PERFORMANCE AUDIT

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
COUNTY MAINTENANCE UNITS

MARCH 1999

STATE OF NORTH CAROLINA
Office of the State Auditor

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AUDITOR'S TRANSMITTAL

March 31, 1999

The Honorable James B. Hunt, Jr., Governor
Secretary E. Norris Tolson, Department of Transportation
Members of the North Carolina General Assembly

Ladies and Gentlemen:

We are pleased to submit this performance audit of the *Department of Transportation, Division of Highways, County Maintenance Units.* The objectives of the audit were to review unit level planning procedures, documents, reports, and their use, as well as compare each unit's achievements and expenditures to its overall planned goals; to examine organizational structures, staffing levels, and spans of control at the maintenance unit level; to review procedures and practices for charging work to identified maintenance functions, work orders, and cost centers; and to evaluate equipment assignments and utilization, including use of contractor rentals.

This report consists of an executive summary, program overview, and operational findings and recommendations. The Secretary of Transportation has reviewed a draft copy of this report. His written comments are included as Appendix D, page 61.

We wish to express our appreciation to Secretary Tolson and his staff for the courtesy, cooperation, and assistance provided us during this effort.

Respectfully submitted,

Ralph Campbell, Jr.

Ralph Campbell, Jr.
State Auditor

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This performance audit of selected highway maintenance units within the Division of Highways, Department of Transportation (DOT) addressed potential statewide operational issues within DOT's county maintenance unit operations. The Division of Highways directs and manages the State's road systems including design, construction, and maintenance. The Division of Highways is subdivided into 14 Divisions, 39 District offices, and 100 county maintenance units to provide services to North Carolina's counties.

To audit the operations of the maintenance units, we reviewed unit level planning procedures, documents, reports, and their use, as well as compared unit achievements and expenditures to the overall planned goals. We examined organizational structures, staffing levels, and spans of control at the maintenance unit level. We reviewed procedures and practices for charging work to identified maintenance functions, work orders, and cost centers. Lastly, we evaluated equipment assignments and utilization, including use of contractor rentals. The scope of the audit encompassed county maintenance unit operations and, to the extent necessary, the operations of DOT's Equipment and Inventory Control Unit.

The Secretary of Transportation has reviewed a draft of the report and his written comments are contained in Appendix D, page 61.

FINDINGS AND CONCLUSIONS

Page

Maintenance Units Operations and Procedures:

FINDINGS AND CONCLUSIONS (concluded)

AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY

North Carolina General Statute §147-64 empowers the State Auditor with the authority to conduct performance audits of any state agency or program. Performance audits are reviews of activities and operations to determine whether resources are being used economically, efficiently, and effectively.

The performance audit of selected highway maintenance units within the Division of Highways, Department of Transportation (DOT), grew out of a special review of maintenance operations at the Jackson County Maintenance Unit. Based on problems identified in Jackson County, we expanded our review to address potential statewide operational issues within DOT's county maintenance unit operations. Specific objectives were to:

- Review unit level planning procedures, documents, reports, and their use, as well as compare each unit's achievements and expenditures to its overall planned goals;
- Examine organizational structures, staffing levels, and spans of control at the maintenance unit level;
- Review procedures and practices for charging work to identified maintenance functions, work orders, and cost centers; and
- Evaluate equipment assignments and utilization, including use of contractor rentals.

The scope of the audit encompassed county maintenance unit operations and, to the extent necessary, the operations of DOT's Equipment and Inventory Control Unit (EICU).

During the period April 1998 through September 1998, we conducted fieldwork for the audit of DOT maintenance units. To achieve the audit objectives, we employed various auditing techniques that adhere to the generally accepted standards promulgated in *Government Auditing Standards* issued by the Comptroller General of the United States. These techniques included:

- Review of existing General Statutes and the North Carolina Administrative Code as they relate to the DOT maintenance units' operations;
- Review of planning procedures, documents, organizational charts, policies and procedures, contractual agreements, and financial data;
- On-site, in-depth interviews at 10 DOT county maintenance units and telephone interviews with an additional 19 County Maintenance Engineers;
- Interviews of key personnel within DOT's Fiscal, Personnel, and Equipment units;
- Examination of financial records and data for allocating expenditures and recording of payments to contractors;
- Evaluation of maintenance units' organizational structures and personnel vacancies; and
- Review of data from other states for comparative purposes.

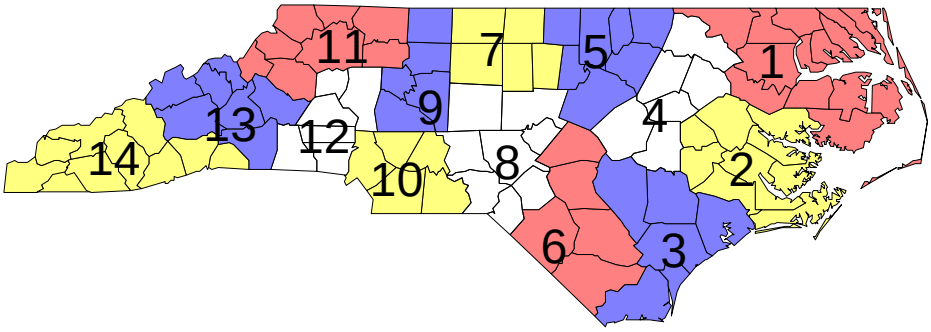
AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY

This report contains the results of the audit, as well as specific recommendations aimed at improving the operations of the DOT Maintenance and Equipment units in terms of economy, efficiency, and effectiveness. Because of the test nature and other inherent limitations of an audit, together with the limitations of any system of internal and management controls, this audit would not necessarily disclose all weaknesses in the system or lack of compliance. Also, projection of any of the results contained in this report to future periods is subject to the risk that procedures may become inadequate due to changes in conditions and/or personnel, or that the effectiveness of the design and operation of the policies and procedures may deteriorate.

BACKGROUND INFORMATION

North Carolina General Statute §143B-345 establishes the Department of Transportation. The Department is responsible for carrying out policies, programs, priorities, and projects as approved by the North Carolina Board of Transportation. The DOT Division of Highways, the largest component within the Department, directs and manages the State's road systems including design, construction, and maintenance. As shown in Exhibit 1, the Division of Highways is subdivided into 14 Divisions, 39 District offices, and 100 county maintenance units to provide services to North Carolina.

Exhibit 1
DOT DIVISIONS, DISTRICTS, AND COUNTY MAINTENANCE UNITS



Division	District	County
1	1	Camden/Pasquotank
		Currituck
		Dare
		Gates
		Perquimans
	2	Bertie
		Hertford
		Northampton
	3	Chowan
		Hyde
		Martin
		Tyrrell/ Washington
2	1	Beaufort
		Pitt
	2	Carteret
		Craven
		Pamlico
	3	Greene
		Jones
		Lenoir
3	1	Onslow
		Pender
	2	Duplin
		Sampson
	3	Brunswick
		New Hanover
4	1	Edgecombe
		Halifax
	2	Nash
		Wilson
	3	Johnston
		Wayne

Division	District	County
5	1	Wake
	2	Durham
		Granville
		Person
	3	Franklin
		Vance
		Warren
6	1	Robeson
	2	Cumberland
		Harnett
	3	Bladen
		Columbus
7	1	Alamance
		Orange
	2	Guilford (2 units)
	3	Caswell
		Rockingham
8	1	Chatham
		Randolph
	2	Hoke
		Lee
		Moore
	3	Montgomery
		Richmond
		Scotland
9	1	Davidson
		Rowan
	2	Davie
		Forsyth
		Stokes
10	1	Cabarrus
		Stanly
	2	Mecklenburg (2 units)
	3	Anson
		Union

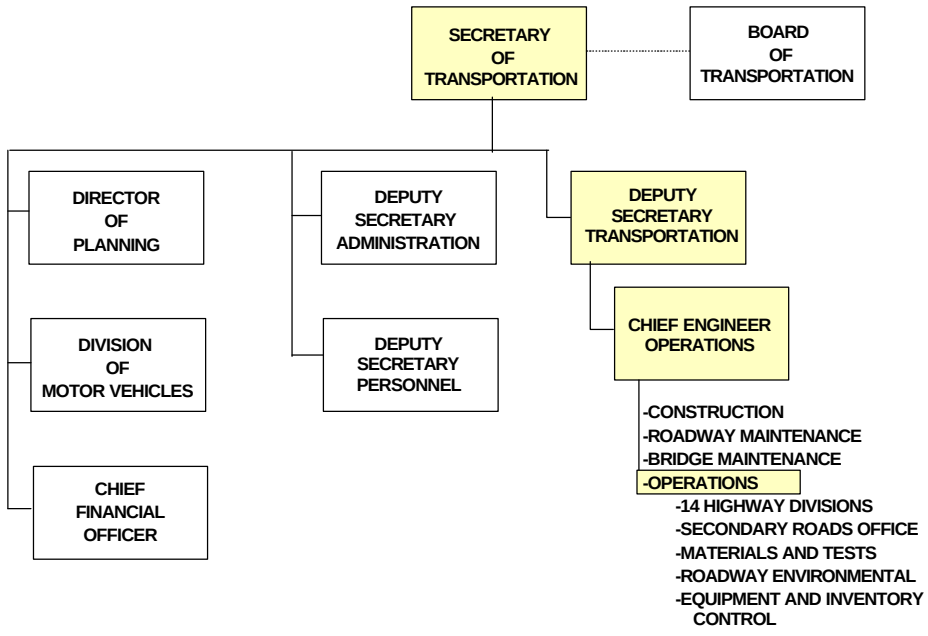
Division	District	County
11	1	Alleghany
		Surry
		Yadkin
	2	Avery
		Caldwell
		Watauga
	3	Ashe
		Wilkes
12	1	Cleveland
		Gaston
		Lincoln
	2	Alexander
		Catawba
		Iredell
13	1	Burke
		McDowell
		Mitchell
		Rutherford
	2	Buncombe
		Madison
		Yancey
14	1	Henderson
		Polk
		Transylvania
	2	Haywood
		Jackson
		Swain
	3	Cherokee
		Clay
		Graham
		Macon

Source: NCDOT

Organizational Structure:

Exhibit 2 shows the overall organizational structure for DOT and the reporting structure for Maintenance and Operations within the Division of Highways. The primary responsibility of the DOT maintenance staff is to maintain some 77,750 miles of roadways and more than 17,000 bridges on the State Highway System. The Chief Engineer of Operations is responsible for construction, roadway maintenance, bridge maintenance, and operations functions for the Department. The DOT Operations section includes the State's 14 Highway Divisions, the Secondary Roads Office, and six operational units. The 14 Highway Divisions, each headed by a Division Engineer, and the Construction, Roadway Maintenance, Bridge Maintenance, Materials and Tests, Roadway Environmental, and Equipment and Inventory Control Unit are headed by the State Engineer who reports to the Deputy Chief Engineer of Operations. The 14 Highway Divisions employ some 8,176 employees. This audit concentrated on the county maintenance units and their responsibilities.

Exhibit 2
DEPARTMENT OF TRANSPORTATION
ORGANIZATION CHART AS OF 8/98



Source: DOT Personnel Section

North Carolina is unique when it comes to owning and maintaining roads in that county governments have no jurisdiction over secondary roads. The State accepted responsibility for the maintenance of secondary roads in 1931. North Carolina's state-maintained highway system is the second largest in the nation with 77,754 miles of state-maintained roads as shown in Table 1. Currently, the Roadway Maintenance unit and the 14 Highway Divisions together are responsible for maintaining over 160,000 lane miles of interstate, primary, secondary (paved and unpaved), and urban roadways.[1]

Table 1
NORTH CAROLINA'S STATE-MAINTAINED ROAD SYSTEM

Road Type	Miles
Interstate	983
Primary	11,177
Urban	6,271
Secondary Paved	48,532
Secondary Unpaved	10,791
Total	**77,754**

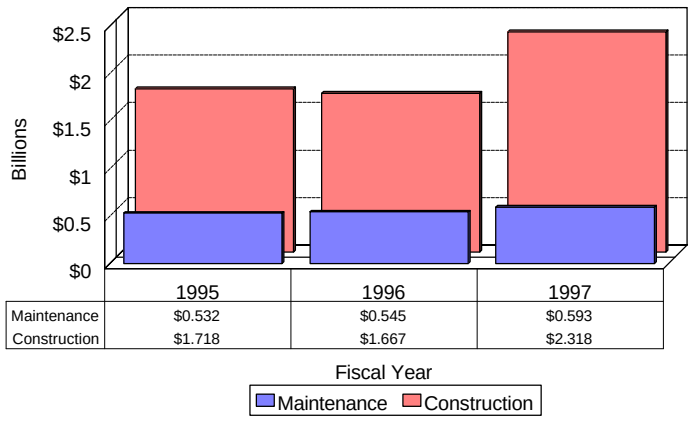
Source: NCDOT

The Roadway Maintenance unit is primarily responsible for developing and formulating uniform highway maintenance policies and procedures and undertaking various maintenance training activities for statewide implementation. Performing routine and preventive roadway maintenance activities is the responsibility of the county maintenance units within each of the 14 Highway Divisions.

Funding:

The General Assembly provides an appropriation to the Department for its operations. Once the appropriation is known, DOT determines specific allotments for each of its major program areas, such as construction and maintenance, as specified by federal and State laws. Exhibit 3 shows allotment funding for construction and maintenance for fiscal years 1994-95 through 1996-97.

Exhibit 3
CONSTRUCTION FUNDING VS. MAINTENANCE FUNDING



Source: NCDOT, Board of Transportation of North Carolina Financial Statements, June 30, 1995-97, Exhibit E, Total Work Order Availability, including Federal Aid to Construction.

Highway maintenance allotments are accomplished through revenue transfers from the Department's Highway Fund. These allotments generally provide for routine maintenance and some minor construction contracting work. They are distributed among the 14 Highway Divisions according to various sub-allotment formulas (allocations), which combine uniform allotments and needs-based funding outlays. DOT also allocates funding for an annual statewide contract resurfacing program. Each Division receives a per-

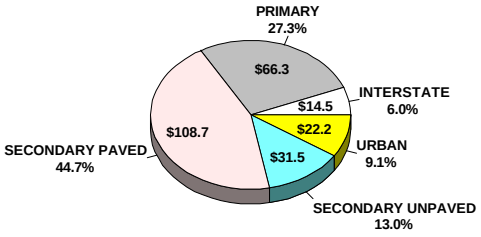
[1] "Total miles" are counted as if one mile of a four lane road were equal to one total mile; one mile of a four lane road would be counted as four "total lane miles."

centage of the total allocation, based on its share of the State's maintenance needs, paved lane miles, and population.

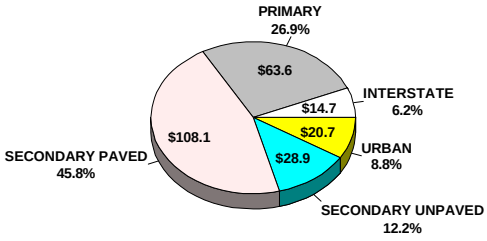
For fiscal year 1997-98, roadway maintenance was allocated approximately $430 million in the maintenance (primary, secondary, and urban systems) and contract resurfacing budget. Under primary, secondary, and urban systems, budgeted funds are divided among various activities such as road maintenance, bridge maintenance, operations, railroad signals, weigh stations, inmate labor, historical markers, renovations of rest areas, training, and other activities. At the county level, maintenance funds are allocated by primary, secondary, and urban road systems. Exhibit 4 summarizes maintenance allocations by type of road for fiscal years 1994-95 through 1996-97.

Exhibit 4
MAINTENANCE ALLOCATIONS BY ROAD TYPE
FISCAL YEARS 1994-95 THROUGH 1996-97

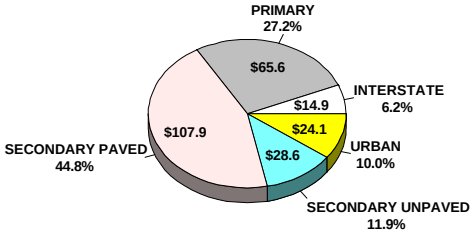
FY 1994-95
Total Allocation: $243.2 million



FY 1995-96
Total Allocation: $236.0 million



FY 1996-97
Total Allocation: $241.1 million



Note: Percentages may not add to 100% due to rounding.

Source: DOT Fiscal Records

Use of Funds:

North Carolina Administrative Code, 19A Section 2D.0405 requires maintenance funds be used to keep roads or highways at their existing condition and traffic carrying capacity. Examples of maintenance activities include:

- Roadway Maintenance
  - Mowing shoulders and right of way
  - Pulling or cleaning of roadway and drainage ditches
  - Cutting down shoulders and uniforming slopes
  - Machining unpaved roads
  - Adding surfacing material 2 inches or less in thickness to unpaved roads
  - Patching pavements
  - Resurfacing 2 inches or less in thickness on paved roads
  - Snow and ice removal
  - Storm clean-up
  - Replacing existing pipe culverts
  - Patching or replacing floors, rails, or individual stringers on timber bridges
  - Placing of driveway pipe purchased by property owners
  - Maintenance and replacement of traffic channelization devices, traffic islands, and curbing
  - Installation of spot traffic channelization devices, traffic islands, and curbing.

- Bridge Maintenance

- Landscape Maintenance
  - Periodic selective cutting of right of way
  - Periodic replanting or fertilization of shoulders and slopes
  - Maintenance of litter cans, picnic tables, and rest areas, welcome centers
  - Seeding and mulching
  - Application of herbicides

- Traffic Services Maintenance
  - Maintenance of traffic control equipment including traffic signals, flashers, and special signaling devices
  - Related equipment such as signal heads, cabinets, detectors, and any other auxiliary equipment
  - Maintenance and replacement of signs, including posts and hardware
  - Installation of new signs when not otherwise provided for
  - Re-marking pavement, including center lines, lane lines, edge lines, pavement symbols and messages, stop bars, crosswalks, etc.
  - New pavement markings when not otherwise provided for

Each year the Department awards more than 1,500 contracts for such maintenance activities as: small bridge replacement, landscape maintenance and planting, guardrail and fence installation, material hauling, mowing, unpaved road maintenance, widening and resurfacing, patching, shoulders and drainage, rest areas, spot safety, markings and signals, fully operated rental equipment, and other miscellaneous work. To expedite the contract solicitation, selection, and award process, the Secretary of Transportation has delegated authority to award highway construction and maintenance contracts up to $100,000 to the Division Engineers. Under this authority, each Division Engineer writes specifications,

accepts bids, awards contracts, and maintains lists of contractors who have expertise in specific roadway construction and/or maintenance activities. Written quotations are obtained from responsible bidders, reviewed, and the contact is awarded to the lowest responsible bidder.

