

**FINAL REPORT OF THE
JOINT LEGISLATIVE AUDIT AND REVIEW COMMISSION AND
THE SJR 50 SUBCOMMITTEE ON
THE ORGANIZATION AND ADMINISTRATION OF THE
DEPARTMENT OF HIGHWAYS AND TRANSPORTATION
TO
THE GOVERNOR
AND
THE GENERAL ASSEMBLY OF VIRGINIA**



SENATE DOCUMENT NO. 7

**COMMONWEALTH OF VIRGINIA
RICHMOND
1982**

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November 30, 1981

The Honorable John N. Dalton, Governor
The Honorable Members of the General Assembly
State Capitol
Richmond, Virginia 23219

Ladies and Gentlemen:

We are pleased to transmit to you the final report on the organization and administration of the Department of Highways and Transportation. The report was prepared by the Joint Legislative Audit and Review Commission with the cooperation of a study committee designated by Senate Joint Resolution 50 of the 1980 Session.

Sincerely,

Theodore V. Morrison, Jr.
SJR 50 Committee Chairman

Richard M. Bagley
JLARC Chairman

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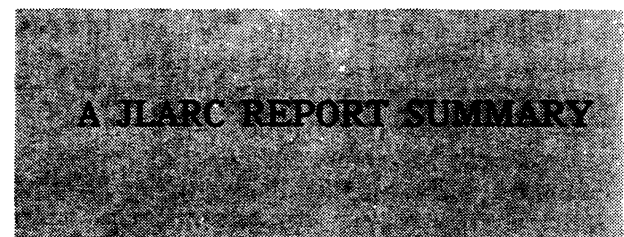


The Department of Highways and Transportation (DHT) has broad responsibilities for the construction and maintenance of 60,881 miles of roadway in Virginia. The department also performs a variety of transportation-related duties, such as providing planning, financial, and engineering assistance to cities, towns, public transit systems, and rail lines. To fulfill these duties, the department has become one of the largest State agencies, with 11,818 authorized staff positions and a biennial appropriation of \$1.9 billion for 1980-82.

The last comprehensive examination of DHT occurred in the early 1960s when the Stone Commission made major recommendations for improving departmental management

and organization. At that time the legislature also endorsed an ambitious program of highway construction consistent with Virginia's population and economic growth and the availability of ample revenues from taxes on gasoline and motor vehicles.

The policy environment for DHT changed dramatically in the late 1970s, however. Slow revenue growth coupled with inflation and increasingly costly maintenance requirements resulted in a one-third reduction in the purchasing power of the construction program. Despite an increase in the motor fuel tax in 1980, DHT projects that without additional revenue the highway construction program will end in 1984.



In response to these trends DHT has reduced staffing levels and taken steps to improve financial management and control. A number of additional improvements are needed to provide a suitable framework for increased accountability and to make best use of available resources. Fifty recommendations for improvements are included in this report. Foremost among these are major changes in highway construction and maintenance budgeting procedures, increased attention to the public transportation function, organizational restructuring to address concerns first raised in the Stone Commission report, and a general upgrading of management controls.

Policy and Program Development (pp 9 to 27)

The Highway and Transportation Commission and the Secretary of Transportation are primarily responsible for developing highway and public transportation policy. The 11-member Highway and Transportation Commission is legislatively assigned the tasks of allocating construction funds, establishing a reasonable and necessary maintenance budget, approving actions taken by the public transportation division, and a variety of other duties. The secre-

tary of transportation is formally charged with directing the development of the DHT budget. Since 1978 the secretary has also been responsible for preparation of the statewide transportation plan.

The development of highway construction, maintenance, and public transportation programs, and conversion of these programs into budget proposals for legislative review, are carried out at several levels of the department. Program development involves the planning, programming, and financial affairs directorates, the public transportation division, and construction and maintenance program managers in the central office and field offices throughout Virginia.

Policy Development. The commission devotes most of its attention to highway construction with correspondingly less attention to highway maintenance and public transportation. In fact, a number of the commission members believed that a legislative formula governed the size of the maintenance budget when, in fact, the General Assembly has directed the commission to provide for "reasonable and necessary" levels of maintenance spending. The commission needs to expand its oversight of maintenance and public transportation in order to provide a comprehensive and uniform base for policy development.

The secretary of transportation has taken important steps toward completing the statewide transportation plan first mandated by the General Assembly in 1974, including the release of a status report in 1981. The plan is needed to provide a multimodal framework for highway and public transportation policy. A completion date for the plan should be established, possibly through legislative action, and the proposed form and content of the plan should be exposed for review as soon as possible. It is essential that the plan contain specific discussion of the major transportation issues and present recommendations for meeting future needs.

Highway Program Development. DHT employs a large staff to carry out the complex process of assessing highway needs, preparing plans to meet those needs, scheduling projects, and managing the flow of federal, State, and local revenues to fund programs consistent with legislative appropriations. In the past, however, information provided the legislature

on highway and transportation needs and funding alternatives has tended to be overly general and in some cases unrealistic.

Major revisions are necessary in DHT's current approach to highway program development and budgeting. Highway construction funds are limited and a means of establishing priorities and monitoring accomplishments is needed. Budgeting for highway maintenance will require increased use of systematic pavement and bridge ratings and closer adherence to maintenance standards. Several important actions, including adoption of an interstate pavement management system and preparation of a departmentally endorsed construction program, have been taken recently by DHT to meet these requirements. DHT should continue refining procedures and adopt a uniform commitment to improving the quality of information available to the legislature for its deliberations.

Public Transportation Needs. DHT assumed formal responsibility for public transportation programs in 1974. The public transportation division was created in 1978 and given a broad mandate to develop information on transit needs, funding requirements, and the efficiency and economy of transit systems operating in Virginia. Statute mandated that the division report to the commissioner. This high-level reporting relationship prescribed in statute was intended to prevent the special needs of public transportation from being overshadowed by the traditional highway responsibilities of the department.

The public transportation division does not, however, play the role intended by the General Assembly. On a day-to-day basis the division reports to the director of planning rather than to the commissioner. And although the division has been active in grant administration, it has not produced the in-depth needs assessments, efficiency studies, or program options provided for in statute.

A clear focus for public transportation programs is particularly important today in light of federal policy shifts which could result in the loss of over \$15 million annually in operating subsidies and a corresponding increase in pressure on State and local resources. Creating a standing committee for public transportation on the commission, upgrading the public transportation division to directorate

status, and expanding the division's role consistent with statute would improve DHT's ability to help the General Assembly deal with changing federal policy.

Compliance with Statute (pp 25 to 32)

The General Assembly uses both statutory allocation formulas and the appropriations act to control the distribution of highway and transportation funds. In several instances DHT appears to have been out of compliance with these provisions.

Construction Allocations. The General Assembly has historically employed an allocation process for stating its intent regarding highway construction funding. The process also communicates construction plans and priorities to legislators, local officials, and the public.

In practice, actual spending patterns vary greatly from allocations. Between 1967 and 1981, \$206 million more was allocated to the urban system than was expended. The primary and secondary systems also showed underspending of \$59 million and \$39 million, respectively, compared to allocations. In contrast, \$14 million more was spent on the interstate system than was allocated.

Variations between statutory allocations and expenditures may not satisfy the intent of the General Assembly. However, although there is a common perception that allocations and expenditures coincide over a reasonable period, this relationship is not firmly established in law.

For the purpose of correcting the imbalance between the allocations made to the secondary, urban, primary, and interstate systems, the General Assembly may wish to (a) require DHT to prepare a plan to address and amortize the existing imbalances, (b) suspend the application of the allocation formula in *Code of Virginia* §33.1-23.1 for a period sufficient to allow DHT to correct the current imbalances, or (c) require consistency between expenditures and allocations made in the future but provide more flexibility in meeting past allocation commitments. In addition, the General Assembly may wish to clarify whether expenditures should be consistent with allocations and whether the term "allocation" means intent to expend allocated funds within a reasonable period of time.

Appropriation Provisions. DHT overspent the legislative appropriation for highway maintenance by \$59 million in the 1978-80 biennium. DHT contends that these funds were used for purposes more similar to construction than maintenance and were, therefore, authorized by a separate provision of the Act. However, similar expenditures have been coded as maintenance by the department at least since the early 1970s.

DHT overspending occurred because checks by the Department of Planning and Budget and the controller were not adequate in this instance. All highway work, both construction and maintenance, is included under one accounting code even though construction and maintenance are separate Appropriations Act items. This arrangement has effectively removed the primary check available to the controller to ensure that spending is consistent with law. The use of one accounting code for these two major DHT programs should be ended immediately.

Capital Outlay. DHT is subject to standard provisions for review and approval of capital outlays for departmental facilities. Only land acquired for highway construction is exempted by statute. Despite these provisions DHT has intended to operate outside established procedures. Consolidation of the capital outlay function with the operating budget would improve control and better ensure compliance with State review and approval procedures.

Management Controls (pp 37 to 66)

DHT recognizes the need to operate efficiently in order to make full use of its limited resources, and a number of improvements have recently been implemented. During the course of this review cost savings of about \$20 million were identified. Additional savings are likely through monitoring of resource requirements and spending levels. Three ways to improve efficiency are described below.

Equipment Purchases. DHT maintains a fleet of equipment valued at over \$100 million. Based on DHT's own standards, many pieces of equipment appear to be underutilized. A review of utilization records for 1980 compared with outstanding requests for new purchases identified as many as 592 items which appeared unnecessary. Deferring new

purchases was projected to save up to \$9.5 million in 1981. In fact, \$8 million in proposed purchases was deferred by DHT.

Inventory Control. The department maintains a large inventory of common stock items. Comparison of current stock levels with issue rates for the last five years indicated that DHT is overstocked by as much as \$5 million. This overstocking ties up funds unnecessarily and increases storage and handling costs. A series of eight recommendations have been made and accepted for improving inventory management and reducing overstocking.

Preventive Maintenance. The equipment fleet is well maintained but some field units spend more time than necessary on maintenance. For example, half of all residencies suspend operations once a week for preventive maintenance. Analysis of cost reports and breakdown rates reveal weekly programs to be no more effective than monthly preventive maintenance. Establishing a monthly program would save \$820,000 annually.

Organizational Structure and Function (pp 67 to 87)

DHT is a large bureaucracy with 11,818 authorized positions, 85 separate organizational units, and eight levels of management between the commissioner and field crews. The current organizational structure is fundamentally sound and reflects, in large measure, the recommendations of the Stone Commission. However, some of the problems noted by the Stone Commission have reemerged and several other changes now appear warranted. Figure 1 shows a proposed reorganization of DHT with key changes highlighted.

Deputy Commissioner. A problem with the current organization is that several major organizational units report directly to the commissioner. In 1963 the Stone Commission criticized excessive day-to-day involvement of the commissioner in routine activities and the resulting "inadequate opportunity to devote effort to the executive responsibilities of the position." Creation of separate deputy commissioner and chief engineer positions would provide better distribution of workload at the top management level and would improve coordination of planning, programming, and budgeting. This change would also free the

commissioner to focus on duties as chief policy officer for the department.

Internal Auditing/Applied Research. A function which has received increased attention in recent years is internal auditing. Internal auditing to inform management about the effectiveness and efficiency of agency operations can be improved by establishing a separate organizational unit reporting to the commissioner and the commission. At the same time, the existing management services division can be streamlined to serve as a focus for applied research into ways to improve practices and reduce costs.

Public Transportation. As described previously, the public transportation division appears to lack the organizational status intended when the General Assembly mandated its establishment. The directorate level is consistent with the legislature's intent to give public transportation a high status in the department. In addition, placing public transportation at a level with highway planning, programming, and financial affairs will provide a better focus for multimodal program planning and development under the deputy commissioner.

District Structure. Boundaries of the eight highway construction districts have not been adjusted since 1923, although changes in population and economic concentrations have resulted in imbalances in district workload. A series of studies has recommended creation of a ninth district in Northern Virginia, and DHT recently established a Northern Virginia Division which appears to be a partial response to the transportation needs of that area. Staffing and maintaining a ninth district would cost about \$860,000 annually and would require changes in commission membership and statutory allocation formulas.

Before creating a ninth district, DHT should review the boundaries of the existing eight and consider realigning boundaries to establish a Northern Virginia district which distributes counties in the existing Culpeper district more in line with workload and logical economic, political, and geographic boundaries.

Other proposed organizational adjustments include consolidating the programming and scheduling function to take advantage of cross-training of staff and relocation of the environ-

mental quality division in recognition of its preconstruction role.

Coordination and Staffing (pp 87 to 101)

DHT is a highly decentralized organization with field offices across the State. Decentralization promotes efficiency in the department but can also lead to coordination problems. Currently, for example, there is no clear consensus as to when central office policies take precedence over field judgements. As a result, practices which may be standard in one area are not followed in another. The roles of the district engineer, resident engineer, and district preconstruction staff need to be clarified with particular attention to the status of central office policies and directives.

DHT has taken action to lay off 251 employees during 1981, and the establishment of a layoff policy is an important step in controlling cutbacks. Department officials, however, are delaying the layoff of some surplus positions until there are clear indications of department funding. Alternatives to permanent layoffs such as shorter work weeks should be considered. Department-wide manpower planning should be developed to facilitate adjusting the number and type of staff with workloads.

Inmate Labor (pp 105 to 111)

A special study was conducted of the inmate labor program. Since 1906 DHT has used inmate labor for highway maintenance activities. The department has proposed reducing the number of inmates used daily from 1,026 to about 640 as a means of reducing the

\$3.6 million annual cost of the program. The Department of Corrections believes that the road program reduces discipline problems with inmates and wants the program to continue at its current level.

Costs of the inmate labor program can be reduced by restructuring the work crew to eliminate one of the two DHT employees assigned to the crews. An estimated \$1 million could be saved by DHT without increasing costs to the Department of Corrections. The General Assembly may wish to consider funding all or part of the inmate labor program from sources other than the highway maintenance and construction fund in recognition of the role it plays within two State agencies.

DHT is currently out of compliance with the laws governing the payment to the Department of Corrections for inmate labor. The Joint Subcommittee on Economic Productivity of the Prison Population and on the Work Release Programs should examine the language and intent of §53-109.1 of the *Code of Virginia* regarding the reimbursement requirement.

Conflict of Interests (pp 113-123)

During the course of this study, several highway commission members resigned as a result of conflict of interest problems. At the request of the committee, a special review was made of the Virginia Conflict of Interests Act as it applies to the highway commission. Chapter VI reports staff findings and includes eight preliminary recommendations concerning administration of the statute.

JLARC

JLARC is an oversight agency of the Virginia General Assembly. Its primary function is to carry out operational and performance evaluations of State agencies and programs.

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I. Introduction

The Department of Highways and Transportation (DHT) has broad responsibilities for construction and maintenance of the 60,881 miles of roadway in Virginia's highway system. The department also performs a variety of transportation-related duties, such as providing planning, financial, and engineering assistance to cities, towns, and public transit systems. To fulfill these duties, the department has become one of the largest State agencies, with 11,818 authorized staff positions and a biennial appropriation of \$1.9 billion in 1980-82.

Over the years the mission and organization of the department have been shaped largely by events external to the department. The Virginia Highway Study Commission (commonly referred to as the Stone Commission) in 1963 recommended increasing highway revenues and embarking on an ambitious construction program for the remainder of the decade. To carry out this directive, the commission proposed major modifications in the department's organizational structure, streamlining highway planning, design, and construction functions. The number of employees devoted to construction-related activities increased.

As the highway system matured during the 1960s and early 1970s, transportation planning and environmental considerations emerged as important concerns. In 1970, as a result of federal mandates, an environmental quality division was created to conduct environmental assessments of highway projects. The following year, the transportation planning function was separated from the programming and scheduling of construction projects. Legislation was enacted in 1974 requiring DHT to prepare a statewide transportation plan. This duty was transferred to the Secretary of Transportation in 1978.

The most visible shift in the Commonwealth's transportation program was the department's 1974 change in name to the Department of Highways and Transportation. Although the department's primary function continued to be highway maintenance and construction, the change recognized the growing interrelationships among all forms of transportation. Since 1974, DHT has added divisions concerned with public transportation and railroads, and has provided staff to the Secretary of Transportation for the development of the Statewide transportation plan.

During the 1960s and most of the 1970s the department operated in a revenue-rich setting. Major emphasis was placed on building and maintaining a roadway system of which Virginians could be proud. For the most part, however, the department functioned outside the mainstream of State budgetary policies and procedures; it was viewed largely as an independent organization supported by special funds. As such, it has not always been subjected to the same kind of budgetary oversight provided other State agencies to ensure accountability.

As in the past, DHT will continue to be affected by external circumstances. But several trends apparent in the late 1970s and early 1980s suggest that the department will be operating in a significantly altered environment in the decade ahead:

- Revenue shortfalls are occurring primarily because of declining gasoline consumption caused by rising gasoline prices and the increasing fuel efficiency of vehicles.
- Maintenance expenditures to preserve existing highways are increasing at a rapid pace. By mid-decade the maintenance budget is projected to surpass the construction budget.
- A period of declining revenues logically requires the department to be increasingly accountable to the General Assembly for its budget and spending actions.

In the face of these trends, DHT has already taken steps to improve organizational management, and the General Assembly has added statutory provisions to strengthen budgetary controls. The department is making cutbacks in the construction program and in staffing levels. A financial affairs directorate has been created to oversee budget preparation. Still, the department has not complied fully with the legislative mandates which are designed to control overspending, and further adjustments will be necessary for the department to carry out its changing transportation mission more efficiently and effectively. In the foreseeable future, it is unlikely that the department will have enough funds to carry out as massive a highway building program as in the past. Rather, construction spending will be increasingly affected by growing maintenance and public transportation needs.

DHT Overview

With the following objectives, DHT has a broad transportation mandate:

- To plan, construct, maintain, and control the state highway systems.
- To provide financial, engineering, and transportation planning assistance to cities and towns in the Commonwealth.
- To develop and coordinate balanced and unified transportation system plans, including coordinating the development of highways with public urban transit, air, rail and water transportation facilities.
- To perform these functions in the most economical manner and in ways responsive to the desires and needs of the citizens of the Commonwealth.

Organization. The department is a large, complex organization with thousands of highly trained engineers and technical support staff (Figure 1). Policy and program guidance is provided by the Governor through the Secretary of Transportation. The secretary is generally responsible for the coordination and preparation of a state-wide transportation plan and the formulation of transportation agency budgets.

