



PMS: A Decision Making Tool for Management at All Levels

Steve Varnedoe, PE
Chief Engineer, Operations
NCDOT



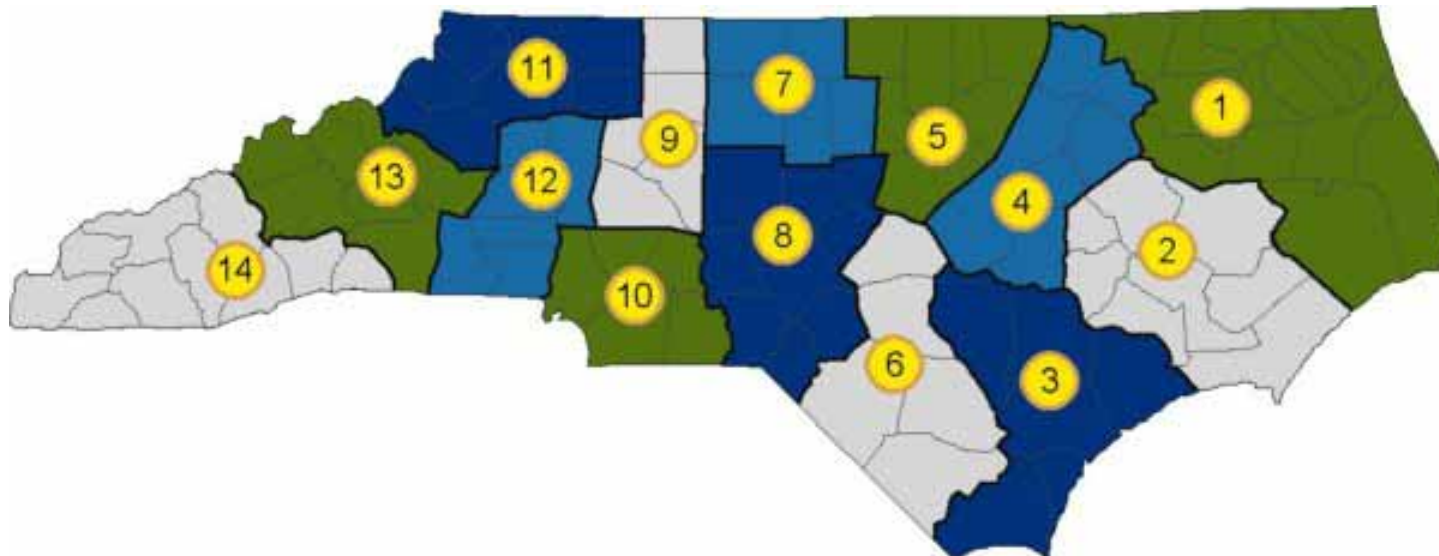
Outline of Presentation

- System Overview
- NCDOT's New Vision
- Performance Based Management
- A New PMS
- Network Level Decision Making
- Division Level Decision Making
- Local Decision Making
- Conclusions



NCDOT Overview

- North Carolina DOT is divided into 14 Divisions and 100 counties
- Diverse geography poses different challenges in the eastern and western halves of the state





Highway System Overview

Since the Highway Trust Fund was enacted:

1989

- 76,808 road miles
- 127,809 paved lane miles
- 16,104 miles of unpaved roads
- 16,900 structures
- 61.1 M sf bridge deck area

