Budget and Staffing

Rodger Rochelle, PE, Director of Technical Services
Mike Holder, PE, Chief Engineer

March 31, 2015
Agenda

- **Technical Services**
  - Overview
  - Project Delivery
  - Staffing Data & Staffing Levels
  - Status of Reorganization & Future Plans

- **Division of Highways**
  - Overview
  - Maintenance Allocation and Budget
  - Core Services
  - Staffing Levels & Strategies
    - Central Units
    - Transportation Divisions
      - Construction Inspection and Contract Administration
      - Routine Highway Maintenance

- **Plan of Action & Future Steps**
Technical Services
Transportation Program Life Cycle

- Long-Range Planning
  
  *Determine Needs*

- Program Development
  
  *Fund Projects*

- Project Planning
  
  *Minimize Impacts*

- Project Design
  
  *Design and Acquire ROW*

- Construction
  
  *Build Facility*

- Maintenance & Operations
  
  *Maintain Facility*

- Technical Services

- Prioritization
Technical Services Division

• Exists to provide project and program management services, contracts, planning and design functions, and other technical support services for all modes of the Department.

• Consists of 14 discrete business functions with work spanning from early planning efforts into construction.

• Business units can be categorized broadly in two groups: project delivery and program delivery.
Technical Services Division

• **Pre-Construction**
  • Roadway Design, Project Development & Environmental Analysis, Geotechnical Engineering, Hydraulics

• **Contract Standards and Development**
  • Contracts, Standards, Provisions, Bidding, Estimates, Contractual Services

• **Design Build**

• **Priority Projects**
  • Priority Project Management, Public Private Partnerships, Sponsorships, Special Projects

• **Transportation Program Management**
  • Research & Development, Value Management, Local Programs Management, Schedule Management

• **Professional Services**
  • Consultant Contracts, Estimates, and Selection

• **Location & Surveys**

• **Photogrammetry**
Technical Services - Program Delivery

Preconstruction - Procurement - Construction

Design-Build, *Express* Design-Build

Priority Projects: Proj. Management, Public-Private Partnerships

Priority Projects: Sponsorships

Transportation Program Management: R & D, Value Management

Transportation Program Management: Local Programs, Schedules
Technical Services - Project Delivery (Preconstruction)

Design:
- Roadway
- Hydraulics
- Geotechnical
- Bridge
- Others

Photogrammetry
Location and Surveys
Professional Services
Project Development and Environmental Analysis
Geotechnical (field)

Contracts
Standards

TAKE BIDS
Project Delivery Improvement Objectives

• Reduce the cycle time for new location and widening projects by **25%**

• Improve project schedule stability

• Minimize the number of changes that create re-work
Strategies

• Fundamentally change how projects are scheduled, managed and delivered
• Learn from Design-Build
  – Overlap activities
  – Begin utility coordination earlier
  – Identify parcels critical for utility or other complex relocations and begin earlier right of way acquisitions
• Implement new scheduling framework and intermediate delivery dates
• Implement improvements in professional services contracting
Other Key Strategies – Design Build

• Selectively Expand Design-Build Delivery Method
  • Work parts of the project in parallel
  • Learn from Design Build to inform conventional Design-Bid-Build process
• Design-Build Let Totals
  • Total # Projects = 102
  • Total Cost = $4.95 Billion

• Express Design-Build
  • New Program Delivery Model
  • 44 contracts let Statewide
  • Over 400 Bridges
  • ~$320 Million
Other Key Strategies

• Leverage Technology
  • DocuSign, Enterprise Content Management, Geographic Information System (data and analytics), Electronic Permit Submittals, etc.

• Improve Coordination
  • Joint training with resource agencies, frequent consultant coordination meetings on complex projects, turnkey project delivery contracts, additional delegated authority such as NC Floodplain Mapping, FHWA, etc.

• Improve Outsourcing
  • Use of embedded consultants
  • Increase outsourcing of eligible work
  • Improve contracting processes to accelerate notice to proceed
Technical Services Division Staffing and Adjustments

- 700 - 800 full time equivalent positions (FTEs)
- More than 90% charge to individual projects (state and federal)
- Some charge to all projects
- Less than 10% charge to administrative functions
Preconstruction Outsourcing Trends

Amount of Consultant Payments by Unit (in Millions) (as of March 13, 2015)

**Supporting Data**

<table>
<thead>
<tr>
<th>Supporting Data</th>
<th>SFY12</th>
<th>SFY13</th>
<th>SFY14</th>
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<td>$6,151,911</td>
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<td>$7,636,716</td>
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<td>$16,775,076</td>
<td>$33,717,184</td>
<td>$36,134,214</td>
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Preconstruction Outsourcing Trends