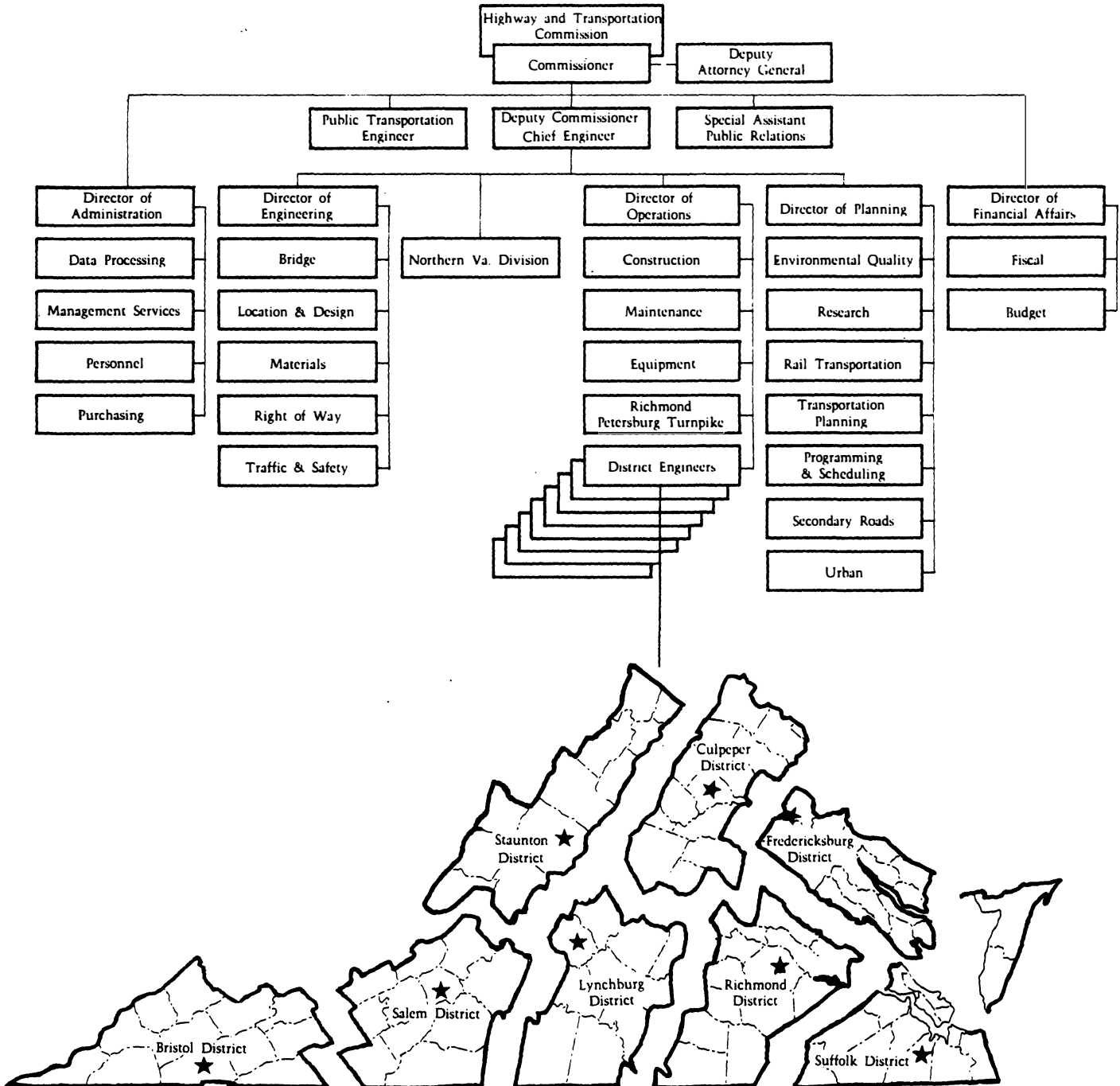
The Highway and Transportation Commission is charged with overseeing the department. The eleven-member commission, whose members are appointed by the Governor and confirmed by the General Assembly, is chaired by the Highway and Transportation Commissioner who is also the department's chief executive officer. Among the important duties of the commission are reviewing and establishing department policies, making rules and regulations, letting construction contracts, locating and establishing highway routes, and approving the department's budget.

The department's headquarters, located in Richmond, provides primarily administrative and technical support for maintenance and construction activities throughout the State. DHT has five directors who are responsible for the major functional areas of the department and who supervise several divisions each:

- Planning Directorate -- This organizational unit houses the department's planning and environmental quality divisions. The Highway and Transportation Research Council, located in Charlottesville, provides the department with research assistance on various technical matters. The selection of highway projects for programming and scheduling is also carried out in this directorate.
- Engineering Directorate -- Major pre-construction activities are carried out by this directorate including right-of-way acquisition, highway location and design, bridge design, materials testing, and traffic and safety.
- Administrative Directorate -- The director of administration oversees six support divisions. The data processing, personnel, and purchasing divisions provide general support services to the department. The management services division prepares financial and management audits.
- Financial Affairs Directorate -- This newly created directorate will coordinate fiscal affairs and prepare the department's program budget.
- Operations Directorate -- The operations directorate contains 10,513 positions, or 89 percent of all authorized positions in the department. Most of these positions are district and residency field staff engaged in construction and maintenance work activities. Recently, a Northern Virginia division (Fairfax County) was created. It reports directly to the Deputy Commissioner.

Figure 1

DEPARTMENT OF HIGHWAYS AND TRANSPORTATION ORGANIZATION



Note: Equal Employment Opportunity and Central Garage operate at the subdivision level and are not shown on this chart.

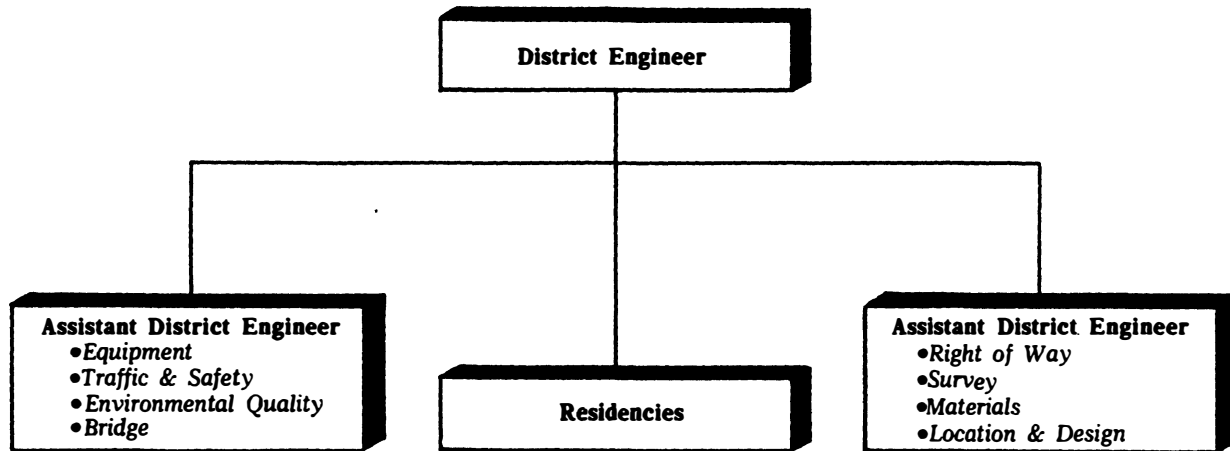
The directors of administration and finance report to the commissioner, while the directors of engineering, planning, and operations report to the deputy commissioner.

In 1978 the General Assembly created a separate division of public transportation administered by a public transportation engineer. The division's responsibilities include the planning, programming, and financing of public transportation facilities and services in the Commonwealth. By statute the public transportation engineer reports to the commissioner which accounts for the division's placement in the organization chart shown in Figure 1.

DHT has established an extensive organization of field offices which oversee and carry out day-to-day highway maintenance and construction activities. The director of operations oversees the entire field organization except for the Northern Virginia division. Eight construction districts, each headed by a district engineer, conduct preconstruction activities and perform limited operational tasks (Figure 2). Preconstruction activities of districts include on-site surveys of construction projects, right-of-way acquisition, bridge and road design, and traffic surveys. District personnel also fabricate traffic signs, paint highway lines, manage the district equipment fleet, and supervise four to seven residencies.

Figure 2

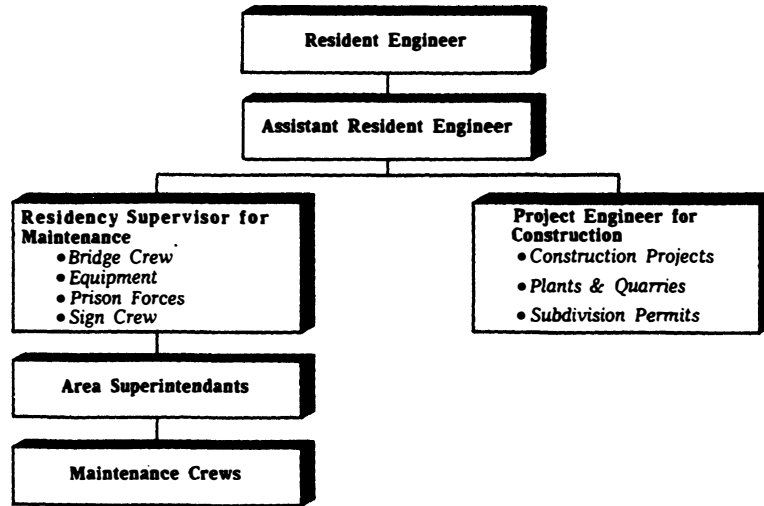
A TYPICAL DISTRICT



The department has established 44 residencies and the Northern Virginia division to carry out the bulk of highway maintenance and construction activities (Figure 3). Each residency is headed by a resident engineer who is responsible for all highway activities within

Figure 3

A TYPICAL RESIDENCY



a one- to three-county area. Maintenance crews and construction inspectors are supervised respectively by area superintendents and project engineers within the residency structure.

DHT Appropriations. DHT appropriations totalled approximately \$1.9 billion in the 1980-82 biennium. During FY 1981, several hundred construction projects were funded through appropriation of almost \$600 million. DHT also spends over \$200 million annually to maintain the existing highway system (Table 1).

Table 1

FY 1981 DHT APPROPRIATIONS
(Dollars in Millions)

| <u>Activity</u> | <u>Appropriations</u> |
|------------------------------|-----------------------|
| Construction and Acquisition | \$590 |
| Maintenance | 222 |
| Administration and Research | 42 |
| Toll Facilities | 41 |
| Regulation | 2 |
| Assistance to Localities | |
| Urban Maintenance | 47 |
| Transit | 16 |
| County | 10 |
| | <u>970</u> |
| | \$970 |

Source: 1980-82 Appropriations Act

Recent Studies of DHT

The organization and management of the department has been the subject of many studies in recent years. As Figure 4 indicates, these studies have generally encompassed the broad range of activities performed by the department, although most of the studies focused on specific organization and management topics.

Figure 4

MAJOR STUDIES OF DHT

| <u>Date</u> | <u>Group</u> | <u>Focus</u> |
|-------------|---|---|
| 1962-64 | Virginia Highway Study (Stone) Commission | Organization of department and funding of highway systems |
| 1963-65 | Worden & Risberg, Inc. consultants | Organization, administrative practices, and control procedures |
| 1969-70 | DHT Self-Study | Organization, administrative practices and procedures, and operations |
| 1970 | Governor's Management Study | Organization and management practices |
| 1975-77 | Governor's Council on Transportation | Organization and policy of the transportation function |
| 1980 | R.J. Hansen Associates, consultants | Organization, management, functions, and operation of field and headquarters units |
| 1980-81 | JLARC | Department organization, management, funding, and statewide highway and transit needs |

The studies by R. J. Hansen Associates, JLARC, and the previous reviews have a common concern with organizational issues. This concern reflects the complexity of managing a large, geographically decentralized agency such as DHT. Several major issues recur in the studies, including the roles and responsibilities of key organizational units, internal communications and priorities, and the geographical structure of DHT. Although the department has addressed many of these issues through the years, important problems have persisted. A variety of measures remain to be taken in order to improve management and control of the organization.

Purpose, Scope, and Methods

This report on the organization and management of DHT is one in a series of reports prepared under Senate Joint Resolution 50. Enacted by the 1980 session of the General Assembly, SJR 50 mandated that the Joint Legislative Audit and Review Commission (JLARC) review the programs and activities of DHT.

SJR 50 directed JLARC to make a final report prior to the 1982 Session of the General Assembly. An interim report was made in January 1981. Additional reports address highway maintenance, construction, and transit needs; highway financing; and the equity between costs and revenues associated with various classes of vehicles.

Purpose and Scope. The objectives of this review were three-fold:

1. To evaluate the efficiency and effectiveness of management and administrative processes.
2. To assess the adequacy of the organizational structure of DHT.
3. To focus attention on selected operational issues of interest to the General Assembly.

Areas reviewed include program direction, budgeting, organizational structure and staffing, and internal management and administrative practices. A special review was conducted of the inmate labor program.

Methods. The findings in this report are based on data collected through extensive interviews and file searches. JLARC staff interviewed members of the Highway and Transportation Commission, visited all eight DHT districts and 18 residencies, and interviewed personnel by telephone in the remaining residencies. All 23 division heads were interviewed, as were all five directors, the Chief Engineer, and the Commissioner. Data on project development, highway maintenance, contracting, inventory, and equipment management were systematically reviewed. Additional data were collected from the Department of Corrections concerning inmate labor, and three field camps were visited.

Report Organization

This report is organized into six chapters. Chapter I has presented an overview of the department's organization and responsibilities. Chapter II assesses program direction and the planning and budgeting functions of DHT. Chapter III reviews selected issues in DHT management control. Chapter IV reviews organization structure and staffing. Chapter V examines the use of inmate labor on the highways. Chapter VI reviews the Virginia Conflict of Interest Act and its application to the Highway and Transportation Commission.

II. Program Direction, Planning, and Budgeting

Three essential aspects of the organizational environment in which DHT operates are policy leadership, planning, and budgeting. Although each aspect blends into others, transportation policy leadership is primarily the responsibility of the Secretary of Transportation and the Highway and Transportation Commission. Planning is largely carried out by the secretary and the department. The budget prepared by the department is simply a monetary expression of plans and policies which reflects the operating programs that will be implemented over the biennium. In FY 1981, the department, under the general direction of the commission, distributed \$849 million among construction projects, maintenance activities, and public transportation assistance programs. Distribution of these funds was guided by legislative policy and suggestions from local officials and interested citizens.

Several criteria can be applied to an evaluation of policy development, planning, and budgeting including the quality of highway systems, the full use of federal aid, and responsiveness to current fiscal circumstances. DHT has built and maintains a large, high-quality highway network for Virginia. Maximum use has been made of federal aid programs, and effective scheduling has allowed funds to be used as they became available--an important consideration in an inflationary period.

The planning and budget procedures now in use by DHT, however, are not fully suitable for the changing highway and transportation environment. Significant problems have been noted and major changes will be required to make the department more accountable for program direction. Changes appear to be needed in three broad areas: (1) the role of the Highway and Transportation Commission and the Secretary of Transportation in setting policy; (2) the process of assessing highway construction and maintenance needs for future funding; and (3) the method used to allocate funds within statutory guidelines and the Commonwealth's program budget.

POLICY DEVELOPMENT

Responsibility for highways and public transportation policy development rests primarily within the Highway and Transportation Commission and the Secretary of Transportation. The commission is the statutory policy body for DHT, while the secretary provides executive direction, budget review, and coordination of highway and public transportation plans and programs with those of other transportation modes.

Role of the Secretary

The Secretary of Transportation oversees administration and policy development as a member of the Governor's cabinet. Legislation gives the secretary two principle policy duties: (1) to direct the formulation of budgets encompassing the programs and activities of the agencies assigned; and (2) to coordinate and present a statewide transportation plan. The secretary also chairs the Governor's Transportation Advisory Council which advises the secretary and the Governor on the total transportation needs of the Commonwealth.

Budget Participation. Some progress has been made in developing and expanding the secretary's role to accommodate the current revenue constraints. For example, the secretary's office has had a role in preparing DHT budget submissions for the recent biennia. The secretary also chaired a series of meetings at which revenue forecasts for the highway maintenance and construction trust fund were coordinated between DHT and the Department of Motor Vehicles. However, the evaluation of the DHT program planning and budgeting process contained in this chapter indicates a need for increased attention to budget development consistent with the Commonwealth's program budget structure and with requirements for legislative accountability.

Statewide Plan. Preparation of the statewide transportation plan began in earnest in 1979 with primary coordination in the Office of the Secretary of Transportation and staff support from the transportation planning division of DHT. A status report was presented to the 1981 General Assembly Session. The status report contained the results of a transportation facilities inventory and a listing of issues raised in meetings among DHT, other transportation agencies, secretarial staff, and local officials.

The status report was apparently developed without consulting the Highway and Transportation Commission about local and regional needs. Members of the commission believed that they should have had an opportunity to participate in the status report development. The secretary subsequently stated that he intended to meet with commission members on development of a final report.

In addition, testimony at a JLARC hearing in September 1980 and subsequent interviews revealed that many local officials believe the lead time for preparation of the needs inventory was insufficient to address the complex nature of the problem. Since January 1981, a second round of meetings with local officials has been held and more are planned for 1982.

The introduction to the status report stated that the statewide plan would be completed by mid-1982, and some progress has been made in bringing the plan to completion. According to the Secretary's office, recommendations have been developed for each transportation mode, and those for the highway system have been reviewed with planning district commissions and, in some cases, local governments. Additional

effort is being made to establish priorities and prepare for meetings with regional and local officials to review initial plan proposals. A draft plan is anticipated to be available by mid-1982. The final format and content of the plan remain uncertain, however, and it is unclear whether the plan as presently envisioned will be adequate as a basis for making major transportation decisions.

The Office of the Secretary of Transportation should continue to lead in the development of the statewide plan and establish a firm target date for its exposure. Every effort should be made to give local officials and planning bodies sufficient time to contribute fully to the plan. Members of the Highway and Transportation Commission as well as governing bodies of other affected agencies should also have opportunity for continued involvement in the plan development and the nature and substance of recommendations. It is essential that the final plan contain specific treatment of the major transportation issues facing Virginia in the 1980s and present recommendations for meeting those needs.

Advisory Council. The Transportation Advisory Council has not been a very active body over the past few years. The council has met only once during 1981, although a second meeting is scheduled in December. Because council members represent diverse transportation interests, they could be a source of valuable information in the development of the statewide transportation plan. The Secretary of Transportation should meet with the council more frequently, perhaps once every quarter.

Role of the Highway and Transportation Commission

The responsibility for developing highway and public transportation policy rests primarily with the Highway and Transportation Commission and the commissioner's office. The 11-member commission is responsible for locating highways, letting construction and maintenance contracts, reviewing and approving department policies and objectives, monitoring and approving actions taken by the public transportation division, and ensuring the coordination of public transportation plans with highway plans. The General Assembly has also assigned the commission the task of allocating construction funds and establishing a maintenance budget to meet reasonable and necessary levels of maintenance spending.

Eight of the 11 commission members are appointed to represent each of the State's eight construction districts. One member is appointed at large from a rural area, one at large from an urban area, and the commissioner acts as chairman of the commission as well as chief executive officer of the department. Despite the regional nature of their appointment, commission members are directed by legislation to be "mindful of the best interest of the State at large instead of those of the district from which chosen" when performing their duties.

Commission members are appointed by the Governor, confirmed by the General Assembly, and serve four-year terms. Members of the Commission generally meet monthly and receive a per diem allowance of \$50 plus actual expenses, subject to a limitation of \$2,000 plus expenses per year.

Maintenance Budget Oversight. In general, commission members play an active role in highway construction decisions by approving the distribution of allocations of expected revenues among construction projects. Much less time is devoted to a review of the maintenance budget, however, despite the legislative priority given to maintenance. In fact, three commission members explained in separate interviews that little attention was given to maintenance spending levels because they thought the levels were established by a formula mandated by the General Assembly. This is an erroneous notion.

The commission should become more knowledgeable about and involved in maintenance budgeting. Highway maintenance is rapidly approaching highway construction in total spending and, based on current DHT projections, will be the dominant DHT program by mid-decade. The commission, in conjunction with DHT staff, should develop a means of defining what maintenance activities and service levels constitute a "reasonable and necessary" program as called for by legislation. Subsequent recommendations in this chapter and other JLARC reports on DHT should be used as a basis for developing a more systematic method for commission review of the maintenance program.

Public Transportation Oversight. In 1974 the commission was given statutory responsibility to develop and coordinate transportation plans including highway, rail, air, and water transportation. The statute was intended to broaden the commission's role to include all transportation planning in the State. Relatively little oversight has been given to public transportation policies and programs at the commission level, however. Although the commission has committees which deal with such topics as ferries and highway use permits, by contrast there is no committee for public transportation. And since multimodal system plans were not developed, in 1978 the mandate for such planning was effectively shifted to the Office of the Secretary of Transportation.

Although the legislature appears to have been dissatisfied with the initiative of the commission in developing a multimodal planning capacity, the location of the public transportation division within DHT has continued to place primary authority over public transportation with the commission.

The commission should increase its involvement in policy determination and oversight for public transportation. To do this, the commission should establish a standing committee for public transportation to give more attention to the function and enhance the commission's ability to carry out its coordinative and oversight role as defined in the legislation.