2005

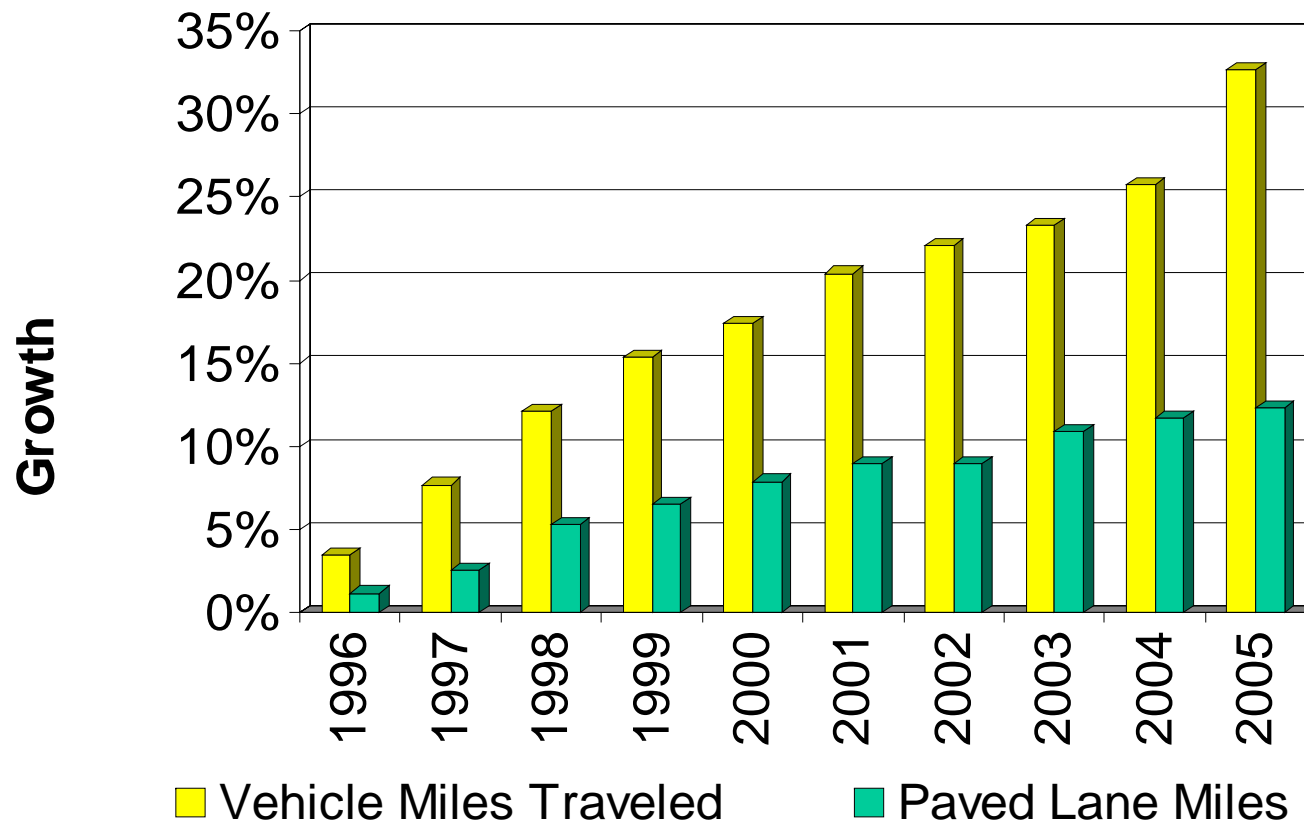
- 79,009 road miles
- 160,609 paved lane miles
- 5,536 miles of unpaved roads
- 17,848 structures
- 79.8 M sf bridge deck area

North Carolina State Highway System



Highway System Overview

Highway System Usage (Vehicle Miles Traveled)





Outline of Presentation

- System Overview
- **NCDOT's New Vision** 
- Performance Based Management
- A New PMS
- Network Level Decision Making
- Division Level Decision Making
- Local Decision Making
- Conclusions



NCDOT's New Vision is to...

■ Play a key role in the Improvement of North Carolina's logistics system by:

- Establishing statewide standards for mobility/asset condition/safety/program delivery - highly visible to stakeholders
- Adopting a systems operations management focus for the statewide tier network regarding travel reliability and safety
- Implementing system preservation programs to expand the infrastructure service life
- Increasing efficiency and operations performance through organization management
- Basing transportation funding on desired outcome consistent with Statewide Transportation Plan



NCDOT's New Vision is to...

Cooperate Extensively with Stakeholders for addressing their needs and securing funding for addressing local mobility challenges (support local option funding)

Promote a Statewide Logistics Plan that will:

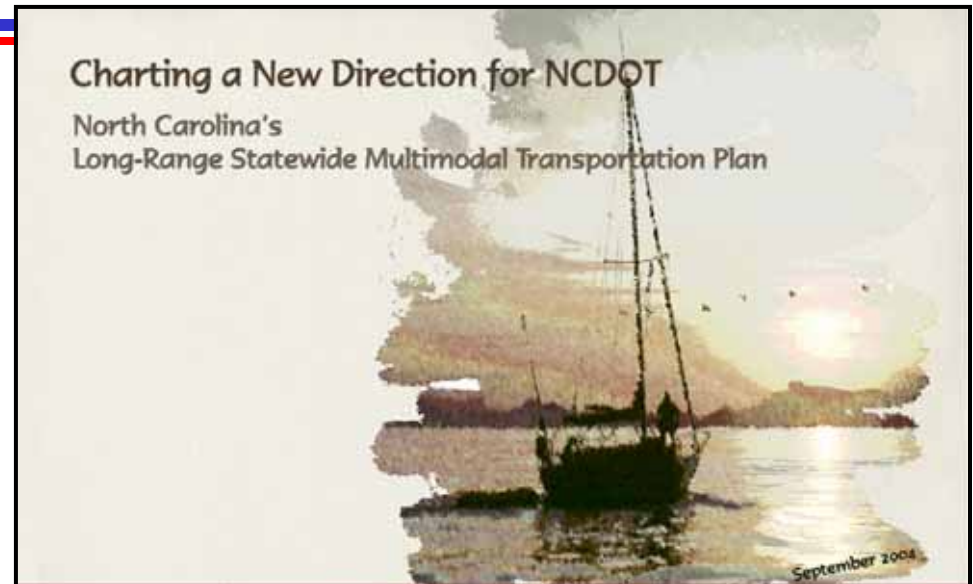
- Target investment of logistics systems with statewide significance
- Seek opportunities for private, public partnerships
- Leverage interagency leadership to mitigate conflicting cultures and priorities