<table>
<thead>
<tr>
<th>Unit</th>
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<th>SFY 13</th>
<th>SFY 14</th>
<th>SFY 15 YTD</th>
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<td>Geotechnical Engineering</td>
<td>14</td>
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<td>134</td>
<td>109</td>
<td>312</td>
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</table>
Technical Services Outsourcing Analyses

- Recent Trends
- Vision for Technical Services
  - Analysis of Unit staffing, discretized by function rather than reporting structure
  - Determined which functions and supporting positions are “outsourcable”
  - Procurement functions and consultant management and work product review are considered government operations
- Outsourcing Rates
  - Analysis of twenty-nine (29) scenarios
  - Various permutations of business units, exclusions, and Department eligible expenses
Roadway Design

- Current FTEs = 115
- Current FTEs performing in-house design = 66
- Total proposed reduction = 31-33 FTEs
  - All from in-house design staff (50% reduction)
  - Last staffing report = 25 FTEs (most which were reallocated to other areas)
- Affects technicians, engineers, and supervisors
- Increases span of control (target 5:1 or greater)
Project Development & Environmental Analysis

- Current FTEs = 125
- Total proposed reduction = 20 FTEs
  - Last staffing report = 5 FTEs (most which were reallocated to other areas)
  - Not low-level staff (includes supervisors and engineers)
  - Increases span of control (target 5:1) and consolidates planning document preparation groups
Technical Services–Other Reductions

- **Hydraulics** – 4 FTEs (~7% reduction)
  - In-house design staff
- **Geotechnical Engineering** – 6 FTEs (~7%)
  - Unit support services and CADD
- **Location & Surveys** – 14 FTEs (~9%)
  - Field support, preliminary surveys for design and construction surveying
- **Photogrammetry** – 4 FTEs (~9%)
  - Automated efficiencies
Division of Highways
Transportation Program Life Cycle

- Long-Range Planning
  - Determine Needs

- Prioritization

- Program Development
  - Fund Projects

- Project Planning
  - Minimize Impacts

- Project Design
  - Design and Acquire ROW

- Construction
  - Build Facility

- Maintenance & Operations
  - Maintain Facility
FY 2015 Maintenance Allocation

- Total Maintenance Funds $ 1,141.0M
- Contract Resurfacing $ (408.2M)
- Pavement Preservation $ (65.0M)
- Bridge Program $ (153.0M)
- Statewide Programs & Emergency $ (109.7M)
- Division Off the Top Allocation* $ (53.9M)
- General Maintenance Allocation $ 351.2M

* Includes expenditures from Trust Fund Program
FY 2015 Maintenance Allocations

- Contract Resurfacing, Pavement Preservation and Bridge Program funds formula:
  
  \[
  \text{Division Assessed Needs} \div \text{Statewide Assessed Needs}
  \]

- Statewide Programs & Emergencies is comprised of:
  - State and Federal Obligations
  - Asset Maintenance and Operations
  - Research and Development
  - Emergencies
FY 2015 Maintenance Allocations

- Division Off the Top Allocation: direct allocation associated with annual cost of:
  - Traffic Signal Operations (Signal Maintenance), Incident Management, Electricity for Traffic Control Devices, Roadway and Interchange Lighting, Rest Areas and Welcome Centers, Special Landscaping, Guardrail Repair, River Ferries

- General Maintenance Allocation Formula:
  \[
  \frac{\text{Division} \ (\text{Assessed Needs} + \text{Non-Assessed Needs})}{\text{Statewide} \ (\text{Assessed Needs} + \text{Non-Assessed Needs})}
  \]
Percentage of pavement miles in good condition (as at October 2014), Target percentage = 80%.
### Division of Highways Budget

- **8,685 FTEs**
- **95% charge to projects (State and Federal) or Highway Fund supported work orders**
- **5% charge to Administrative Budget**

### Administrative Budget Overview

<table>
<thead>
<tr>
<th>Highway Fund</th>
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<tbody>
<tr>
<td>• 339 positions ➔ $20,637,000</td>
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<tr>
<td>• Central &amp; Division office positions:</td>
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<tr>
<td>• Chief’s Office</td>
</tr>
<tr>
<td>• Field Support</td>
</tr>
<tr>
<td>• Facilities Management</td>
</tr>
<tr>
<td>• Division Offices</td>
</tr>
<tr>
<td>• District Offices</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Highway Trust Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 129 positions ➔ $7,077,365</td>
</tr>
<tr>
<td>• Established by 1989 Trust Fund; associated with project delivery</td>
</tr>
<tr>
<td>• Central &amp; Division office positions:</td>
</tr>
<tr>
<td>• Field Support</td>
</tr>
<tr>
<td>• Traffic Mobility &amp; Safety</td>
</tr>
</tbody>
</table>
Division of Highways – Core Services

