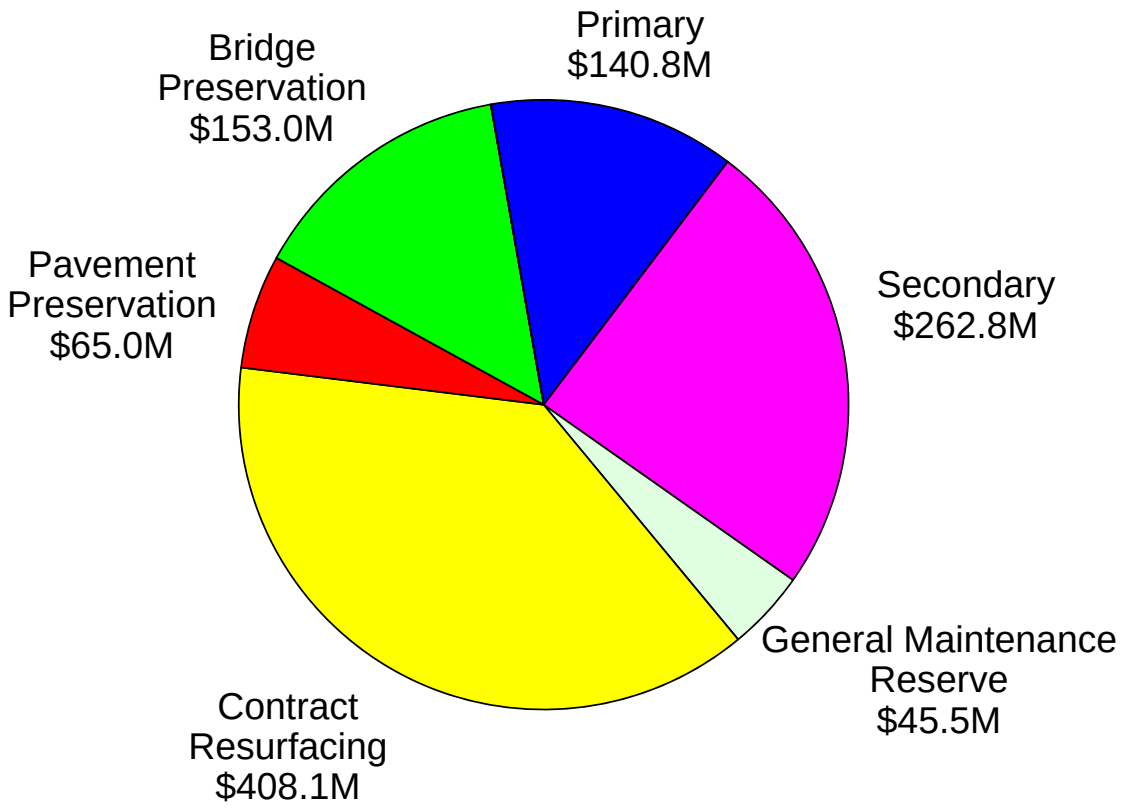


Managing all the “Roads”

(Highway Fund)