Long-Range Statewide Transportation Plan

- Purpose

- Offers Policy Guidance & Strategic Direction for NCDOT
- Federally Mandated
- Inventory of 25-year Transportation Needs for all modes
- Forecast of Available Revenues
- Opportunity to Solicit Public & Stakeholder Interest
- Outlines Long-term Transportation Investment Priorities
- Blueprint for Asset Management





Long Range Statewide Transportation Plan

- Only meets 2/3 of all projected needs and underscores the need for investment flexibility (based on 2001 data - update underway)
 - Must optimize limited resources
 - Recognize differences in regions and usage patterns
- NCDOT is shifting focus toward System Preservation and Systems Operations and Management



Long Range Statewide Transportation Plan

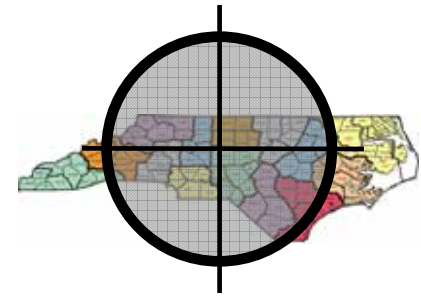
System Tiers

- **Statewide Tier**- Facilities such as Interstates and major Primary Highways. The 5,400 miles of designated Strategic Highway Corridors, which include existing and proposed interstates, account for only 7% of the State's Highway System, but carry nearly half of the traffic
- **Regional Tier** - Minor US and NC designated highways which make up the rest of the primary system. (approx. 9,400 miles)
- **Subregional Tier** - Generally Secondary Roads system (approx. 64,200 miles)



Outline of Presentation

- System Overview
- NCDOT's New Vision
- **Performance Based Management**
- A New PMS
- Network Level Decision Making
- Division Level Decision Making
- Local Decision Making
- Conclusions





Performance Based Management

- Move NCDOT from a reactive organization to an outcome based organization
- Clearly define mission and expectations for NCDOT and its employees
- Operational priorities consistent with Strategic Plan
- Use appropriate LOS measures for each tier as defined by the Strategic Plan
- Provide accessible tools (PMS/MMS etc) to monitor progress and outcomes
- Management flexibility with accountability



Performance Based Management

Key Focus Areas

- **Transportation Safety:** Improve the safety on the transportation network by reducing serious and fatal crashes
- **Program Delivery:** Deliver highway projects on schedule and within budget.
- **Mobility:** Address congestion through transportation system management initiatives, and provide a reliable and efficient transportation system.
- **Infrastructure Health:** Preserve the investment in the state's transportation infrastructure.



