ASSET MANAGEMENT

WHAT IS IT AND WHY SHOULD YOU CARE?

presented at

NE & MW Equipment Management Meeting

Pittsburgh, PA

October 7, 2010

Lacy D. Love

Dir Asset Mgmt

NCDOT

U.S. Department of Transportation
Federal Highway Administration

Presentation Outline

- What is Asset Management
- NCDOT Overview
- Drivers for Change
- Asset Management Approach
- Linkage to NCDOT Mission
- Next Steps & Research
- Lessons Learned

Challenges

Congestion

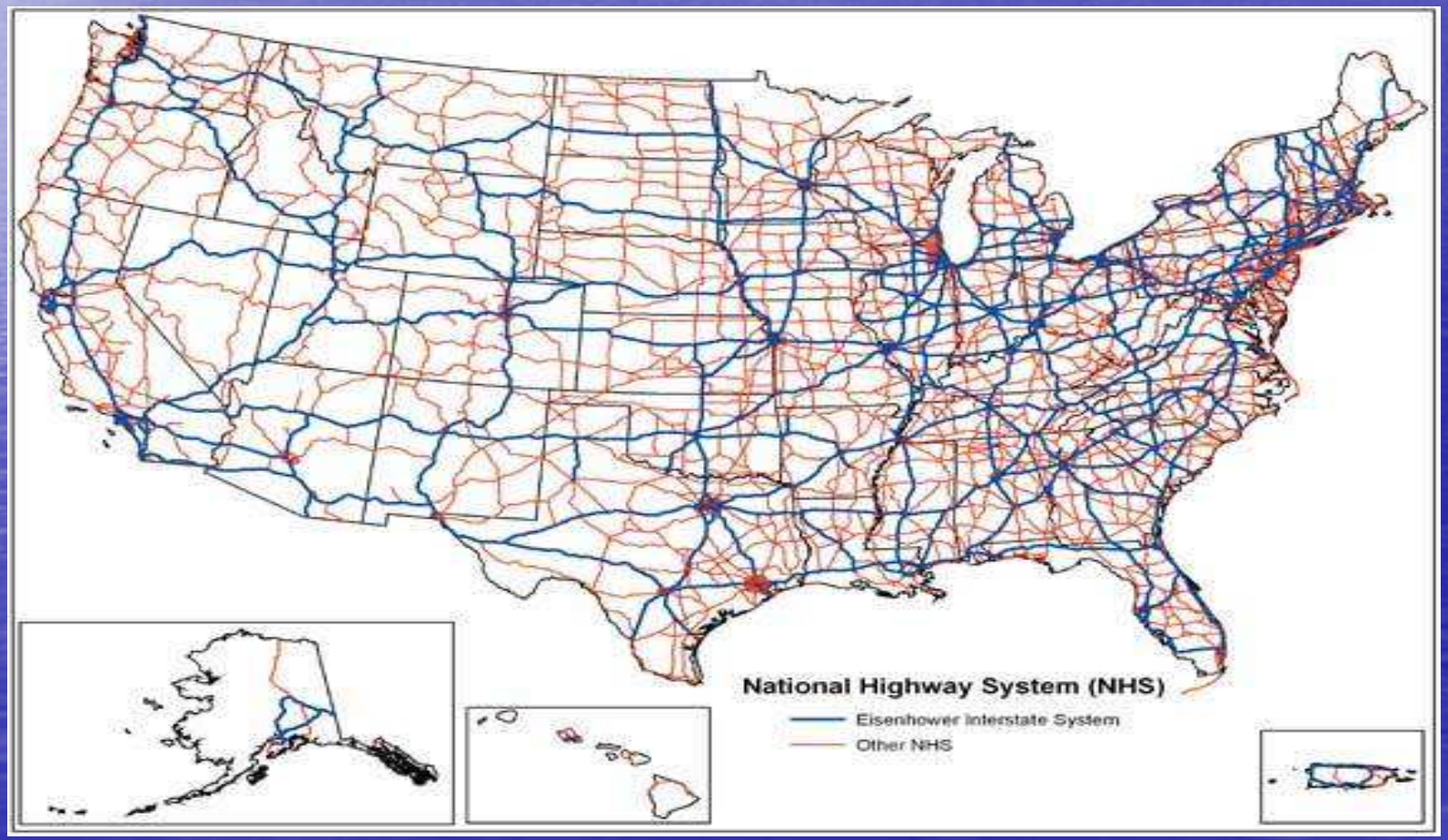
Preserving Investments

Aging Infrastructure

Economic Growth

National Statistics:

3,963,262 miles of Roads
590,685 Bridges



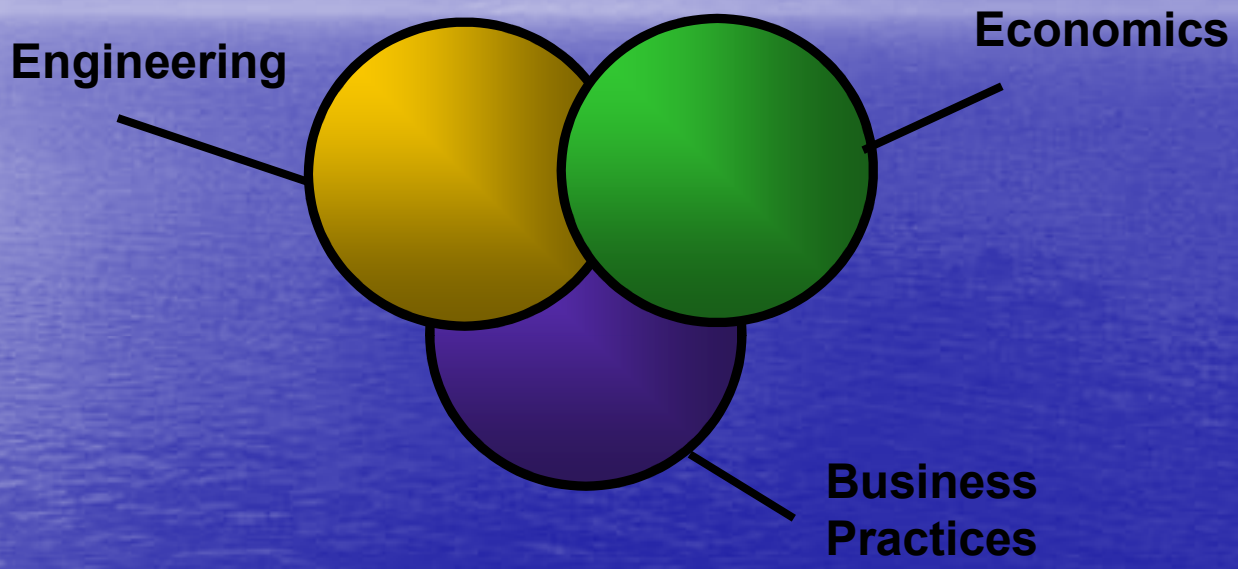
The Old Approach

- Limited Preservation
- Underestimated Use
- Bought Locally
- Repaired Worst First
- Lowest Initial Cost
- Limited Design Life
- Limited Economic Analysis
- Insufficient Funds

Asset Management The New Approach

- **Assets Viewed as Utilities**
- **Investments in Assets Rather than the Traditional Public Idea of Mere Expenditures of Funds**
- **Preservation & Life cycle cost**

Asset Management



Changing the culture from “maintenance” to “asset management”

How Does Transportation Asset Management Work?

- Decisions are based on ***accurate data***, and sound engineering and economic analysis
- Improved decision-making supported by policies, ***performance-based goals***, performance measures, and appropriate service levels
- ***Long-term*** view of assets
- More robust monitoring and ***management systems***