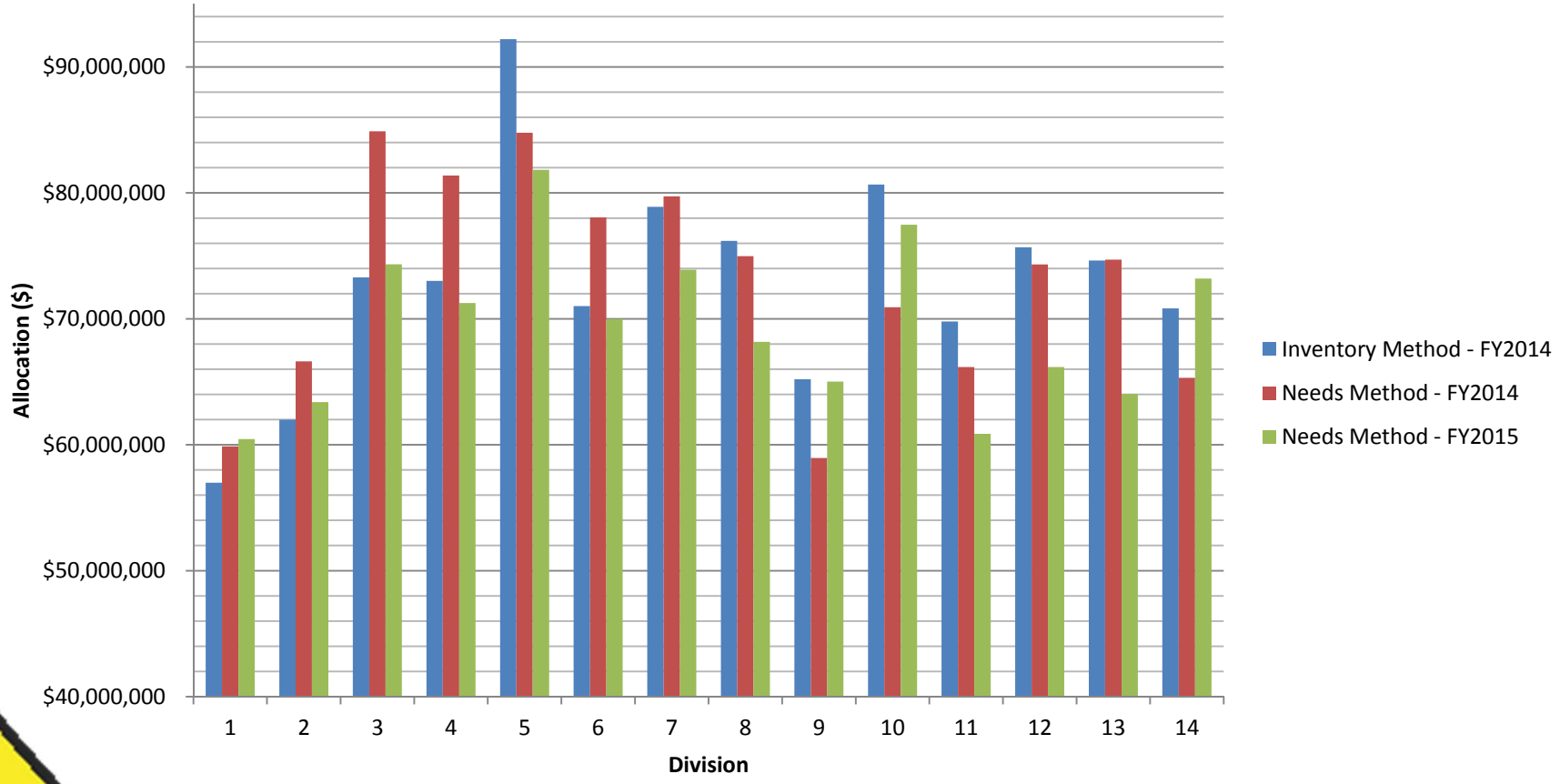
Managing the Yellow Brick Road



Needs-Based Maintenance Allocations

- 100% needs based methodology
- Replaced inventory based method
- Determined funds needed to achieve target LOS or provide routine services
- 3 categories of needs:
  - Assessed
  - Non-assessed
  - Emergency & administration

Impacts of Needs-Based Budgeting



Purpose of Maintenance Allocation Changes

- Data driven decision making
- Targeted Levels of Service
- Better accountability
- Most efficient use of maintenance funds
- Shift resources to better serve the public need

Lessons Learned

- Analysis tools are good
- Shifted funds between areas in some unexpected ways
- Decision trees need to be “tweaked”
- Need to better account for administrative costs
- Like software, this is an iterative process