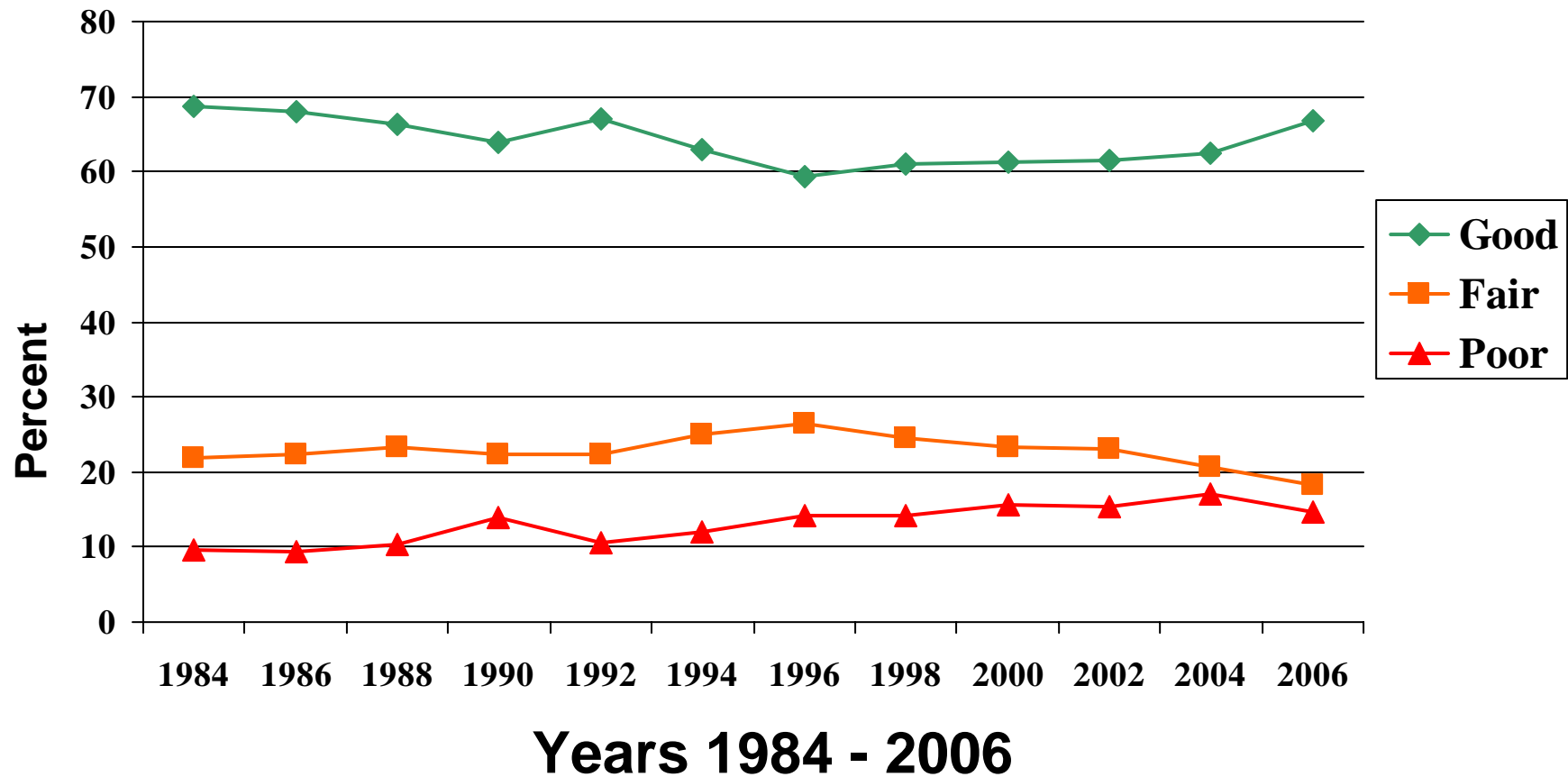
Performance Based Management

- Infrastructure Health:
 - Maintenance Condition
 - Bridge Condition
 - Pavement Condition