The Department Purchasing Officer has been authorized by the Secretary to award purchase order contracts for roadway construction and maintenance valued at more than $100,000 but less than or equal to $500,000. Typically, the plans and specifications for a purchase order contract are developed by one of the operational units within DOT. Written quotations are obtained from a minimum of three responsible bidders. Upon review and evaluation, the Division Engineer, or the appropriate decision-maker, will make a recommendation to the Department Purchasing Officer for the award of the contract to the lowest responsible bidder. Both the division and purchase order contracts require all participating contractors to be pre-qualified by the Department prior to submitting bids.

Availability of Funds:

Table 2 summarizes "maintenance work order allotments" (the actual funds available) by road type for fiscal years 1994-95 through 1996-97. The figures include unexpended work order allotments from prior fiscal years. Allotments for a prior year might be carried forward due to continuing projects.

Table 2
MAINTENANCE WORK ORDER FUNDS BY SYSTEM TYPE[1]

FY	Work Order	Primary	Secondary	Urban	Contract Resurfacing	Total
94-95	Unexpended Allotment[2] 7/1/94	$ 23,615,695	$ 20,887,635	$ 3,758,936	$ 55,355,662	$103,617,929
	Current Year Allotment	117,555,745	189,321,009	31,176,273	90,544,,943	428,597,970
	Total	**$141,171,440**	**$210,208,644**	**$34,935,210**	**$145,900,605**	**$532,215,899**
95-96	Unexpended Allotment[2] 7/1/95	31,266,476	16,237,333	4,126,619	57,123,773	108,754,202
	Current Year Allotment	112,619,378	196,715,711	33,431,908	93,042,381	435,809,377
	Total	**$143,885,854**	**$212,953,044**	**$37,558,527**	**$150,166,154**	**$544,563,579**
96-97	Unexpended Allotment[2] 7/1/96	31,282,855	23,633,521	2,646,288	59,969,120	117,531,783
	Current Year Allotment	115,870,541	195,672,761	39,861,638	123,975,066	475,380,006
	Total	**$147,153,396**	**$219,306,282**	**$42,507,926**	**$183,944,186**	**$592,911,790**

[1]Differences due to rounding.

[2]Unexpended work order allotment at year end represents, in large part, funds that have been committed to specific projects or activities that have not been completed.

Source: DOT Fiscal Reports

MAINTENANCE UNITS OPERATIONS AND PROCEDURES

Objective: *To review unit level planning procedures, documents, reports, and their use, as well as compare each unit's achievements and expenditures to its overall planned goals.*

In the special review conducted at the Jackson County Maintenance Unit, we identified a number of operational issues that we felt had statewide significance. To address these potential statewide issues, we performed on-site reviews at 10 DOT county maintenance units and interviewed key personnel at 19 additional maintenance units selected to include metropolitan, urban, and rural counties. Specifically, we reviewed planning, outcome accomplishments, and expenditures at each unit. Table 3 identifies the units included in this review.

Table 3
UNITS INCLUDED IN REVIEW

Division	County	Division	County
1	Pasquotank	8	Randolph
	Washington		Montgomery
2	Craven	9	Rowan
	Greene		Forsyth
3	Onslow	10	Mecklenburg (2)
	Sampson		Union
4	Edgecombe	11	Ashe
	Johnston		Wilkes
5	Wake	12	Catawba
	Durham		Iredell
6	Robeson	13	McDowell
	Cumberland		Buncombe
7	Orange	14	Cherokee
	Guilford		Jackson

Source: Compiled by the Office of the State Auditor

Conclusion: **DOT has established a number of management control mechanisms to assist in the monitoring of maintenance unit operations. However, we found that most of the maintenance units included in the review are not utilizing those mechanisms to effectively plan, monitor, and compare achievements and expenditures to overall planned maintenance goals. This lack of monitoring has allowed maintenance units to over-expend allocations. Specifically, the annual maintenance planning process is an exercise on paper only, and reports generated through the Maintenance Management System (MMS) are incomplete and contain inaccurate data. Identified areas where improvements could be made are discussed below.**

Auditor's Note*: The following findings and recommendations support the KPMG Peat Marwick LLP finding in the May 1998 performance audit report on the Department of Transportation. Peat Marwick found that the DOT Highway Division needs to emphasize* ***performance*** *reporting of roadway maintenance activities and develop comprehensive performance measures to evaluate maintenance progress.*

THE ANNUAL MAINTENANCE PLANNING PROCESS IS INEFFECTIVE, MAY NOT PROVIDE ACCURATE DATA, AND PERFORMANCE OUTPUTS ARE NOT EFFECTIVELY MONITORED.

DOT has a computerized Maintenance Management System (MMS) designed to provide personnel at the Department, Division, District, and unit levels data on maintenance unit operations. As part of that system, at the beginning of each fiscal year, Division, District, and county maintenance personnel develop an annual maintenance plan. The plans include interstate, primary, secondary paved, secondary unpaved, and urban systems, and are estimates of the amount of work (by work order and function code) each local unit anticipates accomplishing during the year. The plan shows estimated cost, units planned, and total planned costs for each type of project. Once the plan is developed, submitted and approved, it becomes a part of the field output reports generated by MMS. By monitoring these reports, all levels of management should be able to measure progress against the maintenance plan.

We learned during the audit that the plan is considered by District and unit management to be only "a guide", based on budgeted amounts rather than actual needed maintenance requirements. The prior year's maintenance plan is reviewed and revised for the current year, with plans changing very little from year to year[2]. Additionally, the plan is seldom monitored and revised during the year to reflect any changes. Division, District, and County Engineers interviewed stated that the majority of their maintenance activities are reactionary in nature; that is, primarily responding to complaints. Without exception, each level of management stated that this reactionary posture made it difficult to adequately develop useful maintenance plans.

We compared annual maintenance plans to MMS output reports of accomplishments and noted significant variances between planned and actual accomplishments at five selected maintenance units. Table 4, page 13, contains several examples of the variances noted. The primary purpose of the output reports is for use as a management tool to monitor activity and measure progress against each unit's maintenance plan. At the selected units, we compared planned maintenance activity to time sheets (FR-11s) for selected pay periods covering fiscal years 1995-96 through 1996-97. We noted 357 instances where planned man-hours for certain activities had zero accomplishments shown on the output reports. Yet, FR-11s prepared daily by employees in each unit had hours recorded for those activities. Furthermore, discussions with maintenance engineers at the different levels revealed that the plans and output reports are **not used** to monitor the overall performance of their units. (We learned during the audit that at least one maintenance unit in the sample monitored performance by dollars expended. See the following related finding.)

[2] Little change because of established historical standards for major functions. Shoulder and ditch maintenance, patching and pavement repair.

Table 4
EXAMPLES OF VARIANCES IN PLANNED VS. ACCOMPLISHED WORK AT SELECTED MAINTENANCE UNITS

COUNTY	FISCAL YEAR	SYSTEM	DESCRIPTION	UNIT	UNITS ACCOM-PLISHED	PLANNED UNITS	DIFFERENCE OVER (UNDER)
Craven	94-95	Secondary Paved	BST Patching	Square Yards	39,069	85,000	(45,931)
	95-96	Secondary Paved	BST Patching	Square Yards	74,254	7,900	66,354
	96-97	Secondary Paved	BST Patching	Square Yards	39,400	7,900	31,500
Jackson*	95-96	Primary	Guardrail	Linear Feet	425	2,000	(1,575)
	96-97	Primary	Guardrail	Linear Feet	425	2,000	(1,575)
Mecklenburg	94-95	Urban	Routine Mowing**	Shoulder Miles	22	2,000	(1,978)
	95-96	Urban	Routine Mowing**	Shoulder Miles	0	4,000	(4,000)
	96-97	Urban	Routine Mowing**	Shoulder Miles	0	4,500	(4,500)

*Annual Maintenance Plans for Fiscal Year 1994-95 were not available for review.
**May be contracted out and not entered in system.
Source: NCDOT MMS Output Reports and Annual Maintenance Plans for Selected Units

Auditor's Note: *During the course of the audit, the DOT Internal Audit staff investigated situations where 0 hours were showing on the output reports for Jackson County. The internal auditors reported that, due to a MMS programming problem, the output reports did not show accomplishments for maintenance functions reported on the basis of man-hours even though the hours from the FR-11s were input into MMS. The auditors learned that Department personnel had been aware of the problem for some time, but had not initiated the necessary computer program modifications to correct the problem because it was not given a priority status. According to the internal auditors, MMS programmers initiated corrective action during the audit.*

RECOMMENDATION

The process for the development of the annual maintenance plans should be revised. DOT management should prepare realistic maintenance plans based on historical data modified by any specific requirements for the current plan year. Further, management at each level should closely monitor accomplishments against those planned for the unit.

COUNTY MAINTENANCE UNITS HAVE OVER-EXPENDED ALLOCATIONS FOR FY1994-95 THROUGH FY1996-97.

The General Assembly appropriates funds to the Department to operate the State's transportation program, with the Board of Transportation responsible for oversight of the program. The Board approves allocations on an individual project basis for construction, as well as allocations for road maintenance purposes to each of the fourteen field

operating Divisions for interstate, primary, urban, and secondary roads. Each Division Engineer is responsible for properly expending maintenance funds to: (1) maintain the road systems in, or as near to, existing conditions as practical; (2) ensure long term, reasonably safe, and comfortable utilization by the traveling public; and (3) preserve the State's capital investment. Budget allocations and sub-allocations are made at the Division level. Primary and urban funds are used on a division-wide basis. Although there may be overruns of budgets in some counties, the overall balances on primary and urban systems usually balance in the Division. The secondary system is allocated by county and funds are not transferable from county to county.

We reviewed budgeted maintenance allocations and expenditures for fiscal years 1994-95 through 1996-97. Table 5 contains a summary of maintenance allocations for that period. (See Appendix A, page 45, for maintenance allocations by county for the same period.)

Table 5
MAINTENANCE ALLOCATIONS BY ROAD TYPE

Fiscal Year	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Total
94-95	$14,514,803	$66,300,271	$108,687,059	$31,543,107	$22,163,883	$243,209,123
95-96	14,729,636	63,576,756	108,123,098	28,864,467	20,675,162	235,969,119
96-97	14,936,141	65,618,181	107,864,067	28,606,890	24,108,608	241,133,887
TOTAL	$44,180,580	$195,495,208	$324,674,224	$89,014,464	$66,947,653	$720,312,129

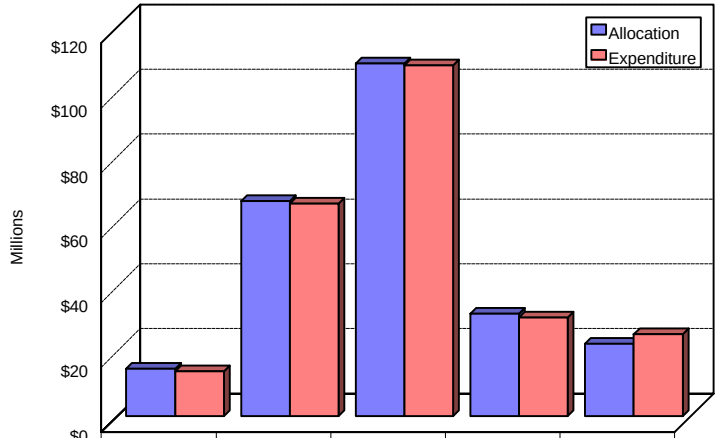
Source: DOT Fiscal Records

Exhibit 5, page 15, shows the statewide cumulative amount allocated to maintenance units by program type and the amounts spent for the three fiscal years. As can be seen, when rolled up to the state level, the amounts allocated and expended are very close. However, when examined at the individual county level, we find a much different picture.

Examination of financial records showed that for fiscal year 1994-95, 81 of 100 counties over-expended maintenance allocations in at least one program category. Over-expenditures continued in fiscal years 1995-96 and 1996-97 with 76 and 90 counties, respectively, over-expending budgeted allocations for those years. Only one county (Madison) did not over-expend allocations during the period. Detailed data by county is contained in Appendix B, page 51. Table 6, page 16 shows the overall impact of county over-expenditures for this period, giving the number of units that over-expended by road type by year.

Exhibit 5
STATEWIDE CUMULATIVE ALLOCATIONS AND EXPENDITURES

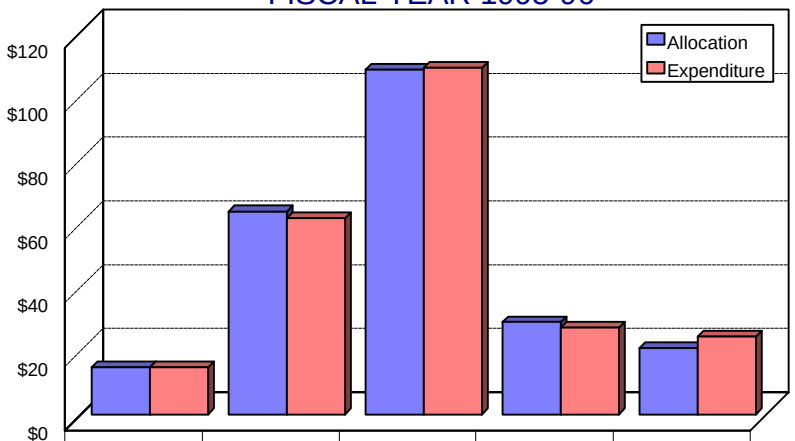
FISCAL YEAR 1994-95



	Interstate	Primary	Sec. Paved	Sec. Unpaved	Urban
Allocation	$14.5	$66.3	$108.7	$31.5	$22.2
Expenditure	$13.8	$65.4	$108.1	$30.4	$25.1

Road Type

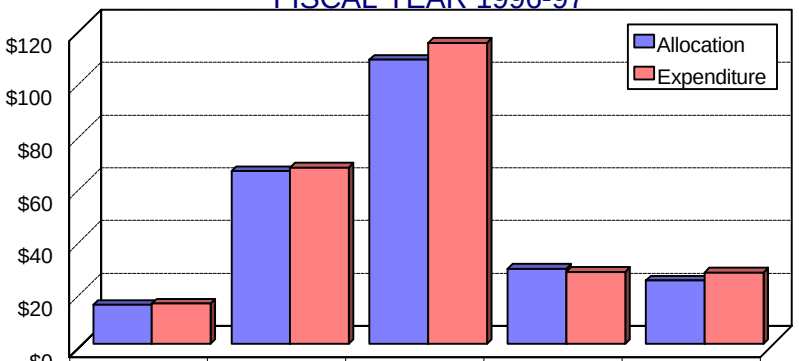
FISCAL YEAR 1995-96



	Interstate	Primary	Sec. Paved	Sec. Unpaved	Urban
Allocation	$14.7	$63.6	$108.1	$28.9	$20.7
Expenditure	$14.8	$61.5	$108.6	$27.2	$24.4

Road Type

FISCAL YEAR 1996-97



	Interstate	Primary	Sec. Paved	Sec. Unpaved	Urban
Allocation	$14.9	$65.6	$107.9	$28.6	$24.1
Expenditure	$15.3	$66.9	$114.3	$27.4	$27.1

Road Type

Source: DOT Fiscal Records

Interviews with personnel at the units visited indicated that allocations may have been overspent due in part to:

- Extra mowing cycles because of rainy weather;
- Disaster or storm-related clean ups (Hurricanes Bertha and Fran or snow storms);
- Extra patching and paving due to freezing/rainy weather;
- Rock slides in some western counties; and
- Incident management (motorist assistance patrol, motorist notification signs, roadway lighting).

This situation significantly impacts maintenance unit operations because over-expended allocations are deducted from the next year's allocations. Therefore, county maintenance units end up with less money to use as a base for maintenance operations in the following year.

Table 6
OVER-EXPENDITURES BY MAINTENANCE UNITS BY PROGRAM AREA

Fiscal Year	Interstate		Primary		Secondary Paved		Secondary Unpaved		Urban		Total
	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars	No.	Dollars	
94-95	9	$412,248	40	$1,718,678	40	$3,247,466	38	$894,387	35	$4,582,121	$10,854,900
95-96	20	699,769	34	1,334,668	53	4,734,632	26	597,959	40	4,744,823	12,111,851
96-97	15	1,134,837	53	3,533,628	62	8,758,725	37	1,004,324	41	5,056,897	19,488,411
TOTAL		$2,246,854		$6,586,974		$16,740,823		$2,496,670		$14,383,841	$42,455,162

Source: Dot Fiscal

RECOMMENDATION

The Division, District, and county maintenance units should closely monitor expenditures to reduce and/or prevent over spending maintenance allocations. Further, DOT management should reexamine the maintenance backlog to update it to consider current needs. As previously recommended, all planning and budgeting for the maintenance units should be based upon historical data showing needs.

Auditor's Note: *As reported in the May 1998, KPMG Peat Marwick LLP report on the Department of Transportation, the State had an identified maintenance backlog of $170,640,897 as of March 31, 1997. Additionally, KPMG found the annual pavement resurfacing funding allocation alone represents a $95 million shortfall.*

ORGANIZATION AND STAFFING

Objective: *To examine organizational structures, staffing levels, and spans of control at the maintenance unit level.*

To evaluate maintenance unit organizational structures, staffing levels, and spans of control, we obtained and analyzed organizational charts for all county maintenance units and position descriptions for supervisory and staff positions. Additionally, we conducted interviews of maintenance personnel at the units visited to identify specific duties and responsibilities of supervisory and non-supervisory staff.