Outline

Convincing
The
Wizard
To
Help

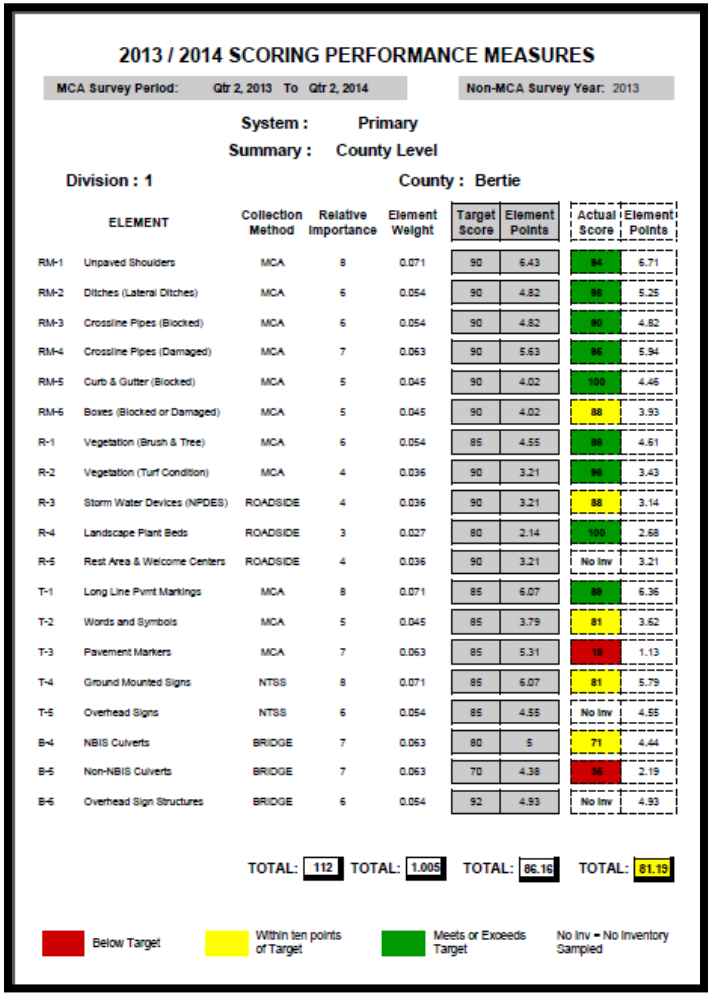
Our “Wizard(s) of Oz”

Governor
Legislature
Transportation Oversight
Board of Transportation
Public

Appearance is Everything…

Accountability (Operational Level)

- Ties funding to performance
- Aides Divisions in setting goals
- Ties to employee performance
    - Outcomes reported quarterly



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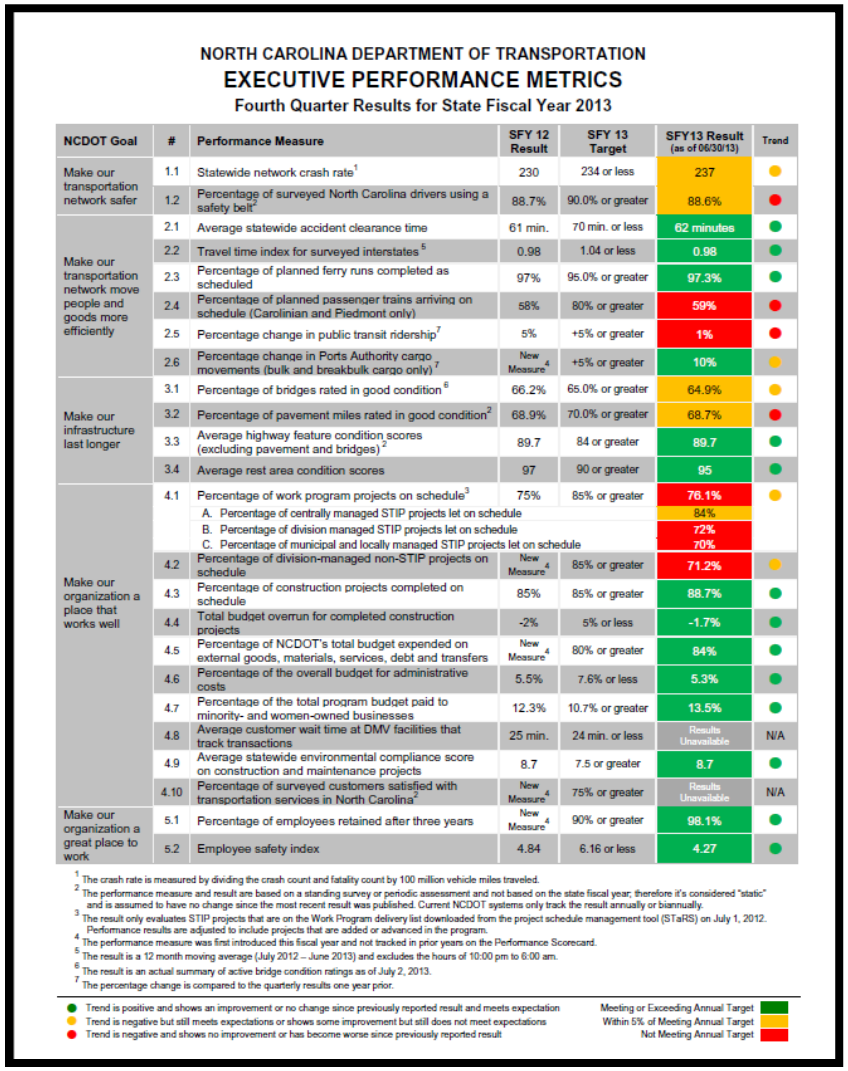
Accountability (Executive Level)