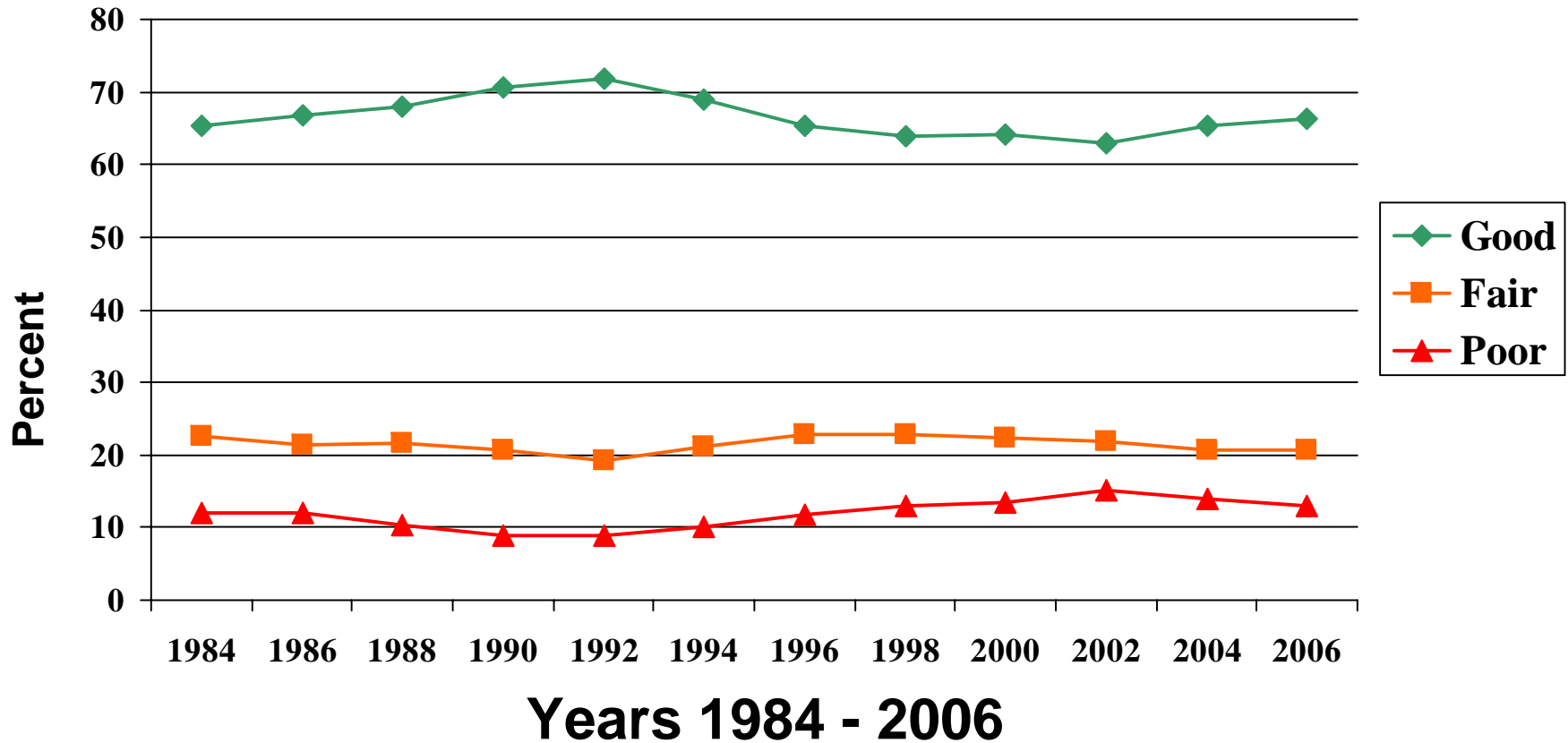
Primary Pavement Condition



Targets: Statewide Tier: 85% “good”
Regional Tier: 80% “good”



Secondary Pavement Condition



Target: Subregional Tier: 75% “good”



Performance Based Management

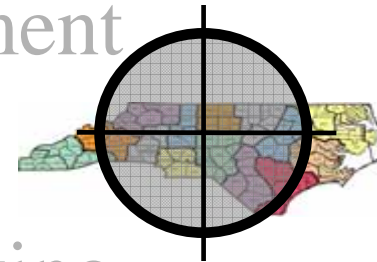
Performance Measures

Functional Work Group Worksheet							P-2
Element:	Pavement						
Asset:	Pavement (Structure or Quality)						
Activities:	Pavement Condition Rating						
Condition Indicator:	Pavement Condition Survey (PCS) Rating of 80 or lower						
Performance Measure:	Road Miles that meet Condition Indicator						
LOS Category		LOS Description					
A		No more than 5% of road miles meet condition indicator					
B		Road miles meeting condition indicator is between 5% and 15%					
C		Road miles meeting condition indicator is between 15% and 25%					
D		Road miles meeting condition indicator is between 25% and 40%					
F		Greater than 40% of the road miles meet the condition indicator					
<hr/>							
		Statewide	Regional	Subregional		Division	County
Performance Target		B	C	C		NA	NA
Assessment Method**		PCS	PCS	PCS		PCS	PCS
Does Assessment Data exist		Yes	Yes	Yes		Yes	Yes
Desired level of survey		Yes	Yes	Yes		Yes	Yes
Does Feature Inventory exist		Yes	Yes	Yes		Yes	Yes
Desired level of Feature Inventory		Yes	Yes	Yes		Yes	Yes
** Is inspection of joints and reflective cracking included?							



Outline of Presentation

- System Overview
- NCDOT's New Vision
- Performance Based Management
- **A New PMS**
- Network Level Decision Making
- Division Level Decision Making
- Local Decision Making
- Conclusions





A New PMS for NCDOT

- System “go live” is August 2007. Developed by Agile Assets.
- Project team included SME’s from central office and field
- PMS to be integrated with existing management systems (i.e. MMS - Maintenance Management System)
 - Statewide, strategic workplans can be created in PMS and those projects migrated to MMS
 - Completed projects in MMS can be “promoted” to the construction history of PMS
- PMS access to be available at all levels from county maintenance offices to central office