• Respond to emergency events (hurricanes, snow and ice)
• Deliver projects:
  • Bridge replacement
  • Contract resurfacing
  • Inspect and administer construction projects
• Maintain, repair, replace assets
  • Bridges, pavements, pipes
  • Safety features (signs, signals, guardrail)
  • Drainage (ditches, pipes) and shoulders
  • Rest areas
  • Clear roadways of debris and trash
  • Mow and manage vegetation
• Respond to citizen complaints and concerns
Division of Highways
(8685 FTE)

- Facilities Management (38 FTE)
- Transportation Mobility and Safety (216 FTE)
- Asset Management (178 FTE)
- Transportation Divisions (7552 FTE)
- Field Support (646 FTE)
Division of Highways – Historical Staffing Levels

- 1236 positions eliminated by NCGA mandate since 2010

(YTD = as of 3/26/2015)
Amount of Consultant Payments by Unit (in Millions)

<table>
<thead>
<tr>
<th></th>
<th>SFY 12</th>
<th>SFY 13</th>
<th>SFY 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structures Mgmt</td>
<td>$19,061,504</td>
<td>$18,969,674</td>
<td>$16,136,697</td>
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<tr>
<td>Divisions</td>
<td>$27,913,683</td>
<td>$25,031,304</td>
<td>$25,000,717</td>
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<tr>
<td>Facilities/Roadside/M&amp;UT</td>
<td>$3,357,676</td>
<td>$4,217,922</td>
<td>$4,885,732</td>
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<tr>
<td>Right of Way</td>
<td>$21,500,146</td>
<td>$20,710,601</td>
<td>$25,719,840</td>
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<tr>
<td>Transport Mobility &amp; Safety</td>
<td>$7,972,344</td>
<td>$15,321,008</td>
<td>$17,323,968</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$79,805,353</strong></td>
<td><strong>$84,250,510</strong></td>
<td><strong>$89,018,302</strong></td>
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</tbody>
</table>

Supporting Data

Note: NCGA directive to increase total expenditures for outsourced activity by 5% in FY 2014-2015

Total Paid to Consultants for Division of Highways (in Millions)

$16,577,632 total expenditures as of March 17, 2015
Division of Highways

Reductions Based on Increased Outsourcing

- **Asset Management**
  - Management Systems and Assessments
  - Operations and Fleet Management
  - Pavement Management

- **Field Support**
  - Materials and Tests
  - Right of Way
  - Structures Management
  - Utilities

- **Transportation Mobility and Safety**
  - ITS and Signals
  - Oversize / Overweight Permits Unit
  - Signing and Delineation
  - Traffic Management
  - Traffic Safety

SFY 14 Outsourcing Utilization 75%
SFY 15 Outsourcing Goal 80%
Central Units

• Increase the outsourcing of functions that are already well developed in the private sector
  • Result- Proposed reduction of 52 FTEs

• Explore and grow outsourcing of other functions
  • Result- Additional proposed reduction of 34 FTEs

• Staggered implementation beginning July 1, 2015, with most complete by July 1, 2016.
## Central Units Staffing Reductions

<table>
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<tr>
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<th>FY 2016 Initial Reductions</th>
<th>FY 2017 Additional Reductions</th>
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<tr>
<td>Asset Management</td>
<td>8</td>
<td>10</td>
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<tr>
<td>Field Support</td>
<td>34</td>
<td>12</td>
</tr>
<tr>
<td>Transportation Safety &amp; Mobility</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>52</strong></td>
<td><strong>34</strong></td>
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</table>
Transportation Divisions

• Construction Inspection and Contract Administration
  • Utilization of the already well developed workforce of the private sector

• Routine Highway Maintenance
  • Scope and variety of various functions
  • Functions by DOT staff
  • Functions currently outsourced
  • Developing private sector interest
Transportation Divisions
Construction Inspection & Contract Administration

• Current FTEs = 900
  • 760 inspectors and 140 supervisors
• Functions
  • Ensure compliance with contract plans
  • Approve payments, change orders, overall contract administration
• Reductions based on outsourcing 50% of construction inspection activities
  • Establish baseline need for inspectors per construction capital program
Construction Inspection
Establish Statewide Staff Needed

3 Year Workload Projection - Statewide

Average = 1258 FTEs

Outsourced Inspection Functions

Inspectors Needed
Average # Inspectors Needed
DOT Inspectors Needed

629 FTEs
Construction Inspection
Division Staff Needed

Average 3 Year Inspection Needs by Division

<table>
<thead>
<tr>
<th>Division</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>Current</td>
<td>37</td>
<td>45</td>
<td>46</td>
<td>55</td>
<td>77</td>
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<td>39</td>
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<tr>
<td>Target</td>
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<td>23</td>
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<td>-9</td>
<td>-11</td>
<td>-19</td>
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</table>
Transportation Divisions
Construction Inspection & Contract Administration