Conclusion: **Overall, we found that the units visited had adequate staff to handle their workloads. Based on our observations and analysis of organizational structure, we believe that some position classifications do not accurately reflect job responsibilities, that attention is needed to narrow spans of control at certain maintenance units, and that vacancies need to be evaluated for need and filled in a more timely manner. Below is a discussion of the issues and recommendations for improvements.**

TRANSPORTATION SUPERVISOR POSITIONS MAY NOT BE PROPERLY CLASSIFIED.

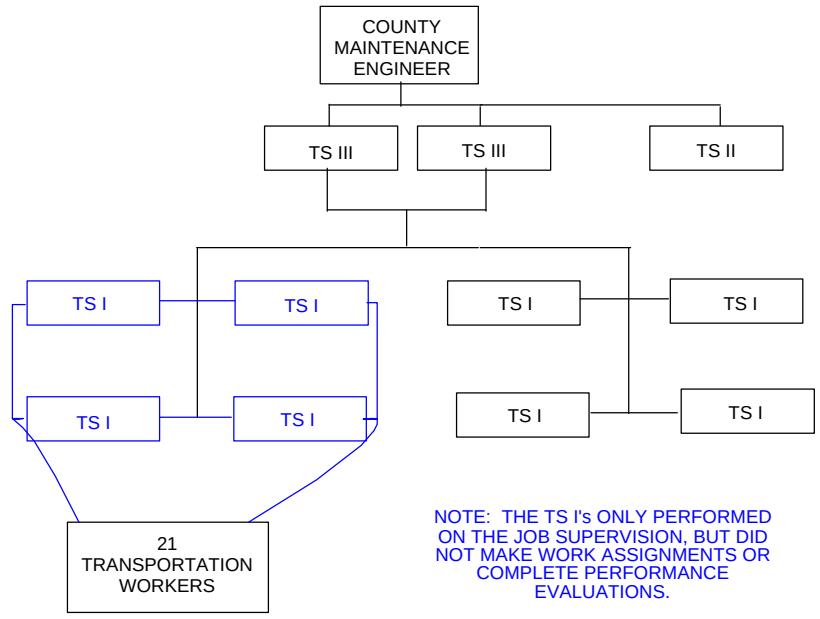
The Department's position descriptions for DOT Transportation Supervisors I, II, and III indicate employees in these positions "supervise one or more crews" in transportation maintenance work in one of four areas: roadway maintenance, traffic services, bridge maintenance, and/or roadside environmental. Under general supervision and guidance from superiors, Transportation Supervisors perform the following duties:

- Counsel and discipline employees;
- Monitor expenditures;
- Maintain work records, time sheets, job reports, and inventory records;
- Plan and staff work operations;
- Monitor project status at key points;
- Conduct performance reviews;
- Interview and recommend hiring new staff;
- Investigate public complaints and recommend solutions; and
- Ensure equipment is maintained and serviced as required.

At one of the county maintenance units included in the review, we noted 11 transportation supervisor (TS) positions for 21 transportation worker positions. The supervisory positions consisted of two TS III's; one TS II; and eight TS I's. We learned that the two

TS III's had joint supervision over the eight TS I's. However, the 21 transportation workers were supervised by only 4 of the 8 TS 1's. The remaining 4 TS 1's plus the TS II had no assigned subordinate staff. Further, we found that only the two TS III's actually performed supervisory functions such as work assignments and performance evaluations. (See Exhibit 6.) While we noted no other specific situations at the units visited, reviews of the organizational charts for all maintenance units indicate similar questionable reporting relationships at units not visited.

Exhibit 6
QUESTIONABLE SUPERVISORY RESPONSIBILITIES



Source: DOT Personnel Records

RECOMMENDATION

DOT management should request DOT Personnel to review the roles, duties, and responsibilities of all transportation supervisors to determine if they are properly classified. Positions that do not perform supervisory functions should be reclassified as non-supervisory. Management should request assistance from the Office of State Personnel, if necessary, regarding the proper classification of these positions.

SPANS OF CONTROL VARY AMONG COUNTY MAINTENANCE UNITS.

In 1997, Senate Bill 352, Section 7.14 directed the Office of State Budget and Management (OSBM) to review and analyze the administrative span of control of State agencies. This study was a sequel to the span of control analysis authorized by the General Assembly in 1995. The starting point and focus of the continued study was the progress achieved on recommendations made in the May 1996 study report entitled *Study of State Agency Spans of Control and Organizational Layers.*

The May 1996 report recommended a statewide span of control goal of 1 supervisor to 8 non-supervisors. Additionally, benchmarks were established for each agency based upon the mix of job classifications and agency mission. DOT's goal was set at 1 to 6.95. The data contained in OSBM's 1998 report shows that department wide DOT's average span of control increased from 1 to 5.76 in 1995 to 1 to 5.80 in 1997, 83% of the Department's 1995 goal.[3]

To determine the current span of control for each maintenance unit, we examined organizational charts, revised as of January 1998, provided by DOT Personnel. These charts revealed an average span of control 1 to 3.852 permanent employees, substantially lower than DOT's overall average. The charts also showed a significant variance in supervisory to non-supervisory positions from unit to unit. Span of control ratios ranged from 13 supervisory positions to 25 permenent staff positions (a ratio of 1 to 1.923), to 4 supervisors to 32 permenent positions, (a ratio of 1 to 8).

We expanded our analysis to include average usage of temporary employees and inmate labor based upon data provided by the Division of Highways. Although the overall average span of control increased to 1 to 5.868 with the inclusion of temporary employees and inmate labor, there were still significant variances in supervisory to non-supervisory positions from unit to unit. Table 7, page 20, shows the span of control variances among county maintenance units. Including temporary employees and inmate labor, we found that the average span of control for the eastern divisions (1-4) was 1 to 6.173. Spans of control in divisions 5-10 located in the central part of the State, as well as the western divisions (11-14), had lower averages: 1 to 5.727 and 1 to 5.894, respectively.

RECOMMENDATION

As part of its ongoing efforts to increase span of control ratios, DOT management should review the organizational structure regarding the number of supervisory positions to staff positions for each county maintenance unit. DOT management should strive to increase span of control ratios wherever possible at each unit.

[3] OSBM intends to review span of control again in 2000. That effort will review goals based on agency progress and will determine if modifications are necessary.

Table 7
SPAN OF CONTROL RATIOS OF SUPERVISORY TO NON- SUPERVISORY POSITIONS

DIV.	DIST.	COUNTY	SUPV. POSITIONS[1]	NON-SUPERVISORY POSITIONS[2]				PS RATIO 1 to	TOTAL RATIO 1 to	DIV.	DIST.	COUNTY	SUPV. POSITIONS[1]	NON-SUPERVISORY POSITIONS[2]				PS RATIO 1 to	TOTAL RATIO 1 to
				PS	TS	IC	TOTAL							PS	TS	IC	TOTAL		
5	3	VANCE*	4	32	3	0	35	8.000	8.750	14	2	JACKSON, SWAIN	13	54	15	8	77	4.154	5.923
13	2	BUNCOMBE	11	50	13	30	93	4.545	8.455	7	2	GUILFORD	15	61	19	8	88	4.067	5.867
1	2	BERTIE, HERTFORD	11	59	19	4	82	5.364	7.455	2	2	CRAVEN, PAMLICO	13	51	6	19	76	3.923	5.846
6	2	HARNETT	10	40	18	16	74	4.000	7.400	4	1	HALIFAX	9	42	10	0	52	4.667	5.778
11	1	ALLEGHANY, YADKIN	12	57	10	21	88	4.750	7.333	2	1	BEAUFORT	10	51	5	0	56	5.100	5.600
2	3	LENOIR	10	40	14	17	71	4.000	7.100	3	3	BRUNSWICK	7	26	4	9	39	3.714	5.571
1	1	CAMDEN, GATES, PASQUOTANK, PERQUIMANS	14	67	15	16	98	4.786	7.000	8	1	CHATHAM	9	41	9	0	50	4.556	5.556
6	3	BLADEN	9	33	12	18	63	3.667	7.000	9	1	DAVIDSON	15	34	3	46	83	2.267	5.533
2	1	PITT	13	58	3	29	90	4.462	6.923	10	3	UNION	15	49	4	30	83	3.267	5.533
14	1	HENDERSON	11	42	12	22	76	3.818	6.909	9	2	STOKES	12	39	2	25	66	3.250	5.500
6	2	CUMBERLAND	10	55	14	0	69	5.500	6.900	11	3	ASHE	12	39	17	10	66	3.250	5.500
3	2	DUPLIN	10	52	8	9	69	5.200	6.900	8	3	MONTGOMERY	7	23	4	11	38	3.286	5.429
5	1	WAKE	17	78	4	35	117	4.588	6.882	3	1	PENDER	8	33	3	7	43	4.125	5.375
1	3	HYDE, TYRRELL, WASHINGTON	8	48	7	0	55	6.000	6.875	12	2	CATAWBA	11	37	0	22	59	3.364	5.364
2	3	GREENE, JONES	12	43	8	31	82	3.583	6.833	10	3	ANSON	11	29	3	27	59	2.636	5.364
11	1	SURRY	11	62	5	8	75	5.636	6.818	9	1	ROWAN	15	37	3	40	80	2.467	5.333
13	1	MCDOWELL, MITCHELL	10	49	10	9	68	4.900	6.800	14	3	CHEROKEE, GRAHAM	13	56	13	0	69	4.308	5.308
13	2	MADISON	8	36	8	10	54	4.500	6.750	4	3	WAYNE	10	41	12	0	53	4.100	5.300
14	2	HAYWOOD	9	32	4	24	60	3.556	6.667	12	2	ALEXANDER	8	24	0	18	42	3.000	5.250
3	3	NEW HANOVER	6	18	7	15	40	3.000	6.667	13	1	RUTHERFORD	12	37	8	18	63	3.083	5.250
5	2	DURHAM	9	31	6	23	60	3.444	6.667	11	2	CALDWELL	13	25	11	32	68	1.923	5.231
1	1	CURRITUCK, DARE	8	37	5	11	53	4.625	6.625	8	3	SCOTLAND	6	21	1	9	31	3.500	5.167
6	1	ROBESON	15	55	9	35	99	3.667	6.600	8	3	RICHMOND	8	26	1	14	41	3.250	5.125
11	3	WILKES	17	46	19	47	112	2.706	6.588	5	2	PERSON	9	38	7	1	46	4.222	5.111
9	2	DAVIE	7	26	2	18	46	3.714	6.571	12	1	GASTON	12	34	1	25	60	2.833	5.000
1	3	CHOWAN, MARTIN	9	47	8	4	59	5.222	6.556	12	1	LINCOLN	8	23	1	16	40	2.875	5.000
4	1	EGECOMBE	6	33	6	0	39	5.500	6.500	4	3	JOHNSTON	15	59	14	0	73	3.933	4.867
9	2	FORSYTH	16	39	13	52	104	2.438	6.500	12	1	CLEVELAND	14	45	4	19	68	3.214	4.857
13	1	BURKE	8	37	1	14	52	4.625	6.500	10	1	STANLY	11	36	3	14	53	3.273	4.818
14	1	POLK, TRANSYLVANIA	11	37	15	19	71	3.364	6.455	14	3	CLAY, MACON	14	48	19	0	67	3.429	4.786
8	2	HOKE, LEE	9	34	6	18	58	3.778	6.444	4	2	WILSON	9	35	8	0	43	3.889	4.778
7	3	ROCKINGHAM	9	48	10	0	58	5.333	6.444	10	1	CABARRUS	13	30	3	29	62	2.308	4.769
13	2	YANCEY	5	22	10	0	32	4.400	6.400	3	1	ONSLOW	8	32	6	0	38	4.000	4.750
8	1	RANDOLPH	12	62	14	0	76	5.167	6.333	5	3	FRANKLIN	8	37	1	0	38	4.625	4.750
1	2	NORTHAMPTON	6	32	6	0	38	5.333	6.333	12	2	IREDELL	12	49	2	0	51	4.083	4.250
8	2	MOORE	10	41	4	18	63	4.100	6.300	10	2	MECKLENBURG (NEWELL)	10	22	8	12	42	2.200	4.200
4	2	NASH	10	42	5	16	63	4.200	6.300	11	2	AVERY, WATAUGA	16	52	13	0	65	3.250	4.063
6	3	COLUMBUS	11	57	12	0	69	5.182	6.273	5	2	GRANVILLE	11	39	4	0	43	3.545	3.909
2	2	CARTERET	7	18	5	20	43	2.571	6.143	7	1	ALAMANCE	11	38	5	0	43	3.455	3.909
7	1	ORANGE	10	31	2	28	61	3.100	6.100	10	2	MECKLENBURG (PAW CREEK)	12	25	8	12	45	2.083	3.750
3	2	SAMPSON	12	55	9	9	73	4.583	6.083	7	3	CASWELL	6	20	2	0	22	3.333	3.667
5	3	WARREN*	6	32	4	0	36	5.333	6.000			**STATE TOTAL**	**870**	3,351	627	1,127	5,105	3.852	5.868

[1]Includes the County Maintenance Engineer.
[2]PS = Permanent State Employees and includes Transportation Technicians, Equipment Operator Specialists, and clerical staff.
TS = Temporary State Employees
IC = Inmate Work Crews overseen by Maintenance Employees
*Vance County and Warren County share a Transportation Technician I position. We included the position with Vance County.

Source: NCDOT Personnel

DOT MAINTENANCE HAS NOT FILLED VACANCIES IN A TIMELY MANNER.

We reviewed the use of DOT maintenance personnel resources to assess effectiveness. As of June 12, 1998, DOT maintenance had 205 vacant permanent positions, 104 (50.7%) of which had been vacant for more than three months. Thirty-one of the 104 positions (29.8%) remained vacant in excess of a year, while another ten positions (9.6%) went unfilled for over two years. County Maintenance Engineers interviewed indicated that they often encounter obstacles in filling maintenance vacancies such as: difficulty hiring employees at current salary levels, a lack of qualified applicants, and the inability of applicants to acquire a Commercial Drivers License (CDL). The majority of the positions that have been vacant for more than three months require a CDL. Table 8 shows the vacant positions as of June 12, 1998 that have remained unfilled for over 90 days. (See Appendix C, page 57, for listing by position number.)

Table 8
MAINTENANCE POSITIONS VACANT IN EXCESS OF 90 DAYS AS OF JUNE 12, 1998

Division	Number Vacant
1	7
2	9
3	2
4	17
5	12
6	18
7	0
8	9
9	9
10	10
11	0
12	3
13	0
14	8
TOTAL	104

Source: DOT Personnel

RECOMMENDATION

DOT should continue to aggressively attempt to fill all necessary positions. Positions that remain vacant for more than three months should be evaluated for necessity.

***Auditor's Note**: During the audit, DOT management began looking at this issue with the intent of moving positions to areas of greatest need.*

FINANCIAL ACCOUNTABILITY

Objective:	*To review procedures and practices for charging work to identified maintenance functions, work orders, and distributing costs.*

As part of the review of maintenance unit operations, we examined the procedures for recording maintenance activities against established work orders. Our analysis included reviewing documentation supporting charges against work orders for contracted equipment and services. The DOT work order system is designed to:

- Secure the approval of funds to accomplish a particular type of work;
- Provide authorization to accomplish the work identified on the order;
- Establish a systematic method of accumulating costs applicable to a specifically approved project; and
- Establish the basic foundation for charging DOT cost centers.

Work order configurations consist of a multi-digit numerical code. For example, maintenance work orders begin with the number "5", followed by additional numerical codes to identify road surfaces, systems, and counties. DOT's cost distribution process requires costs to be distributed to appropriate cost centers and activities for transactions involving the use of material, services, equipment, and labor. Cost distribution information is used for funds checking, funds encumbering, and costs allocating.

Conclusion: **We found that maintenance units generally followed proper procedures in recording maintenance charges against work orders. However, our review of documentation for one district revealed instances where established controls and verifications did not disclose deviations from procedures nor identify improper charges to work orders. Below is a discussion of the issues and recommendations for improvements.**

EXPENDITURES WERE CHARGED TO INAPPROPRIATE FUNCTION CODES AND FUND ACCOUNTS IN ONE DISTRICT.

When contractor owned and operated rental equipment is used to perform maintenance activities, county maintenance units prepare Form RE-2 (Rental Equipment Time Sheet). The RE-2s are first sent to the District office for approval and then forwarded to the DOT fiscal section as supporting documentation for payment of contractor invoices. The activities performed by the contractor are identified on the RE-2 by function codes. Function codes are three digit numbers that identify the specific activity performed along with a designated unit of measure for work accomplished. Work order numbers and

function codes serve as key elements in DOT's cost distribution process. DOT fiscal policy states that a primary function of the Commercial Accounts Branch is to verify correct distribution of expenditures prior to paying contractor invoices. Further, DOT fiscal procedures also indicate computer controls are maintained to determine that function codes are valid.

We noted deviations from established practices for charging contractor work in Division 7, District 1 covering Orange and Alamance Counties. Specifically, our initial sample at the Orange County Maintenance Unit (OCMU) revealed RE-2s with identified function codes that were incompatible with assigned work order numbers and/or with the contracted goods and services. These deviations occurred on two purchase order contracts issued for the use of contractor owned and operated rental equipment covering the period March 1997 through April 1998.

We originally selected and reviewed ten of 62 payment vouchers involving 18 of 91 charges made against the two purchase orders. We discovered that RE-2s supporting payment for 15 of the 18 charges (83.3%) on nine vouchers identified inappropriate function codes. The RE-2s covered work performed on maintenance work orders, contract resurfacing work orders, and construction work orders. Function codes on ten of the RE-2s were identified as "Payment to Contractors." DOT policy specifically excludes charging payment to contractors on maintenance or contract resurfacing work orders. Another five RE-2s charged the rental of backhoes, rollers, tandem dump trucks, and asphalt saws to "Routine Mowing." Also, three of these five RE-2s were charged against contract resurfacing work order numbers. Upon inquiry, we learned that the original RE-2s prepared by the OCMU and sent to the District office for approval reflected "Full Depth Patching Using Plant Mix Asphalt for Surface"[4] as the function performed. However, the District modified the RE-2s prior to forwarding them to DOT's Fiscal section for payment.