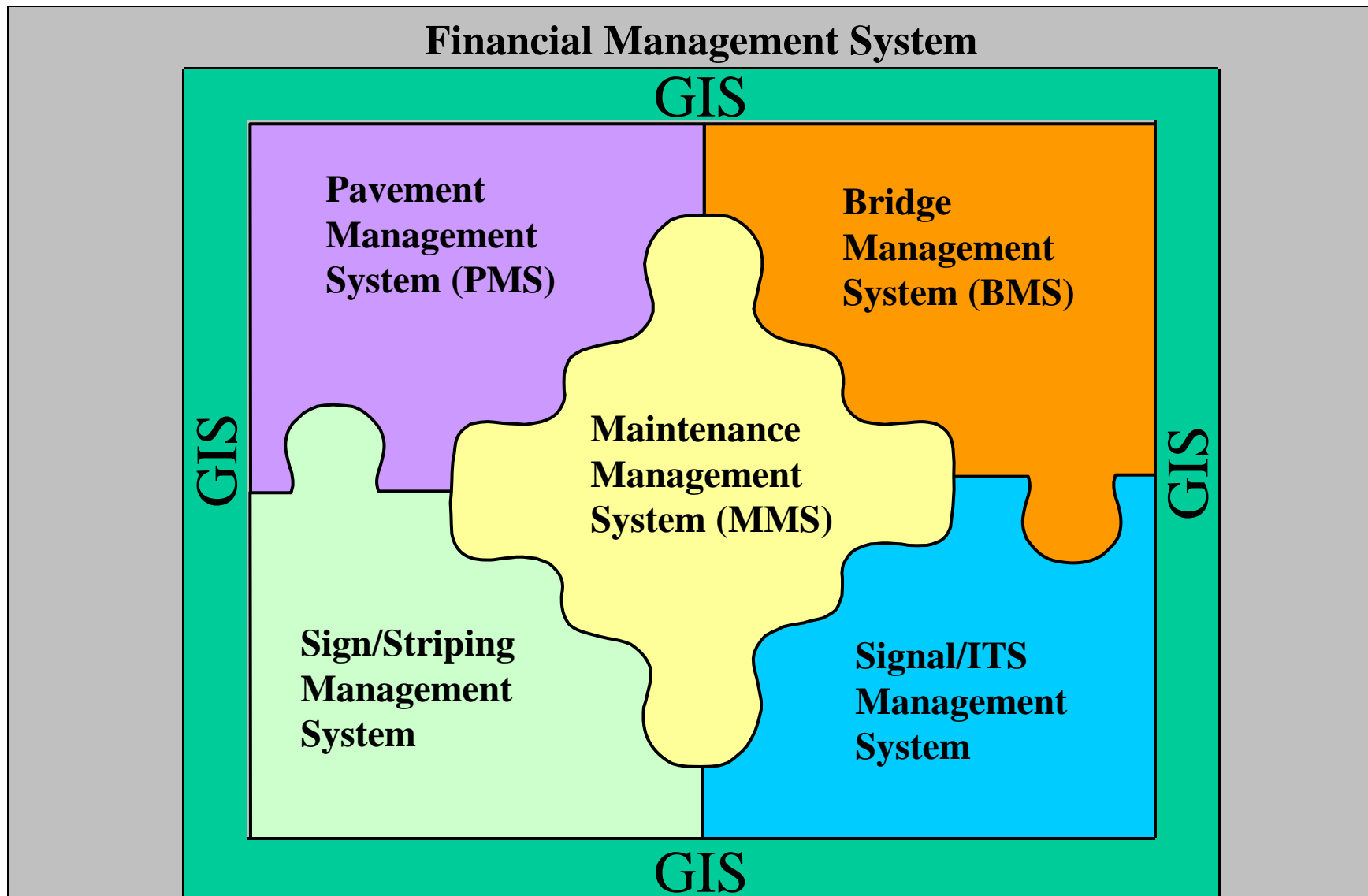


A New PMS for NCDOT

- PMS should drive our decision making:
data based planning and programming
- PMS should be able to answer those “what-if” scenarios
 - NCDOT is currently unable to easily evaluate alternate resource allocation scenarios
- Part of the Transportation Asset Management System vision of NCDOT is to fully integrate our management systems...



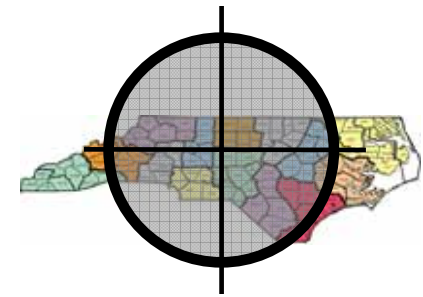
Pieces of the Puzzle





Outline of Presentation

- System Overview
- NCDOT's New Vision
- Performance Based Management
- A New PMS
- **Network Level Decision Making**
- Division Level Decision Making
- Local Decision Making
- Conclusions





Network Level Decision Making

- At a network level, PMS will provide the ability to understand the impacts of investment decisions
 - As changes are made in investment prioritization, be able to predict impacts to the network and analyze trends
 - Accurate data collection allows validation of effectiveness of decisions



