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Efficiency – Establishing Baseline Unit Pricing

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Efficiency – Establishing Baseline Unit Pricing & Streamlining Project Delivery

- **Summary of NCDOT Efficiency Requirements per SL 2015-241**
- **Development the Baseline Unit Costs (BUC)**
- **SAS Analysis**
- **Overview of Core Work Activities & Review of Baseline Unit Costs**
- **Going Forward - Monitoring/Reporting on Baseline Unit Costs**
- **Industry Concerns**

NCDOT Efficiencies Requirements

- Session Law 2015-241, section 29.14.(b) states:

“Efficiency... Beginning January 1, 2016, no Highway Division shall exceed a ten percent (10%) variance over a baseline unit price set for that year in accordance with this subsection. The Department of Transportation shall institute quarterly tracking to monitor pricing variances. The ten percent (10%) maximum variance set under this subsection is intended to account for regional differences requiring varying product mixes. The Department of Transportation shall report to the Joint Legislative Transportation Oversight Committee and the Fiscal Research Division on December 1, 2015, on information required by this subsection. If a Highway Division exceeds the unit pricing threshold, the Department of Transportation shall report to the Joint Legislative Transportation Oversight Committee and the Fiscal Research Division no later than the fifteenth day following the end of the quarter on why the variance occurred and what steps are being taken to bring the Highway Division back into compliance.”

AND

“Efficiency ... The Department shall adopt procedures in all stages of the construction process to streamline project delivery, including consolidation of environmental review processes, expediting multiagency reviews, accelerating right-of-way acquisitions, and pursuing design-build and other processes to collapse project stages.”

Baseline Unit Costs

- Report established baseline unit costs for the following principal, planned work activities:

- 1) Contract Resurfacing * - Hot Mix Asphalt Overlays,
- 2) Pavement Preservation - Contract and Force Account Chip Seals & Crack Sealing
- 3) Division Bridge Replacements,
- 4) 10 Core Planned Maintenance Functions, and
- 5) Free On-Board (FOB) Goods prices for CRS-2L, #78M stone, S9.5A & B asphalt, & ABC stone

* Also reported baseline costs for asphalt plant mix and liquid binder

REGION			
	Coast/ Sandhills	Piedmont	Mountains
Divisions	1,2,3,4,6	5,7,8,9,10,12	11,13,14



SAS Analysis

- Cary based SAS assisted in setting the baseline unit costs
- NCDOT provided the data sets to SAS for in depth statistical analysis
 - ❖ Note - Data collection included previous fiscal years to obtain a sufficient sample size
- SAS analyzed the data by aggregating by region, division, county, system (primary or secondary), force account or contract, and functional area.
- Work activities were assessed for extreme values and SAS made the determination, when necessary, to remove outliers based on customary statistical practices.



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Contract Resurfacing – Hot Mix Asphalt Overlays

- Thickness typically ranges from ¾” to 1 ½”
 - ❖ has a significant impact on the cost per lane mile
- Route specific variables impacting cost:

Patching, Edge Repair, & Crack Sealing	Milling
Shoulder Reconstruction & Seeding/Mulching	Pavement Markings & Markers
Adjustment of Manholes, Water Valves, & Drainage Structures	Curb Ramps



- \$464M Annual Allocation
- ~85-90% are contract costs
- Bid & commodity prices will be primary drivers of future costs

Contract Resurfacing (\$/Lane Mile)		
	Primary	Secondary
Coast/Sandhills	\$83,093.87	\$51,770.74
Piedmont	\$110,099.70	\$97,196.32
Mountains	\$137,213.48	\$79,076.40
Statewide	\$97,940.30	\$61,422.01

Pavement Preservation - Chip Seals & Crack Sealing

- Chip seals account for the majority of PP activities
- Double Seals are primary chip seal application; \$49.3M and 3,860 Lane Mi. in FY 2015 (~75% of PP allocation)

Double Seal Chip Seals (\$/Lane Mile)		
	Contract	Force Account
Statewide	\$15,942.76	\$11,694.17



- Crack sealing added to the list of eligible PP treatments during the 2015 session of the NCGA
- Beginning in FY 2015-16, PP funds will be used to fund this treatment