Transportation Asset Management

RESOURCES

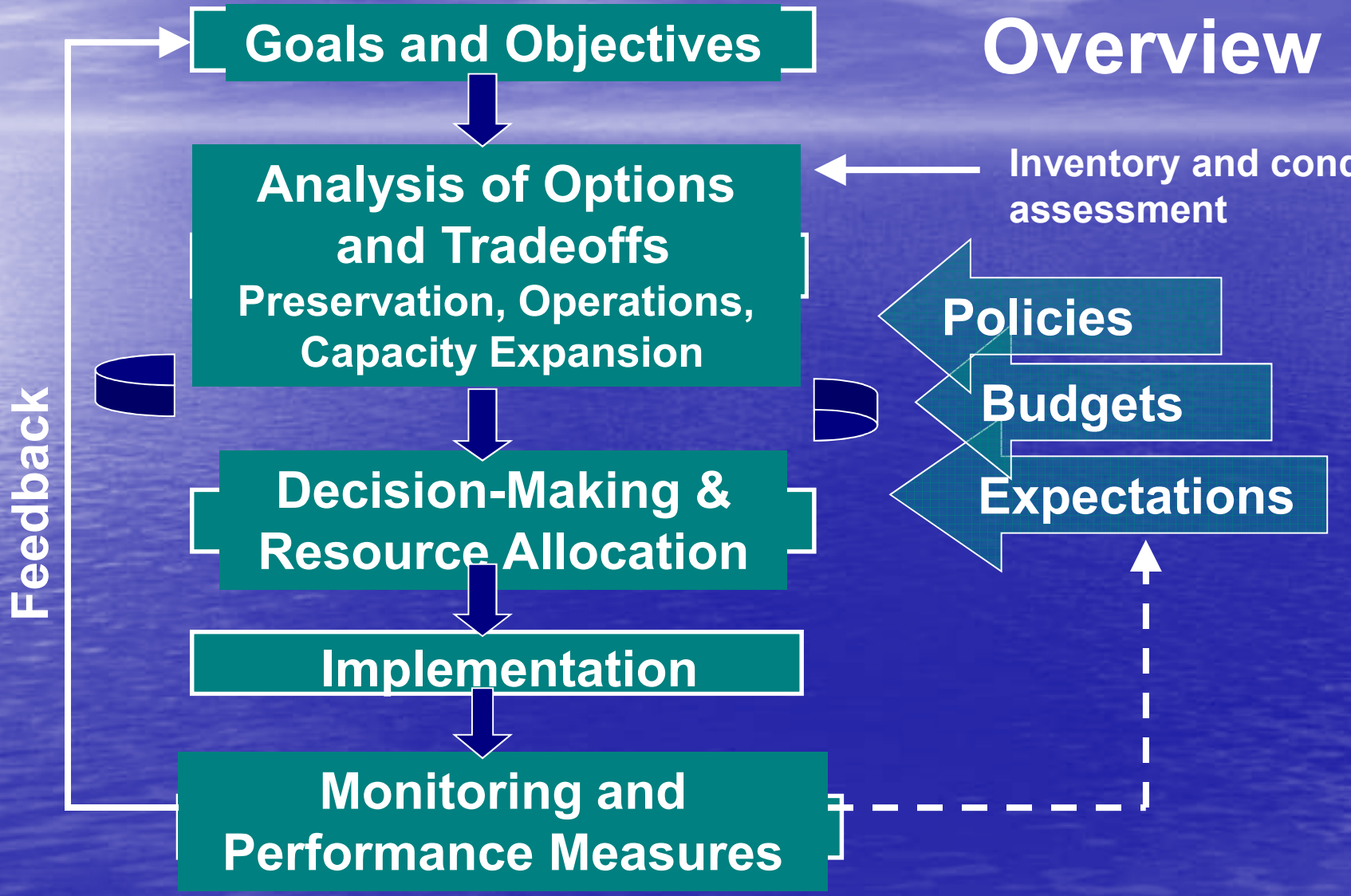
Preservation

Operations

Capital Improvement

Safety, Etc.

Transportation Asset Management



What Makes TAM Strategic?

- Focus on the strategic goals of the agency, performance measures, and system performance
- All assets considered comprehensively
- Tradeoff analysis and life cycle performance used to support decision making
- Apply economics, business and engineering principles, needs assessment, and risk assessment to manage assets and evaluate tradeoffs

Why is Data Important?