Network Level Decision Making

- Create cohesive, statewide workplans
- Account for regional variations in climate, subgrade and materials
- Will influence policy decisions
- Key input into distribution of funds
- Will help achieve performance targets
- Assist in communicating needs to senior management and legislative bodies



Network Level Decision Making

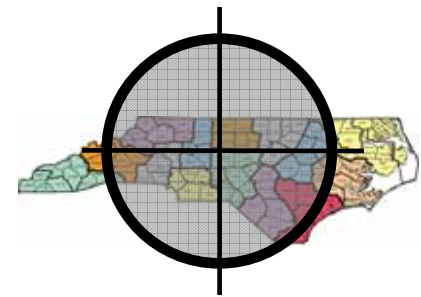
- Determine optimum treatment selection and timing
- Quantify the condition benefits gained from various treatments
- Evaluate materials and techniques for effectiveness





Outline of Presentation

- System Overview
- NCDOT's New Vision
- Performance Based Management
- A New PMS
- Network Level Decision Making
- **Division Level Decision Making**
- Local Decision Making
- Conclusions





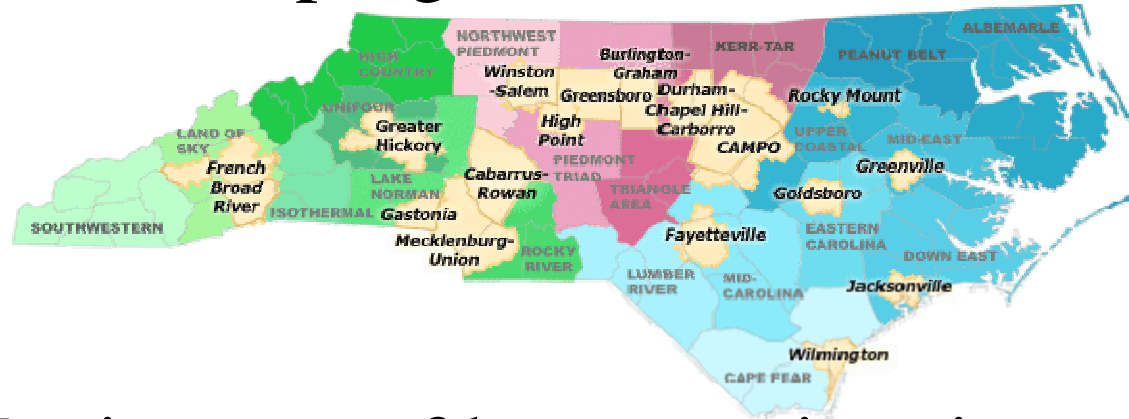
Division Level Decision Making

- Division Engineers to track progress:
 - Monitor changes in pavement condition
 - Verify that work performed is consistent with work planned
- Future needs will be based on PMS, and will be used to update the Statewide Transportation Plan
- Division Engineers will apportion funds to counties based on performance measures



Division Level Decision Making

- Use data from the PMS to communicate needs and progress to MPOs and RPOs

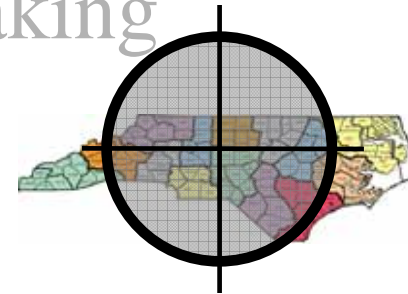


- Monitor use of best practices in program areas in their Division.
 - Example: Selecting appropriate routes for pavement preservation projects