Because of the incorrect coding noted, we expanded our review to cover the remaining vouchers and charges against the two purchase orders through April 1998. This analysis revealed that improper function codes were also charged for rental equipment used by the Alamance County Maintenance Unit under the same purchase orders. In addition, we found that "Routine Mowing" was charged against Highway Trust Fund work orders in Orange County. The Highway Trust Fund was established for purposes of construction and contains no provisions for maintenance. In total, we found 74 charges made to improper function codes. DOT Fiscal's verifications of cost distribution, as well as computer controls, failed to detect these invalid charges. Table 9, page 24, shows the overall impact of the improper charges.

[4] Full Depth Patching Using Plant Mix Asphalt for Surface is defined as: **"Repair of base or subgrade failure under bituminous surfaces by excavation and replacement of unsatisfactory material and wearing surface. Includes removal and disposal of unsatisfactory material."**

Table 9
IMPROPERLY CHARGED CONTRACTOR WORK

Invalid Function Code	County	Total Invalid Charges
Payments to Contractors	Orange	$ 376,715.00
	Alamance	276,455.00
	Total	$ 653,170.00
Routine Mowing	Orange	$ 701,870.00*
	Alamance	282,282.50
	Total	$ 984,152.50
	Grand Total	**$1,637,322.50**

*Includes $42,362.50 charged to Highway Trust Fund work orders

Source: DOT Fiscal Records

RECOMMENDATION

DOT should strengthen its current manual and automated controls to prevent distribution of costs to improper function codes and work orders. Prior to paying vendor invoices, manual and automated checks should be made to ensure that function codes charged are in accordance with administrative policies and are compatible with the contracted goods and/or services.

Auditor's Note: *KPMG Peat Marwick found in its May 1998 audit of the Department of Transportation that the Department should provide contract management training at the Division level for staff. The problems noted above could possibly have been prevented with proper training.*

EQUIPMENT ASSIGNMENTS AND UTILIZATION

Objective: *To evaluate equipment assignments and utilization, including use of contractor rentals.*

To accomplish this objective, we interviewed applicable agency/program staff and field personnel. We focused on determining whether DOT's operating procedures, controls, and reporting systems provided the most efficient and effective approach to assignment, utilization, and controls over DOT equipment. At field units visited, we evaluated the procedures followed for a sample of contractor rental equipment. We compared contractor rentals to DOT owned equipment and evaluated the justification for utilizing contractor rental equipment. To evaluate controls over DOT equipment, we interviewed senior management personnel at the Equipment and Inventory Control Unit (EICU), plus 29 County Maintenance Engineers. We also reviewed equipment assignments, status, utilization, and other data contained in the Equipment Management Information System (EMIS).

Conclusion: **DOT has established adequate procedures for utilizing contractor rental equipment. Contractor equipment rentals at the units visited were normally utilized to augment DOT equipment and were properly justified. However, we noted numerous examples of incorrect or incomplete data in the EMIS. Based on the problems noted with the procedures and data contained in the EMIS, we believe that DOT management should undertake an in-depth review of the EICU's operating structure and procedures. The review should focus on equipment complements, acquisitions, rate setting policies, controls over equipment inventories, overall equipment utilization, and reporting systems.**

INEQUITABLE DAILY RENTAL RATES RESULT IN SIGNIFICANT OVERPAYMENTS FOR EQUIPMENT.

DOT's Equipment and Inventory Control Unit (EICU) purchases equipment on behalf of field users, and rents the equipment to DOT operational units, including the maintenance units. The user takes a life lease on each piece of equipment by paying EICU a daily flat rate (DFR). The DFRs are calculated to recoup the purchase cost through depreciation charges, cost of maintenance and repairs, indirect costs to operate the EICU, and an operating gain. The operating gain along with depreciation charges, sale of used equipment and prior year adjusted reserve balances is used to purchase new equipment. Table 10, page 26 illustrates the funding of new equipment during fiscal year 1996-97. Division Engineers determine the size and makeup of their equipment complements. DOT's Budget Office provides EICU with an estimated yearly budget to purchase new equipment. This amount is then distributed to field units and becomes each division's "fair share," which is derived primarily from the previous year's DFR revenue receipts.

Table 10 FUNDING FOR PURCHASE OF EQUIPMENT FOR FY1996-97		
Total Receipts[1]	$124,096,199	
Total Expenditures[1]	(112,962,175	
Operating Gain		$11,134,024
Add Funds Provided From:		
Depreciation[1]	$33,153,352	
Sale of Equipment (Book Value)	320,463	
Adjusted Fund Reserve Balance	68,709	33,542,524
Total Funds Available		44,676,548
Funds Applied During Current Year/ Purchase of Equipment		(37,880,230
Funded Reserve Balance		$ 6,796,318
[1]Includes funds from the Fuel Dispensing System		
Source: DOT Financial Statements (June 30, 1997)		

EICU groups equipment into classes such as pick-up trucks, dump trucks, backhoes, etc. for rental to DOT's operational units. EICU's policy is to charge the same DFR for all equipment within a specific class code regardless of its cost. As a result, maintenance units (as well as other operational units) could end up paying charges far exceeding the cost of the equipment. These excess charges deprive units of funds to meet maintenance needs and could be a contributing cause for over-expending allocations (See finding on page 14.) We examined a limited sample of 1,137 items covering 58 equipment class codes in DOT's equipment inventory. We found that EICU had collected approximately $6.7 million in excess depreciation for the items in the sample alone. Since there are approximately 350 classes of equipment totaling over 21,000 items in DOT's equipment inventory, we cannot extrapolate the excess depreciation from the sample to the total population of equipment rentals. The following instances illustrate the problems:

- One maintenance unit is paying $67.70 per day for a 1977 model bus purchased used in May 1992. Although 15 years old when purchased, EICU set it up on the standard depreciation schedule for its class (10 years). As of July 1998, the maintenance unit paid a total of $110,470 (138 times its cost) for the use of the bus. If this equipment is kept until "fully depreciated" in year 2002, the unit could end up paying rental fees of $175,000 (219 times its original cost).
- Currently EICU shows 40 chain saws on rent throughout the State[5]. Although the total capitalized cost of the saws is $10,269, as of August 1998, EICU had collected $251,112 (over 24 times the original total cost) in rental fees. We found that DOT procedures have allowed for a number of years the individual units to purchase chainsaws which are not placed in EICU.

Maintenance units often keep equipment well beyond the depreciable period. The practice of continuing to charge the same DFR after the depreciation has been recouped results in significant overpayments by the units. According to EICU management, the current DFRs have been in effect for almost a decade without any significant modifications. Further, no policy exists requiring EICU to periodically review and revise daily rental rates. Table 11 shows 25 examples of excess depreciation noted during our review.

Table 11 EXAMPLES OF EQUIPMENT FOR WHICH RENTAL INCOME HAS EXCEEDED COSTS				
			Rental	Number of

[5]Includes maintenance units and other DOT operational units.

Setup Date	Description	Capitalized Cost	Income Generated	Times Paid For
08/93	1951 Jeep Truck (Used)	$ 240	$ 17,707	74
02/73	1973 Riding Mower	2,247	45,440	20
09/74	1974 Wood Chipper	4,164	78,722	19
08/79	1979 Tractor with Sickle Mower	8,263	153,570	19
11/79	1979 GMC 24,000 GVW Truck	10,898	190,598	17
10/74	1974 Tractor with Sickle Mower	6,409	109,354	17
06/79	1979 Tractor with Rotary Broom	6,915	112,555	16
08/81	1981 Chev. 24,000 GVW Truck	10,720	167,611	16
06/78	1978 Tractor	7,852	118,442	15
03/78	1977 Riding Mower	3,395	50,987	15
02/92	1991 Wood Chipper	2,437	36,093	15
08/79	1979 Tractor with Rotary Broom	8,263	119,212	14
08/79	1979 Tractor with Rotary Broom	8,260	118,979	14
06/77	1977 Tractor with Rotary Broom	10,404	148,431	14
06/79	1979 Tractor	8,263	117,354	14
06/78	1978 Tractor with Rotary Broom	8,256	115,669	14
06/78	1978 Tractor with Rotary Broom	8,330	116,048	14
08/81	1981 Chev. 24,000 GVW Truck	12,309	170,509	14
09/66	1966 Tractor	5,228	73,002	14
06/78	1978 Tractor with Rotary Broom	8,330	115,362	14
09/78	1978 Ford 24,000 GVW Truck	6,939	95,453	14
06/78	1978 Tractor with Rotary Broom	8,330	112,816	14
07/81	1981 Chev. 24,000 GVW Truck	12,910	172,113	13
06/79	1979 Tractor with Rotary Broom	8,774	115,768	13
08/71	1971 Rubber Tired Loader	18,226	234,691	13
	TOTALS	$196,362	$2,906,486	14.8
Source: DOT EICU records as of 7/24/98				

RECOMMENDATION

DOT management should direct EICU to review all equipment classifications to establish equitable daily rental rates based on capitalized cost plus a factored amount for depreciation, maintenance and repairs, indirect costs, and operating gain. Procedures should include an appropriate adjustment to rental rates once an item is fully depreciated. This will result in significant savings to maintenance units, reduce over-expending of allocations, and will provide maintenance units with additional funds for more appropriate use.

Auditor's Note: *The May 1998 KPMG Peat Marwick audit of the Department of Transportation found that the procurement of specialty equipment takes too long and that the majority of Divisions, the central inventory yard, and the Bridge Maintenance Unit were not meeting the Department's established inventory turnover rate. Both these problems impact the length of time maintenance units keep equipment and the ultimate amount paid by the units in daily rental rates.*

MANAGEMENT CONTROLS ARE INADEQUATE TO SAFEGUARD EQUIPMENT.

We found that management controls over equipment at county units and the EICU were either insufficient or nonexistent. For example:

- There is no policy requiring periodic physical inventories of equipment complements. None of the County Maintenance Engineers interviewed indicated that physical inventories are taken. Two County Maintenance Engineers did not know the physical location of some equipment charged to their units. The equipment in question was later located at other units.
- Utilization of equipment is not reviewed. County Maintenance Engineers interviewed told us that they receive an assignment listing from the EICU, but do not utilize the data to monitor equipment utilization.
- In reviewing various records contained in the EMIS, we found one instance where ten new tires were charged to a Chevrolet pickup (map) truck on May 27, 1998, at a cost of $855.60. The truck was in wrecked condition and on the sale line for disposal. In another instance we found that an equipment shop spent over $4,500 to repair a 1980 model rubber tire loader in March and April 1998, and then put the loader on the sale line for disposal in July. It remained on the sale line as of August 20, 1998.

Without adequate controls, neither the Department nor the county maintenance units can be sure that equipment is on-hand, properly safeguarded, or utilized to the fullest extent possible.

RECOMMENDATION

DOT management should implement controls designed to monitor equipment complements including performing periodic physical inventories of equipment assigned to maintenance units. Additionally, maintenance units should monitor utilization of the equipment and be held accountable for their equipment complements. All equipment determined to be unneeded or obsolete should be taken off rent and turned in to EICU for proper disposal. EICU's disposal procedures should be reviewed for adequacy and management should take steps to ensure that the procedures are followed.

MAINTENANCE UNITS CONTINUE TO PAY RENT FOR EQUIPMENT WHILE IT IS BEING REPAIRED.

Under EICU's policy, equipment should be taken off rental status if it remains out of service for more than four consecutive hours. During site visits, Maintenance Engineers told us that they were not sure if they were paying rental on equipment that was being repaired. Spot checks of the EMIS Equipment Repair History and Equipment Assignment History reports at 3 county units revealed 20 instances where equipment was in the shop in excess of four hours, but remained on rental status, as shown in Table 12, page 29. While the total dollar amount shown in the sample is small, the maintenance units incurred rental fees for equipment that was unavailable for use. Due to the size of the equipment complement, we are unable to extrapolate from the sample the magnitude of rent being paid by maintenance units for equipment that is in for repairs.

Table 12
Examples of Equipment Not Taken Off Rent When In Shop Over 4 Hours

County Unit	Equipment Number	Description	Date(s) In Shop	Excess Hours Charged	Daily Flat Rate	Dollars Overcharged
Washington	1066-0048	Leby Paver	06/19/97	2	66.31	16.58
	1572-4789	Int'l. Wheel Tractor	09/10/96	6	29.60	22.20
			03/31/98	4	29.60	14.80
	1464-4538	Ford Truck	08/02/96	8.5	47.38	50.34
			03/03/97	1	47.38	5.92
	1013-2469	Ferg. Roller	02/24/98	1	27.65	3.46
			04/29/98	0.5	27.65	1.73
Mecklenburg (Paw Creek)	1466-0043	Ford Tandem Truck	07/09/98	1.5	67.01	12.56
	2250-0077	Brush Chipper	03/20/97	6	23.05	17.29
	1706-0106	Riding Mower	05/14/98	4	14.10	7.05
	1464-4325	Ford Truck	06/26/98	13.5	47.38	79.95
	1464-4524	Ford Truck	06/25/97	5.5	47.38	32.57
Mecklenburg (Newell)	1803-0115	JCB Backhoe	05/08/98	4	45.00	22.50
	1466-0067	Ford Tandem Truck	03/13/98	2	67.01	16.75
	1064-3091	Chevrolet Dump Truck	11/25/96-11/26/96	10.5	47.38	62.19
	1013-2422	Galn. Roller	09/18/97	7	27.65	24.19
	1013-7028	Leby Roller	03/26/97	1	18.25	2.28
	1464-5207	Ford Truck	01/05/98-01/09/98	58.5	23.31	170.45
	1466-0089	Ford Tandem Truck	10/21/97	2.5	67.01	20.94
	1464-4436	Ford Dump Truck	07/11/97	2	47.38	11.85
Total						**$595.60**

Source: NCDOT EMIS Reporting System

RECOMMENDATION

EICU should immediately remind equipment repair shops of its policy concerning the rental status of equipment that is in for repairs or preventative maintenance. Repair shop foremen should place the equipment on "in/shop" status when the equipment remains in the shop over four hours. In the future, edits should be incorporated into the Equipment Management Information System to automatically remove equipment from rental status when the equipment is shown in for repair in excess of 4 hours. Finally, County Maintenance Engineers should monitor their equipment status and EICU billings to ensure that they are not charged excess rent for equipment not available for use.

THE EQUIPMENT MANAGEMENT INFORMATION SYSTEM CONTAINS INACCURATE INFORMATION AND IS NOT EFFECTIVELY UTILIZED.

The Equipment Management Information System (EMIS) is designed to maintain and track all relative information for each piece of equipment in the system. System data includes:

- Description
- Date put into use
- Capitalized cost
- Depreciation period
- Rental income generated
- Accumulated depreciation
- Repair history and accumulated maintenance costs
- Accumulated miles driven or hours used
- The amount of fuel used
- Total year-to-date unit cost.

Because of problems discussed in the previous findings, we performed additional spot reviews of the EMIS output data and found that the system often reflects incorrect information. The following examples illustrate our concerns:

- We found that capitalized equipment costs and depreciation rates on at least ten pneumatic tire rollers were incorrectly entered, with capitalized cost for the same model type and year ranging from $15 to $78,987. Since the amount of depreciation expense to be recovered is based on capitalized cost, the inaccurate amounts also affect the amount of depreciation to be recouped through the DFRs.

- In another case we found that trucks with attached attenuators (traffic safety devices placed on the rear of trucks to absorb impact from a collision) were misclassified in the EMIS. The DFR for attenuators is set at $8.52. Attenuators are usually mounted on either a short wheelbase or a tandem type dump truck. The current DFR for the short wheelbase truck is $47.38 and $67.01 for the tandem truck. Once the attenuator is attached to an existing truck, the vehicle is reclassified as a "crash truck". The DFR for a crash truck and attenuator is $23.04. The EMIS identified 87 attenuators assigned to various maintenance units throughout the State; however, there were only 36 crash trucks listed in the system. As shown in Table 13, maintenance units could be paying between $8,000 and $13,000 per year in excess charges on misclassified trucks.

Table 13
POTENTIAL EXCESS RENTAL CHARGES ON MISCLASSIFIED ATTENUATORS

COL. 1	COL. 2	COL. 3	COL. 4	COL. 5
Crash Truck Annual Cost[1] (DFR $23.04)[2]	Single Axle Truck Annual Cost[1] (DFR $55.90)[3]	Difference (Col. 2 minus Col. 1)	Tandem Axle Truck Annual Cost[1] (DFR $75.53)[4]	Difference (Col. 4 minus Col. 1)
$5,760	$13,975	$8,215	$18,882.50	$13,122.50

[1]Based on 250 working days per year
[2]Truck charge of $14.52 plus $8.52 attenuator charge
[3]Truck charge of $47.38 plus $8.52 attenuator charge
[4]Truck charge of $67.01 plus $8.52 attenuator charge

Source: Computed by the Office of State Auditor from EICU records.

Other EMIS system errors noted included:

- Incorrect amounts for mileage or hours used;
- Inaccurate fuel usage[6];
- Equipment Shop mechanics entering incorrect mileage and other equipment information; and
- Equipment shown in "On-Sale" status for as much as nine years after actual sale**.**

EMIS is available for use by County Maintenance Engineers, as well as other DOT managers, and is designed to provide pertinent information to assist them in overseeing equipment complements. However, EICU personnel told us that EMIS training has not been offered to field management personnel. Thus far, it has been limited to field staff responsible for entering data into the system. We believe that, had field management received adequate system training and then utilized the system as it was intended, many of the errors noted would have been detected.