- Asset management efforts are data-driven
- There should be a strategic plan for data acquisition and storage
- Data should have a clear purpose and be directly linked to AM decision making
- Data acquisition can be expensive – collect only what you need
- Collect and update data cost-effectively

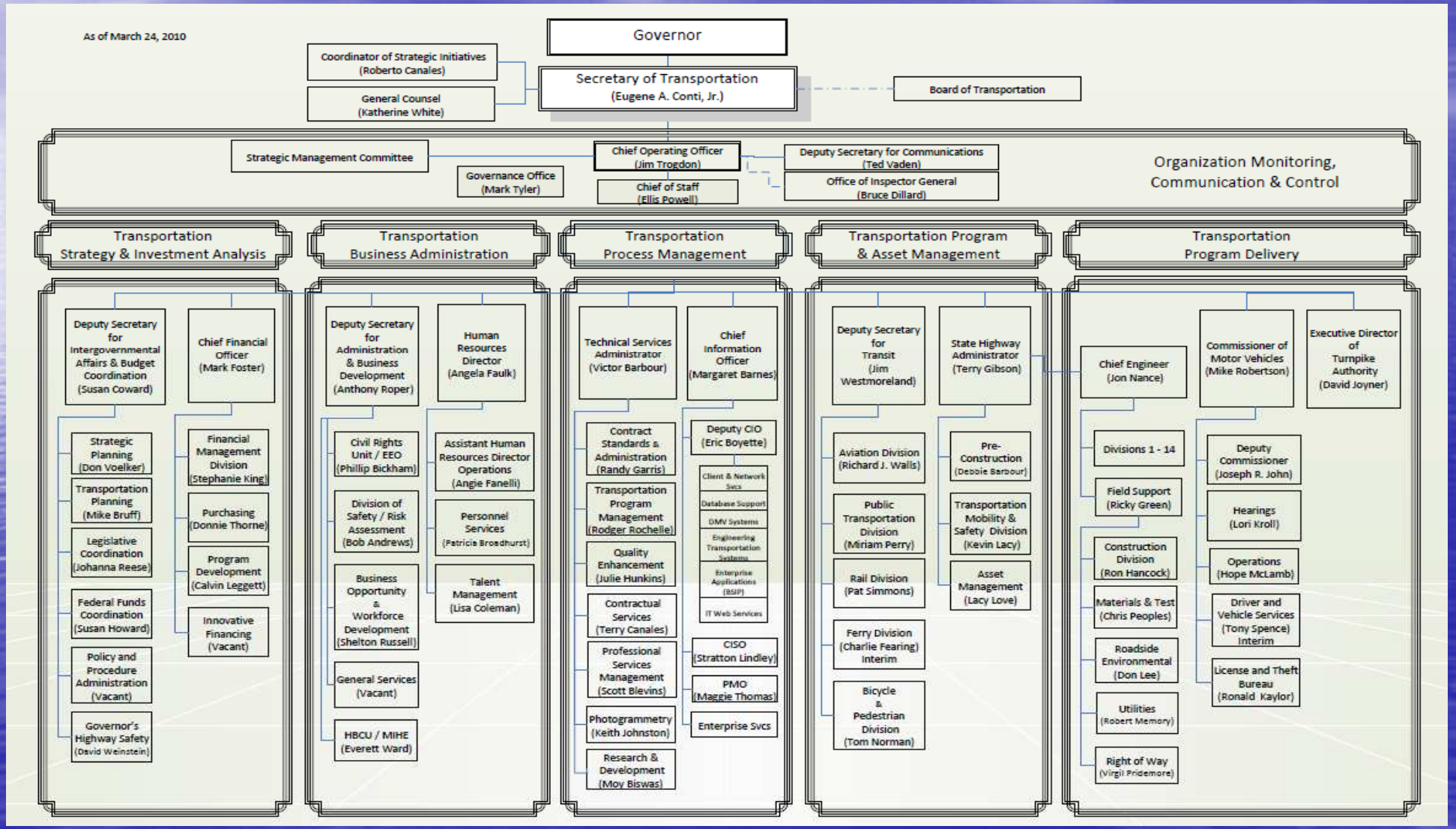
Why is Data Important?