- High level outcome based performance measures
- Indicators of agency success
- Established annually
  - Tracked/reported quarterly



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

EXECUTIVE PERFORMANCE METRICS

Fourth Quarter Results for State Fiscal Year 2013

NCDOT Goal	#	Performance Measure	SFY 12 Result	SFY 13 Target	SFY13 Result (as of 06/30/13)	Trend
Make our transportation network safer	1.1	Statewide network crash rate[1]	230	234 or less	237	●
	1.2	Percentage of surveyed North Carolina drivers using a safety belt[2]	88.7%	90.0% or greater	88.6%	●
Make our transportation network move people and goods more efficiently	2.1	Average statewide accident clearance time	61 min.	70 min. or less	62 minutes	●
	2.2	Travel time index for surveyed interstates[5]	0.98	1.04 or less	0.98	●
	2.3	Percentage of planned ferry runs completed as scheduled	97%	95.0% or greater	97.3%	●
	2.4	Percentage of planned passenger trains arriving on schedule (Carolinian and Piedmont only)	58%	80% or greater	59%	●
	2.5	Percentage change in public transit ridership[7]	5%	+5% or greater	1%	●
	2.6	Percentage change in Ports Authority cargo movements (bulk and breakbulk cargo only)[7]	New Measure[4]	+5% or greater	10%	●
Make our infrastructure last longer	3.1	Percentage of bridges rated in good condition[6]	66.2%	65.0% or greater	64.9%	●
	3.2	Percentage of pavement miles rated in good condition[2]	68.9%	70.0% or greater	68.7%	●
	3.3	Average highway feature condition scores (excluding pavement and bridges)[2]	89.7	84 or greater	89.7	●
	3.4	Average rest area condition scores	97	90 or greater	95	●
Make our organization a place that works well	4.1	Percentage of work program projects on schedule[3]	75%	85% or greater	76.1%	●
		A. Percentage of centrally managed STIP projects let on schedule			84%	
		B. Percentage of division managed STIP projects let on schedule			72%	
		C. Percentage of municipal and locally managed STIP projects let on schedule			70%	
	4.2	Percentage of division-managed non-STIP projects on schedule	New Measure[4]	85% or greater	71.2%	●
	4.3	Percentage of construction projects completed on schedule	85%	85% or greater	88.7%	●
	4.4	Total budget overrun for completed construction projects	-2%	5% or less	-1.7%	●
	4.5	Percentage of NCDOT's total budget expended on external goods, materials, services, debt and transfers	New Measure[4]	80% or greater	84%	●
	4.6	Percentage of the overall budget for administrative costs	5.5%	7.6% or less	5.3%	●
	4.7	Percentage of the total program budget paid to minority- and women-owned businesses	12.3%	10.7% or greater	13.5%	●
	4.8	Average customer wait time at DMV facilities that track transactions	25 min.	24 min. or less	Results Unavailable	N/A
	4.9	Average statewide environmental compliance score on construction and maintenance projects	8.7	7.5 or greater	8.7	●
	4.10	Percentage of surveyed customers satisfied with transportation services in North Carolina[2]	New Measure[4]	75% or greater	Results Unavailable	N/A
Make our organization a great place to work	5.1	Percentage of employees retained after three years	New Measure[4]	90% or greater	98.1%	●
	5.2	Employee safety index	4.84	6.16 or less	4.27	●