As part of DOT's overall Business Systems Improvement Project (BSIP), DOT issued a Request For Proposal (RFP) on August 18, 1998 to procure goods and services necessary to implement a complete fiscal system. The system is to include equipment management software components, project management, design, as well as development and support services necessary to meet Department needs. Conversion and implementation of the new system is not anticipated until the year 2003. We are concerned that conversion of the existing EMIS data without verification of its accuracy will only perpetuate the current problems with the system. In the interim, we believe the current EMIS could be a valuable management tool if the data were verified and corrected and if field management personnel receive training on the use of the system.

RECOMMENDATION

DOT management should take immediate steps to review all data and correct all errors in the current EMIS. Edits and controls should be designed and activated to assure that input information is as accurate as possible. Additionally, management should monitor output data to detect and correct errors timely and to monitor equipment utilization. A specific training program for field personnel should be developed and implemented once the data contained in the system is verified.

[6] Although fuel pumps can be set not to operate if the operator inputs incorrect mileage, we were told that the EICU has not activated this capability at its fueling stations.

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Summary Survey of Other States

The detailed results of the survey of other states begins on page 34. We have listed each question and the responses to those questions. We have included data on North Carolina's maintenance operations for comparative purposes. All states did not respond to each question.

The survey questions covered topics including organizational structures, staffing, maintenance mileage responsibilities, planning and performance monitoring, and budget and expenditures. Below are some key points noted.

- Although organizational structures varied from state to state, all have a central maintenance operation with field activities consisting of divisions and/or districts and county maintenance units.
- Two states have or are currently performing studies of organizational layers (supervisory to non-supervisory personnel).
- North Carolina has the lowest span of control ratio for maintenance operations among the seven states responding. Spans of control in other states ranged from 1 to 4.55 to 1 to 25.
- All states utilize both inmate and temporary labor.
- North Carolina ranks first among the states with a total of 59,323 miles of secondary road maintenance.
- All states except South Carolina responded that they currently prepare annual maintenance plans. South Carolina indicated that it plans to initiate yearly planning in the near future. Although six states responded that they monitor year-end performance against the plan, only two could identify the average deviation from the original plan.
- North Carolina ranked second only to Virginia in maintenance operating budget funds for fiscal year 1996-97 and third behind Virginia and Texas in maintenance expenditures.

We made additional inquiries with 7 of the states regarding their overall equipment operations, shown as questions 19-27 on the survey. Similar to North Carolina, the equipment operations in Georgia, Pennsylvania, and Virginia are operated as profit and loss centers where maintenance units rent state-owned equipment from the centralized equipment unit. Florida, South Carolina, Tennessee, and Texas assign equipment to using activities based on need. All seven states indicated that they monitor equipment utilization through either computer reports or mileage. Further, all states indicated that they perform annual physical inventories of assigned equipment.

DOT MAINTENANCE UNIT
SURVEY OF OTHER STATES

1. How is the DOT State Maintenance Section structured from State to the smallest local unit?

State	Response
North Carolina	State Maintenance Engineer; 14 Divisions; 39 Districts; 100 county maintenance units.
Alabama	Bureau of Maintenance at state level; 100 District offices; and 9 field divisions.
Arkansas	No response.
Florida	Central Maintenance office; 8 regional District offices; 27 field units; and 29 maintenance sub-yards.
Louisiana	No response.
Mississippi	Central Maintenance Office under Highways, Operations Branch; and 7 District offices.
Pennsylvania	Central Office; 11 Engineering District offices; and 67 County Maintenance offices.
South Carolina	Maintenance officer at State Headquarters; 7 Engineering Districts; 47 Resident Maintenance offices.
Texas	Central Maintenance Division; 25 District offices; and 288 local maintenance offices.
Virginia	Central Office; 9 District offices; 45 Residencies, 219 Area Headquarters.
West Virginia	State Division of Highways; 10 District Headquarters; 55 County Maintenance organizations; 17 Interstate Maintenance Organizations. Districts are composed of 4 to 7 county maintenance organizations depending on area of responsibility.

2. Approximately what size area (number of counties and miles) does each maintenance unit serve?

State	Response
North Carolina	Most units maintain one county, a few serve an additional half county. Road mileage ranges from a high of 2,033 miles to a low of 191 miles.
Alabama	41 District offices, 9 Division offices, and 67 counties.
Arkansas	75 counties and 85 crews (some larger counties have two crews). Each county maintains approximately 250 two-lane miles.
Florida	Each maintenance unit is responsible for approximately 1200 lane miles, and covers a geographic area with a radius of approximately 30 miles in rural areas, and 20 miles in urban locations.
Louisiana	Largest Parish maintenance unit is 5,727 miles. Smallest Parish maintenance unit is 2,931 miles. Average size is 4,255 miles.
Mississippi	Each maintenance unit serves one county on average; varies on mileage.
Pennsylvania	67 counties serve approximately 40,000 miles of state-owned highways.
South Carolina	Each county has a resident maintenance office. One county has two because of the large land area in the county. Mileage varies from approximately 500 to 1500 centerline miles.
Texas	Generally, the local maintenance section serves one county. In some of the metropolitan areas, there are two maintenance sections in a county. Texas has 254 counties. Each section maintains an average of 267 centerline miles of roadway.
Virginia	95 counties; 45 residencies; 120,559 (area miles L.M.); each residency office is responsible for 1-4 counties and approximately 2700 lane miles.
West Virginia	Districts are composed of 4 to 7 county maintenance organizations. WVDOH maintains 34,359 road miles of highway. The smallest District is responsible for 2,280 road miles while the largest has 4,620 road miles.

3. What is your ratio for the number of supervisory to non-supervisory staff?

State	Response	State	Response
North Carolina	1 to 3.852 (average).	Pennsylvania	1 to 6.3
Alabama	No response.	South Carolina	1 to 5. Does not include district or state office personnel.
Arkansas	1 to 7; 14% supervisors.	Texas	1 to 19
Florida	No response.	Virginia	1 to 15-20
Louisiana	1 to 4.55	West Virginia	County Maintenance Headquarters: 1 to 20-25 Interstate and APD Corridor Maintenance: 1 to 10
Mississippi	Approximately 1 to 10.		

4. Has your state performed a study of organizational layers in DOT (supervisory to non-supervisory personnel)?

State	Response
North Carolina	A study is underway.
Alabama	No.
Arkansas	No.
Florida	Maintenance Contract Cost Effectiveness Study 1994
Louisiana	Currently preparing reorganization plan including a limited review of supervisory to non-supervisory personnel.
Mississippi	No.
Pennsylvania	No.
South Carolina	No.
Texas	No.
Virginia	No.
West Virginia	No.

5. What is the criteria for determining staff size for DOT maintenance (all levels)?

State	Response
North Carolina	Need
Alabama	Performance Standard for various maintenance activities.
Arkansas	Annual Maintenance Work Plan.
Florida	The Department has been undergoing a manpower reduction effort over the last four years. As a result, in-house positions have been assigned in the most efficient method possible to maintain optimum performance.
Louisiana	No set standard.
Mississippi	By lane miles in the county.
Pennsylvania	Budget and operational requirements.
South Carolina	There is no set formula.
Texas	Texas utilizes the minimum staff level based on the service needs.
Virginia	Based on VA DOT's authorized maximum employment level numbers, which is overseen by Virginia's Department of Planning and Budget.
West Virginia	Established quotas based on funding and area of responsibility.

6. How do you measure operational efficiency of the maintenance units?

State	Response
North Carolina	Against established annual work plans
Alabama	Visual by local District and Division Maintenance Engineers.
Arkansas	Monthly Performance Summary.
Florida	Maintenance units report actual production and compare standard versus actual production rates. In-house production rates and unit costs are compared with contract maintenance production rates where appropriate.
Louisiana	Annual inspections develop planned quantities of work. Actual accomplishments are then compared monthly to planned. Also, we track various key indicators such as lane miles resealed.
Mississippi	Maintenance Accomplishment Report.
Pennsylvania	By maintenance reports generated from payroll input and a productivity tool (Magellan) that reviews selected activities for "Best Practice" organizations.
South Carolina	We are developing a Maintenance Management System to aid in establishing such measures.
Texas	Texas has a reporting system (MEARS—Maintenance Efficiency and Reporting System) to monitor efficiency.
Virginia	Comparison of past and current condition assessments of major maintenance elements (pavements, shoulders, traffic control, etc.) Also production figures (such as unit costs).
West Virginia	The WVDOH Maintenance Management System (MMS) monitors all maintenance-related activities and many of the maintenance activities have a standard level of productivity established as well as standard costs. Each maintenance organization's actual reported productivity and costs are compared to the standard productivity and costs as well as comparisons for selected activities to statewide averages. This information is made available to supervisor/managers in MMS reports.

OTHER STATES

7. What is your maintenance highway mileage?

State	Primary	Secondary Paved	Secondary Unpaved	Urban	Interstate	Other	Total
North Carolina	11,177	48,532	10,791	6,271	983		77,754
Alabama	9,920				905		10,825
Arkansas	15,759				542		16,301
Florida	9,949				1,472	506	11,927
Louisiana	2,169				1,088	14,507	17,764
Mississippi	7,660	3,795			1,660		13,115
Pennsylvania	13,715	26,952	544		1,254		42,465
South Carolina	9,412	30,619	675	6,917	828		48,451
Texas	28,403	40,822			7,747		76,972
Virginia	7,983	36,476	10,011	9,920	1,106		65,496
West Virginia	5,435	13,870	14,500	1,368	554		35,727

8. Does DOT use inmate labor? If so, for what types of maintenance work?

State	Response
North Carolina	Yes, litter pickup, clearing right-of-way, and traffic control.
Alabama	Yes, minimal intermixing with normal work crews to perform regular routine activities; use some inmate crews for litter control.
Arkansas	Yes, limited; litter pickup and some brush cutting.
Florida	Yes, routine maintenance work including asphalt and concrete repair, shoulder repair, sodding, slope and ditch repair, drainage system repair and cleaning, mowing, weed control, tree trimming, guardrail repair, litter removal, and sweeping.
Louisiana	Yes, litter pickup and rest area maintenance.
Mississippi	Yes, litter pickup and general cleanup.
Pennsylvania	Yes, litter pickup.
South Carolina	Yes, labor which does not involve the use of motorized equipment; predominantly litter and debris removal.
Texas	Yes, generally labor intensive activities such as brush clearing in the right of way; sometimes low priority work that we could not accomplish.
Virginia	Yes, rural areas only; brush cutting, trim trees, cleaning right of way, drainage care, hand mowing, hand cleaning ditches, etc.
West Virginia	Yes, limited; vegetation control, litter control, animal carcass pickup, building and grounds maintenance, repair and construction, highway laborers, and as flaggers.

9. Do the Maintenance employees include temporary workers?

State	Response	State	Response
North Carolina	Yes.	Pennsylvania	Yes.
Alabama	Yes.	South Carolina	Yes.
Arkansas	Yes.	Texas	Yes.
Florida	Yes.	Virginia	Yes.
Louisiana	No.	West Virginia	Yes.
Mississippi	No.		

10. Do you prepare a maintenance plan for each year? If so, at what level is the plan prepared — county, district, or state?

State	Yes/No	Level
North Carolina	Yes.	County with district and division approval.
Alabama	Yes, our budget is by activity.	State.
Arkansas	Yes.	State with district involvement.
Florida	Yes.	State with district involvement.
Louisiana	Yes.	Parishes and districts.
Mississippi	Yes.	State but district can make minor adjustments.
Pennsylvania	Yes.	County.
South Carolina	No, but we will with the new MMS.	County.
Texas	Yes, not formally required; for budget purposes.	District with help from sections within the district.
Virginia	Yes.	District.
West Virginia	Yes, each organization prepares annual plan.	District with county involvement.

OTHER STATES

11. Is the plan in response to Federal requirements?

State	Response	State	Response
North Carolina	No	Pennsylvania	No
Alabama	No	South Carolina	No
Arkansas	No	Texas	No
Florida	No	Virginia	No
Louisiana	No	West Virginia	No
Mississippi	No		

12. How is your plan developed and how is it used?

State	Response
North Carolina	Budget requirement and prior year's maintenance plan.
Alabama	From performance standards by activity and based on historical data.
Arkansas	Based on needs per two lane mile; used to determine budget allotments and to size work staff.
Florida	Devised to ensure achievement of established performance standards for maintenance conditions; also used to allocate resources to the districts.
Louisiana	Less emphasis is placed on our current planning effort, which is developed through annual inspection by the Parish superintendents and District maintenance specialists.
Mississippi	Historical inventory; budgeting process.
Pennsylvania	From revenue, budget, and roadway inventories that establish needs.
South Carolina	Planned by Resident Maintenance Engineer with direction from District staff. Will be used to help schedule work to be performed and resources needed.
Texas	The plan is developed by identifying and quantifying maintenance needs. It is used to establish priorities.
Virginia	Begins with Central Office notification, local areas assimilate needs which are aggregated to district and statewide levels. Frequency depends on the type of work.
West Virginia	Maintenance organizational supervisors develop annual plans with the help and oversight of district managers utilizing historical information. The Annual Plan is a management tool and organizational supervisors are not held to strict compliance.

13. Is your plan monitored at year-end against actual performance? If so, what is the average deviation from the original plan?

State	Plan Monitoring	Average Deviation
North Carolina	Seldom.	Ranged from 45,931 units under the plan to 66,354 units over the plan.[1]
Alabama	Somewhat.	Unknown.
Arkansas	Yes.	25-35%.
Florida	Yes.	Unknown.
Louisiana	Yes.	Unknown.
Mississippi	Yes.	Varies.
Pennsylvania	Yes.	Varies by activity.
South Carolina	Soon to be.	Plan has not been established.
Texas	No.	N/A
Virginia	Yes.	Plus or minus 10%.
West Virginia	Management discretion.	Unknown.
[1]Based on a sample of five counties.		

14. What were your budget and expenditures for the maintenance unit for 1996-97?

State	Operating Budget	Net Expenditures	State	Operating Budget	Net Expenditures
North Carolina	$592,911,789	$446,764,911	Pennsylvania	Undetermined	Undetermined
Alabama	$196,775,610	$196,729,529	South Carolina	195,300,002	179,944,041
Arkansas	No reply	157,943,507	Texas	No reply	635,726,458
Florida	296,452,000	No reply	Virginia	620,393,916	656,993,765
Louisiana	No reply	248,146,336	West Virginia	313,260,000	288,647,640
Mississippi	103,900,000	97,700,000			

OTHER STATES

15. Does the Maintenance Section have policies and procedures? If so, are they well defined?

State	Policies & Procedures	Defined	State	Policies & Procedures	Defined
North Carolina	Yes	Yes	Pennsylvania	Yes.	Yes.
Alabama	Yes.	Yes.	South Carolina	Yes.	No response.
Arkansas	Yes.	Yes.	Texas	Yes.	Yes.
Florida	No response.	No response.	Virginia	Yes.	Yes.
Louisiana	Yes.	Yes.	West Virginia	Yes.	Yes.
Mississippi	Yes.	Yes.			

16. Do you own or rent equipment for road maintenance?

State	Percent Owned	Percent Leased	State	Percent Owned	Percent Leased
North Carolina	100%[1]	0%[1]	Pennsylvania	83%	17%
Alabama	99%	0%	South Carolina	98%	2%
Arkansas	100%	0%	Texas	99%	1%
Florida	Vast Majority	Nominal	Virginia	100%	0%
Louisiana	100%	0%	West Virginia	90%	10%
Mississippi	100%	0%			

[1]Maintenance units use contractor rentals and leases on an as needed basis to augment owned equipment.

17. What categories of state equipment are owned?

Each state indicated that state-owned equipment ranged from passenger vehicles to heavy duty equipment such as large trucks and motor graders, etc.

18. What is your criteria for upgrading or replacing equipment?

State	Response
North Carolina	Division Engineers determine the content of the equipment fleet. Divisions compile a list of desired new, upgraded and replacement equipment each year based on their area requirements.
Alabama	Primary factors include useful life, replacement cost, and salvage value.
Arkansas	Estimated usable life based on comparisons of purchase price, upkeep costs, etc. Each piece of equipment is evaluated as to condition and availability of replacement funds.
Florida	Based on a trade criteria considering utilization and vehicle age.
Louisiana	When equipment is beyond economical repair, obsolete, and based on budget limitations.
Mississippi	No Response.
Pennsylvania	Based on age, hours, condition and budget constraints.
South Carolina	No specific guidelines. However, usage and repair costs are predominant factors.
Texas	Based on age, mileage or hours.
Virginia	Based on age, mileage, amount and severity of repairs, condition and usage.
West Virginia	Equipment is targeted for replacement when it has met its assigned life expectancy. Field evaluations of each equipment unit are performed before the item is replaced.

19. Does your State's DOT operate as a profit and loss center? Is purchased equipment leased to the user, such as a Maintenance or Construction Unit?

State	Response
North Carolina	Yes
Florida	No, funds are appropriated from the Legislature.
Georgia	Yes
Pennsylvania	Partially. Units purchase equipment up to $10,000. Equipment costing over $10,000 is purchased by the Equip. Dept. and leased to units.
South Carolina	Not currently. However, the State intends to reorganize into a profit & loss center type operation.
Texas	No. General Assembly appropriates funds to purchase equipment.
Tennessee	No. Equip. is purchased from budgeted funds.
Virginia	Yes

OTHER STATES

20. If leased, are rates based on the individual piece of equipment or by equipment class?

State	Response	State	Response
North Carolina	Class	South Carolina	N/A
Florida	N/A	Texas	N/A
Georgia	Class	Tennessee	N/A
Pennsylvania	Class	Virginia	Class

21. Is the lease period for the life of the equipment or something less?

State	Response	State	Response
North Carolina	Yes	South Carolina	N/A
Florida	N/A	Texas	N/A
Georgia	Yes	Tennessee	N/A
Pennsylvania	Yes	Virginia	Yes

22. How are rental rates assessed (daily or otherwise)?

State	Response	State	Response
North Carolina	Daily	South Carolina	Vehicles are assessed on mileage hours per month. Larger equip. is on a per hour basis.
Florida	N/A	Texas	N/A
Georgia	Monthly	Tennessee	N/A
Pennsylvania	Annually	Virginia	Hourly

23. Do rental rates include an amount to cover depreciation?

State	Response	State	Response
North Carolina	Yes	South Carolina	N/A
Florida	N/A	Texas	N/A
Georgia	Yes	Tennessee	N/A
Pennsylvania	Yes	Virginia	Yes

24. Are rental rates adjusted when equipment is kept beyond the depreciation period?

State	Response	State	Response
North Carolina	No	South Carolina	N/A
Florida	N/A	Texas	N/A
Georgia	Yes	Tennessee	N/A
Pennsylvania	Yes	Virginia	Yes

25. Do you charge rental when equipment is down for repairs?

State	Response	State	Response
North Carolina	No	South Carolina	N/A
Florida	N/A	Texas	N/A
Georgia	No	Tennessee	N/A
Pennsylvania	Yes	Virginia	Partially. Some rates are adjusted based on inventory, cost, and hours used.