NEEDS ASSESSMENT, PLANNING, AND PROGRAMMING

A primary responsibility of DHT is the preparation of needs assessments, plans, and programs for highway construction, highway maintenance, and public transportation assistance programs. Needs assessments should include the following steps:

1. An assessment for a specific time period of highway condition, travel volume, and future trends in population and economic growth which provides a list of likely highway construction and maintenance needs. These assessments are incorporated in highway and transportation plans and periodically updated.
2. A framework that assigns funding priorities for construction projects and maintenance activities consistent with legislative policy and assumptions about available revenues. This priority list represents a program for highway construction and maintenance for use in preparing the biennial budget submission and informing the legislature of options for various spending levels.
3. An annual program update to reflect changes resulting from progress in meeting objectives as well as additions or deletions resulting from changed circumstances. In essence, the program becomes a working document which both represents the intentions and priorities of DHT and provides a record of program accomplishment and expenditures.

DHT has completed various highway construction need assessments over the years. Major assessments were completed in 1963 for the Stone Commission which resulted in the establishment of the arterial highway system. In 1972 the General Assembly endorsed and provided funding for a ten-year highway improvement program which promised "vast improvements" on all highway systems. Most recently, in 1980 DHT, in conjunction with a joint subcommittee, reported on highway and public transportation needs to the General Assembly. The subcommittee concluded, however, that, despite the DHT report, it was unable to obtain a clear understanding of what Virginia's needs were or what revenues were required.

The development of maintenance needs assessments has not received similar attention. While legislative policy has called for a "reasonable and necessary" level of maintenance spending, this priority spending level has not been further defined either in law or by DHT. In practice, maintenance needs are determined by a combination of performance standards and negotiation. This approach provides a framework for increased accountability but does not make full use of available technology.

Needs assessment for public transportation has received relatively little attention outside the public transportation division. Despite legislation requiring that the public transportation engineer report directly to the Commissioner, the Commissioner has assigned the public transportation engineer a day-to-day reporting relationship at a lower organizational level. This arrangement is of particular concern because recent federal action may create a more complex environment for public transportation policy in Virginia. This issue is addressed in detail in Chapter IV.

Construction Needs Assessment

The highway construction program as defined by DHT includes new construction, reconstruction of deteriorated existing roads, and improvements to existing roads such as straightening curves, reducing grades, and improving intersections. Most highway construction in Virginia today involves rebuilding, adding lanes to existing roads, constructing by-passes of smaller cities and towns, and improving intersections. Outside the interstate system there is relatively little construction of completely new highway facilities and corridors.

Virginia has spent more than \$4.5 billion for highway construction in the last fifteen years. On an annual basis the highway construction program peaked in FY 1980 when \$501 million was spent. The following year \$463 million was expended, while the DHT program proposal for FY 1983 and FY 1984 projects a construction program of \$348 million and \$290 million respectively.

If the projections prove accurate, the construction program will be reduced by 42 percent over the next four years. When an estimated eight percent annual inflation rate is considered, the real reduction in purchasing power of the construction program between FY 1981 and FY 1984 would be 57 percent. Circumstances clearly require DHT to develop an effective method of assessing construction needs in order to meet priority needs as directed by the General Assembly.

DHT Needs Assessment. The most recent (1980) DHT needs assessment projected "present day" construction needs at \$6.7 billion. At the same time, the assessment concluded that present day needs could not be funded under any realistic assumption of inflation. Despite this conclusion, DHT provided no means of establishing priorities among the projects listed in the study in order to offer alternatives for legislative review.

Closer examination of the listed projects by JLARC in conjunction with DHT engineering and programming staff found that over one-half the proposed spending--\$3.8 billion--was for projects which could not realistically be put under construction until the end of the decade.

According to the recently completed report of the R. J. Hansen consulting firm, DHT typically experiences an eight-year lead

time between the initiation of construction project planning and actual construction. In other words, many projects, particularly those on the urban and primary systems, which are at the initial planning stages in 1982, would not be ready for construction until about 1990 if they followed the general pattern. Although individual projects can be accelerated through the planning and design process, DHT staff were able to identify numerous projects included in the baseline data which were unlikely to reach the construction stage before 1988.

Despite the practical constraints imposed by project lead times, no distinction was made in the DHT assessment among projects which could be constructed in the near future and those which were only conceptual in nature. For example,

A proposed project in Alexandria called for upgrading a portion of existing Route 1 to a six-lane limited access facility. The project was intended to improve traffic flow at the intersection of Route 1 and the proposed extension of I-595. The I-595 extension is itself, however, only a concept. Moreover, the city does not now desire more than four lanes in this corridor. Consequently, it does not appear that Route 1 will be under construction in the immediate future.

In contrast, a section of the Route 29 by-pass in Warrenton is ready for construction immediately. All plans have been completed and right of way acquired. Some grading work has already been done.

The relative immediacy of the funding need is clearly an important element of program planning and budget development. Projects such as the one on Route 1 described above, regardless of any absolute measure of need, do not require construction funding in the near term. Virginia's program budget process includes information and projections for a six-year period consisting of the upcoming biennium and the subsequent four fiscal years. DHT should avoid preparing needs assessments for construction spending which are intended to represent "present day" needs but are, in fact, open-ended in time. Needs assessments should be linked specifically to DHT's best estimates of when each project will require construction funds, and the estimates should be presented in a format consistent with the six-year planning cycle used for the Commonwealth's program budget.

The approximately \$2.9 billion in projects from the 1980 needs assessment which are feasible for construction by the end of FY 1988 represent a more realistic estimate of maximum present day construction needs. It is important to note that the \$2.9 billion cost estimate is expressed in 1980 dollars. If an eight percent inflation estimate is used, the cost to fund all construction needs for the 1980s would increase to \$3.86 billion by FY 1988, or an average annual construction expenditure of \$643 million.

Because this amount exceeds both previous funding levels and current estimates of available revenue, it appears that priorities will need to be set among feasible projects. To accomplish this, DHT will need a means of classifying and describing construction need to provide the General Assembly with a framework for establishing construction priorities and reviewing proposed budgets. Such an approach to needs assessment and funding can be used by the General Assembly for examining proposed construction needs in relation to expected revenues and for determining what needs can be addressed if revenues are increased.

Unfortunately, DHT does not have a mechanism for such a framework at the present time. Instead, all present day needs are portrayed as equivalent and there is no departmental procedure for identifying priority needs estimates presented to the General Assembly. Consequently, legislative review of proposed construction budgets is hindered by a lack of information about relative need among projects. As a result, the legislature cannot ensure that available funds are used to meet the most critical needs or to evaluate the impact of increasing revenue available for construction.

Model for Priority Framework. In order to assess the relative status of construction needs feasible for inclusion in a six-year program, JLARC has developed a model for a priority analysis of construction needs. This model is described in detail in a separate report. The model used a classification based on five general measures with nine separate need criteria: extent of plan development; federal aid availability; traffic volume, congestion, safety, structural deterioration, and functional limitation; local government endorsement; and, in the case of projects in urban areas, the immediacy of the funding requirement.

The analysis was able to identify various levels of construction need within the time limits of the State budget process. For example, one option would call for a six-year spending program, based on 1980 needs, of \$1.9 billion compared to the open-ended DHT assessment of \$6.7 billion. This set of projects met the following criteria:

1. Using all available federal aid funds for interstate completion.
2. Meeting the needs of all rural primary and secondary projects which are now structurally deteriorated.
3. Replacing bridges on all highway systems which are judged by DHT as needing immediate attention.
4. Moving to construction all urban area projects which have local endorsement and will be ready for work by 1985.

DHT should develop an analytic framework for assigning priorities to highway construction needs and for presenting several levels of spending as alternatives in the biennial program budget. The analytic

framework could be similar to the one used by JLARC and amended as better information became available.

Maintenance Needs Assessment

The highway maintenance program in Virginia has increased from \$48 million in 1970 to over \$150 million in 1980 and it is projected to reach \$260 million by FY 1983. Although some of this growth is the result of maintaining a larger highway system, increases in maintenance expenditures per lane-mile indicate that the program has also experienced substantial real growth. Table 2 shows expenditures per lane-mile for the eighty percent of total budgeted spending which can be related to lane-miles.

Combined maintenance spending per lane-mile has increased 13 percent, from \$444 in 1971 to \$501 in 1980, based on 1971 dollars. (Actual spending rose from \$444 to \$1,022 per lane-mile.) Indexed spending declined from 1971 to 1974 and was stable until 1977. The 1976-78 and 1978-80 biennia show marked patterns of real growth in spending in the first year of the biennium followed by a small cutback in the second year.

The columns of Table 2 for routine maintenance and replacement maintenance provide additional insight into spending growth. Routine or "ordinary" maintenance involves day-to-day work such as filling potholes, clearing brush or cleaning ditches. Spending for routine maintenance fluctuated during the decade but closed the period with virtually the same indexed expenditure per lane-mile as in FY 1971. In other words, despite annual fluctuations, spending for routine maintenance kept pace with inflation and provided no real growth.

In contrast, replacement maintenance accounts for all the real growth over the decade. Replacement maintenance is primarily major rehabilitation work such as resurfacing, replacing guardrails, signs or drainage structures, or bridge rehabilitation.

Table 2 shows two years of real growth in replacement spending followed by alternating years of decline and growth through the remainder of the decade. The pattern of real growth in the first years of the 1976-78 and 1978-80 biennia accounts for the change observed in the combined expenditure column. Overall, real growth in replacement maintenance spending per lane-mile increased 28 percent over the decade, with dramatic increases over 1971 expenditure levels in the last four years.

Based on DHT projections, keeping maintenance spending at the current rate will absorb all available revenue by the mid-1980s and will effectively end the State's construction program. The General Assembly has endorsed placing a priority on maintenance spending to protect the existing highway investment and provide acceptable levels of safety, comfort, and convenience. The methods currently used by DHT

Table 2

MAINTENANCE EXPENDITURES PER LANE-MILE
FY 1971-FY 1980, indexed to 1971 costs
(dollars in millions)

| <u>Fiscal Year</u> | <u>Combined Expenditures</u> | <u>Percent Change</u> | <u>Routine Maintenance</u> | <u>Percent Change</u> | <u>Maintenance Replacement</u> | <u>Percent Change</u> |
|----------------------|------------------------------|-----------------------|----------------------------|-----------------------|--------------------------------|-----------------------|
| 1971 | \$444 | | \$276 | | \$168 | |
| 1972 | 425 | - 4% | 252 | - 9% | 173 | + 3% |
| 1973 | 423 | -- | 237 | - 6 | 186 | + 8 |
| 1974 | 382 | -10 | 208 | -12 | 174 | - 6 |
| 1975 | 412 | + 8 | 227 | + 9 | 185 | + 6 |
| 1976 | 408 | - 1 | 250 | +10 | 158 | -15 |
| 1977 | 488 | +20 | 230 | - 8 | 258 | +63 |
| 1978 | 456 | - 7 | 220 | - 4 | 236 | - 9 |
| 1979 | 544 | +19 | 250 | +14 | 294 | +25 |
| 1980 | 501 | - 8 | 286 | +14 | 215 | -27 |
| Total Percent Change | | +13% | | + 4% | | +28% |

Note: Excludes maintenance expenditures for weight stations, drawbridges, and ferries which are not correlated with lane-miles. Also excludes extraordinary repair of winter and flood damage, snow removal general expense and supervisory costs. Expenditures for 1971 were adjusted by changing pavement marking expenditures from ordinary to replacement to be consistent with subsequent years.

Source: JLARC analysis of DHT data.

for assessing maintenance needs, however, cannot guarantee that the intent of the legislature is realized. Of particular concern are weaknesses in the application of routine maintenance standards and the fact that replacement maintenance spending has been accelerated without making full use of available information and technology to determine the extent of need.

Routine Maintenance Needs. Under the current process about 86 percent of the routine maintenance budget is created around workload standards. The workload standards were originally developed jointly in 1964 by DHT and a consultant employed under a highway research project sponsored by the U.S. Bureau of Public Roads.

The 1964 study was exhaustive and the resulting maintenance management system appeared to offer a sound framework for maintenance needs assessment and budgeting. Subsequent adjustments to the standards have reduced the resource requirement per unit of output in most cases, suggesting either increased efficiency or a recognition that the original standards were higher than necessary. In general, however, the framework developed in 1964 remains intact.

Application of the standards is used to develop maintenance budgets for most routine maintenance activities. Figure 5 illustrates the standards applied to one activity, machining (smoothing with a grader) non-hard surface roads. The number of machinings per mile of road, as well as the man-hours of effort required and the expected cost per mile, are specified for various regions of Virginia. Regional differences are based on variation in soil conditions, topography, and material and labor costs. Using the standards in Figure 5, for example, the Bedford residency would have an annual budget of \$120 per mile of non-hard surface road and could expect to commit 9.6 man-hours per mile to satisfy the standard of eight machinings annually.

Figure 5

EXAMPLE OF MAINTENANCE MANAGEMENT SYSTEM COMPONENTS

ACTIVITY: Machining Non-Hard Surface Roads on Secondary System

Inventory Unit

Miles of non-hard surface roads in county.

Quantity Standards

4 machinings/mile annually - Staunton, Salem, Bristol districts
8 machinings/mile annually - Culpeper and Lynchburg districts
18 machinings/mile annually - Richmond, Suffolk and Fredericksburg districts

Performance Standards

4.0 man hours/mile machined - West of Blue Ridge
2.4 man hours/mile machined - Counties bordering on eastern slope of Blue Ridge
1.4 man hours/mile machined - State

Unit Cost Allowance

\$53.00/mile - Wise, Dickenson, Buchanan
49.50/mile - Staunton, Salem and Bristol districts
31.40/mile - Leesburg
30.00/mile - Amherst, Charlottesville, Culpeper, Warrenton, Bedford, Martinsville and Rocky Mount residencies
21.00/mile - Fairfax
20.00/mile - Manassas
18.60/mile - Lynchburg, Richmond, Suffolk and Fredericksburg districts and Louisa residency

Source: VDH&T Maintenance Division.

Although the workload standards provide a framework for budgeting routine maintenance, there are two problems with the current process. First is the fact that field staff commonly deviate from the budget targets. Table 3 shows that there was relatively little consistency between budgeted amounts and actual spending in the 1978-80 biennium.

According to DHT such variation is acceptable because the budget targets are merely guidelines and maintenance needs are subject to unanticipated events. For example, the broad tendency to underspend on drainage system repair was generally acknowledged by field personnel to be caused by unanticipated increases in the cost of using heavy equipment resulting from high fuel costs. Consequently, resident engineers reduced ditch cleaning and shifted funds into other areas such as bituminous surface repair.

Table 3
RESIDENCY BUDGET PERFORMANCE
IN SELECTED ORDINARY MAINTENANCE CATEGORIES
1978-1980

| <u>Maintenance Category</u> | <u>Residencies Under Budget</u> | | | <u>Residencies Over Budget</u> | | |
|-----------------------------|---------------------------------|-----------------------|-------------------------|--------------------------------|-----------------------|-------------------------|
| | <u>N</u> | <u>Median Amount*</u> | <u>Median Percent**</u> | <u>N</u> | <u>Median Amount*</u> | <u>Median Percent**</u> |
| Bituminous | 11 | \$100,025 | 20% | 34 | \$140,640 | 27% |
| Concrete | 21 | 7,275 | 86% | 7 | 3,181 | 54% |
| Non-Hard | 16 | 21,954 | 10% | 27 | 55,193 | 27% |
| Shoulder | 30 | 73,039 | 26% | 15 | 37,858 | 26% |
| Drainage | 32 | 128,902 | 24% | 13 | 64,757 | 14% |
| Roadside | 38 | 32,859 | 32% | 7 | 47,403 | 14% |
| Vegetation | 32 | 61,268 | 17% | 13 | 45,744 | 11% |
| Guard Rail | 31 | 7,813 | 59% | 14 | 20,723 | 127% |
| Structures | 33 | 25,565 | 46% | 12 | 13,744 | 22% |
| Signs & Traffic Signals | 34 | 32,014 | 19% | 11 | 26,048 | 13% |

*Amount by which fifty percent of the residencies were under or over budget.

**Amount expressed as percent of the total amount budgeted for each item in each residency.

Although some variation due to unanticipated events may be warranted, the degree of variation shown in Table 3 raises a question about the actual value of the maintenance management system as a means of assessing funding needs and establishing a budget. In addition, the practice of shifting funds among activities makes it more difficult for

DHT to establish priorities among various work activities. DHT should carefully reevaluate its policy with regard to residency compliance with budgets based on workload standards. The standards should be carefully reviewed to determine current validity. Either closer adherence to the standards should be required or the value of maintaining and updating the standards should be examined.

The second problem with current needs assessments for routine maintenance involves the lack of a mechanism to establish priorities based on the best information available to DHT. In the past, the need for careful review of spending on routine maintenance has been minimized by the relatively small budget and the availability of adequate revenues to meet both construction and maintenance demands. Now, however, maintenance needs must be carefully scrutinized to ensure that only necessary spending occurs. In fact, DHT is presently considering a number of service level reductions in response to reduced revenues. One proposal to reduce snow removal standards, for example, would save an estimated \$2 million annually by reducing service to all highway systems.

In order to carry out a service reduction proposal systematically, DHT requires a Statewide plan for assigning priorities to maintenance activities. However, the consultant employed by DHT in 1980 concluded that management decisions regarding cutbacks and service reductions are made at the individual field office level rather than as part of a deliberate and consistent adjustment to maintenance operations. JLARC staff field work confirmed that the lack of a statewide perspective on routine maintenance priorities continues to be the case.

DHT should develop an annual maintenance program to provide the necessary level of accountability for spending. The program should identify alternate spending levels and assess the implications of funding each level. The minimum amount necessary for protecting the existing highway network and providing acceptable safety and comfort levels should be identified as a first priority; higher desirable levels of comfort, convenience, and aesthetic considerations should be identified separately.

The Highway and Transportation Commission should review and approve the maintenance program and provide opportunity for review and consultation with appropriate legislative committees. A draft version of the program should be developed by January 1983 and a status report provided to the General Assembly. The approved program should then be available for incorporation into the budget development cycle for the 1984-86 biennium.

Replacement Maintenance Needs. All highway facilities eventually deteriorate and require major expenditures for rehabilitation and replacement. The most common type of replacement maintenance is resurfacing roads with asphalt. Approximately \$35.8 million was spent on resurfacing in the 1978-80 biennium. Other examples of replacement

maintenance include the major rehabilitation of bridges and the replacement of guardrails, drainage structures, and signs.

Replacement needs are based on past experience with some judgemental increases. After the legislature acts, the department conducts a field review process to establish spending priorities for replacement maintenance. Unlike ordinary maintenance where budgets are developed using quality standards and assumed levels of need based on experience, however, replacement maintenance needs are identified and addressed to the extent that funding is available each year.

Further, the replacement needs assessment process differs for secondary, interstate, and primary roads. On the secondary system, funds are allocated to residencies based on county mileages and anticipated differences in costs. The resident engineer reviews needs, often in consultation with county boards of supervisors, and funds the projects considered to be most important within budget limits. Thus, resident engineers exercise a high degree of discretion about which projects to undertake within a county.