Crack Sealing (\$/Lane Mile)		
	Primary	Secondary
Statewide	\$3,100.00	\$3,300.00

Division Bridge Replacements

Division Bridge Replacement (\$/SF)		
	Division Managed	Express Design-Build
East (1,2,3,4,6)	\$110.54	* \$92.21
Central (5,7,8,9,10)	\$101.77	\$123.09
West (11,12,13,14)	\$150.34	\$220.75
Statewide	\$117.42	\$153.40



*Average cost may not be representative as sample size includes only one contract in Division 6

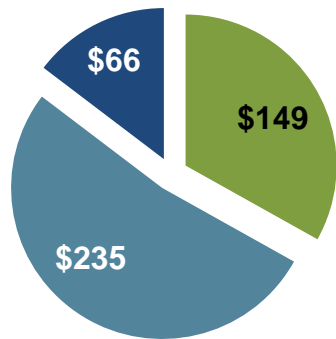
- Avg. Cost/SF is common in industry/consistent with FHWA reporting requirements for federally funded bridge replacement projects
- Miscellaneous items excluded (i.e., bridge approach slabs, under-bridge slope protection, construction/maintenance/removal of temporary detour structure, removal of existing bridge).
- Engineering, right of way, utility relocation and approach roadway construction costs are not included; these costs are variable and site dependent.

Core Maintenance Work Functions

- 10 Work Functions identified
- Maintenance work functions capture wide variety of project scopes; therefore variation in excess of 10% is likely
- Improving data reliability is a major focus area for the Department
- Reactionary exp. to be reduced due to legislative increases in CR & PP funding and proactive/planned maintenance strategy
- Additional funding for core maintenance work functions recommended



Annual Maintenance Expenditures (\$Millions)



- 10 Planned Maint. Work Functions
- Reactionary Maintenance Activities
- Service/Support Functions

Maintenance Activity Statewide Baseline Unit Costs			
	Primary	Secondary	Unit of Measure
2817-Mechanical Asphalt Patching	\$250.32	\$222.53	per ton
2900-Grass Mowing	\$63.34	\$39.41	per shoulder mile
2912-Mechanical Brush & Tree Control	\$698.81	\$684.19	per shoulder mile
3104-Litter Removal	\$279.65	\$334.91	per shoulder mile
3108-Drainage Ditch Maintenance	\$12,934.22	10,153.76	per shoulder mile
3112-Shoulder Maintenance/Reconstruction	\$5,672.95	\$4,114.58	per shoulder mile
3126-Install Pipes (48" or Less)	\$194.92	\$155.14	per linear foot
3222-Long Line Painted Pavement Markings	\$0.16	\$0.07	per linear foot
3232-Install/Replace Pavement Markers and Vertical Delineators	\$20.37	\$15.79	each
3300-Install Non NBIS>48" Up to NBIS structures	\$1,084.13	\$1,781.52	per linear foot

Free On-Board (FOB) Goods

- FOB materials are used by Maintenance forces in force account operations
- Either FOB destination or FOB origin
- Four most commonly use commodities for core planned work were selected for analysis
- Primarily used for chip seals, pavement patching, pipe replacement, & shoulder maint.
- Bid & commodity prices (i.e. liquid asphalt binder) will be primary drivers of future costs

	CRS-2L (\$/gal)	S9.5A & S9.5B (\$/ton)	ABC (\$/ton)	No. 78M Stone (\$/ton)
Coast/Sandhills	\$2.15	\$78.66	\$16.80	\$25.14
Piedmont	\$2.21	\$65.99	\$17.24	\$23.69
West	\$2.18	\$77.13	\$12.63	\$18.39
Statewide	\$2.18	\$74.10	\$15.86	\$22.00
Approx. Annual Expenditures	\$13M	\$14M	\$11M	\$3.3M



Monitoring & Reporting

Chief Engineer's Office sends report to Joint Legislative Oversight Committee (JLTOC) & Fiscal Research Division by the 15th day after each quarter.

- Data & input collected from various sources
 - Quarterly reporting of contract baseline unit costs will be based more on when work was paid for than when it was performed for accuracy reasons.
- Report will provide explanation of Division variances >10%
- Department plans to report BUC's that will "roll" with each quarter through a FY
- BUC's will be updated at beginning of each FY

Questions?