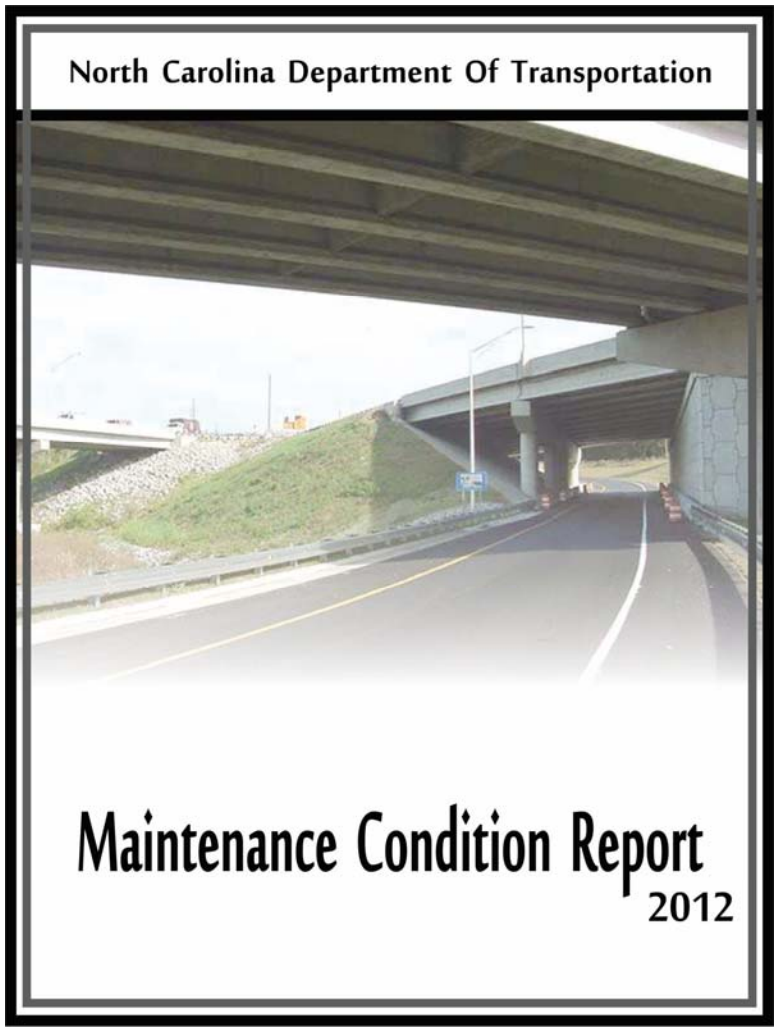
[1] The crash rate is measured by dividing the crash count and fatality count by 100 million vehicle miles traveled.
[2] The performance measure and result are based on a standing survey or periodic assessment and not based on the state fiscal year; therefore it's considered "static" and is assumed to have no change since the most recent result was published. Current NCDOT systems only track the result annually or biannually.
[3] The result only evaluates STIP projects that are on the Work Program delivery list downloaded from the project schedule management tool (STaRS) on July 1, 2012. Performance results are adjusted to include projects that are added or advanced in the program.
[4] The performance measure was first introduced this fiscal year and not tracked in prior years on the Performance Scorecard.
[5] The result is a 12 month moving average (July 2012 – June 2013) and excludes the hours of 10:00 pm to 6:00 am.
[6] The result is an actual summary of active bridge condition ratings as of July 2, 2013.
[7] The percentage change is compared to the quarterly results one year prior.

● Trend is positive and shows an improvement or no change since previously reported result and meets expectation
● Trend is negative but still meets expectations or shows some improvement but still does not meet expectations
● Trend is negative and shows no improvement or has become worse since previously reported result

Meeting or Exceeding Annual Target
Within 5% of Meeting Annual Target
Not Meeting Annual Target

Accountability (Legislative Reporting)

- New and improved
- Broader scope
- Move operations forward



Traveling to Oz…

- Plotting a course
  - Unconstrained funding
  - Credibility with Legislature/leadership
  - Develop meaningful annual maintenance plans
  - Performance driven
  - Funding necessary to achieve a desired LOS

Questions