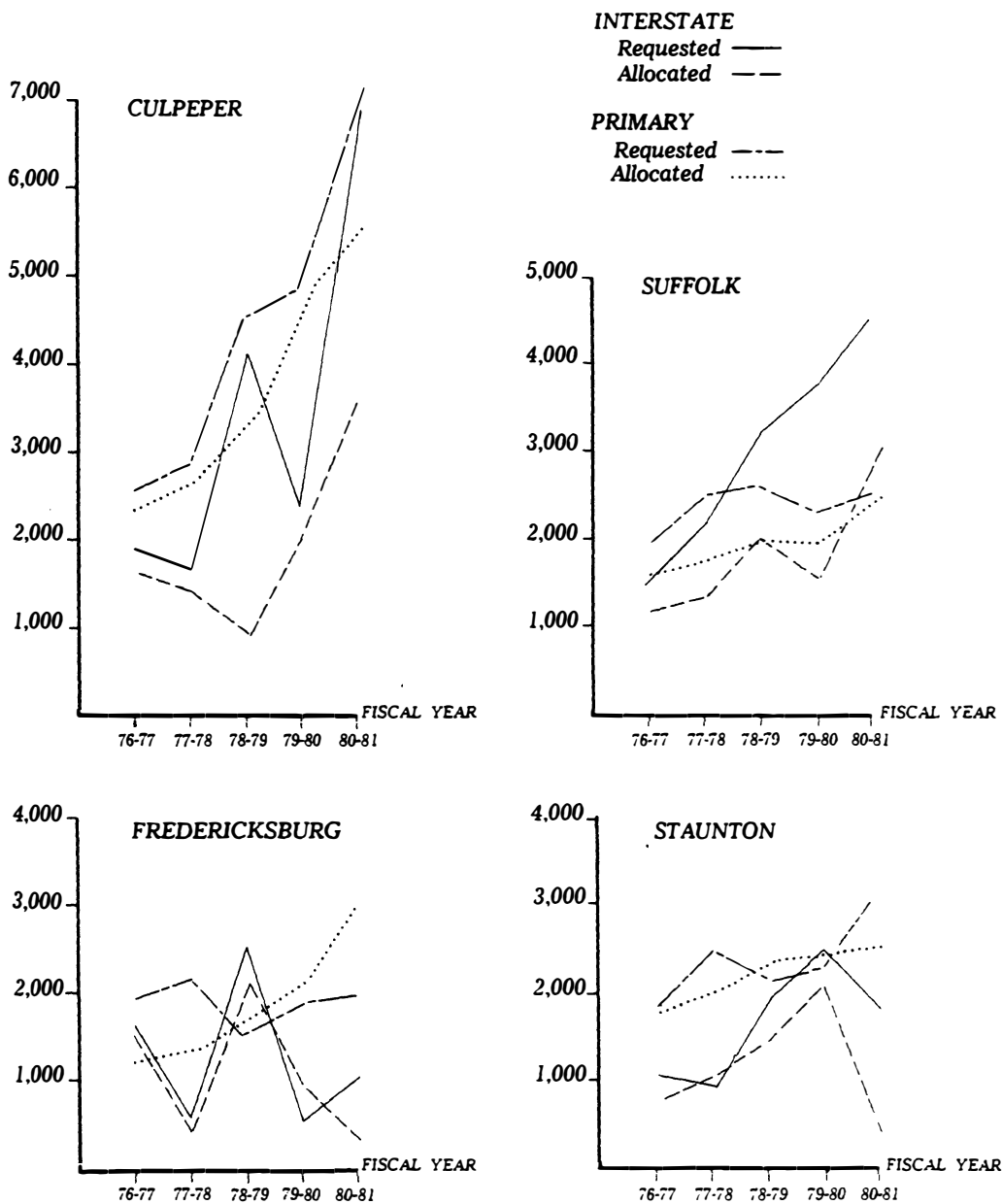
On the interstate and primary systems control in selecting projects is more centralized. Residency staff request spending levels which are reviewed and amended by district staff and forwarded to the central office. A field review of individual requests is conducted and priorities are negotiated among residencies, districts, and the central office. Budgets for these systems account for almost 40 percent of replacement maintenance expenditures.

A review of the differences between district requests and final allocations for interstate and primary spending illustrates the differences in opinion about needs and funding requirements (Figure 6). The graphs show both great variability in requests and allocations from year to year and substantial gaps between field requests and central office allocations. In most cases the central office took the expected action of reducing field spending requests. However, in the case of primary roads in both the Fredericksburg and Staunton districts, central allocations were actually higher than the spending level requested by the field staff.

The difficulty in estimating needs for maintenance replacement is also illustrated by differences between intended and actual resurfacing schedules. DHT staff stated that primary roads should be resurfaced every eight to 12 years. Maintenance records, however, show that primary roads have been resurfaced on an average cycle of 15 years. The discrepancy would suggest that road surface quality should be deteriorating. However, the 1980 consultant study found Virginia's roads in good condition, and DHT maintenance staff believe that the only loss in service level has been in the area of ride quality, a difficult category to define. Nevertheless, appropriately frequent resurfacing is necessary to ensure the continued serviceability of the highway network.

Figure 6

REQUESTS AND ALLOCATIONS FOR MAINTENANCE REPLACEMENT BY DISTRICT



DHT staff acknowledge the need for a more systematic means of determining what level of resurfacing and other pavement maintenance is required, and the maintenance division has developed and begun to implement a pavement management system for Virginia highways. A pavement management system collects and analyzes data on the pavement condition including surface distortions such as cracking and rutting, ride quality, and structural integrity. This information is used to index the pavement condition and monitor changes. The resulting information on road condition will allow DHT to determine more accurately the need for maintenance replacement spending. Policy decisions can then be made regarding minimum pavement serviceability levels with full consideration of costs as well as comfort and convenience. In addition, data on road conditions can be used to help distribute funds to geographic areas and among road systems.

According to the maintenance engineer, pavement condition data on the interstate system will be available this year, and given an adequate priority, data on a representative sample of the primary and secondary systems could be developed in 1982. DHT should place a high priority on developing a pavement management system for Virginia, and the preliminary information should be incorporated in the maintenance program described previously for the 1983 status report to the General Assembly. A complete assessment of highway condition should be completed by the start of the 1984-86 biennial budget cycle.

A second area of replacement maintenance needs assessment and budgeting which underutilizes existing information is the Commonwealth's bridge replacement maintenance program. DHT spent \$11 million in 1978-80 for replacement maintenance of bridges. Bridge maintenance funds are budgeted and allocated to residencies on the basis of a field review as well as requests and complaints.

The DHT bridge division maintains a comprehensive inventory of bridges on all systems. The inventory provides basic information on bridge condition based on field inspections made annually or semi-annually by district bridge engineers. Reports made by the inspectors are used to determine the sufficiency rating of each bridge on the federal bridge replacement list. Sufficiency ratings range from 100 (excellent condition) to zero (very poor condition). In addition, inspectors' reports often contain recommendations for specific maintenance needs on bridges. Despite the potential usefulness of the bridge condition inventory, the reports are not reviewed by the central office maintenance staff. According to the maintenance engineer, districts are expected to use bridge ratings to establish work priorities, but there is no systematic use of the data statewide.

The bridge inventory can serve as an important source of information for assessing maintenance needs. The data maintained on the inventory can be used to generate reports on bridge condition and problems. In order to be fully useful for this purpose, however, greater uniformity in bridge inspections is needed, particularly among districts. Some district bridge inspectors tend to rate bridges very

low while bridges in similar condition in other districts are rated higher. For example,

Two bridges in different districts have a sufficiency rating of 4.6, an indication of very poor condition. However, review of actual inspection reports reveals that one bridge is in generally good condition and not in need of immediate replacement or major maintenance work, while the second shows evidence of significant deterioration and should be replaced.

Bridge division personnel indicated that inconsistent ratings and reports are a problem which limits the usefulness of the bridge inventory. Greater emphasis on consistent reporting to ensure state-wide comparability of data would significantly enhance the usefulness of the bridge inventory in assessing maintenance as well as replacement needs.

BUDGETING

After DHT generates a needs estimate and the accompanying plans and priority program, a budget is prepared within statutory guidelines for the allocation of funds, and a legislative appropriation is requested. Nevertheless, an evaluation of the DHT budgeting process revealed that actual spending differs significantly from appropriations and the apparent intent of the law. The allocation procedure used by DHT to apportion construction and maintenance spending does not meet the necessary levels of control and public accountability inherent in the budget process.

Compliance with Appropriations Act

DHT appears to have overspent highway system maintenance beyond levels authorized in the 1978-80 Appropriations Act. Table 4 shows that in the 1976-78 and 1978-80 biennia appropriations were exceeded by 38 percent and 35 percent respectively. The overspending was authorized in 1976-78 but did not appear to be authorized for 1978-80.

Nature of the Overspending. The overspending for the 1976-78 biennium was authorized under the general provisions of Section 185 which allowed the Governor to subsequently appropriate non-general funds when, in his judgement, later developments were believed to make such expenditure necessary. However, item 622.1 of the 1978-80 Appropriations Act specifically limited authorized overspending for highway construction and maintenance to no more than ten percent of the appropriated amount plus an additional amount necessary to provide a cost-of-living increase to DHT employees. The same provision is included in the current Appropriations Act.

Table 4

MAINTENANCE APPROPRIATIONS AND EXPENDITURES
(dollars in thousands)

| | <u>1976-78</u> <u>Biennium</u> | <u>1978-80</u> <u>Biennium</u> |
|-------------------------|-----------------------------------|-----------------------------------|
| <u>Interstate</u> | | |
| Appropriation | \$ 33,080 | \$ 44,270 |
| Expenditure | <u>39,520</u> | <u>49,514</u> |
| Overexpenditure | \$ 6,440 | \$ 5,244 |
| <u>Primary</u> | | |
| Appropriation | \$ 73,090 | \$102,326 |
| Expenditure | <u>112,664</u> | <u>128,056</u> |
| Overexpenditure | \$ 39,574 | \$ 25,730 |
| <u>Secondary</u> | | |
| Appropriation | \$133,295* | \$160,400 |
| Expenditure | <u>179,681</u> | <u>237,105</u> |
| Overexpenditure | \$ 46,386 | \$ 76,705 |
| <u>All Systems</u> | | |
| Appropriation | \$239,465 | \$306,996 |
| Expenditure | <u>331,865</u> | <u>414,675</u> |
| Overexpenditure | \$ 92,400 | \$107,679 |
| Percent Overexpenditure | 39% | 35% |

*Prior to the 1978-80 biennium, secondary system maintenance and construction expenditures were made under one item. The appropriation amount is the amount allocated by the highway commission.

Source: Appropriations Act for 1976-78 and 1978-80 as amended, and financial supplements to DHT annual reports, 1977-80.

The ten percent cap provided an additional \$31 million in authorized spending over the biennium, while the cost-of-living provision added an estimated \$17 million. Therefore, provisions of the act allowed overspending of approximately \$48 million while actual overspending was almost \$107 million. The \$59 million difference between adjusted appropriations and actual spending appears to be without legislative basis and contrary to the intent of the General Assembly to limit maintenance spending to a specified amount.

Lack of DPB Controls. The unauthorized overspending in the maintenance program occurred because of a weakness in Department of Planning and Budget (DPB) control over allotments. The Commonwealth Accounting and Reporting System (CARS) will not allow spending in a particular account unless adequate authorized funds are available. Funds may be authorized for expenditure by legislative appropriation or subsequent action of the Governor through DPB, as provided for in the Appropriations Act. Under the CARS framework it should not have been possible for unauthorized spending of the magnitude found in the maintenance program to occur.

Because DPB and the Controller have historically combined the appropriations for both highway construction and maintenance into a single account, CARS cannot currently control spending in either the construction or maintenance program separately if sufficient funds are authorized to cover the spending in both programs combined. In 1979, for example, the General Assembly provided an increased appropriation for highway construction. Subsequently, \$150 million in the unexpended cash balance of DHT was allocated to the combined construction and maintenance account in CARS. This subsequent allocation was sufficient to allow DHT to overspend its authorized maintenance budget without triggering the control mechanism built into the CARS.

The significance of the current monitoring weakness is illustrated by the overspending for secondary system maintenance. Section 33.1-23.4 of the *Code of Virginia* establishes provisions for addressing extraordinary maintenance expenditure needs resulting from severe weather or other unanticipated damages to the secondary road system. The section specifically gives the Highway and Transportation Commission the authority to transfer funds allocated to construction to maintenance purposes "made necessary by highway damage resulting from accidents, severe weather conditions, from acts of God, or vandalism."

Although DHT overspent its appropriation for secondary system maintenance by \$67 million, DHT staff indicate that the overspending was accomplished through use of cash in the combined construction and maintenance account instead of the statutory provisions for transfer between construction allocations and maintenance. According to DHT staff, there was no reduction in secondary construction allocations during the 1978-80 biennium. The fact that the department was able to increase secondary system maintenance spending by \$67 million during the biennium without using the statutory provision designed to address the need for such an increase illustrates graphically the lack of control over DHT expenditure.

DPB intends to correct the control weakness in CARS for the 1982-84 biennium. Unfortunately, however, the existing controls will not be in a position to monitor spending for the current biennium. DPB and the Department of Accounts should move as quickly as possible to implement a means of controlling appropriation and allotment increases made to the "highway work in progress" fund. Controls should identify the amount of increase for maintenance and construction separately and the specific legislative authorization for the increase.

Compliance with Allocations

The General Assembly has historically employed statutory language to guide the allocation of construction funds among highway systems. Although the formulas and provisions have been amended from time to time, the allocation process has remained the means for stating legislative intent with regard to construction funding. The allocation process as it has developed has also served the important function of communicating construction plans and priorities to legislators, local officials, and the general public. The importance of the allocation process as a means of public communication was noted by the R. J. Hansen consultants who found that allocations are "a communication of priority to the public and, of course, result in expectations by the public." This view was confirmed by local officials interviewed by JLARC staff who indicated that they considered an allocation a commitment to construct a project.

The JLARC interim report on DHT organization and administration showed that actual spending patterns for highway construction varied greatly from allocations. As updated, between 1967 and 1981, \$206 million more was allocated to the urban system than actually expended. The primary and secondary systems showed similar underspending compared to allocations of \$59 million and \$39 million respectively. In contrast, \$14 million more was spent on the interstate system than was allocated.

A similar situation exists on the allocation of secondary construction funds to individual counties. In 1977 the General Assembly mandated in *Code of Virginia* Section 33.1-23.4 a formula for allocating secondary system funds to counties. However, an analysis of the period 1977-1980 found that in only 24 of 94 counties did expenditures come within ten percent of allocations over the three-year period. Differences ranged from one county in which expenditures were 235 percent of allocations to another county in which spending was only 39 percent of allocations.

Significant discrepancy between allocations and expenditures may not satisfy the intent of the General Assembly with regard to the distribution of construction funds. To some extent the intent of the General Assembly may not be clearly stated: although there is a common perception that expenditures should equal allocations (at least over a period of several years), the statutory relationship between the two has not been documented by legislation or legislative reports.

In its interim report, JLARC recommended that the General Assembly consider a more explicit statement of legislative intent to establish a clear basis for accountability for the distribution of construction funds among the various highway systems. The subsequent finding that allocations and expenditures differ on secondary system funds distributed to counties reinforces the need for legislative review.. The General Assembly may wish to reinforce its intent regarding allocations and expenditures. There also may be a need to consider suspending the statutory allocation formulas if the legislature wishes to reestablish balance between past allocations and actual expenditures by system. Otherwise it appears virtually impossible for DHT to honor past spending commitments, particularly to the urban system, within the current allocation formulas and anticipated future federal aid apportionments.

A second JLARC interim report recommendation has been partially addressed but will require additional important revisions in DHT internal budgeting practice. The interim report recommended the development of a multi-year construction program in order to provide more realistic and reliable means of communicating construction priorities. The program, which would include planning for four to six years, would include project-specific lists of actions to be taken and anticipated expenditures.

DHT is in the process of developing a "four year critical improvements program" which will identify high priority projects to be constructed with anticipated revenues. The program has not yet been formally adopted by the Highway and Transportation Commission, however, and it is unclear as to how this planning process will be used in preparation of the 1982-84 budget. DHT should take steps to complete the critical improvement program and make it available for distribution and review by the General Assembly in the 1982 session.

Annual updates to the program would provide information on progress and expenditures made against plans and would note any revisions required to meet changing conditions. A formal process should be established for annually updating and adjusting the program to accommodate General Assembly action or changing priorities.

Compliance with Budget Procedures

Virginia recently adopted a program budgeting process which provides an opportunity to link agency goals and objectives with the specific work programs of each directorate, division, and district. Budget instructions require agencies to provide the following information:

- Historical background of the program;
- Current bases for the program;
- Program goals;
- Subprogram objectives and strategies for six years; and
- Program finances.

To date, DHT has not been able to fully integrate its practices with the requirements of State operating and capital budgeting processes.

Program Budget. DHT was unable to submit a budget in a program framework for the 1980-82 biennium. In general, middle management support for the program budgeting process has been weak. For example, only three of 16 division heads interviewed said they found merit in using program budgeting to manage their units. Moreover, DHT managers who have developed program budgets for their units appear to have received little support from the agency's higher levels of management, as in these examples:

The head of one division developed and submitted a program budget request for FY 1981. He was subsequently authorized to spend a lump sum which did not reflect the submitted budget request. He received no comment about the proposed program and was unable to find out how the final allocation was determined.

* * *

The director of another organizational unit reported a similar experience. Staff developed goals and objectives in support of their budget request. Although DHT subsequently gave the unit the requested amount, no comments or acknowledgement of the planned goals and objectives were made.

DHT recently established a budget division based on an R. J. Hansen recommendation to consolidate several budget, accounting and financial planning functions into a single office. An important task of the new budget division will be to train central office and field staff in the usefulness of managing with a program budget. Top management of DHT must play an important leadership role in supporting the program budgeting concept throughout the organization.

Capital Outlay. DHT has built and now maintains approximately 300 facilities across the State. In FY 1981, the department spent \$6.4 million to build and maintain these facilities. One problem with current budget procedures is that DHT erroneously considers itself exempt from the capital outlay process. In addition, capital outlay activities within DHT should be better integrated with the department's total budget process.

Land Aquisition and Capital Projects. For many years DHT operated outside the State's capital outlay policy and procedures. For example, the central materials lab, which was constructed at a cost of \$2.1 million, was not submitted for review through the State capital outlay process. In addition, central office renovations totalling \$1.76 million since 1979 did not come under the State process. In

1980, however, the General Assembly directed in Section 2.1-507 of the *Code of Virginia* that "acquisitions of real property for office space, district offices, residencies, area headquarters, and correctional facilities shall be subject to such review and approval [by the Division of Engineering and Buildings]." Under the statute, only acquisition of land for "the construction, improvement and maintenance of highways and transportation facilities and purposes incidental thereto" is exempted from the State's capital outlay procedures.

DHT officials have seemed to feel that the department is exempt from the capital outlay procedures used by other agencies since the department is not funded by the State general fund. On March 9, 1981, in fact, the Highway Commissioner stated in a letter to the Department of Planning and Budget:

As you know, the Department is specifically exempted by the *Code* in complying with certain planning activities of the Department of General Services for the construction of its facilities. It is essential that the Department continue to maintain control over the construction of its facilities in order to effectively carry out the Highway Maintenance and Construction Program.

A review of legislation did not reveal any language exempting DHT from the State's capital outlay policies and procedures. In fact, the Appropriations Act incorporates capital projects "irrespective" of the source of funds and reflects legislative intent to make capital approvals only in even-numbered years. The 1980-82 Appropriations Act has one capital appropriation to DHT. And although provisions for exceptions are clearly specified in Section 4-7.01h, the department has not taken advantage of these.

Although DHT has generally resisted complying with this provision, the department is now submitting land acquisition requests to DEB. These requests should also be carefully reviewed by the Department of Planning and Budget for their program need and operating budget implications.

Budget Procedure. DHT uses a committee to make capital outlay decisions. Chaired by the director of operations, the committee distributes funds among the districts based on a review of operational needs.

Funding for DHT capital projects has come from the department's operating budget, as the following example illustrates:

In past years, operating funds have been spent to construct material storage facilities. Construction costs for these buildings are recovered by adding overhead charges to the stored materials and

charging each residency for the materials it consumes. As of August 1981, more than \$2.3 million of construction costs remained to be recovered in this manner.

Using operating funds to build facilities is not consistent with sound capital budgeting practice. According to DHT officials, this method of financing capital construction will not be used in the future.

A major function of the new DHT budget office should be the coordination of the operating and capital budget processes. To ensure adequate legislative review, DHT must clearly justify the need for capital improvements within its program guidelines. Thus, it is critical that a district demonstrate how a capital project request will assist in achieving program objectives. This determination is a key step in the decision to include a capital request in the department's budget. Accordingly, the DHT budget process must be able to effectively evaluate capital requests in terms of program implications.