- Poor quality data may be worst than no data at all
- Data collection should be automated as much as possible and accessible to all parties
- Data should be viewed as a corporate asset and data collection process seen as an important decision support function

North Carolina Experience

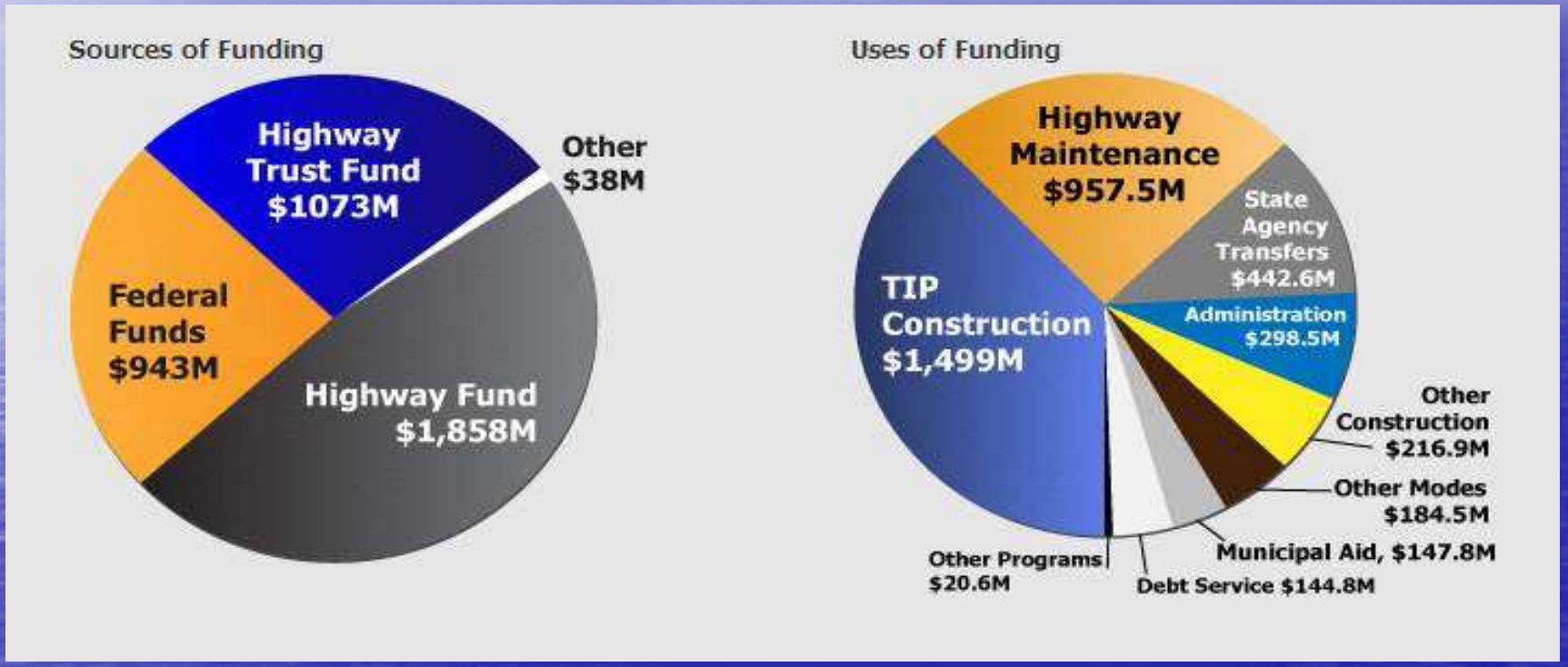
North Carolina – Mountains to Sea

North Carolina – Government



NCDOT – Funding

$3.9 Billion Transportation Budget



NCDOT Facts

- 9.5 Million residents
- Supports 74 public airports
- 2 Passenger train routes
- Statewide bicycle routes
- 7 Coastal ferry routes
- 8,800 Traffic Signals
- 25,000 heavy equipment, acquisition cost $633 M
- 79,800 road miles
- 156,000 paved lane miles
- 4,600 unpaved road miles
- 18,000 structures
- 72.4 Million SF bridge deck
- $3.9 Billion Transportation Budget

NCDOT- Div. of Highways

Field Operations

14 Highway Divisions

Responsible for carrying out NCDOT's Construction & Maintenance Programs

Asset Management

5 Central Units (BMU, PMU, Secondary Roads, SRMU, Equipment & Inventory)

Technical support, Program Management in support of the Divisions

Timeline of Evolution

1996	MQ
1998	Leg
2001	Est n Engineer
2003	Imp s
2004	Imp Op Lor
2005	Op rkshop I
2006	Op rkshop II
2007	Hire
2008	Imp
2009	New

Why Change?