OTHER STATES

26. How is equipment utilization monitored?

State	Response
North Carolina	Field activities receive monthly inventory report. Utilization is primarily monitored by personal knowledge of unit managers.
Florida	Daily reports are maintained. Reports are generated twice each year. Field activities must respond to justify retaining unutilized equipment.
Georgia	Tracked by mileage.
Pennsylvania	Reported daily. Penalties are assessed if minimum utilization standards are not met.
South Carolina	Computer utilization reports.
Texas	Tracked state wide by equipment class. Districts are divided into peer groups (Urban, Rural & Metro). Individual pieces of equipment are tracked by peer group. Reports are generated identifying zero and low utilization. Districts are required to respond to reports to continued need.
Tennessee	State office monitors equipment time by project number.
Virginia	Computer printouts.

27. Do you perform physical inventories of equipment?

State	Response	State	Response
North Carolina	No	South Carolina	Yes
Florida	Yes	Texas	Yes
Georgia	Yes	Tennessee	Yes
Pennsylvania	Yes	Virginia	Yes

ISSUE FOR FURTHER STUDY

During interviews at county maintenance units, some County Maintenance Engineers expressed concern that DOT could be incurring maintenance costs too early on subdivision roads built by developers. Under current policy, DOT will often accept subdivision roads into the State system long before housing construction is completed. Roads constructed by developers may be added to the State system if they meet the following standards established by *North Carolina Administrative Code, 19A Section 2C.0203* (Requirements/Addition Of Subdivision Roads To The System):

- At least 20 percent of the lots bordering the road must be individually owned;
- There must be at least two occupied residences for each one-tenth of a mile;
- Subdivision Access Roads must provide ingress and egress for at least five occupied residences for roads less than 1 mile in length and an average of five occupied residences per mile for roads over 1 mile in length; and
- A minimum of four occupied homes is required for the addition of roads less than two-tenths of a mile in length. Short cul-de-sacs less than two-tenths mile in length must serve at least four occupied homes. If four occupied homes are not served, it will be treated as a private drive.

Although the subdivision roads meet the standards for intended passenger car use, they are not built to withstand prolonged exposure to heavy-duty construction vehicle and equipment traffic. The County Maintenance Engineers had not determined the cost impact to DOT. However, they believed it could be substantial in counties experiencing significant subdivision growth. We suggest that DOT management undertake a study to determine whether the current policies for adopting subdivision roads should be revised to increase the residency occupancy requirements before accepting those roads into the State system.

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APPENDICES

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ROAD SYSTEM MAINTENANCE ALLOCATIONS BY COUNTY BY FISCAL YEAR							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Totals
Alamance	1995	700,000	520,000	1,055,000	229,396	481,512	2,985,908
	1996	695,000	585,000	955,000	210,000	480,000	2,925,000
	1997	730,000	711,773	930,000	210,001	702,456	3,284,230
Alexander	1995		539,047	917,494	251,263	43,236	1,751,040
	1996		281,481	908,825	209,195	75,501	1,475,002
	1997		455,762	1,103,247	288,036	182,647	2,029,692
Alleghany	1995		482,063	695,048	339,697	32,881	1,549,689
	1996		468,541	830,606	322,327	15,163	1,636,637
	1997		599,532	783,205	330,530	29,368	1,742,635
Anson	1995		553,170	1,025,535	320,139	95,550	1,994,394
	1996		532,453	1,174,483	219,807	137,417	2,064,160
	1997		520,000	1,064,156	150,000	95,788	1,829,944
Ashe	1995		816,361	1,138,797	639,676	19,605	2,614,439
	1996		836,467	1,197,446	830,111	20,472	2,884,496
	1997		1,013,958	1,128,627	724,394	30,238	2,897,217
Avery	1995		604,994	451,130	244,509	51,077	1,351,710
	1996		613,324	492,232	205,727	23,456	1,334,739
	1997		720,034	498,984	220,152	27,079	1,466,249
Beaufort	1995		996,655	1,177,459	432,000	149,195	2,755,309
	1996		941,825	1,220,000	538,000	150,000	2,849,825
	1997		873,840	1,224,885	500,060	165,000	2,763,785
Bertie	1995		824,000	857,389	286,112	54,000	2,021,501
	1996		746,000	898,000	252,109	73,000	1,969,109
	1997		728,218	791,233	311,623	70,467	1,901,541
Bladen	1995		1,047,278	1,359,208	233,500	103,478	2,743,464
	1996		995,000	1,225,000	233,500	90,000	2,543,500
	1997		994,323	1,191,790	208,500	75,000	2,469,613
Brunswick	1995		1,193,100	1,005,942	306,293	220,532	2,725,867
	1996		1,236,005	954,696	287,214	186,092	2,664,007
	1997		771,894	1,009,471	254,706	241,109	2,277,180
Buncombe	1995	841,766	1,014,655	1,759,960	382,165	840,019	4,838,565
	1996	764,046	1,014,501	1,749,740	405,164	810,732	4,744,183
	1997	909,133	1,094,717	1,855,326	272,617	1,026,883	5,158,676
Burke	1995	464,664	475,907	959,345	516,057	147,400	2,563,373
	1996	428,684	470,259	972,415	538,636	205,900	2,615,894
	1997	359,339	557,209	1,081,686	542,350	230,972	2,771,556
Cabarrus	1995	387,689	790,004	1,198,860	243,974	240,892	2,861,419
	1996	301,424	469,278	1,380,342	139,258	126,954	2,417,256
	1997	265,000	329,000	1,382,987	82,810	350,000	2,409,797
Caldwell	1995		521,475	860,122	371,226	306,774	2,059,597
	1996		614,548	859,141	309,250	256,790	2,039,729
	1997		790,188	775,962	358,269	237,100	2,161,519
Camden	1995		318,500	291,617	137,000		747,117
	1996		327,000	272,077	111,458		710,535
	1997		309,759	292,578	136,677		739,014
Carteret	1995		669,932	558,858	160,000	167,061	1,555,851
	1996		630,000	560,999	165,000	220,000	1,575,999
	1997		584,940	564,096	155,000	210,000	1,514,036
Caswell	1995		486,000	635,000	236,000	36,999	1,393,999
	1996		465,000	765,000	156,000	42,001	1,428,001
	1997		614,088	756,081	358,138	37,001	1,765,308

ROAD SYSTEM MAINTENANCE ALLOCATIONS BY COUNTY BY FISCAL YEAR (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Totals
Catawba	1995	490,926	418,145	1,455,037	307,776	354,238	3,026,122
	1996	645,031	369,149	1,630,091	290,957	612,283	3,547,511
	1997	386,256	325,553	1,561,647	267,437	459,519	3,000,412
Chatham	1995		666,730	1,471,693	339,368	112,019	2,589,810
	1996		635,197	1,497,497	459,277	111,330	2,703,301
	1997		637,684	1,396,940	469,755	75,287	2,579,666
Cherokee	1995		611,573	1,105,537	427,140	49,972	2,194,222
	1996		629,236	1,216,277	360,387	59,569	2,265,469
	1997		638,288	821,003	361,314	44,408	1,865,013
Chowan	1995		263,000	404,674	67,000	33,000	767,674
	1996		244,000	394,069	68,058	42,000	748,127
	1997		249,507	399,300	51,497	48,934	749,238
Clay	1995		440,174	395,392	171,743	9,522	1,016,831
	1996		379,007	461,532	130,119	16,706	987,364
	1997		343,244	454,200	164,091	9,639	971,174
Cleveland	1995	524,867	708,309	1,611,734	487,912	238,515	3,571,337
	1996	414,164	560,640	1,733,020	391,256	180,385	3,279,465
	1997	522,207	511,019	1,741,184	275,118	212,850	3,262,378
Columbus	1995		1,096,699	1,782,340	383,500	186,455	3,448,994
	1996		995,000	1,600,000	358,500	137,500	3,091,000
	1997		992,518	1,573,761	361,001	115,000	3,042,280
Craven	1995		1,011,223	981,308	348,000	262,000	2,602,531
	1996		1,030,000	1,019,000	384,509	280,000	2,713,509
	1997		980,025	1,044,807	370,000	365,000	2,759,832
Cumberland	1995	659,805	1,279,936	2,279,484	337,243	621,832	5,178,300
	1996	590,000	1,220,000	2,354,348	337,500	685,000	5,186,848
	1997	341,069	1,181,124	2,011,472	287,500	432,500	4,253,665
Currituck	1995		498,000	414,862	99,000		1,011,862
	1996		449,000	397,000	92,572		938,572
	1997		423,608	378,679	104,694		906,981
Dare	1995		653,249	254,127	35,000	314,447	1,256,823
	1996		699,000	223,000	58,894	274,000	1,254,894
	1997		725,766	256,199	65,704	278,812	1,326,481
Davidson	1995	134,481	399,079	2,149,391	270,299	164,996	3,118,246
	1996	288,805	454,172	1,835,563	510,059	112,970	3,201,569
	1997	405,421	553,194	1,912,128	211,613	154,521	3,236,877
Davie	1995	348,325	563,476	599,979	254,756	48,065	1,814,601
	1996	415,670	438,846	644,935	247,567	54,729	1,801,747
	1997	354,512	478,729	715,132	194,334	55,031	1,797,738
Duplin	1995	155,517	1,103,646	2,039,564	334,859	131,394	3,764,980
	1996	140,171	1,143,146	1,734,852	340,179	104,807	3,463,155
	1997	141,661	853,940	1,660,416	294,320	125,354	3,075,691
Durham	1995	254,000	645,113	938,711	188,343	1,125,691	3,151,858
	1996	183,069	534,689	1,074,419	207,439	990,047	2,989,663
	1997	246,920	442,225	1,253,590	233,967	1,080,072	3,256,774
Edgecombe	1995		780,000	883,500	111,800	146,300	1,921,600
	1996		717,757	839,476	110,038	169,592	1,836,863
	1997		812,396	864,292	121,916	112,073	1,910,677
Forsyth	1995	354,619	817,129	1,829,952	121,097	1,682,493	4,805,290
	1996	395,023	783,387	1,439,905	170,588	1,533,417	4,322,320
	1997	540,371	698,493	1,592,505	172,527	2,244,540	5,248,436

ROAD SYSTEM MAINTENANCE ALLOCATIONS BY COUNTY BY FISCAL YEAR (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Totals
Franklin	1995		352,991	1,053,957	238,798	72,882	1,718,628
	1996		519,997	1,016,743	198,495	43,225	1,778,460
	1997		412,587	1,002,197	136,966	37,956	1,589,706
Gaston	1995	257,006	532,884	1,263,519	395,448	709,581	3,158,438
	1996	313,207	317,964	1,266,080	254,715	399,065	2,551,031
	1997	411,766	424,975	1,310,370	224,615	573,844	2,945,570
Gates	1995		344,159	392,978	226,000	3,000	966,137
	1996		345,000	429,153	198,688	6,000	978,841
	1997		347,429	489,604	213,903	4,836	1,055,772
Graham	1995		427,332	454,225	139,762	30,513	1,051,832
	1996		322,684	507,131	64,821	23,317	917,953
	1997		484,972	509,354	75,098	9,839	1,079,263
Granville	1995	465,245	412,560	838,386	343,000	84,708	2,143,899
	1996	452,068	170,710	750,588	425,342	85,499	1,884,207
	1997	397,798	412,049	759,984	441,996	58,665	2,070,492
Greene	1995		522,331	771,377	150,000	37,000	1,480,708
	1996		499,999	791,000	130,412	30,000	1,451,411
	1997		472,492	739,454	130,000	30,000	1,371,946
Guilford	1995	568,000	1,007,052	1,970,000	516,000	961,000	5,022,052
	1996	589,214	1,015,000	2,025,000	544,823	1,002,686	5,176,723
	1997	558,754	1,120,000	2,265,907	565,000	1,301,474	5,811,135
Halifax	1995	133,000	755,300	1,090,100	222,000	223,500	2,423,900
	1996	157,474	816,515	1,010,530	231,150	163,869	2,379,538
	1997	193,840	742,071	923,354	193,582	182,896	2,235,743
Harnett	1995	120,000	717,609	1,670,505	287,500	223,124	3,018,738
	1996	110,000	735,000	1,650,000	257,500	178,033	2,930,533
	1997	109,732	684,912	1,477,500	257,501	140,001	2,669,646
Haywood	1995	935,321	620,513	822,341	561,356	60,974	3,000,505
	1996	981,869	951,302	1,060,774	441,222	78,451	3,513,618
	1997	976,697	975,120	1,126,678	447,836	112,134	3,638,465
Henderson	1995	202,582	443,747	1,375,322	683,358	90,210	2,795,219
	1996	317,741	597,266	1,282,295	618,290	120,310	2,935,902
	1997	347,244	718,331	1,359,821	572,577	234,053	3,232,026
Hertford	1995		536,088	598,330	223,196	55,000	1,412,614
	1996		566,000	652,000	95,036	80,000	1,393,036
	1997		493,614	679,287	148,136	63,909	1,384,946
Hoke	1995		457,218	806,345	83,983	15,196	1,362,742
	1996		351,893	805,394	70,914	41,131	1,269,332
	1997		349,695	743,060	65,040	35,277	1,193,072
Hyde	1995		460,590	398,700	124,084		983,374
	1996		469,000	352,000	115,452		936,452
	1997		379,757	332,371	129,756		841,884
Iredell	1995	578,231	845,723	2,025,512	603,904	323,235	4,376,605
	1996	761,695	368,414	1,963,428	614,729	328,656	4,036,922
	1997	541,933	593,462	1,783,953	540,354	399,514	3,859,216
Jackson	1995		1,143,436	836,910	367,751	25,060	2,373,157
	1996		1,143,731	784,350	369,723	45,125	2,342,929
	1997		1,109,527	761,696	392,853	67,938	2,332,014
Johnston	1995	421,100	824,700	2,047,400	450,400	147,200	3,890,800
	1996	637,881	931,044	2,078,758	518,992	194,017	4,360,692
	1997	577,486	974,997	1,868,738	538,153	188,647	4,148,021

ROAD SYSTEM MAINTENANCE ALLOCATIONS BY COUNTY BY FISCAL YEAR (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Totals
Jones	1995		516,248	482,052	145,000	22,000	1,165,300
	1996		470,001	477,000	120,000	30,000	1,097,001
	1997		430,313	472,017	120,000	30,000	1,052,330
Lee	1995		388,690	843,444	88,739	240,685	1,561,558
	1996		393,783	754,857	121,044	229,461	1,499,145
	1997		431,994	778,027	99,465	238,828	1,548,314
Lenoir	1995		858,335	1,174,623	306,000	328,000	2,666,958
	1996		860,000	1,211,096	298,078	315,000	2,684,174
	1997		851,030	1,207,843	265,000	225,000	2,548,873
Lincoln	1995		466,398	958,976	294,177	118,256	1,837,807
	1996		355,283	1,174,982	258,310	54,002	1,842,577
	1997		417,184	1,354,172	191,319	75,571	2,038,246
Macon	1995		663,785	1,161,855	581,061	47,934	2,454,635
	1996		633,230	1,442,312	429,310	67,439	2,572,291
	1997		910,956	929,846	441,449	82,240	2,364,491
Madison	1995		693,052	923,397	315,871	56,001	1,988,321
	1996		658,493	913,299	211,108	35,001	1,817,901
	1997		620,661	967,737	215,108	35,000	1,838,506
Martin	1995		665,096	683,218	228,000	94,000	1,670,314
	1996		670,000	694,073	177,297	113,000	1,654,370
	1997		607,678	721,802	229,037	106,190	1,664,707
McDowell	1995	411,366	596,495	658,050	398,451	75,987	2,140,349
	1996	361,051	525,915	717,266	319,831	76,487	2,000,550
	1997	355,068	587,057	767,883	293,803	65,551	2,069,362
Mecklenburg	1995	612,826	475,729	1,671,981	340,508	1,157,220	4,258,264
	1996	597,727	474,230	1,878,268	176,101	135,706	3,262,032
	1997	586,470	409,000	1,700,000	254,968	1,793,668	4,744,106
Mitchell	1995		472,919	372,268	325,805	89,610	1,260,602
	1996		453,375	318,715	295,974	64,510	1,132,574
	1997		439,786	406,614	243,629	69,510	1,159,539
Montgomery	1995		556,688	963,737	243,613	73,563	1,837,601
	1996		389,270	1,041,947	154,475	161,414	1,747,106
	1997		674,006	937,222	283,803	78,825	1,973,856
Moore	1995		1,230,078	1,451,119	365,107	211,765	3,258,069
	1996		1,291,128	1,382,439	449,669	237,287	3,360,523
	1997		1,446,955	1,350,513	343,697	219,797	3,360,962
Nash	1995	171,300	785,300	1,479,000	215,900	449,200	3,100,700
	1996	263,708	765,025	1,281,586	140,678	413,094	2,864,091
	1997	263,575	784,441	1,235,421	89,036	275,258	2,647,731
New Hanover	1995	101,030	827,631	801,278	145,110	465,749	2,340,798
	1996	83,000	806,422	729,941	114,390	511,682	2,245,435
	1997	43,181	697,280	846,711	100,036	435,716	2,122,924
Northampton	1995	319,600	627,088	813,035	228,000	42,000	2,029,723
	1996	416,744	540,000	775,000	185,908	71,000	1,988,652
	1997	438,618	497,411	764,901	185,590	58,446	1,944,966
Onslow	1995		1,031,517	1,625,123	213,785	306,065	3,176,490
	1996		1,081,138	1,422,379	162,452	417,574	3,083,543
	1997		737,442	1,157,936	138,256	384,049	2,417,683
Orange	1995	305,000	411,000	822,500	210,000	309,000	2,057,500
	1996	265,000	436,000	910,000	235,000	329,000	2,175,000
	1997	282,000	425,001	1,130,015	244,023	437,001	2,518,040