DHT should assign capital budgeting responsibilities to the new budget division. Such a change would ensure close coordination of the operating and capital budget processes. The capital outlay committee could advise the division on specific project requests.

CONCLUSION AND RECOMMENDATIONS

The program planning and budgeting decisions of DHT affect the distribution of large amounts of resources and should meet high standards of fiscal control and accountability. Improvements are needed in current procedures which will assist DHT, the Governor, and the General Assembly in meeting these standards while dealing with resource constraints.

Role of the Secretary

Recommendation (1). The Secretary of Transportation should expedite the preparation of the statewide transportation plan. The plan should treat specifically the major transportation issues facing Virginia in the 1980s and present recommendations for resolving those issues. Members of the Highway and Transportation Commission, local officials, and regional and local planning agencies should be consulted about the plan development and given adequate time to prepare their suggestions about the nature and substance of recommendations.

The General Assembly may wish to take action through resolution or statute to set a deadline for completion of the statewide transportation plan.

Recommendation (2). The Secretary of Transportation should exercise fully the budgetary formulation and review responsibility for all agencies under his control as provided for by law. It is the responsibility of the secretary to take a strong leadership role in policy development for all modes of transportation in Virginia.

Role of the Commission

Recommendation (3). The Highway and Transportation Commission should establish a standing committee to oversee the public transportation planning and coordinating roles assigned to that body.

Construction Needs Assessment Planning and Programming

Recommendation (4). DHT should improve its construction needs assessment process by taking the following actions:

- a. All future needs assessments done by the department should reflect the immediacy of the funding requirement. Projects which are not anticipated to require construction funds within the six-year planning cycle used for the Commonwealth's program budget should be clearly identified and distinguished from projects which could be moved to the construction phase within six years.
- b. An analytic framework should be developed for establishing priorities among highway construction needs and presenting several levels of spending as alternatives in the biennial program budget. The analytic framework should include but not be limited to the following factors: federal aid availability, traffic volume and congestion, safety, structural deterioration, and functional limitations of the existing facility, and local government endorsement.
- c. DHT should expedite the completion of a highway improvement program which identifies high priority spending objectives for construction during the subsequent four-to six-year period. The program should be completed and made available to the General Assembly for distribution and review in the 1982 Session. The program should include provisions for annually updating and adjusting the program to report on progress in fulfilling program objectives and to accommodate General Assembly action or other charges to existing conditions.
- d. The Highway and Transportation Commission should formally review and approve the highway improvement program as well as annual updates and keep apprised of progress made by the department in meeting the program objectives.

Maintenance Needs Assessment, Planning and Programming

Recommendation (5). DHT should re-evaluate its policies regarding the workload standards used in budgeting for routine maintenance. Either closer adherence to the standards by field managers should be required, or the value of maintaining and updating the standards should be reconsidered.

Recommendation (6). DHT staff should develop an annual maintenance program to provide the necessary level of accountability for spending. The program should identify a "minimum funding level necessary for maintenance which constitutes a program to protect the highway investment and provide for reasonable levels of safety and comfort to the travelling public." The plan should also identify "other spending levels above the minimum program which are recommended to provide for higher levels of comfort, convenience, and other maintenance enhancements." The intent of this recommendation is to provide the General Assembly with alternatives for funding highway maintenance and the implications of each spending level.

The Highway and Transportation Commission should review and approve the maintenance program and provide opportunity for review by and consultation with appropriate legislative committees. A draft version of the program should be developed by January 1983 and a status report provided to the General Assembly. The approved program should then be available for incorporation into the budget development cycle for the 1984-86 biennium.

Recommendation (7). DHT should place a high priority on full implementation of a pavement management system for Virginia. The system should be able to provide analytically based data on the pavement condition on all of the highway systems by using appropriate sampling procedures. The preliminary information should be incorporated in the maintenance program described in Recommendation 6 for the 1983 status report to the General Assembly. The 1982-84 Appropriations Act should mandate that a complete assessment of highway condition be finished by the start of the 1984-86 biennial budget preparation cycle.

Recommendation (8). Greater emphasis should be placed on the bridge condition rating system by the Bridge Division. Data from the rating system should be used systematically by maintenance staff to set Statewide priorities for bridge maintenance and replacement.

Budgeting

Recommendation (9). The Department of Planning and Budget and the Department of Accounts should take immediate steps to establish separate control accounts for highway construction and maintenance in the "highway work in progress" fund. Appropriation and allotment increases made to the work in progress fund should identify the amount of increase for maintenance and construction separately, and the specific legislative authorization for the increase.

Recommendation (10). The General Assembly may wish to clarify its intent as to whether expenditures should be consistent with the allocation of construction funds under *Code of Virginia*, Section 33.1-23.1 and Section 33.1-23.4. Definition of the term "allocation" to mean intent to expend allocated funds within a limited reasonable time (for example, consistent with DHT's four-year program) would provide the basis for greater legislative direction and establish a clear basis for accountability in the distribution of construction funds.

Recommendation (11). For the purposes of addressing current imbalances between allocations and expenditures among highway systems, the General Assembly may wish to consider one of the following actions:

- a. require DHT to prepare a plan for General Assembly consideration to address and amortize the existing imbalances within the statutory provisions; or
- b. suspend the application of *Code of Virginia* Section 33.1-23.1 for a time period sufficient to allow DHT to address the current imbalances; or
- c. require reasonable consistency between expenditures and allocations made in the future but specifically exempt all past allocations from the provisions of subsequent statutory clarifications.

Recommendation (12). The DHT budget division should place a priority on bringing the program budget into compliance with established format and content requirements. Both DHT management and the budget division should take steps to familiarize managers with the budget process.

Recommendation (13). DHT should improve control and coordination over capital outlays by consolidating the capital budget function with the preparation of the operating budget. The capital budget responsibility should be assigned to the budget division with the existing capital outlay committee assigned an advisory role.

The department should fully comply with the capital outlay policies and procedures of the Department of Planning and Budget and the Division of Engineering and Buildings. All construction and renovation projects affecting office space, district offices, residencies, area headquarters, and correctional facilities should come under the State's capital outlay policy and procedures. Acquisition of land for such purposes should be reviewed by DEB. If the department wishes to be exempted, it should submit appropriate amendments for consideration.

III. Selected Management Control Issues

Because the department needs to manage its resources prudently in light of dwindling revenues, an effective system of management control is essential. DHT maintains control over programs and expenditures through policies and procedures and management information systems. Numerous procedures have been developed to guide operating decisions at the district and residency levels. They apply to such activities as residency spending, equipment maintenance, and inventory management. Automated data processing provides managers with information for monitoring program performance. Problems in project implementation can be detected early and corrected appropriately.

A major conclusion of the Stone Commission report was the need to delegate sufficient authority for decisionmaking to field managers while maintaining appropriate central control. The commission recommended that "the department should delegate more authority to these men and should encourage them to make decisions and handle problems locally to the greatest degree possible. Control of policy, however, must be retained in Richmond."

Implementation of this recommendation has not been completed, however. While the department has made a concerted effort to decentralize operations, the central office has had problems maintaining adequate control over districts and residencies. Important actions have already been taken to improve administrative practices and control procedures, but more needs to be done.

CONTROLS

Management controls are important to ensure that spending and work activities occur according to plan and only with the approval of the appropriate level of management. DHT has established an extensive network of controls through policies and procedures focused at the residency level. In general these controls allow field managers appropriate flexibility to make operational decisions. In some cases, controls are too lax or are not being effectively implemented.

Controls on basic support activities were found to need strengthening. For example, central office controls on highway maintenance spending by residencies should be increased. In addition, a review indicated that improved equipment maintenance practices could save as much as \$820,000 per year and that a reduction of the inventory could produce a one-time saving of up to \$5 million. Improved purchasing practices also appear necessary. Sound management of the department's extensive land holdings would suggest that a higher priority should be placed on selling surplus land to generate revenue. Finally, improved monitoring could help reduce the administrative costs related to highway construction projects.

Residency Spending

The growing maintenance budget requires that the department exercise effective control and oversight of residency spending. DHT needs to make some refinements in central office monitoring procedures for controlling ordinary maintenance expenditures. Development of utilization measures for expendable equipment should also be considered.

Ordinary Maintenance. Statewide, residencies spent 4.6 percent less than budgeted during the 1978-80 biennium, although 18 residencies overspent their budgets for ordinary maintenance by a total of \$5.3 million during the biennium. Overspending in each of six residencies exceeded planned amounts by more than \$350,000 (Table 5).

Table 5

RESIDENCIES WITH ORDINARY MAINTENANCE
OVEREXPENDITURES GREATER THAN \$350,000
1978-1980 Biennium

| <u>Residency</u> | <u>Planned Expenditure</u> | <u>Actual Expenditure</u> | <u>Amount Above Plan</u> | <u>Percent</u> |
|------------------|--------------------------------|-------------------------------|------------------------------|----------------|
| Fairfax | \$10,891,290 | \$12,254,454 | \$1,393,164 | 12.8% |
| Salem | 4,240,720 | 4,906,529 | 665,809 | 15.7 |
| Fredericksburg | 3,446,073 | 4,073,666 | 591,593 | 17.2 |
| Hillsville | 3,432,988 | 3,957,191 | 524,203 | 15.3 |
| Edinburg | 4,100,783 | 4,467,953 | 367,170 | 9.0 |
| Charlottesville | 3,448,207 | 3,809,457 | 361,250 | 10.5 |

Note: Snow removal expenditures excluded.

Source: DHT Maintenance Management System.

Maintenance division personnel monitor monthly residency spending for compliance with budget levels. Snow removal expenditures are combined in the monitoring system with all other types of maintenance expenditures. When particularly severe winters cause snow removal spending to exceed budgeted amounts, the practice of combining all expenditures weakens monitoring effectiveness. For example, when asked about the residency overspending shown in Table 5, maintenance division staff stated that overspending was due to snow removal demands. In fact the actual expenditures shown in Table 5 exclude all snow removal costs.

DHT should consider separating snow removal spending from other maintenance expenditures for the purpose of central office budget monitoring. This would provide for more consistent monitoring while allowing separate control over highly variable snow removal spending.

The department has recently tightened controls on spending in one important maintenance activity. Repairs to storm and flood damaged roads amounted to \$77 million during the 1978-80 biennium. A report by the management services division noted that some residencies performed work in addition to needed maintenance repairs and inappropriately charged it to storm and flood damage. However, DHT has implemented a requirement for estimates to be made and prior authorizations given before work is commenced, along with closer monitoring of actual repairs. These procedures should provide the degree of control needed on such spending.

Expendable Equipment. Another problem at the residency level has been overexpenditures for expendable equipment. Expendable equipment, as opposed to fleet equipment, is of less value and has a shorter operating life than large motorized machinery. Expendable equipment includes such items as chain saws, water pumps, chemical spreaders, snow plows, and portable generators.

As of December 1980, DHT owned 12,107 pieces of expendable equipment, with a total value of \$10.58 million. Expenditures for the purchase and maintenance of expendable equipment totalled \$5.4 million in FY 1980.

Management of expendable equipment is decentralized, with the districts providing primary control. The equipment is distributed among districts as shown in Table 6. Districts are responsible for determining the need for expendable items, for updating the inventory and other equipment division records, and for assessing the need to dispose of old equipment.

Table 6

EXPENDABLE EQUIPMENT BY DISTRICT
(December 31, 1980)

| <u>District</u> | <u>Number</u> | <u>Value</u> |
|-----------------|---------------|----------------|
| Bristol | 1,460 | \$ 1,188,822 |
| Salem | 1,485 | 1,206,062 |
| Lynchburg | 1,245 | 1,141,317 |
| Richmond | 1,620 | 1,465,236 |
| Suffolk | 1,308 | 1,143,777 |
| Fredericksburg | 997 | 844,198 |
| Culpeper | 2,306 | 2,091,747 |
| Staunton | 1,634 | 1,393,212 |
| Equipment Depot | <u>52</u> | <u>108,504</u> |
| Total | 12,107 | \$10,582,875 |

Source: Expendable Equipment Inventory.

The delegation of control over expendable equipment purchases to the districts and residencies appears appropriate given the nature and use of individual equipment items. However, overspending of the expendable equipment budget has occurred--in the 1978-80 biennium, by \$1.26 million. Given the amount of expendable equipment owned by the department, DHT should consider reviewing its expendable equipment inventory to identify means of monitoring the use of equipment purchased and controlled at the district and residency level. A simple check-out system, for example, could be developed to determine the frequency with which a particular piece of equipment is used.

Inventory Management

Supplies and materials are maintained in two inventories:

General Supply Stock. This inventory includes 6,559 classes of parts and supplies such as automotive maintenance and repair items, hand tools, janitorial supplies, small equipment and electrical supplies.

Road Stock. Road stock includes sand, aggregates, bulk chemicals, pipe, and guardrail used by DHT for highway and bridge maintenance and construction.

As of March 1981, the value of the general supply stock was \$7.5 million, and the road stock inventory was valued at \$27.2 million.

The department spends millions of dollars annually to purchase supplies and materials. A review of the general supply inventory, however, revealed that DHT is overstocked by \$4 million. This overstocking suggests that better controls are needed to ensure that adequate but not excessive amounts of supplies and materials are available. Although inventory security seems to be adequate, scheduling of district audits is irregular.

A JLARC letter report on DHT's inventory management was prepared in July 1981. The report contained nine recommendations for improving inventory procedures, and the department has agreed to implement all the recommendations. The following summary of the letter report highlights the major findings and recommendations.

Inventory Levels. An important part of inventory control is setting and maintaining appropriate levels of stock. Since purchasing excess supplies ties up cash and contributes to storage and handling problems, the department's goal should be to provide supplies adequate to meet but not exceed needs. DHT appears to overstock the general supply inventory, and it could realize a one-time cost savings of as much as \$5 million through improved reordering procedures.

DHT's methods for maintaining an optimal inventory have not fully utilized standard procedures for inventory control. Specifically, DHT relies on individual judgements to establish minimum and maxi-

mum stock levels to be maintained in each location, rather than use the full potential of the automated inventory system. Under the present process a clerk or shop foreman at each stock location determines when an item should be reordered. The amount to be ordered is usually the same quantity that was ordered previously. If actual needs for the item are declining, this practice produces overstocking.

JLARC staff conducted an analysis of the general supply inventory, using data on stock issues for 53 months (October 1976 to February 1981). The 53-month period was used to establish average monthly issue rates for each item and to reduce the effect of seasonal fluctuations. The monthly issue rates were compared to balances on hand in March 1981 in order to calculate the number of months' supply of each stock item in the inventory.

Table 7 shows the result of the analysis. Applying the DHT criterion that four months' supply of items would be sufficient, the department was overstocked in two-thirds of all inventory classes. The value of the overstocking was almost \$5 million. Using a more liberal six months' supply criterion, DHT still appears to be overstocked by \$4 million.

Table 7

STOCK ITEMS IN EXCESS OF MAXIMUM CRITERIA

| <u>Maximum Criterion</u> | <u>No. of Classes of Supply in Excess of Criterion</u> | <u>Value of Stock in Excess of Criterion</u> |
|--------------------------|--|--|
| 4 Months | 4,903 | \$4,941,601 |
| 6 Months | 4,597 | \$3,982,219 |

Source: DHT Inventory Data.

Besides the obvious problem of tying up needed funds in an overstocked inventory, other effects of overstocking can be seen in some DHT stockrooms. In three stockrooms visited by JLARC staff, inadequate storage space had become a serious problem. In one of the district stockrooms there were also complaints of insufficient staff to handle the workload. Reducing the overall size of the inventory could be expected to help alleviate these problems.

DHT has agreed to reduce inventory balances to more appropriate levels. This will be accomplished by setting levels for all classes of inventory items, using a methodology similar to that used by JLARC staff. DHT will then delay additional purchasing in the overstocked classes until the desired level is reached. Second, the automated inventory system is being modified to compare issue rates with desired stock levels and provide DHT buyers with a periodic listing of classes which are approaching the minimum desired stock level. Buyers will then be able to reorder stock before a shortage occurs.

Scheduling of District Audits. During recent years, a purchasing division accountant has audited all locations in a district and then reported findings to the district engineer through the purchasing agent. But the scheduling of district audits has been erratic (Figure 7). While each district was audited every year before 1974, only three districts were audited in 1980, the central warehouse has been audited only twice since 1973, and the Richmond district has not been audited between 1974 and 1981.

Figure 7
DISTRICT AUDIT VISITS

| Location | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|-------------------|------|------|------|------|------|------|------|------|
| Central Warehouse | | | • | | | • | | |
| Bristol | • | • | • | • | • | | • | |
| Salem | • | • | | | • | | • | |
| Lynchburg | • | • | | • | | | | • |
| Richmond | • | • | | | | | | |
| Suffolk | • | • | | | • | • | | • |
| Fredericksburg | • | | • | | | • | | |
| Culpeper | • | • | | | • | | • | |
| Staunton | • | • | | • | | | | • |
| Toll Facilities | • | • | | | • | • | | |

Source: DHT Purchasing Division.

Because these audits are the only method available to the purchasing division for reviewing stockroom operations and ensuring the accuracy of the inventory, the scheduling of audits as shown in Figure 7 is clearly insufficient. Failure to conduct any audits in the Richmond district for the past seven years points to the inadequacy of the schedule. DHT has agreed to audit the central warehouse and district stockrooms annually and to audit the residency stock locations biennially.

Inventory Adjustments. Eight of the 12 stockrooms visited by JLARC staff appeared to conduct required quarterly inventories in proper fashion. In four locations, however, stock adjustments were not

properly recorded. In one location, the clerk was found to be arbitrarily charging shortages in repair parts to whatever equipment happened to be in the shop at the time, although the parts were not actually used on the equipment. Since the JLARC review of this stockroom, DHT has taken action to correct the problem.

In three other locations, area superintendents were found to assist in eliminating the appearance of shortages by approving an issue of the missing items to a random highway maintenance activity. In each case the improper charges distorted the stock correction account as well as the highway maintenance accounts to which the supplies were improperly charged.

Failure to report stock corrections accurately is a serious problem because quarterly inventories are a primary means of detecting loss or theft. By randomly charging shortages to equipment or maintenance activities, the clerk may impede efforts to detect and reduce employee pilferage. DHT has agreed to provide training for stockroom clerks to ensure that quarterly inventories are conducted in compliance with department procedures.

Inventory Security. Inventory control also involves the physical security of the stockroom and adjacent storage facilities. On-site inspection of 12 stockrooms found two problems which need to be addressed.

Basic security at the 12 stockrooms visited by JLARC staff was found to be adequate. However, a problem was found in compliance with the purchasing division policy that stockroom access be limited only to those employees responsible for operation of the stockroom. Six of the locations visited did not appear to be in compliance with this policy. These locations allowed unlimited access to the stockroom by all mechanics. The mechanics could issue stock for themselves without the assistance of the clerk or shop foreman. The department has agreed to enforce this policy more carefully.

A second problem was inadequate protection of transfers of parts and supplies from districts to residencies. Although each district has at least one driver who normally makes such deliveries, shipments may also be made on other vehicles that happen to be going to a location receiving a shipment. Supplies transferred in this manner are not sealed and certification of the items to be shipped from the district is not required. Shipment of the items should be certified by having the district storekeeper sign for the shipment of items.

Purchasing Procedures

Most purchases are made by staff in the purchasing division, which is also responsible for warehousing and issuing all materials and supplies. Central purchases amounted to \$133.1 million in FY 1980. DHT field units may also make some purchases locally for items valued at less than \$300. Local purchases amounted to \$4.1 million in FY 1980.

While DHT's purchasing procedures are patterned after generally accepted standards for public procurement, some practices are clearly at variance with those standards. These problems are significant even in the absence of any evidence of corruption which might result from inadequate procedures. In its second interim report, a special grand jury investigating the State Division of Purchase and Supply concluded that "inadequate procedures create a climate in which allegations of favoritism, fraud and corruption become credible. Poor procedures can also be used . . . by those who wish to defraud the Commonwealth." Because of illegal activity already discovered in the bidding of construction contracts, it is important for purchasing procedures to be above reproach. This is not the case in at least four areas--the division of purchasing responsibilities, the registration of vendors, the certification of non-collusion, and the avoiding of tied bids.