- Aging Highway System
- High Growth State with Capacity needs
- Traffic growth
- System growth
- Heavier and more trucks
- Funding Constraints
- Higher Customer Expectations
- Younger Managers

2004 What do we want to do?

- 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 as defined by the Strategic Plan
- Develop management tools and systems to measure outcomes and performance and make appropriate adjustments
- Management flexibility with accountability

2005 What Did We Do?

- Committee and Workgroup members for establishing Performance Measures:
  - Steering committee- Chief Engineers office Division Engineers, & FHWA
  - Functional Area Workgroups Established - Division Engineers and Unit Head Co-Chairs, with Assistant Division Engineer, Assistant Unit Head and FHWA staff members

Performance Based

- Performance Measurement:
  - Clearly defines organizational objectives or outcomes
  - Uses data/statistical evidence to determine progress toward established goals/outcomes
  - Measures efficiency, effectiveness of organization's programs and operations (condition, quality, timeliness, reliability, etc.)
  - Simple, understandable, logical, repeatable
  - Shows a trend over time

Equipment Performance Measures – Initial effort

- % of Equipment with PM's accomplished on time
- % of Fleet Depreciated out
- % of time equipment is used – Utilization Rate

PERFORMANCE DASHBOARD AND APPRAISAL WORKSHEET

Goal	Metric	Metric Definition	Target	Data Source	Sub wt.	Wt (%)
1	Crash Rate	*Reduce 5 Yr. Statewide Avg. (Crash Rate per 100M VMT)*		*Traffic Eng.*		5
2	System Reliability		Composite			5
	A) Incident Clearance	*% of Incidents Cleared within 90 Minutes of Standard*	70-85%	TIMS	1.5	
	B) Signal Timing and Maintenance	*% of Signals Meeting Timing and Maintenance Standards*	80-94%	Signal Mgnt. System	3.5	
3	Infrastructure Health and Performance		Composite			40
	A) Infrastructure Health	*Improve Index Score (3 year avg.) toward Goal*	68-72	Asset Management	28	
	B) Facility Health	*Statewide Avg. Condition Scores of Rest Areas and Welcome Centers*	90-92	Asset Management/REU	4	
	C) Construction Quality	*% of Projects Meeting Construction Quality Index Standard*	70-85	Construction Unit	8	
4	Programs/Projects/Services Meeting Standards		Composite			40
	A) Projects and Programs on Schedule					
		1) % Central Let Projects Completed on Time	70-85%	HiCAMS	6.4	
		2) % Div. Let/Built Projects Completed on Time	70-85%	SAP	4.8	

2009 - New NCDOT

NCDOT 5 YEAR WORK program

DRAFT

NCDOT Transportation Reform - Five Year Work Program Briefing

September 2, 2009

Alignment & Linkage

Transportation Reform (Plan Components)

NCDOT 5 YEAR WORK program
DRAFT

- **NC Transportation Plan (20 Year)**
  - Documents the mission & goals, objectives and strategies of the Department
  - Guides investment decisions
- **NCDOT Program and Resource Plan (10 Year)**
  - Allocations of funds between programs (Highway, Rail, Aviation, Public Transportation, Ferry, Bicycle and Pedestrian, etc.)
  - Programs and projects evaluated and prioritized based on objective criteria
- **NCDOT Work Program (5 Year)**
  - comprehensive work plan that guides the daily activities of Departmental staff
  - reliable, stable and fiscally constrained