ROAD SYSTEM MAINTENANCE ALLOCATIONS BY COUNTY BY FISCAL YEAR (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Totals
Pamlico	1995		251,354	394,378	129,000	38,000	812,732
	1996		274,180	425,000	132,000	45,000	876,180
	1997		253,885	473,777	130,000	40,000	897,662
Pasquotank	1995		322,100	534,000	121,139	101,000	1,078,239
	1996		288,000	458,000	157,986	115,000	1,018,986
	1997		286,690	460,749	145,184	128,544	1,021,167
Pender	1995	232,602	1,010,595	958,824	205,506	76,088	2,483,615
	1996	211,483	1,172,085	948,266	203,095	40,053	2,574,982
	1997	179,823	968,260	977,852	166,550	59,615	2,352,100
Perquimans	1995		133,000	476,000	180,707	48,000	837,707
	1996		163,000	520,600	143,282	55,000	881,882
	1997		187,748	482,398	154,331	40,859	865,336
Person	1995		465,806	700,571	367,000	45,016	1,578,393
	1996		305,854	835,941	341,632	67,592	1,551,019
	1997		318,117	741,106	278,736	70,814	1,408,773
Pitt	1995		1,515,357	1,559,568	552,000	455,796	4,082,721
	1996		1,520,000	1,559,000	496,363	470,000	4,045,363
	1997		1,474,351	1,533,245	500,000	470,000	3,977,596
Polk	1995	272,667	250,531	538,438	341,750	17,354	1,420,740
	1996	262,569	330,371	623,850	248,406	20,667	1,485,863
	1997	315,184	333,774	746,340	370,995	57,489	1,823,782
Randolph	1995	105,487	842,597	2,055,231	913,722	209,930	4,126,967
	1996	59,504	784,080	2,238,070	904,071	434,321	4,420,046
	1997	239,576	1,044,170	2,218,609	816,550	306,067	4,624,972
Richmond	1995		611,509	1,140,491	144,648	321,404	2,218,052
	1996		525,794	1,040,449	135,501	211,053	1,912,797
	1997		613,266	1,403,586	130,171	260,869	2,407,892
Robeson	1995	438,780	1,236,049	2,753,058	434,926	282,693	5,145,506
	1996	445,086	1,115,000	2,465,000	385,000	240,000	4,650,086
	1997	397,687	1,113,397	2,309,523	335,001	190,001	4,345,609
Rockingham	1995		1,000,000	985,000	420,000	337,140	2,742,140
	1996		955,000	1,080,000	370,000	249,000	2,654,000
	1997		1,126,098	1,213,906	620,863	262,000	3,222,867
Rowan	1995	393,097	463,517	1,507,558	369,313	213,467	2,946,952
	1996	291,188	598,333	1,118,725	417,400	302,017	2,727,663
	1997	334,772	1,099,913	1,477,598	303,818	359,559	3,575,660
Rutherford	1995		661,671	1,400,899	777,644	163,500	3,003,714
	1996		614,110	1,325,171	547,637	141,500	2,628,418
	1997		614,740	1,476,442	579,599	188,500	2,859,281
Sampson	1995	159,839	1,262,443	2,229,428	404,873	216,227	4,272,810
	1996	98,000	1,376,520	2,113,766	349,598	227,978	4,165,862
	1997	91,414	1,061,235	1,938,751	308,667	173,827	3,573,894
Scotland	1995		454,955	794,023	67,495	90,864	1,407,337
	1996		377,583	782,257	69,897	117,752	1,347,489
	1997		357,031	692,489	234,522	112,866	1,396,908
Stanly	1995		455,912	1,033,678	230,064	633,247	2,352,901
	1996		416,949	1,150,836	149,272	414,462	2,131,519
	1997		532,000	1,103,274	100,000	300,000	2,035,274
Stokes	1995		783,779	1,376,875	688,004	34,943	2,883,601
	1996		676,318	1,349,230	598,050	23,791	2,647,389
	1997		850,159	1,219,496	809,812	24,112	2,903,579

ROAD SYSTEM MAINTENANCE ALLOCATIONS BY COUNTY BY FISCAL YEAR (concluded)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Totals
Surry	1995	773,508	1,008,937	1,664,383	439,143	143,972	4,029,943
	1996	573,482	811,082	1,684,859	317,659	137,899	3,524,981
	1997	705,865	826,723	1,645,173	291,194	121,004	3,589,959
Swain	1995		546,470	383,889	253,122	36,250	1,219,731
	1996		376,744	466,658	134,521	23,871	1,001,794
	1997		511,364	441,421	193,725	28,153	1,174,663
Transylvania	1995		524,810	456,724	274,624	38,982	1,295,140
	1996		476,483	583,055	260,712	47,476	1,367,726
	1997		664,253	716,519	320,013	55,837	1,756,622
Tyrrell	1995		265,000	317,129	96,000	11,000	689,129
	1996		372,000	256,000	105,218	68,000	801,218
	1997		219,610	276,587	107,956	35,900	640,053
Union	1995		370,237	1,819,607	551,315	228,111	2,969,270
	1996		338,753	1,565,450	469,654	243,702	2,617,559
	1997		383,776	1,902,462	400,000	200,000	2,886,238
Vance	1995	270,957	211,942	784,325	125,177	126,084	1,518,485
	1996	210,504	199,807	792,710	91,705	133,818	1,428,544
	1997	242,013	85,884	717,944	57,702	115,593	1,219,136
Wake	1995	355,638	1,415,273	2,782,439	680,402	1,584,703	6,818,455
	1996	339,819	1,103,465	2,720,752	654,825	1,490,214	6,309,075
	1997	409,851	1,374,923	2,713,595	534,603	1,840,148	6,873,120
Warren	1995	116,353	209,723	1,052,090	305,095	20,080	1,703,341
	1996	132,070	268,666	925,124	324,123	20,524	1,670,507
	1997	150,892	194,803	696,838	345,907	22,637	1,411,077
Washington	1995		410,000	445,000	150,101	45,000	1,050,101
	1996		505,000	371,000	157,646	56,000	1,089,646
	1997		357,453	386,294	164,470	63,220	971,437
Watauga	1995		1,046,475	731,000	609,508	186,941	2,573,924
	1996		962,996	777,278	303,905	168,053	2,212,232
	1997		1,036,718	1,003,209	401,223	146,208	2,587,358
Wayne	1995		672,600	1,584,100	246,000	320,500	2,823,200
	1996		815,771	1,526,060	253,077	251,220	2,846,128
	1997		885,418	1,592,409	242,748	247,506	2,968,081
Wilkes	1995		858,044	1,606,819	1,029,363	143,537	3,637,763
	1996		799,004	1,699,096	1,070,861	159,858	3,728,819
	1997		1,035,402	1,534,056	1,014,235	201,620	3,785,313
Wilson	1995	206,700	743,300	1,162,500	142,100	294,000	2,548,600
	1996	274,144	720,934	1,048,400	129,894	261,573	2,434,945
	1997	234,522	629,554	980,912	158,528	330,534	2,334,050
Yadkin	1995	270,909	341,379	1,175,265	256,855	53,686	2,098,094
	1996	262,321	363,765	1,078,112	183,755	57,914	1,945,867
	1997	348,491	446,227	1,292,299	230,413	57,844	2,375,274
Yancey	1995		476,002	438,157	161,001	26,000	1,101,160
	1996		535,389	533,013	107,138	21,000	1,196,540
	1997		550,506	561,651	237,138	21,001	1,370,296
TOTALS		44,180,580	195,495,208	324,674,224	89,014,464	66,947,653	720,312,129
Source: DOT Fiscal							

OVER-EXPENDITURES BY MAINTENANCE UNITS BY ROAD SYSTEM							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Total
Alamance	1995					19,330	19,330
	1996	371	27,568				27,939
	1997		9,509			65,419	74,928
Alexander	1995		46,519	47,179	8,603		102,301
	1996		50,234	90,020			140,254
	1997		149,731	328,368	50,607		528,706
Alleghany	1995						
	1996				12,408		12,408
	1997				23,563	1,313	24,876
Anson	1995		17,544	245,516		12,581	275,641
	1996		23,277	275,650	4,495		303,422
	1997		222,304	362,433	20,103	25,724	630,564
Ashe	1995				43,830		43,830
	1996		12,491	171,858	82,881		267,230
	1997			355,657	99,571	1,125	456,353
Avery	1995				5,125		5,125
	1996		13,759		28,505	12,518	54,782
	1997		184		18,079	588	18,851
Beaufort	1995				571		571
	1996			8,456			8,456
	1997			885			885
Bertie	1995						
	1996						
	1997				778		778
Bladen	1995						
	1996						
	1997		121	94,935		26,964	122,020
Brunswick	1995			25,304			25,304
	1996				2,332		2,332
	1997						
Buncombe	1995				77,640		77,640
	1996		36,547	12,532			49,079
	1997		61,724	92,060	1,430		155,214
Burke	1995		18,566	122,549		14,747	155,862
	1996						
	1997			2,926			2,926
Cabarrus	1995		20,724			123,046	143,770
	1996	6,863	84,799	63,747		238,093	393,502
	1997	54,194	93,776	252,483	19,870	115,780	536,103
Caldwell	1995		25,404	24,724	57,721		107,849
	1996		48,108	141,142	34,437	27,018	250,705
	1997			216,568	63,058	81,334	360,960
Camden	1995		13,341		538		13,879
	1996						
	1997		110				110
Carteret	1995		5,671		8,177		13,848
	1996			52,795			52,795
	1997		34,033			2,068	36,101
Caswell	1995						
	1996			59,271			59,271
	1997		45,675	24,552	2,993		73,220

OVER-EXPENDITURES BY MAINTENANCE UNITS BY ROAD SYSTEM (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Total
Catawba	1995						
	1996			160,778		74,501	235,279
	1997	295,744	23,672	188,391	1,160	99,407	608,374
Chatham	1995					5,667	5,667
	1996						
	1997			208,150			208,150
Cherokee	1995					551	551
	1996						
	1997		6,100	371,227			377,327
Chowan	1995				364		364
	1996						
	1997			778			778
Clay	1995						
	1996					3,850	3,850
	1997		41,437	9,283	11,477		62,197
Cleveland	1995	6,833	16,361	27,984		14,617	65,795
	1996	39,651	74,981	146,287	17,246	4,149	282,314
	1997	38,512	331,835	282,414	88,630		741,391
Columbus	1995			22,205	368		22,573
	1996					24,135	24,135
	1997					135,548	135,548
Craven	1995		630	8,662			9,292
	1996			526	10,127		10,653
	1997			26,662	10,668		37,330
Cumberland	1995		186,209			213,376	399,585
	1996	24,994		176,374		48,172	249,540
	1997	89,719		127,074		338,865	555,658
Currituck	1995						
	1996			3,323			3,323
	1997						
Dare	1995		11,849	842		15,734	28,425
	1996						
	1997		2,359			555	2,914
Davidson	1995		30,831	57,105		10,030	97,966
	1996	26,614	1,805			15,480	43,899
	1997			373,449			373,449
Davie	1995			7,010	12,435	24,271	43,716
	1996			22,498			22,498
	1997			16,230	14,173		30,403
Duplin	1995						
	1996	10,338				48,646	58,984
	1997	277	4,020				4,297
Durham	1995	23,533	134,310	108,581			266,424
	1996	2,082	61,776		8,033	192,929	264,820
	1997		118,533	164,383			282,916
Edgecombe	1995						
	1996			9,941			9,941
	1997			8,705			8,705
Forsyth	1995		1,613			80,414	82,027
	1996		16,506	145,219		158,054	319,779
	1997		320,951	83,694		109,142	513,787

OVER-EXPENDITURES BY MAINTENANCE UNITS BY ROAD SYSTEM (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Total
Franklin	1995		63,003	169,523		274	232,800
	1996			131,207	22,183	10,043	163,433
	1997		57,762	167,462			225,224
Gaston	1995	87,794	77,034	138,920	52,285	30,934	386,967
	1996		108,127	419,464		168,581	696,172
	1997	74,184	65,313	403,112	52,621	206,815	802,045
Gates	1995				3,933		3,933
	1996						
	1997						
Graham	1995						
	1996				1,097		1,097
	1997					4,673	4,673
Granville	1995	34,932		140,414		499	175,845
	1996	46,204	43,449	25,616			115,269
	1997	31,559	58,761	101,691		11,207	203,218
Greene	1995				186		186
	1996		55,528	24,588			80,116
	1997		7,493	7,072	8,287		22,852
Guilford	1995			84,430	46,935	17,161	148,526
	1996		12,641	138,547	32,916	47,731	231,835
	1997	45,366		104,391			149,757
Halifax	1995						
	1996			42,260		15,967	58,227
	1997				12,355	21,994	34,349
Harnett	1995			2,357	3,818		6,175
	1996			190,770			190,770
	1997			130,924			130,924
Haywood	1995		19,483				19,483
	1996						
	1997	99,738					99,738
Henderson	1995					27,328	27,328
	1996						
	1997			91,812			91,812
Hertford	1995		14,188			842	15,030
	1996		387				387
	1997				3,584		3,584
Hoke	1995						
	1996						
	1997		6,529	30,096			36,625
Hyde	1995		12,023		3,521		15,544
	1996		246				246
	1997						
Iredell	1995	305	54,084				54,389
	1996	160,932	98,026	380,054	9,426	52,486	700,924
	1997	149,657	8,916				158,573
Jackson	1995		23,235		188,068		211,303
	1996					760	760
	1997		111,799	149,053			260,852
Johnston	1995		63,284	16,641	21,668		101,593
	1996	12,750	118,018		73,743	858	205,369
	1997			256,564		30,320	286,884

OVER-EXPENDITURES BY MAINTENANCE UNITS BY ROAD SYSTEM (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Total
Jones	1995				6,073		6,073
	1996			28,188			28,188
	1997				2,535		2,535
Lee	1995					27,539	27,539
	1996			16,475		68,169	84,644
	1997			33,087		34,746	67,833
Lenoir	1995						
	1996			20,250	2,259		22,509
	1997		17,873	25,689	1,004	15,845	60,411
Lincoln	1995						
	1996						
	1997		36,816	10,243			47,059
Macon	1995					2,099	2,099
	1996						
	1997			83,906			83,906
Madison	1995						
	1996						
	1997						
Martin	1995		39,645		2,270		41,915
	1996		6,230	196			6,426
	1997						
McDowell	1995		10,705	6,805			17,510
	1996						
	1997			12,937	786		13,723
Mecklenburg	1995	137,274	140,774	106,729		3,685,702	4,070,479
	1996	25,530	51,018	201,711		2,737,197	3,015,456
	1997	118,652	128,812	453,967		2,988,293	3,689,724
Mitchell	1995			17,221		10,730	27,951
	1996			6,245			6,245
	1997		1,281	54,671		4,313	60,265
Montgomery	1995			5,054		12,586	17,640
	1996		32,746				32,746
	1997			101,682		7,690	109,372
Moore	1995			37,566		13,711	51,277
	1996			50,791			50,791
	1997		87,539	118,280		3,148	208,967
Nash	1995					7,807	7,807
	1996	8,901		21,575		36,470	66,946
	1997		56,212			131,215	187,427
New Hanover	1995			82,559			82,559
	1996			13,291	37,247		50,538
	1997		81,448	103,190	26,148	33,934	244,720
Northampton	1995				1,168		1,168
	1996						
	1997	14,158	107				14,265
Onslow	1995						
	1996						
	1997		11,427	6,989	9,190	91,108	118,714
Orange	1995			77,630	21,904		99,534
	1996			10,497			10,497
	1997		9,784	158,553	1,854		170,191

OVER-EXPENDITURES BY MAINTENANCE UNITS BY ROAD SYSTEM (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Total
Pamlico	1995						
	1996			14,067			14,067
	1997			8,151			8,151
Pasquotank	1995						
	1996						
	1997					4,005	4,005
Pender	1995		32,414				32,414
	1996			19,149		7,385	26,534
	1997		110,861			11,424	122,285
Perquimans	1995						
	1996				232		232
	1997						
Person	1995		40,142	96,959		6,409	143,510
	1996		7,885				7,885
	1997		120,797	80,687	74,852		276,336
Pitt	1995		15,286		2,224		17,510
	1996			31,561	13,663		45,224
	1997		106,208		36,950		143,158
Polk	1995				40,211		40,211
	1996						
	1997		18,183				18,183
Randolph	1995					6,681	6,681
	1996	4,523				1,932	6,455
	1997			467,610		47,882	515,492
Richmond	1995					22,949	22,949
	1996						
	1997		9,244		464		9,708
Robeson	1995	45,897					45,897
	1996	87,115		69,022			156,137
	1997	56,834				36,275	93,109
Rockingham	1995			58,584			58,584
	1996					150	150
	1997		108,036	40,586	4,958		153,580
Rowan	1995		4,664	63,914	27,598	21,985	118,161
	1996	231		179,209		40,446	219,886
	1997			17,233		30,481	47,714
Rutherford	1995			21,935	4,932	22,692	49,559
	1996		995	54,046	6,009	1,847	62,897
	1997		39,995	7,718	5,442		53,155
Sampson	1995		48,217				48,217
	1996					9,921	9,921
	1997		81,125				81,125
Scotland	1995			65,741	2,102	246	68,089
	1996		20,713	126,962		25,135	172,810
	1997						
Stanly	1995		38,050	224,165			262,215
	1996		65,879	375,269	12,198	80,421	533,767
	1997		41,705	469,050	56,460	97,686	664,901
Stokes	1995			25,044	1,952		26,996
	1996				3,787	2,890	6,677
	1997					2,630	2,630