Division of Purchasing Responsibilities. One section of the purchasing division handles all procurement activities. The procurement section has been organized so that the buyers are responsible for all phases of the bidding process for a given group of commodities. For the purchase of stone, for example, a single buyer would perform the following functions:

- Develop and maintain the list of bidders;
- Receive requests for purchases from DHT's field offices;
- Review and evaluate specifications;
- Develop the bid proposal;
- Mail the proposals to vendors;
- Open the bids and tabulate the results;
- Evaluate bids for compliance with requirements and specifications; and
- Award contracts for bids valued at less than \$1,000.

The only function not performed by the buyer is the actual receipt of the bids in the mail. Currently, the secretary for the purchasing agent receives the bids and records their receipt before forwarding them to the buyers.

The special grand jury found that this sort of organization was a contributing factor to the fraud and corruption found in the Division of Purchases and Supply. Allowing a single buyer to control all aspects of the bidding process makes it more difficult for management to detect improper activity.

When the Division of Purchases and Supply was reorganized after the investigation, one of the most important steps was to provide for some division of functions in the procurement process. Buyers in

that organization are no longer permitted to mail out invitations to bid, or to receive, open, and tabulate the bids. Buyers, also, are never involved in the award of the contract. While the buyers retained responsibility for preparing bidders lists and evaluating the bids submitted, other functions are now performed by a separate section in the agency.

The purchasing division should be reorganized in such a way that procurement would be divided between two entirely separate sections. Buyers should not be involved in sending, receiving, opening or tabulating bids. Instead, buyers should be more active in seeking out qualified bidders, reviewing specifications and evaluating bids received.

Registration of Vendors. Registration of prospective bidders is a standard procedure for most government purchasing agencies. The Council of State Governments recommends that all vendors be required to be pre-registered. Registration is considered important because it allows the purchasing agency to include on its bidders list only those vendors who are qualified to bid. It also provides an opportunity for requiring vendors to certify that they have not been previously barred from doing business with the State or convicted of any collusion.

Registration of vendors is required by the Division of Purchases and Supply, and DHT requires registration of all contractors who wish to bid on construction contracts. While the purchasing division requires out-of-state firms to pre-register, Virginia businesses are not required to provide any information about their qualifications.

The DHT purchasing agent claims that requiring the registration of Virginia firms would reduce competition by discouraging small businesses. This effect seems unlikely, however, since the one-page form asks for only the most general information, such as names of officers, net worth, and references. Information provided on the registration could be obtained from other State agencies such as the SCC and Department of Taxation.

The failure to register Virginia businesses which bid for DHT contracts presents three problems. First, DHT has no way to know if a bidder is qualified to meet the terms of the contract. Second, the purchasing division cannot ensure that affiliated firms are not bidding against each other. Finally, Virginia firms are never required to certify that they have not been declared ineligible to bid on State contracts as the result of some previous improper activity.

DHT should require that all vendors register before submitting bids for any contract. The current form used for registration of out-of-state firms is generally adequate except that it should be revised to require disclosure of corporate affiliations. Firms already on the bidders list should be required to complete the application as a part of their next bid proposal. Once registered, periodic notices should be sent with invitations to bid, requesting that the purchasing division be notified of any changes in the information.

Certification of Non-Collusion. The Governmental Frauds Act of 1980 makes it a felony for any person dealing with the Commonwealth to certify falsely that the transaction is free of any collusion. Despite the provisions of the act, DHT bid proposals do not require such certification. All bidders should be required to sign a statement certifying that the bid is made without collusion.

Awarding of Tie Bids. Under current DHT policy, if two or more identical bids are received, the award is made first by determining if some aspect of one bid makes it superior to the others. Such items as better delivery arrangements or Virginia incorporation are considered. If there is no way to distinguish between the tied bids, the award is made by alternating between the firms. The history of tied bids is maintained for the purpose of making such alternating awards.

While DHT's practice of determining if one bid is technically superior to another is acceptable, its practices of drawing lots and making alternating awards are not. The Council of State Governments points out that anticompetitive agreements which rely on identical bids will continue "as long as the method of making awards divides the government's business in a manner that is satisfactory to the conspirators." The Council recommends that drawing lots be discontinued because it tends to divide the government's business evenly among identical bidders. The practice of making alternating awards is even worse in that respect.

DHT should revise its procedures for awarding contracts for which it receives tied bids. Several options are acceptable. When no bid can be identified as more technically correct, all bids could be rejected and new bids requested. Or bids could be requested for package deals, combining a number of items. Award can then be made on the lowest priced combination of items.

Although some cases of tied bids could be valid, the purchasing division should be more suspicious of tied bids. The Division of Purchases and Supply sends all tied bids to the antitrust division of the Attorney General's office for review, for example. And the Council of State Governments concludes that all tied bids may be considered a sign of anticompetitive activity. DHT may want to report identical bids to the antitrust division.

Equipment Maintenance

A well maintained equipment fleet is necessary for the department to carry out its highway maintenance and construction mission. Overall costs can be better controlled through a standardized policy for preventive maintenance at the residency level. Improved use of maintenance expenditure records could also lead to a reduction of expenditures by focusing management attention on individual items of equipment with high repair costs.

Preventive Maintenance. A preventive maintenance program designed to identify and correct problems and provide necessary servicing can help reduce equipment breakdowns and repairs. This is important for DHT because breakdowns can disrupt scheduled highway construction and maintenance work and increase overall costs by idling work crews.

Since 1973 DHT has had a policy of preventive equipment maintenance intended to facilitate early correction of mechanical problems and to ensure an appropriate level of routine servicing. Under the policy, equipment operators are responsible for performing weekly inspections and cleaning their vehicles. According to DHT policy, routine servicing, which includes fluid and filter changes, should be performed at regular mileage or time intervals, depending on the type of vehicle.

While DHT has a policy of preventive maintenance, no guidelines existed before June 1981 for implementing such a program in the field. According to equipment division staff, districts and residencies established their own schedules and specifications for preventive maintenance.

The result of the lack of standard guidelines has been wide variation in the management of preventive maintenance. In FY 1980, the preventive maintenance programs in residencies ranged from no program at all to the practice of essentially stopping all construction and maintenance work for one-half day a week to wash, lubricate, and inspect all vehicles. Variation in current preventive maintenance practice is illustrated in Table 8.

Table 8

VARIATION IN PREVENTIVE MAINTENANCE PROGRAMS
(1980-81)

| <u>Frequency of Program</u> | <u>Number of Residencies</u> |
|--------------------------------|------------------------------|
| No program | 2 |
| Sporadically - no set schedule | 5 |
| Manufacturers' recommendations | 8 |
| Semi-annually | 2 |
| Quarterly | 1 |
| Bimonthly | 2 |
| Monthly | 5 |
| Weekly | <u>20</u> |
| Total | 45 |

The wide variation in actual practice raises questions about the overall effectiveness of the preventive maintenance program. The

key distinction in current practice is that between residencies which shut down all operations once a week and those with monthly or less frequent programs. Twenty residencies have weekly programs, while 23 perform preventive maintenance monthly, or less frequently.

Staff in both the equipment and the maintenance division have stated that, in their judgement, weekly preventive maintenance programs are excessive and that a less frequent program would suffice. Accordingly, residencies do not receive sufficient budgeted funds to support the cost of a weekly program, and those with such programs are likely to overspend their budgets, as well as incur the indirect costs resulting from lost productive time when all maintenance staff are involved in preventive maintenance. Residencies with a weekly program spent \$820,000 more in FY 1980 on personnel costs for preventive maintenance than residencies with a monthly program.

The real test of the weekly program, however, is whether it improves equipment performance or decreases other repair and maintenance expenditures that can be shown to result from a more frequent preventive maintenance effort. But statistical analysis on each of six major classes of equipment showed essentially no difference in the average yearly expenditures for equipment assigned to residencies with weekly programs compared to residencies with less frequent programs. Nor was there significant variation in the amount of broken down time per piece of equipment. Table 9 illustrates the finding using dump trucks as an example.

Table 9

COMPARISON OF PREVENTIVE MAINTENANCE
PROGRAMS FOR DUMP TRUCKS
(FY 1980)

| <u>Frequency of Program</u> | <u>Average Year to Date Cost Per Truck</u> | <u>Average Hours of Broken Down Time Per Truck</u> |
|---------------------------------|--|--|
| Weekly (N=20) | \$1621 | 155 hours |
| Less Frequent (N=25) | \$1600 | 148 hours |

The analysis supports the central office position that weekly shut-downs for preventive maintenance do not produce a significant improvement in equipment performance to justify the added cost. Staff in several residencies with monthly or less frequent preventive maintenance programs reported that they had previously used a weekly program and found it took more time than necessary to adequately maintain the fleet.

Despite the accuracy of central office judgement regarding the value of a weekly preventive maintenance program, guidelines distributed in June 1981 do not clearly limit preventive maintenance to a monthly activity. DHT should review the guidelines and require all residencies to limit full shutdowns to one a month.

Lifetime Costs. An important control for managing equipment maintenance is accurate information on the lifetime cost of maintaining each piece of equipment. Lifetime costs include all expenditures for repair and upkeep from the time a unit enters the inventory. In this manner "normal" or typical costs can be identified for a particular type of equipment at a particular age. Planned expenditures on a piece of equipment that would put the cost above the normal range for a specific age would suggest caution and special review before the expenditure is made.

Examining lifetime equipment costs can also give management a means of assessing maintenance management performance. Substantial expenditures in excess of normal or expected patterns would suggest a lack of sufficient control and the potential for overspending.

Figure 8 shows how an analysis of lifetime costing can be made and illustrates the concept with a graph of DHT maintenance expenditures for the more than 2,000 dump trucks in the fleet. In the case of dump trucks, 737 individual units have had life-to-date maintenance expenditures above the normal range for all dump trucks in each age group. A total of \$1,249,939 has been spent above the normal range for all such vehicles as a class. While Figure 8 does not necessarily mean that inappropriate expenditures have been made, the figure does highlight several points.

- Lifetime costing can be used by the equipment division to identify individual vehicles which have a high cost compared to the normal range. These units should receive particular management attention to determine why costs have been high and to weigh additional expenditures against the alternative of replacing the units, particularly in the later years of the unit's service life.
- Using the average and threshold amounts, future maintenance costs can be predicted as the age of the fleet changes. This information can be important to the equipment division for budgeting purposes.
- The \$1.25 million in expenditures above the threshold represent a goal for increased management efficiency and cost savings with regard to dump truck maintenance. Although spending which pushes an individual dump truck above the threshold may be justified in some cases, spending in excess of threshold levels is the most likely area for savings through improved supervisory review at the residency level.

Figure 8

CALCULATION OF LIFETIME COSTS AND NORMAL EXPENDITURE THRESHOLD

Lifetime costs include the total life-to-date maintenance expenditures for each unit of equipment. Lifetime cost analysis focuses on each class of equipment (e.g., dump trucks) separately. The example in this figure uses dump trucks to illustrate the analysis. Similar calculations can be done for all classes of equipment with a reasonable minimum number of units (20-30).

The average curve in the graph represents the average lifetime cost expenditures for all units at each age. For example, there were 379 four-year old dump trucks in the fleet with total life-to-date maintenance expenditures of \$1,655,913. The average for all four-year old dump trucks is \$4,369.

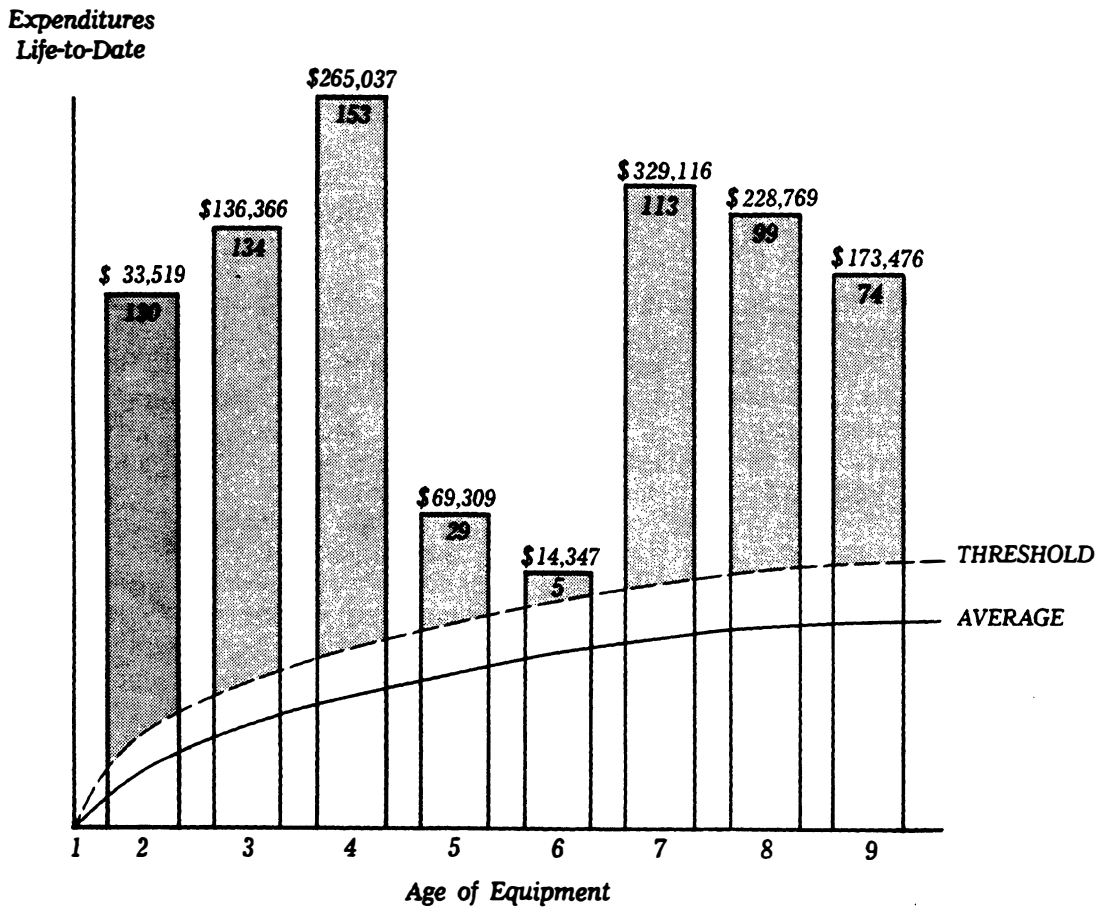
The threshold curve in the graph represents the top limit of the "normal" range of life-to-date expenditures above the average. In this case normal is defined as two standard errors of the mean. A standard error is a statistical measure which defines a range within which the majority of cases can be expected to fall. In the example dump trucks with life-to-date expenditures above the threshold have proven themselves to be unusually expensive to maintain in relation to all dump trucks of the same age.

The shaded area of each age level in the graph represents the number of dump trucks found to be above the normal expenditure range and the amount by which they exceeded the threshold expenditure. For example, 153 four-year old dump trucks fell above the four-year old threshold in life-to-date maintenance expenditures, and the amount by which all 153 exceeded the threshold expenditure (in this case \$4,575 per unit) was \$265,037.

Adding the shaded area totals for all nine years of age shows a grand total of 737 trucks and \$1,249,939 spent above the threshold curve. The 737 individual trucks represent unusually costly units which should receive particular management attention. The \$1,249,939 represents those expenditures most likely to offer savings through increased management review. Finally, the average and threshold curves are good predictors of the expected cost of maintaining all dump trucks and can be used to budget and monitor maintenance expenditures as the size and age distribution of the dump truck fleet change over time.

Figure 8
(continued)

**LIFE TIME EQUIPMENT COSTS AND
NORMAL EXPENDITURE THRESHOLD
EXAMPLE, DUMP TRUCKS, FY 1980**



The analysis shown in Figure 8 was applied to six classes of equipment, which represent two-thirds of all equipment in the fleet. Table 10 shows that the six classes have a combined total of 1,563 units with \$2.5 million in expenditures above the threshold. About one-third of all units in the six classes are above the threshold, with dump trucks contributing 50 percent of the total amount.

Table 10

EQUIPMENT EXCEEDING MAINTENANCE EXPENDITURE THRESHOLDS,
6 MAJOR CLASSES
FY 1980

| <u>Class</u> | <u>Number of Vehicles</u> | <u>Percent of Class</u> | <u>Amount Spent Above Threshold</u> |
|---------------------|---------------------------|-------------------------|-------------------------------------|
| Dump Trucks | 737 | 39% | \$1,249,939 |
| Pickup Trucks | 442 | 34 | 341,455 |
| Motor Graders | 97 | 29 | 303,260 |
| Tractor Mowers | 201 | 30 | 353,240 |
| Front Loaders | 66 | 28 | 202,062 |
| Rollers | <u>24</u> | <u>22</u> | <u>34,957</u> |
| Total for 6 classes | 1,563 | 34% | \$2,484,913 |

Source: JLARC staff analysis of DHT equipment data.

A further indicator of the usefulness of better information is the potential for identifying particular characteristics shared by pieces of equipment which surpass the expenditure threshold illustrated in Figure 8. If a disproportionate number of high-cost vehicles share a particular characteristic, such as the manufacturer or geographic location, the equipment division could consider ways to address these factors which appear to contribute to higher than normal costs.

The equipment division should use the existing data base to develop lifetime costs for all major classes of equipment. Individual pieces of equipment which require maintenance spending that would exceed the threshold level for its age should receive particular supervisory review by the equipment division, district equipment superintendents, and residencies. Data from the lifetime costing analysis should be used by the equipment division in budgeting for equipment maintenance.

Surplus Land

DHT controls more than 336,000 acres of land--more than any other State agency. Most of the land is devoted to right-of-way for the various highway systems. The right-of-way division is responsible

for acquiring and disposing of all real estate needed for construction of interstate, arterial, primary, urban, and secondary highways.

The need for more effective review of DHT land holdings was identified in the 1977 JLARC report Management of State-Owned Land in Virginia. Since the report, the department has reviewed right-of-way parcels and land on which correctional facilities are located. Surplus lands have been identified and sold.

Still, an estimated 1,000 acres are identified on a computerized listing as residue property. A residue parcel is the unused portion of land purchased for highway projects but located outside right-of-way boundaries. An additional 1,300 acres of correctional field unit land owned by DHT have been declared surplus. However, DHT actually owns 1,867 acres which are used by Department of Corrections field units. According to DHT personnel only about 84 acres are needed by DHT for the area headquarters and maintenance yards associated with the use of inmate labor. The remaining 1,783 acres of land are surplus to DHT needs, and these should be considered for transfer or sale. Because DHT has declared only about 1,300 acres of the correctional field unit land surplus, approximately 483 additional acres should be declared surplus to DHT. Transfers of property to the Department of Corrections have not yet occurred.

The Highway and Transportation Commissioner placed priority on selling surplus land near its appraised value to generate revenue in 1975. As noted in the 1977 JLARC report, sales of surplus DHT land increased in the mid-1970s. From FY 1976 through FY 1980, DHT sold 581 parcels of land for \$2.76 million.

Although a commission policy to sell surplus land remains in effect, right-of-way division staff stated that surplus land is sold only when a buyer requests a sale. Identification, advertisement, and sale of surplus land are low priorities for the division.

Sale of surplus property is hindered because the listing of residue property is incomplete. For example, JLARC staff identified 12 land parcels owned by DHT in the City of Richmond. According to DHT personnel, these parcels were purchased as residue and are considered surplus. However, none of the parcels was listed on DHT's residue parcel listing. In addition, DHT had a policy in the mid-1970s to include residue property in the operating right-of-way for all acquisitions. Since the residue parcel listing includes only residue outside right-of-way boundaries, all properties purchased as residue during this period are not listed on the inventory.