Outline of Presentation

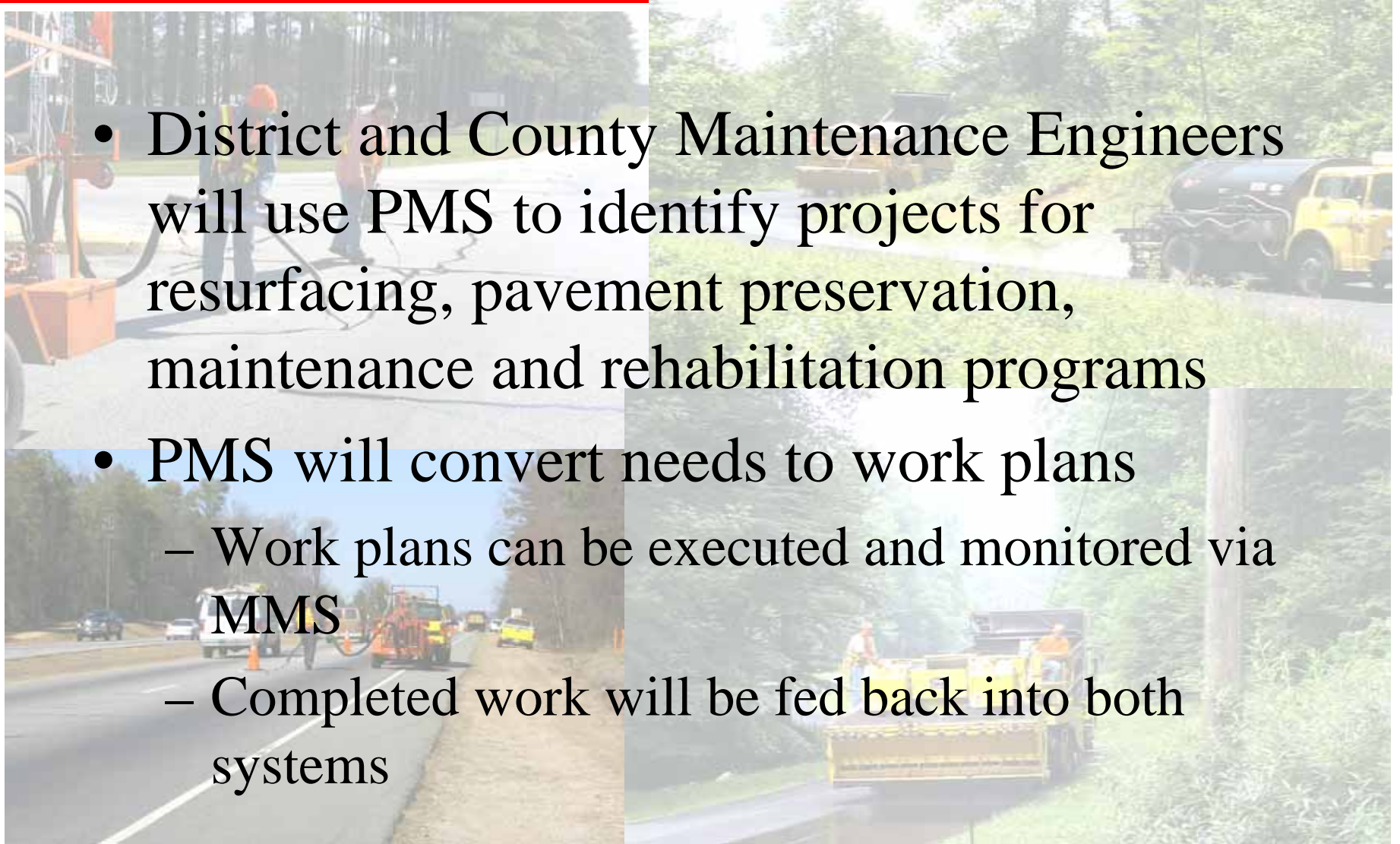
- System Overview
- NCDOT's New Vision
- Performance Based Management
- A New PMS
- Network Level Decision Making
- Division Level Decision Making
- **Local Decision Making**
- Conclusions





Local Decision Making

- District and County Maintenance Engineers will use PMS to identify projects for resurfacing, pavement preservation, maintenance and rehabilitation programs
- PMS will convert needs to work plans
 - Work plans can be executed and monitored via MMS
 - Completed work will be fed back into both systems





Local Decision Making

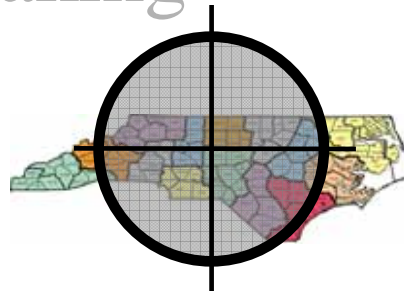
- Will also track progress toward performance goals
- In the future, PMS will provide “What if” capabilities at the local level, allowing evaluation of funding decisions on local system performance





Outline of Presentation

- System Overview
- NCDOT's New Vision
- Performance Based Management
- A New PMS
- Network Level Decision Making
- Division Level Decision Making
- Local Decision Making
- **Conclusions**





Conclusions

- Future planning and programming based on the Statewide Transportation Plan, new PMS, MMS and performance based management rather than a reactive approach
- PMS will provide better tools and more accountability at all levels



Thoughts

- The vision of the PMS in the hands of decision-makers at all levels is a critical component to the success of the Department's performance based management philosophy
- If we are spending \$500+ million per year on pavements, isn't it worth a 1% one-time investment to develop tools to improve how we use the money?



Questions?

Welcome
to



North Carolina

'The Good Roads State'