OVER-EXPENDITURES BY MAINTENANCE UNITS BY ROAD SYSTEM (continued)							
County	FY Ended	Interstate	Primary	Secondary Paved	Secondary Unpaved	Urban	Total
Surry	1995			49,135	1,688		50,823
	1996	128,729	1,325	74,265		13,786	218,105
	1997		46,536	58,144	19,868	13,011	137,559
Swain	1995					153	153
	1996						
	1997					17,349	17,349
Transylvania	1995				15,383		15,383
	1996						
	1997						
Tyrrell	1995		952		914		1,866
	1996					6,099	6,099
	1997						
Union	1995		52,266	384,552		106,299	543,117
	1996		19,022	178,443	82,509	78,619	358,593
	1997		138,343	287,513		123,183	549,039
Vance	1995	54,499		10,287			64,786
	1996	25,489	6,115	107,055	1,149		139,808
	1997		152,965	233,315	45,340		431,620
Wake	1995	21,181	81,534	287,250	98,172		488,137
	1996	47,149	182,078	16,407		336,353	581,987
	1997	52,819	71,013	358,930	45,762		528,524
Warren	1995		38,332	10,878			49,210
	1996	21,109	4,195	19,662	19,092		64,058
	1997	13,424	24,454	35,144	1,894		74,916
Washington	1995		14,374		334		14,708
	1996		548	2,707			3,255
	1997		823				823
Watauga	1995			259,660	74,882		334,542
	1996			86,295	12,495	29,367	128,157
	1997		6,492	252,852	41,638	41,288	342,270
Wayne	1995		157,331		3,747		161,078
	1996			59,695		12,569	72,264
	1997		96,751	66,303			163,054
Wilkes	1995		46,573		39,013	1,204	86,790
	1996		47,646	45,449	67,490	36,404	196,989
	1997			90,155	126,172	29,991	246,318
Wilson	1995		94,279			21,927	116,206
	1996			13,227		70,524	83,751
	1997		146,151				146,151
Yadkin	1995		7,234	83,655	14,034		104,923
	1996	20,194				5,168	25,362
	1997			81,056		12,559	93,615
Yancey	1995			22,197			22,197
	1996						
	1997			7,600			7,600
TOTALS		2,246,854	6,586,974	16,740,823	2,496,670	14,383,841	42,455,162
Source: DOT Fiscal							

Listing Of Vacant Maintenance Positions As Of June 12, 1998					
Division	District	Position Number.	Classification	Date Vacated	Days Vacant
10	2	425003021002-486	Highway Maint. Worker	12/16/95	909
6	2	425003010602-356	Mach. Oper. II	01/31/96	863
10	3	425003021003-135	Mach. Oper. IV	02/07/96	856
10	3	425003021003-106	Mach. Oper. II	02/10/96	853
6	2	425003010602-319	Maint. Crew Ldr. II	02/24/96	839
6	2	425003010602-333	Mach. Oper. IV	02/29/96	834
6	2	425003010602-326	Mach. Oper. IV	04/12/96	791
6	2	425003010602-340	Mach. Oper. IV	04/30/96	773
4	3	425003010403-456	Mach. Oper. IV	05/30/96	743
6	2	425003010602-369	Mach. Oper. I	06/04/96	738
6	1	425003010601-404	Highway Maint. Worker	07/16/96	696
10	3	425003021003-173	Highway Maint. Worker	08/01/96	680
9	1	425003020901-331	Maint. Crew Ldr. II	08/10/96	671
9	1	425003020901-406	Trans. Supv. I	08/10/96	671
8	3	425003020803-391	Trans. Supv. I	08/24/96	657
6	2	425003010602-345	Transportation Worker	09/06/96	644
8	3	425003020803-384	Maint. Crew Ldr. II	09/27/96	623
6	2	425003010602-427	Transportation Worker	10/01/96	619
4	1	425003010401-375	Transportation Worker	10/14/96	606
4	1	425003010401-400	Transportation Worker	01/23/97	505
4	1	425003010401-427	Transportation Worker	01/25/97	503
4	3	425003010403-355	Transportation Worker	02/08/97	489
6	2	425003010602-422	Transportation Worker	02/10/97	487
4	1	425003010401-322	Equip. Oper. Specialist	02/28/97	469
10	2	425003021002-370	Transportation Worker	03/08/97	461
5	2	425003020502-360	Transportation Worker	03/31/97	438
6	2	425003010602-438	Transportation Worker	04/18/97	420
6	3	425003010603-373	Transportation Worker	04/21/97	417
6	2	425003010602-441	Transportation Worker	05/16/97	392
6	1	425003010601-315	Maint. Crew Ldr. II	05/17/97	391
5	2	425003020502-474	Transportation Worker	05/31/97	377
2	1	425003010201-466	Transportation Worker	06/28/97	349
1	2	425003010102-336	Transportation Worker	06/30/97	347
14	2	425003031402-575	Maint. Crew Ldr. II	07/01/97	346
8	3	425003020803-374	Maint. Crew Ldr. II	07/21/97	326
10	2	425003021002-472	Transportation Worker	07/26/97	321
14	2	425003031402-596	Transportation Worker	07/28/97	319

Listing Of Vacant Maintenance Positions (continued)
As Of June 12, 1998

Division	District	Position Number.	Classification	Date Vacated	Days Vacant
5	2	425003020502-400	Maint. Crew Ldr. II	08/05/97	311
10	3	425003021003-055	Maint. Crew Ldr. II	08/21/97	295
2	3	425003010203-436	Transportation Tech. I	08/23/97	293
8	3	425003020803-381	Maint. Crew Ldr. II	08/31/97	285
10	3	425003021003-137	Transportation Worker	08/31/97	285
12	1	425003031201-465	Unknown	08/31/97	285
14	2	425003031402-574	Maint. Crew Ldr. II	08/31/97	285
6	2	425003010602-380	Transportation Worker	09/30/97	255
6	3	425003010603-343	Transportation Worker	09/30/97	255
9	1	425003020901-384	Transportation Worker	10/18/97	237
9	1	425003020901-416	Transportation Worker	10/18/97	237
14	2	425003031402-346	Equip. Oper. Specialist	10/23/97	232
4	2	425003010402-309	Transportation Worker	10/31/97	224
5	1	425003020501-416	Transportation Worker	10/31/97	224
5	2	425003020502-318	Transportation Worker	10/31/97	224
1	1	425003010101-347	Transportation Worker	11/01/97	223
5	2	425003020502-437	Transportation Worker	11/01/97	223
1	2	425003010102-472	Transportation Worker	11/01/97	223
2	1	425003010201-368	Transportation Worker	11/12/97	212
2	1	425003010201-342	Transportation Worker	11/15/97	209
14	2	425003031402-571	Maint. Crew Ldr. II	11/29/97	195
14	2	425003031402-583	Transportation Worker	11/29/97	195
4	3	425003010403-496	Transportation Worker	12/02/97	192
8	2	425003020802-303	Equip. Oper. Specialist	12/04/97	190
4	1	425003010401-423	Transportation Worker	12/08/97	186
2	3	425003010203-408	Transportation Worker	12/10/97	184
2	3	425003010203-379	Processing Asst. III	12/13/97	181
2	3	425003010203-359	Transportation Worker	12/19/97	175
3	2	425003010302-353	Transportation Worker	12/27/97	167
4	2	425003010402-300	Transportation Tech. II	12/27/97	167
4	2	425003010402-317	Maint. Crew Ldr. II	12/27/97	167
4	2	425003010402-345	Equip. Oper. Specialist	12/27/97	167
5	2	425003020502-354	Transportation Worker	12/27/97	167
8	3	425003020803-418	Trans. Supv. I	12/27/97	167
12	2	425003031202-355	Processing Asst. III	12/27/97	167
10	2	425003021002-337	Maint. Crew Ldr. I	12/28/97	166

Listing Of Vacant Maintenance Positions (continued) As Of June 12, 1998					
Division	District	Position Number.	Classification	Date Vacated	Days Vacant
1	2	425003010102-345	Transportation Worker	12/31/97	163
4	3	425003010403-371	Transportation Worker	12/31/97	163
4	3	425003010403-442	Transportation Worker	12/31/97	163
5	2	425003020502-358	Maint. Crew Ldr. II	12/31/97	163
5	2	425003020502-403	Transportation Worker	12/31/97	163
8	3	425003020803-383	Maint. Crew Ldr. II	12/31/97	163
9	1	425003020901-312	Maint. Crew Ldr. II	12/31/97	163
1	1	425003010101-464	Transportation Worker	01/09/98	154
1	1	425003010101-303	Maint. Crew Ldr. II	01/10/98	153
9	1	425003020901-304	County Maint. Eng.	01/10/98	153
9	1	425003020901-333	Transportation Worker	01/10/98	153
14	2	425003031402-356	Transportation Worker	01/10/98	153
6	2	425003010602-315	Maint. Crew Ldr. II	01/23/98	140
9	1	425003020901-311	Maint. Crew Ldr. II	02/02/98	130
4	3	425003010403-403	Transportation Worker	02/07/98	125
4	3	425003010403-406	Transportation Worker	02/07/98	125
5	2	425003020502-379	Transportation Worker	02/07/98	125
9	1	425003020901-428	Transportation Worker	02/07/98	125
10	1	425003021001-334	Trans. Supv. I	02/07/98	125
2	2	425003010202-337	Transportation Worker	02/08/98	124
1	1	425003010101-335	Transportation Worker	02/10/98	122
6	1	425003010601-346	Transportation Worker	02/12/98	120
5	2	425003020502-307	Maint. Crew Ldr. II	02/18/98	114
2	1	425003010201-450	Transportation Worker	02/20/98	112
4	2	425003010402-418	Transportation Worker	02/21/98	111
3	2	425003010302-350	Transportation Worker	02/28/98	104
14	2	425003031402-594	Transportation Worker	02/28/98	104
8	1	425003020801-381	Transportation Worker	03/06/98	98
8	3	425003020803-429	Transportation Worker	03/06/98	98
5	3	425003020503-393	Transportation Worker	03/12/98	92
12	2	425003031202-433	Transportation Worker	03/12/98	92
Source: DOT Personnel Section					

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
JAMES B. HUNT, JR.
GOVERNOR
P.O. BOX 25201, RALEIGH, N.C. 27611-5201
E. NORRIS TOLSON
SECRETARY

March 23, 1999

Mr. Ralph Campbell, Jr.
State Auditor
Legislative Office Building, Suite 201
300 North Salisbury Street
Raleigh, NC 27611-5201

Dear Mr. Campbell:

Our staff has completed a review of the Performance Audit on Division of Highways County Maintenance Units. State Highway Administrator Len Sanderson and Chief Engineer Don Goins recently met with the audit team to discuss our concerns with some of the data and several revisions have now been incorporated into the report. Outlined below, we have provided additional comments on the findings and recommendations for each of the four emphasis areas of the audit:

MAINTENANCE UNITS OPERATIONS AND PROCEDURES

Our existing Maintenance Management System (MMS) has been in place since 1974. It is a mainframe program generating specific reports with a turn around time of approximately six weeks. Data from these reports is used by management, however, it is not sufficient to provide daily operational guidance. Consequently, its use as an effective planning tool is questionable. We have a new Maintenance Management System currently being developed with an implementation date of 2000. This system will have the capability of providing immediate information with unlimited query options thereby greatly enhancing the engineer's ability to manage expenditures and plan activities. While the existing planned maintenance program does serve primarily as "a guide" as stated in the audit, the major maintenance functions planned are typically based on production standards established through crew size studies tied to system mileage and historical data. Our maintenance operations in most areas of the state have evolved into reactionary vs. planned work due to several factors including population growth, significant increases in vehicle miles traveled, and inadequate funding. The more urbanized the area, the more likely planned work is determined by complaints and pavement failures caused by roads carrying more traffic than they were designed to handle. We are in agreement that immediate improvements in planning and reporting of work accomplished are needed. Training is planned for field engineering personnel within the next three months prior to development of the 1999-2000 planned maintenance program. This will also set the stage for the new Maintenance Management System and the accompanying training which will be required to maximize its potential.

With regard to over-expenditure of maintenance budgets, the audit has now been revised to reflect the fact that County Maintenance Engineers are not solely responsible for all expenditures against standing county maintenance work orders. County Maintenance units as

The response from the Department has been reformatted to conform with the style and format of the rest of the audit report. However, no data has been changed.

well as division-wide departments such as Traffic, Roadside Environmental, and Division Bituminous charge to

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these work orders. Funds are allocated and sub-allocated at the division level. Primary and Urban funds are allocated on a division-wide basis and typically balance as a whole while Secondary funds are allocated directly to the county. Our maintenance funding has remained relatively flat during the last several years while costs have continued to rise. This is due in part to increases in material costs, new programs, and unforeseen weather related impacts. We acknowledge that a significant maintenance backlog exists which tends to contribute to budget over-expenditure. This backlog simply cannot be addressed until adequate funding is provided for routine maintenance. Budget expenditures are closely monitored by Division management and adjustments made as necessary to include reducing services to stay within allocations.

ORGANIZATION AND STAFFING

We believe that the supplemental information provided to the audit team regarding the use of inmate and temporary labor which was not included in the draft findings and recommendations indicates that span of control ratios are considerably better than originally stated. It is important to note that the Transportation Supervisor I position is considered as a working supervisor. While the Department will continue to work toward increased spans of control, the practicality of increasing work crew sizes in maintenance operations is questionable. Ideal crew sizes for field operations have been established based on the type of operation and productivity. The TS I typically serves as a lead worker over a crew of about 5-8 individuals that may be a combination of permanent employees, temporaries or inmates, however, they do not conduct employee evaluations. This function is typically limited to the TS II and TS III level. It should be noted that the TS II level position may supervise multiple operations which often includes fully operated rental equipment in addition to our employees. We will continue existing efforts to improve efficiency in maintenance operations to include periodic reviews of span of control. Changes will have to eventually be made to our staffing due to restructuring/relocation of prison facilities over which we have no control, though we are mandated to utilize inmates in our maintenance operations.

FINANCIAL ACCOUNTABILITY

The audit findings indicated numerous errors in procedures and correct charging to work orders and function codes in one district. Immediate steps will be taken to address this isolated problem, however, we plan to provide appropriate training for both clerical and managerial staff state-wide. Significant turnover in many of these positions in recent years has contributed to this problem.

EQUIPMENT ASSIGNMENTS AND UTILIZATION

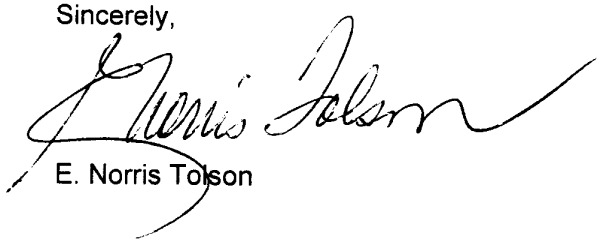
Our existing Equipment Management System (EQMS) is outdated and is being replaced as part of the Department's BSIP project. The data generated by the system is often inaccurate due to data entry errors and is not as effectively used by management as it could be due to reliability and turn-around time. We do plan to conduct training for both Central and Division Equipment personnel to reduce data entry and other procedural errors. Many of our Maintenance Engineers are unaware of data available to them through the existing system and this too will be handled through training.

The response from the Department has been reformatted to conform with the style and format of the rest of the audit report. However, no data has been changed.

We are in agreement that equipment rental rates should be reviewed and adjusted on a more frequent basis. We are currently unable to replace equipment on the established depreciation schedule. Division management must make decisions regarding replacement on the basis of condition, utilization and importance to the overall operations due to funding constraints. We disagree at this time with adjusting rental rates for depreciated equipment as the remaining useful life of a piece of equipment depends on condition, hours, and performance of particular makes and models. It should be noted that any overall increases in rental rates will significantly impact our maintenance budget which is not sufficiently funded at present. Division Engineers are closely reviewing equipment complements at present as a result of the maintenance funding situation and with respect to an anticipated reduction in secondary road construction (paving) operations over the next few years. We will follow up on the audit recommendations to implement procedures for periodic physical inventories of equipment to ensure that all equipment is accounted for and assigned to the appropriate cost center.

In summary, we are in general agreement with many of the findings of the audit as it confirms the need for better data management systems, which fortunately are under development with implementation coming over the next two years. Numerous training needs exist in the areas of planned maintenance, data entry, and monitoring of various management system reports. Efforts are currently underway to provide appropriate training for both field managers and clerical support. This training will better enable us to transition into the new BSIP, MMS, and EMIS systems as they go on line. With respect to organizational and staffing issues, it should be noted that we have successfully implemented a Skilled Based Pay (SBP) system in our field maintenance operations and this will soon be expanded into the equipment organization. We believe that this program may provide us an opportunity to widen spans of control in some units by utilizing the lead worker concept. We will continue to review the Transportation Supervisor Series which evolved out of the SBP program and make adjustments as necessary. As previously mentioned, the TS I level complement is heavily influenced by inmate labor utilization and availability. We continue to work toward our goal of adequate funding for our maintenance operations tied to periodic system condition surveys with established levels of service. This effort coupled with the new management information systems and enhanced training will give our engineers the ability to successfully plan and monitor field operations with increased productivity and accountability.

Sincerely,



E. Norris Tolson

ENT/wsv

cc: Len A. Sanderson, P. E., State Highway Administrator
J. D. Goins, P. E., Chief Engineer - Operations

The response from the Department has been reformatted to conform with the style and format of the rest of the audit report. However, no data has been changed.

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Mr. Edward Renfrow	State Controller
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March 31, 1999

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