The 12 Richmond parcels of land currently owned by DHT were purchased in cases where the department needed only a portion of a lot, but the remainder would have been of little value to the original landowner. DHT personnel stated that the parcels were not developable and, as such, were not deemed feasible for sale. A visit to several

parcels in Richmond revealed a somewhat different picture, however. And there does appear to be some interest in acquiring portions of the property.

DHT owns a small parcel of land near the downtown campus of J. Sargent Reynolds Community College. The land which included a house was purchased in 1962 for \$3,500. The house was removed and a portion of the property was included in DHT right-of-way. The DHT lot is between two other parcels, but a curb cut would give access to a city street. The realtor owning the two adjacent parcels requested in 1962 to purchase the DHT residue for \$2,500, but the department refused because the highway work was not complete.

Currently, the adjacent properties are being used as a parking lot--and the DHT parcel has been inappropriately included in the private-pay area. The manager of the lot charges customers \$12.50 monthly to park on the DHT lot. Approximately 15-20 vehicles can be parked on the DHT parcel. DHT does not lease the land to the manager for parking purposes, however, and officials from the right-of-way division were not aware of its use. The realtor owning the adjacent lots indicated he was still interested in purchasing the land. The lot is currently appraised at \$11,000.

Because the lot is adjacent to J. Sargeant Reynolds Community College a transfer should be explored.

* * *

DHT owns four additional parcels of land several blocks from the J. Sargeant Reynolds Community College campus. JLARC staff observed cars parked on this land. Apparently there was no charge for parking. The properties are valued at approximately \$24,000 based on City of Richmond records.

DHT officials indicated there is no interest in these properties. However, several parcels between the DHT holdings have been recently sold by a local real estate company.

Although most residue parcels are very small, the June 30, 1981 listing contained 107 separate residue parcels of two or more acres, and some of these parcels were sizeable. For example, 28 parcels exceeded 10 acres, and one tract of 260 acres was listed on the inventory.

As acknowledged by the commissioner in 1975, DHT could receive significant income from a more active approach to selling residue and surplus property. The right-of-way division should devote more staff time to identifying and selling surplus land owned by DHT. Priority efforts should focus on large or valuable parcels. To facilitate land sales, the residue parcel listing should be updated to include as many parcels as can be identified. Random inspections of residue parcels should also be conducted by district right-of-way staff to guard against improper use of DHT property. Furthermore, State agencies (such as community colleges) located near residue parcels should be notified and provided an opportunity to acquire such property.

Construction Spending

The department has established detailed formal spending controls on construction projects, including the following:

- Pre-bid engineering estimates and competitive bidding procedures which help ensure that projects are awarded to the lowest bidder.
- Oversight and review by project engineers and construction inspectors of work performed by contractors to ensure that construction standards are met and that the work is performed before payment.
- A process whereby extra costs which arise during construction can be incurred only after review and approval by DHT management.

Although highway construction projects had \$18.2 million in cost overruns in FY 1980, DHT has procedures in place for ensuring that all work performed is necessary and completed to the department's satisfaction. As much as 60 percent of the overruns are subject to extensive documentation requirements, and the remaining 40 percent essentially reflect inaccurate estimates of quantities by project planners. However, some measures can be taken to improve contract administration--especially in the areas of engineering estimates, administrative costs, and the processing of work orders.

Engineering Estimates. As noted in the interim JLARC report, DHT develops its own estimates of project costs as guides in evaluating the reasonableness of bids received. DHT policy is to review bids very closely if the low bid is more than seven percent above the engineering estimate, and to check the estimate itself for any possibility of error. If there is no error in the estimate and the low bid is more than seven percent higher than the estimate, then the bids are usually rejected. Rejected projects are then readvertised. Although engineering estimates cannot prevent bid-rigging, sound estimates can help avoid awarding contracts for excessive amounts.

Of 540 advertised projects in FY 1978, bids on 121, or 22 percent, were rejected. However, when the projects were readvertised, departmental estimates were increased an average of 34 percent while the corresponding low bids were reduced less than one percent. Consequently, there was little evidence that the estimation procedures actually served as a check on the eventual contract price. The interim JLARC report cited one case where a project was advertised for bids on three occasions, and the bid finally accepted was \$31,000 higher than a bid previously received on the project and rejected.

Since the interim JLARC report, the department has taken several actions to improve the engineering estimates. Five staff positions have been added in the construction division to refine estimates of project costs. These estimates will be based on current materials prices and will serve as a check on bids submitted independent of the engineering estimates. In addition, the construction division is adapting a charting procedure developed by the Attorney General to aid in identifying potential cases of bid-rigging. These actions should improve DHT's control over costs.

Administrative Costs. Administrative costs cover DHT inspectors' salaries and overhead associated with projects. The federal government reimburses DHT for project-related administrative costs at the same rate as construction costs, up to ten percent of the project cost.

In FY 1980, 40 percent of the 198 projects completed incurred administrative costs in excess of the limit for federal reimbursement, costs which must be absorbed by DHT. For an interstate project with administrative costs of ten percent of the project value, for example, the federal government pays 90 percent of the administrative costs and the State pays ten percent. But because of the ten percent federal reimbursement limit, a project with, say, 20 percent administrative costs results in DHT's paying 11 percent of the total project cost, or 55 percent of the administrative costs. In FY 1980, State administrative costs in excess of the federal limit totalled as much as \$770,000, for which no federal reimbursement was made.

Control over projected-related administrative costs could be improved by specifically monitoring these costs. Projects which have administrative costs approaching ten percent should be identified and project staffing immediately reassessed to keep costs within the ten percent limit for federal reimbursement.

Work Orders. The work order approval process is a key method of controlling costs on construction projects. This process provides a mechanism whereby the department can add items of work or change the scope of work required by the contract after construction has begun. Before the contractor may begin the additional work, however, the work order must be approved at a higher management level within the Department, as shown in Table 11. If total project spending will exceed the project allocation, the Chief Engineer must approve any added spending.

Table 11

MANAGEMENT APPROVAL OF CONSTRUCTION WORK ORDER

| <u>Work Order Value</u> | <u>Approved By</u> |
|-------------------------|--------------------------------|
| Up to \$25,000 | District Engineer |
| \$25,000 - \$100,000 | Construction Division Engineer |
| Over \$100,000 | Chief Engineer |

Source: DHT.

The study by R. J. Hansen Associates recommended raising the dollar limits for approvals because inflation had increased the number of work orders requiring approval from the central office. Since 1977, however, the number of work orders requiring central office approval has not increased significantly (Figure 9). In fact, 383--more than three-quarters of all work orders--were approved at the district level in FY 1980. Only 33 work orders required the approval of the chief engineer.

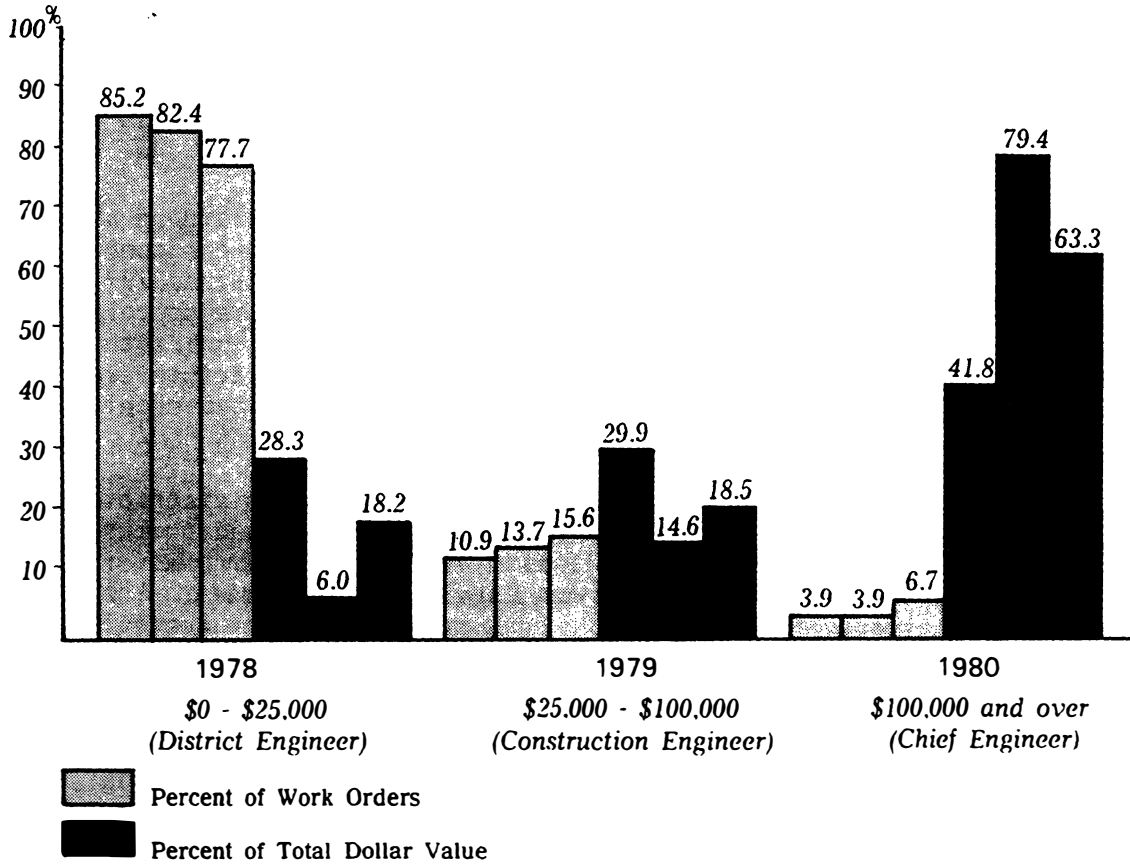
A review of work orders in 1980 shows that implementation of the Hansen recommendation would shift control of overruns away from the chief engineer. The current dollar limits for approval provide for most work orders to be handled at lower levels, while most of the dollar value of increases are approved by top management in the central office (Figure 9). In FY 1980, 78 percent of all work orders were approved by the district engineers, while 63 percent of the total dollar value of the work orders was approved by the chief engineer.

Under the approval limits proposed by Hansen, the chief engineer would have approved 14 work orders valued at \$6.8 million instead of 33 work orders valued at \$9.1 million. The current system of approvals provides adequate control of high-cost overruns from the office of the chief engineer while avoiding excessive paperwork for top management.

INFORMATION SYSTEMS

Automated data processing provides DHT with useful management information. Through automated information systems managers can be alerted that something which was supposed to be done according to plan has not been done or is not being done well enough. Providing such information in a comprehensive and timely manner is the hallmark of an effective information system.

Figure 9
WORK ORDERS APPROVED
 1978-1980



Source: DHT Summary of Work Orders.

The data processing division develops and maintains the department's automated information systems. In FY 1981, DHT spent \$2.2 million to support the division. Computer equipment is provided to DHT by the Department of Computer Services.

Both the JLARC review and the review conducted by R. J. Hansen Associates have noted that DHT has made major strides in developing automated information systems. In fact, without the assistance of the data processing division the cost responsibility study mandated by SJR 50 could not have been completed. But some systems

seem to have a constrained role and limited usefulness. Systems are used mainly as monitoring devices, although in some cases their role in management decision making could be significantly enhanced by small changes. Weaknesses in information systems also appear in the usefulness, timeliness, and accuracy of some automated reports.

Need for Information Systems

Information systems can facilitate management efficiency in many ways. But information users in the department have not been regularly surveyed to determine unmet management information needs. One survey, which was limited to the use of existing data processing reports, was conducted prior to 1974. A second survey was completed in July 1981. This survey identified 117 specific information needs, ranging from minor adjustments in existing systems to requests for major new systems.

The usefulness of some existing information systems could be increased by improvements identified in the recent needs assessment. For example, systems which are limited simply to monitoring information could be used to adjust and improve communication of key management information such as target dates, manpower needs, projected stock needs, and financial commitments. While monitoring may be appropriate, the real information needs of management may not be met by current systems, as in these examples:

The automated inventory system is not currently used to predict future needs for materials and supplies. Data currently collected on issues of items could be used to generate information on future needs. Instead, field units must base reorder levels on past experience or previous orders, an approach which does not account for increasing or decreasing demand. This practice has contributed to overstocking of supplies.

* * *

The project development and management system (PDMS) could be programmed to automatically generate intermediate target dates between the conception of a construction project and the date for advertising the project for bids. When the PDMS was first established in 1976, the system was limited strictly to information monitoring. The advertising review committee continues to set the intermediate target dates manually, a cumbersome process that could be handled quickly by the computer.

The data processing division should use the recent needs assessment to determine priority tasks and address the needs. Such assessments

should be conducted every two or three years to identify new information needs.

Timeliness and Information Adequacy

Much information is available to management from DHT's information systems. However, two problems exist: information sometimes reaches the potential user too late, and information reported by the systems is not always adequate. As a result, decisions are sometimes based on inadequate data, and in some cases records are kept manually as well as in automated form.

Timeliness. To be useful, information provided by a management information system must reach the manager before a decision is made. Information that is not timely cannot be used to plan or direct activities.

Timeliness has been a key weakness with the project development and management system (PDMS). This system is a primary tool in planning and coordinating preconstruction activities. Although district preconstruction staff depend on the system to plan their work, the PDMS is not consistently updated when target dates for projects are changed. This lag in updating information has caused staff in some cases to continue work on projects that have been delayed or cancelled.

Also, reports generated by the maintenance management system (MMS) were found to be reaching field managers too late to be useful in planning residency and district activities.

Maintenance activity reports and equipment reports are prepared monthly and distributed to districts and residencies. However, the reports are not actually received by the field units until late in the following month. Consequently, some residencies have kept manual records to provide information on equipment and maintenance activities. As a result, the reports are widely perceived by residency and district staffs as not being as helpful as possible.

In this instance, information received through the automated system was too slow to meet the field managers' needs, and other sources were more timely. Clearly, the usefulness of this system could be improved by adjusting the data processing schedule to meet the needs of field managers.

Adequacy of Information. Managers need valid and accurate information on which to base decisions. However, three instances were identified of invalid data being entered into information systems. In one case corrections are made manually so the final user of the information receives accurate data.

The traffic and safety division maintains an extensive database of descriptive characteristics of Virginia's highway system. Because data--such as lane-miles of interstate--is shared between divisions and between information systems, there should be agreement about the data accuracy. However, staff in DHT's maintenance division routinely make corrections to the data prior to use in the maintenance management system.

Such manual changes reflect an acknowledgement of data inaccuracy and reflect a need to improve the system.

In another case, inaccurate data are entered into an information system without being corrected, a condition which erodes the usefulness of the system.

In the stock inventory management system, data were routinely recorded incorrectly by four of the 12 residency storeroom clerks interviewed by JLARC staff. These recording errors make reconciliation with the computerized inventory printout meaningless.

* * *

During the 1978-80 biennium DHT spent \$4.7 million on repairing sidewalks. Field staff recorded these expenditures as "maintenance replacement engineering" instead of "roadside structures." The result was to show higher expenditures in one activity than actually occurred and lower expenditures in another activity.

The usefulness of these information systems can be improved by ensuring that data are entered accurately into the system.

For operating managers, information should be simple and clearly formatted. Data are sometimes presented in a form that hampers use, however. In one case, for example, inventory of hundreds of transactions is provided instead of a summary report. In other cases, all levels of the organization receive identical and lengthy reports, creating unnecessary paperwork for upper levels of management and obscuring the important items.

The maintenance division receives the complete listing of activities that occurred in each county. Staff in the division attempt to monitor each residency's activities by manually aggregating counties into residencies, although this is not a consistent practice. The result is that manpower is spent aggregating counties, which the information system could do more quickly. In addition,

delays occur in transmitting summary data to the field units. The division should be provided with reports for such major cost responsibility centers as residencies.

* * *

Equipment utilization in terms of percentage of the utilization standard is an important indicator of effective fleet management. Until recently, an equipment division report listed hours of use for each vehicle but showed no totals for classes of vehicles or percentage utilization figures.

* * *

Similarly, monthly equipment reports list year-to-date broken down time for each vehicle but do not identify vehicles with excessive broken down time. As a result, staff manually determined which units had excessive broken down time.

* * *

The maintenance management system lacks comparative reporting by geographical area, by "level of effort" and by cost. The system is used to update budget guidelines and review accomplishments, a use which could be facilitated by comparative reporting.

* * *

DHT managers receive a substantial amount of information that is cumbersome and less useful than it should be.

The department could benefit from a comprehensive review of its automated information systems. The Department of Management Analysis and Systems Development (MASD) should conduct such a review specifically looking at timing of reports, data accuracy, level of detail in reports, and improved use of exception reports.

In addition, DHT should consider a data base management system for organizing its data files and computer programs. Where appropriate, stand-alone programs should be integrated into systems. A consequence of these efforts would be the need for increased agreement between divisions on how data should be reported. A position of data base manager should also be considered. This person would coordinate the integration of the separate files and programs and would help ensure that service to information users is improved.

CONCLUSION AND RECOMMENDATIONS

Although DHT has established extensive support for management decisionmaking, a review of administrative controls and information systems found several gaps and weaknesses. Due to the prospect of decreasing revenues, the department needs to take an aggressive and comprehensive approach to improving these controls and procedures. A variety of steps should be taken.

Controls

Recommendations to strengthen management and administrative controls follow:

Recommendation (14). The department should clarify the role of the maintenance division in controlling spending for ordinary maintenance at the residency level. Control would be improved by more systematic monitoring of expenditures against budgets with exception reporting of overexpenditures provided to field staff and the director of operations. Separating snow removal spending from other maintenance expenditures for monitoring purposes should be considered.

Recommendation (15). DHT should consider conducting a review of the expendable equipment inventory to identify means of monitoring the use of such equipment.

* * *

The following recommendations related to inventory management (16-24) have been reviewed and accepted by the department:

Recommendation (16). DHT should establish desirable inventory levels for all classes of general supplies. These desired levels should be incorporated in the automated inventory information system and used as a guide by purchasing agents and field stock clerks in determining when to requisition and purchase additional stock. DHT should eliminate current overstocking by delaying additional purchasing until appropriate levels are reached.

Recommendation (17). DHT should review its policies governing local purchases. Policies on dollar limits and competitive pricing should either be enforced or amended.

Recommendation (18). Purchasing agents should review local purchase invoices on a sample basis to determine compliance with DHT policies, and to determine whether particular items are purchased frequently enough to justify central purchasing. The sample should be statistically reliable but need not involve an extensive commitment of time on the part of central office staff.

Recommendation (19). The purchasing division should conduct audits of every stockroom annually. When samples are used, a statistically reliable method of selecting the items for audit should be used. The sample should be weighted to account for the relative value of the class of stock to be audited.

The audit reporting format should be revised to include more specific information on the size and dollar value of errors. Greater attention should also be given to reporting use of improper procedures or failures to comply with policies. The audit report should be provided to district and resident engineers in a more timely fashion.

DHT should consider simplifying quarterly inventory corrections by removing the approval requirement before a correction is processed. Supervisory review should focus on the corrected inventory reports and on audit reports.

Recommendation (20). The DHT purchasing division should develop a training program for stockroom employees. Particular attention should be given to procedures for conducting quarterly inventories and correcting errors in the inventory. The importance of retaining proper documentation should be stressed.

Recommendation (21). The purchasing division should require that all salvage parts be inventoried by the stock clerk and inventory records maintained. Salvage parts should be kept in controlled areas consistent with procedures for other parts and supplies.

Recommendation (22). Stockrooms should continue to be considered areas of controlled access. But DHT should improve compliance with limits on access. A bill of lading should be used to control shipment of parts and supplies from district to residency and area headquarters.

Recommendation (23). Salvaged road stock should be inventoried and records maintained on the amount and location of salvaged materials.

Recommendation (24). The equipment division should post information on procedures for issuing gasoline at self-service pumps. Pumps should be locked whenever feasible in the absence of DHT personnel. All storage tanks should be equipped with locks.

Recommendation (25). Procurement procedures used by the purchasing division should be strengthened to reduce the possibility of fraudulent activity and to conform to accepted purchasing procedures.