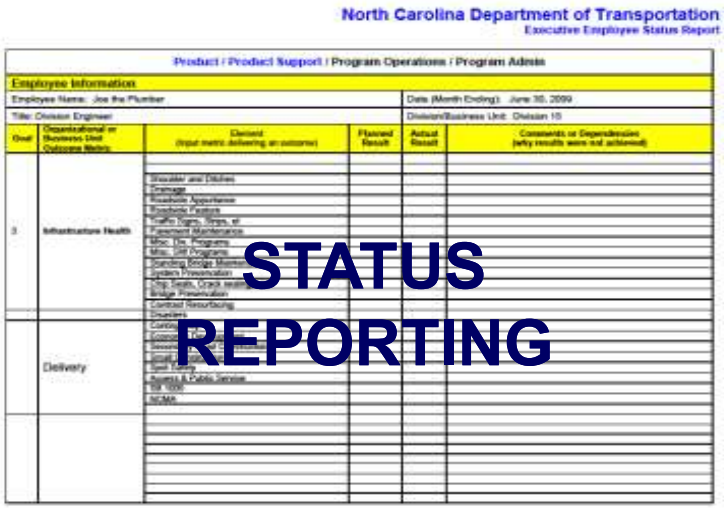
Alignment & Linkage

ORGANIZATIONAL PERFORMANCE MEASURES

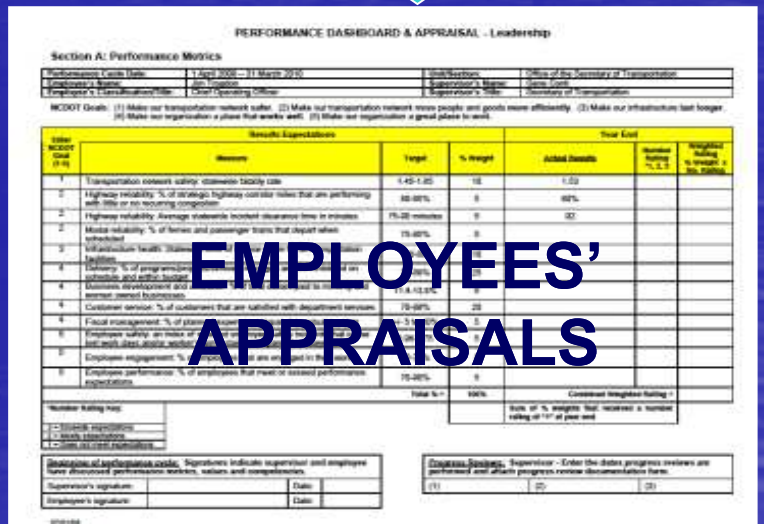
BUSINESS UNIT WORK PLANS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

5 YEAR WORK program



STATUS REPORTING



EMPLOYEES' APPRAISALS

Monitoring for Accountability

Results, Benefits and Expectations

- Uniformly acquired, maintained & operated Assets
- Data drives decision making
- Shift to Outcome Based approach with clear goals
  - Move from a reactive to a planned approach
  - Increased focus on preventive maintenance
  - Agree on Target LOS
  - Emphasis on planning & scheduling
- Highest & best use of resources
- Clearly defined performance expectations for all employees
- Increased accountability and flexibility – let managers manage
- Challenging and rewarding workplace

Next Steps! – Some Research

- Fleet Optimization Study
  - Initiated a Fleet Management Study by East Carolina University
- Objectives
  - Develop Methodology for 6 classes of equipment
    - Appropriate rate of depreciation
    - Appropriate disposal point
    - Appropriate level of utilization
  - Apply Methodology for 3 geographical areas of state

Research - Solutions

- What overall % of a fleet should be depreciated out at any one point in time for effective fleet operation?
- At what point in time should each piece of fleet be disposed of before major repair cost take an exponential jump?
- How many pieces of the 6 classes are needed based on the amount of time the piece of equipment is used?

Wrapping Up - Lessons Learned

- Bad
  - Don't try to measure too many things
    - Keep it simple
    - Most important
  - Don't let the process overshadow the purpose
  - Collect only what you need
  - Don't wait for the perfect solution
  - Don't let a passionate person set unreasonable targets
  - Too much data to internalize and prioritize

Lessons Learned

- Good
  - Communicate with stakeholders in terms they understand
  - Involve lots of people
    - Gets buy in at the beginning
    - Creates ownership
  - Communicate with managers
    - Meet with field managers to rolled it out
    - Reviewed at Conferences
  - Give feedback on LOS and Deficiencies
  - Set priorities – Can't do it all at once
  - Flexibility with Accountability

Questions!