• Construction Inspectors
  • Total proposed reduction = 131 FTEs by 6/30/16
• Construction Supervisors
  • To remain mostly NCDOT staff
  • Responsible for overall contract administration, project oversight, and supervising both DOT and consultant staff
  • Minimizes conflicts of interests related to consultant design / consultant inspection
  • Inspector to supervisor span of control ratio of 9:1
Routine Highway Maintenance

Pavement and Road Maintenance Crew Functions

- Fill potholes, repair ditches, shoulders and drainage; remove obstructions
- Repair/replace pipe (35%)
- Pavement preservation (50+%)
- Slab replacement (50%)
- Full depth patching (50%)
- Guardrail repair (100%)
- Mowing (98%)

(% indicates current outsourcing level for activity)
Routine Highway Maintenance

Bridge Crew Functions

- Emergency repairs
- Priority maintenance and critical find repairs
- Routine maintenance (10%)
- Large pipe replacement and installation (90%)

(\% indicates current outsourcing level for activity)
Growing Outsourced Programs
Routine Highway Maintenance

• Best work to contract:
  • Planned, predictable, quantifiable (and large volume)
  • Needing little to no oversight (and outcome easily seen)
  • Lower risk to contractor and State

• Outsourcing growth
  • Pavement preservation
  • Pipe replacement
  • Routine sign installation, signal preventative maintenance
  • Routine bridge maintenance
  • Traffic control (setting up and taking down)
Summary
Routine Highway Maintenance

• Current FTEs = 4,272

• Staffing Evaluation Basis
  • Inventory quantity, inventory condition, traffic volumes, snow/ice expenditures

• Analysis Complete
  • Workforce realignment necessary

• Implementation Plan
  • Maximize workforce effectiveness
Inventory – Condition Staffing Analysis

Routine Highway Maintenance

- Method allocates staff to each county based on inventory, current condition and significant variables
  - Pavement: system lane-miles, vehicle miles traveled, annual snow/ice expenditures
  - Bridge: bridge count, deck area, culverts and priority maintenance item count
  - Maintenance Condition Assessment items: shoulders, small pipes, striping, etc…
Inventory – Condition Staffing Results
Routine Highway Maintenance

<table>
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<tr>
<th>Division</th>
<th>1</th>
<th>2</th>
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Routine Maintenance Staff – Next Steps

- Currently 567 of 4272 positions vacant
- Maintain hiring restrictions through June 30, 2016
- Historical attrition rate of 8.5% will yield approximately 310 more vacancies
- Abolish (or move) vacant positions in accordance with “Asset – Condition Based Analyses” results
- Exercise complete by July 1, 2016
Future Steps
To meet established timeline for staffing reform

• Implement performance targets and hold staff accountable
• Identify additional contractor opportunities and use them
• Measure outcomes and adjust staffing and contractor levels for optimal performance and effectiveness
• Allocate budget to optimize system performance
Highway Maintenance Improvement Program (HMIP)
Highway Maintenance Improvement Program

General Statute states that the Board of Transportation will publish:

- Highway Maintenance Improvement Program (HMIP)
  - 3 year pavement plan
  - Rehabilitation, Resurfacing and Preservation
  - Based on previous FY contract resurfacing and pavement preservation funds
  - Posted on the web by April 1\textsuperscript{st} each year
Highway Maintenance Improvement Plan

Includes:

- Year work is to be completed
- Specific roadways in each county
- Specific sections of roadways to be treated
- Type of treatment applied
- Estimated cost

<table>
<thead>
<tr>
<th>Plan Year</th>
<th>County</th>
<th>Route</th>
<th>Begin Description</th>
<th>End Description</th>
<th>Length</th>
<th>Budget Group</th>
<th>Treatment</th>
<th>Estimated Cost</th>
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<tbody>
<tr>
<td>FY 2016</td>
<td>Bertie</td>
<td>SR 1107</td>
<td>SR 1106</td>
<td>END MAINT</td>
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<td>Preservation</td>
<td>Split Seal</td>
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<tr>
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<td>NC 308 + 1.793 miles</td>
<td>SR 1001 + 1.082 miles</td>
<td>2.000</td>
<td>Resurfacing</td>
<td>Mill 1.5&quot; &amp; Replace (B Level)</td>
<td>$397,750.00</td>
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<td>FY 2016</td>
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<td>.4 mile E NC 308</td>
<td>NC 308 + 1.793 miles</td>
<td>1.793</td>
<td>Rehabilitation</td>
<td>Mill 1.5&quot; &amp; Replace / 1.5&quot; Overlay (B Level)</td>
<td>$354,750.00</td>
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(Sample from Division 1)