- a. The procurement function should be divided between two separate sections within the purchasing division. Buyers should not send, receive, open, or tabulate bids.

- b. All vendors should register with the department before submitting bids on any contract. Disclosure of corporate affiliations should be required and vendors should update the registration as necessary.
- c. All bidders should be required to sign a statement that the bid is being made without any collusion.
- d. The procedure for awarding contracts when bids are tied should be revised. The department should consider referring identical bids to the Attorney General for review, as does the Division of Purchase and Supply.

Recommendation (26). The department should review its preventive maintenance policies and guidelines. A clear policy on preventive maintenance should be developed and communicated to the residencies, and the equipment division should ensure that it is consistently carried out. Weekly shutdowns for preventive maintenance should be discontinued.

Recommendation (27). DHT should improve on the existing equipment information system by developing lifetime cost profiles for each age group of all major equipment classes. These profiles should be used as a budget and management guide. DHT should also consider a separate budget activity for equipment maintenance.

Recommendation (28). The right-of-way division should complete its residue parcel listing and place a higher priority on disposing of large or valuable parcels. Random inspections of residue parcels should be conducted by district right-of-way staff to guard against improper use of DHT property. State agencies located near residue parcels should be notified and provided an opportunity to acquire such property.

Recommendation (29). DHT should specifically monitor construction engineering. A summary report should be prepared which identifies projects that have construction engineering costs approaching ten percent of the project's value. Based on this information, the construction division should reassess staffing for these projects in order to minimize additional construction engineering costs.

Recommendation (30). Current dollar limits for approval of work orders by the construction engineer and chief engineer should be retained.

Information Processing

Recommendation (31). Steps should be taken to review and modernize DHT's present data processing system with the objective of providing the department's managers with information that is accurate, up-to-date, and meaningful. The Department of Management Analysis and Systems Development should conduct a comprehensive assessment of DHT

data processing, looking specifically at information needs, timing of reports, data accuracy, level of detail in reports, and improved use of exception reports. Such assessments should be conducted every two to three years.

Recommendation (32). DHT should explore with MASD the feasibility of a data base management system for organizing its data files and computer programs. A staff position of data base manager should be considered in order to facilitate the integration of the department's computer systems and programs. Every effort should be used to recruit a person who is educated and trained in the computer sciences.

IV. Organization and Personnel

The Department of Highways and Transportation (DHT) is a sizeable bureaucracy with an extensive field organization and 11,818 authorized positions. DHT has established 85 separate organizational units, 54 of which are located throughout the State, with eight levels of management between the commissioner and the crew that performs highway maintenance.

Organizing such a large and diversified group into an effective work force is a difficult undertaking. The department's success in achieving the highway and transportation goals of the Commonwealth reflects, in part, the soundness of its organizational structure. The organizational framework within which DHT staff presently operate is fundamentally sound. Still, a reorganization of the central office would provide a better distribution of workload, enhance oversight of field operations, and ensure proper coordination of needs assessment and program budgeting. Geographical boundaries of some districts should also be adjusted to take into account recent changes in population and lane-miles.

DHT personnel possess a rich mixture of administrative, engineering, and technical skills. Much of the engineering and technical expertise has been obtained through many years of on-the-job experience and training. Recent shortfalls in revenue, however, have forced the department to cut back personnel and the department has implemented a layoff policy, reducing staff primarily in construction-related positions. By mid-decade, the department could be operating with 1,500 fewer authorized positions.

An initial layoff of 126 positions occurred in July 1981. An additional cut of 125 positions was made in October. But employee layoffs have been delayed for two reasons: the belief that additional revenue would make layoffs unnecessary, and the absence of clear guidelines for identifying surplus positions. As a result, it is difficult to ensure that the remaining mix of positions is sufficient to carry out vital tasks. A stronger manpower planning function could result in better control over personnel reductions.

ORGANIZATION

The organizational evolution of DHT has been influenced by a number of significant legislative and executive initiatives. In 1906 the General Assembly created the highway department. At that time the principal functions of the department were to allocate State aid to counties on a matching basis and to advise counties on road construction methods. Later legislative actions expanded the authority of the

department. The State highway system was initiated in 1918, incorporating 4,000 miles of road previously administered by counties. The Byrd Road Act of 1932 brought all county roads into the State secondary road system at county option. And landmark legislation was enacted by Congress in 1956 authorizing the creation of the interstate system of highways. These federal and State legislative actions left their mark on the DHT organization structure. By the early 1960s the department had evolved into a complex organization employing over 10,000 persons.

In 1962 sweeping revisions in the department were recommended by the Stone Commission, which concluded that the structure was outdated and inefficient. A streamlined organization was proposed to delineate clearly the authority and duties of the highway commission, commissioner, deputy commissioner, and other important division heads. The number of organizational units reporting to the highway commissioner and deputy commissioner was reduced from 15 to five. Directorates were proposed for operations, engineering, right-of-way, programming and planning, and administrative process. An important objective was to get problems handled at the lowest practical echelon of the organization while maintaining proper management controls. The department's present structure derives largely from the Stone Commission proposal. There have been several major exceptions, however.

During the 1970s, the department became more involved in broader transportation issues, and transportation planning became an important facet of the highway program. In 1971 planning was separated from programming and established as a fifth directorate. The name of the department was changed in 1974 to the Department of Highways and Transportation. Although the department's primary program emphasis remained highway construction and maintenance, the change recognized the growing interrelationships among all forms of transportation. In 1978 the General Assembly created a division of public transportation within DHT, and a rail division was created in 1979 in response to federal rail planning legislation.

More recently the structure of DHT has been affected by the revenue shortage. Steps have been taken to strengthen fiscal management and project programming. The department created a financial affairs directorate to coordinate fiscal and budgetary matters. In addition, the program management directorate was abolished and its responsibilities transferred to the planning directorate. The latter change ensures improved coordination between transportation planning, programming, and scheduling activities.

Structure

Since the Stone Commission study the central office has undergone organizational change. The present organization is illustrated in Figure 1. Several key problems exist with the central office structure, however:

- An increasing number of important organization units are reporting to the highway commissioner;
- Planning and programming activities need to be more closely coordinated with the program budgeting process;
- The public transportation division is not functioning as the General Assembly intended; and
- Matters related to internal auditing are not reported directly to the highway commissioner and the Highway and Transportation Commission.

A proposed reorganization of the central office is shown in Figure 10. The thrust of the proposed reorganization is to distribute workload better among DHT top managers and to strengthen oversight and coordination of field operations and planning and budgeting activities. Directors would continue to have authority over distinct functional groups of activities, and the status of the district engineers is maintained. Consistent with the Stone Commission proposal, the objective of the proposed reorganization is to get problems handled at the lowest level of the organization while reinforcing proper management controls.

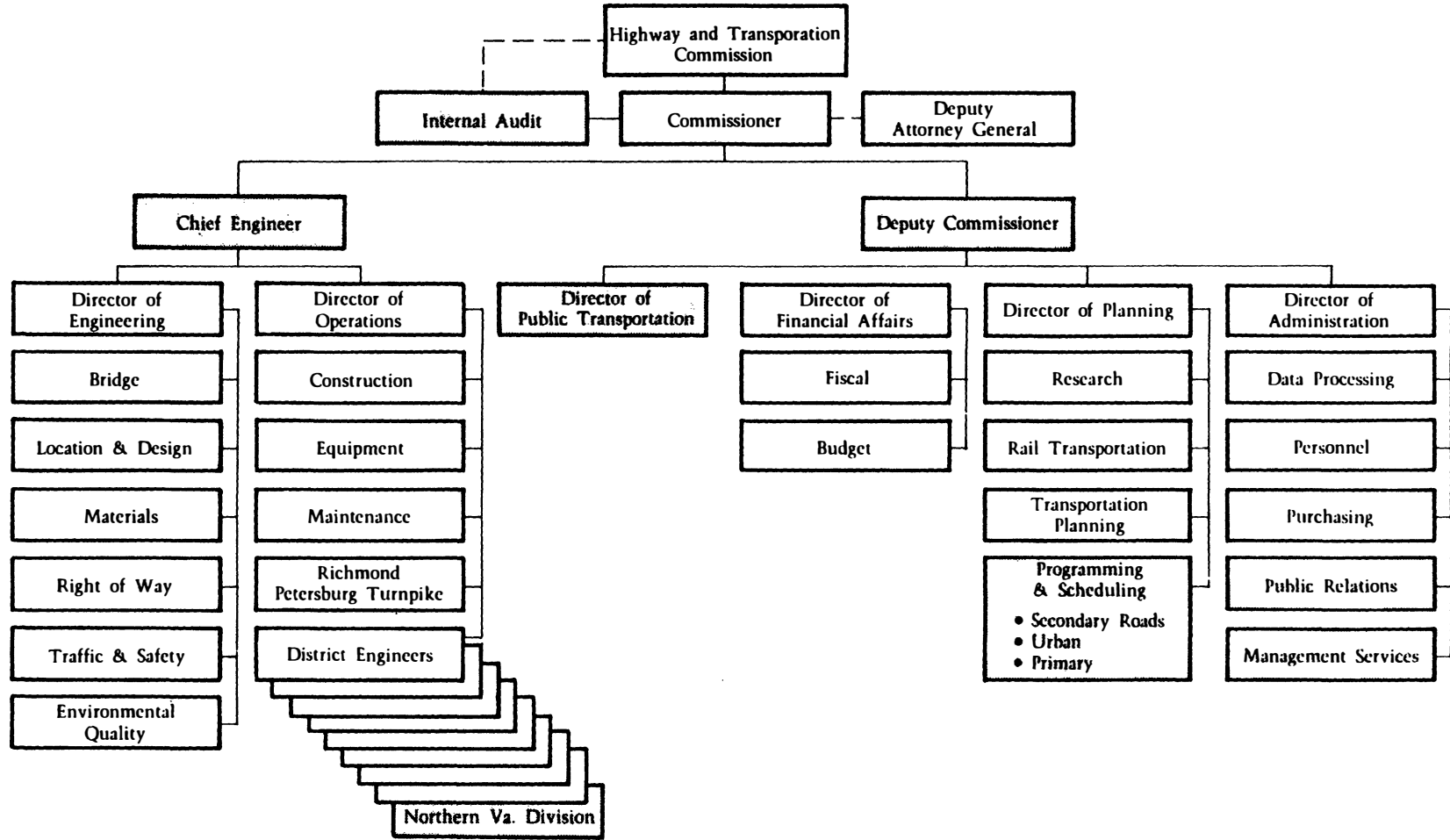
The proposal splits the position of chief engineer-deputy commissioner. The deputy commissioner would oversee planning, budgeting, and administrative functions, and public transportation would be elevated to a directorate with a clear reporting relationship to the deputy commissioner. All operations and engineering functions would fall under the chief engineer. Some of the staff of the management services division would be reassigned to an internal auditing division and others to engineering, methods improvement, and policy research duties. The environmental quality division would be transferred to the engineering directorate.

Top Management. Legislation establishes two top management positions in the highway department--State highway commissioner and chief engineer-deputy commissioner. Section 33.1-3 of the *Code of Virginia* states that the highway commissioner "shall be an experienced administrator, able to direct and guide the Department in the establishment and achievement of the State's long-range highway and other transportation objectives." The duties of the deputy commissioner and chief engineer are not defined in legislation.

The workload of the commissioner and chief engineer-deputy commissioner have long been a subject of concern. A management study performed for the Stone Commission in 1962 identified an excessive concentration of administrative responsibilities on these department executives. Four major administrative units, including the purchasing agent, fiscal director, personnel director, and right-of-way engineer,

Figure 10

PROPOSED REORGANIZATION OF DHT OFFICES



were reporting to the highway commissioner. The Stone Commission reached the following conclusion:

The present statutes and organization concept require the Highway Commissioner to establish the plans and objectives of the Department and to play the leading role in carrying out programs to achieve these ends. In effect, he is the chief executive officer and the chief operating officer of this very large agency. It is apparent that the Commissioner, under the present arrangement, becomes so involved with many minor operating problems that he has inadequate opportunity to devote effort to the executive responsibilities of his position. The Chief Engineer, who is second in command, could relieve his superior of many operating problems with a net beneficial effect on the contribution of both officials. . . .

. . . The Chief Engineer-Deputy Commissioner should be appointed by the State highway commissioner, subject to the approval of the Highway Commission. He should function as the chief operating officer of the Department with authority over all divisions of the Department. . . . (emphasis added).

Ironically, the present organization is experiencing similar problems. The highway commissioner is personally involved in the daily direction of three major organizational units--administration, financial affairs, and public transportation. The duties of the chief engineer-deputy commissioner were recently realigned and his workload lessened. The commissioner has stated that he has assumed responsibility for the administrative and financial affairs directorates because he has a special interest in them. By doing so, however, the ability of the commissioner to carry out his executive responsibilities successfully may be hampered. If the workload of the present deputy commissioner-chief engineer position is excessive, then creation of separate positions for a deputy commissioner and a chief engineer would result in a better distribution of workload at the top management level.

Under the present arrangement at the top management level, planning, programming, and budgeting functions are not coordinated by the same manager. The financial affairs directorate reports to the commissioner while the planning and programming directorate reports to the deputy commissioner. Highway construction needs assessment activities of the planning directorate, however, need to be more closely linked to the fiscal planning activities of the budget division. Many decisions made by the programming divisions (Programming and Scheduling, Urban, and Secondary Roads) will affect the construction portion of the program budget. For this reason, coordination under the deputy commissioner appears to be the most logical organization of these functions.

Four directorates would report to the deputy commissioner-- administration, planning and programming, financial affairs, and public transportation. Policy planning and development would also be a major responsibility of the deputy. To carry out this responsibility, a small policy research and statistics team (one or two persons from the management services division) should be available to the deputy. An important activity of this team would be to perform special policy studies at the request of the commissioner and deputy commissioner. From time to time, staff from other DHT units could be temporarily assigned to the team for special projects.

The chief engineer would oversee the engineering and operations directorates. District engineers would continue to report to the director of operations.

In conclusion, the proposed organization would provide specialized leadership and coordination both in operations and in planning and budgeting. All directorates would report to these two managers. The deputy commissioner would serve as a strong spokesperson in the department for all matters related to transportation policy development, fiscal planning, and program budgeting. The chief engineer, on the other hand, would supervise highway and construction activities and exert an appropriate level of control over field operations through his staff divisions.

Finally, and most important, the highway commissioner would direct and guide the department in the establishment and achievement of the Commonwealth's long-range highway and transportation objectives. He would function as the chief policy officer of the agency.

Internal Auditing. Internal auditing is a key function for informing top management about the effectiveness and efficiency of agency operations. According to the Institute of Internal Auditors, internal auditing fulfills the following role:

[It] is an independent appraisal function established within an organization to examine and evaluate its activities as a service to an organization. The objective of internal auditing is to assist members of the organization in the effective discharge of their responsibilities. To this end, internal auditing furnishes them with analyses, appraisals, recommendations, counsel, and information concerning the activities reviewed.

Many of the studies currently prepared by the management services division are internal audit-related. However, the division does not report all management-related findings and recommendations to the Highway and Transportation Commission. Nor does the division receive any direction from the commission. The existing organization structure requires the division to report to the director of administration.

The division conducts a variety of financial and management audits. Over a two-year cycle, it conducts audits for the Federal Highway Administration of all federally-assisted DHT activities. These audits cover preliminary engineering, construction, highway planning and research, financial management, and right-of-way acquisition. The division also conducts audits of functions not covered by federal aid, such as ferry and toll collections, employment practices, and private equipment rental. In addition, the division conducts no-notice, on-site quality control inspections of construction projects. Management reviews which assess the effectiveness and efficiency of division, residency, and district operations are also performed.

Financial audits are reported directly to the commissioner and to the audit committee of the Highway and Transportation Commission. However, findings from management audits are not automatically reported to the commission or the commissioner. Instead these findings are reported to the director of administration and the head of the division reviewed. According to the Institute of Internal Auditors, an internal audit unit should always report to "an individual in the organization with sufficient authority to promote independence and to ensure broad audit coverage, adequate consideration of audit reports, and appropriate action on audit recommendations." Clearly, the director of administration does not have this authority.

A second problem with the division's reporting relationship is that major recommendations may go unheard by the appropriate levels of management, as in the following case:

The management services division reviewed the operations of the rail division in August 1980. The review recommended either that the division be given an increased role within DHT or that DHT propose to the Secretary of Transportation that a new rail agency be created. The report went to the rail division, the director of administration, and the director of planning. It was never formally transmitted to the commissioner or the commission. No action was taken on either recommendation.

Management and operations reviews performed by the management services divisions are internal audits and should be reported both to the commissioner and to the commission.

In particular, the audit committee of the Highway and Transportation Commission should receive all internal audit reports. It should also participate in selecting topics for internal audit review. Commission members would be provided with important information about department operations and, as a result, would be better able to carry out their statutorily assigned duty "to review and approve policies of the department and State highway objectives, to assist in establishing such policies and objectives, to oversee the execution thereof, and to report thereon to the Commissioner."

Furthermore, a survey of DHT internal auditing should be carried out by the Office of the State Internal Auditor. The auditor should assist the department in preparing and organizing an internal audit program consistent with appropriate State policies and guidelines.

Division of Management Services. Creation of a separate internal audit unit will free the management services division to focus on policy research and improved organizational efficiency. Value engineering, methods improvements programs, and engineering research are three ways that DHT could save substantial sums by improving work efficiency. The division should have a stronger role in these activities.

Value engineering is a procedure whereby teams of designers review preliminary project designs to reduce costs. For example, a value engineering team suggested eliminating curbs and gutters and making minor geometric changes on one road design--for a savings of \$621,167 on a \$4.5 million design.

DHT has used value engineering for eight years but has no formal process for selecting projects. And it is not certain that projects with the greatest potential for cost savings are currently being submitted for value engineering review. The function is now limited to the location and design division, but it should be expanded to include personnel from other divisions. Also, designating a value engineering coordinator should be considered to provide uniformity of project screening and to chair value engineering teams.

The management services division might also give more attention to methods improvement programs, which are an important means to increase productivity. Interviews conducted with field personnel and maintenance division staff revealed that residencies try various methods in performing tasks. At present, though, technology transfer is largely informal, and new ideas travel from residency to residency without the benefit of systematic evaluation and dissemination. For example:

Although the rotary ditcher was first introduced in 1979, the maintenance division has not evaluated its performance in the residencies where it is used or compared it with methods used in other residencies.

Engineering research is a function largely lacking within DHT. Engineering research attempts to make statistical and other models to represent DHT processes. During the JLARC review several areas were identified where savings could be obtained by using a model to predict future needs. Two areas mentioned in this report are lifetime costing for rental equipment and inventory management.

The role of the management services division should be strengthened by assigning it coordinating duties for value engineering,

methods improvement, and engineering and policy research. As the department's focal point for these tasks, the division should take the lead in using interdisciplinary skills to develop a more efficient department.

Public Transportation. In 1978 the General Assembly mandated the establishment of the public transportation division within DHT, which would report to the commissioner. The high-level reporting relationship was intended to prevent the special needs of public transit from being overshadowed by the traditional highway responsibilities of the department. However, the commissioner reports that he has directed the Public Transportation Engineer to report for day-to-day purposes to the director of planning. Moreover, it appears that the public transportation division lacks the organizational status intended by the General Assembly.

The General Assembly specified that the division would have the following objectives:

- To determine the present and future public transportation needs in the State;
- To formulate, implement and evaluate public transportation plans and programs;
- To develop appropriate data and investigate matters affecting the economic and efficient operation of public transportation activities in the State;
- To maintain liaison with all governmental and private entities responsible for public transportation programs; and
- To administer State and federal grants for public transportation purposes in Virginia.

The division carries out activities in each of these areas, with grant administration the most visible of the division's activities. In all, eight programs are administered through this agency. The division directly administers the State Aid Program for transit systems. Transit systems as well as innovative programs such as ride-sharing are funded through the State Experimental Mass Transportation and Ride-Sharing Program. These State programs and six federal Urban Mass Transit Administration (UMTA) grant programs provided approximately \$44 million to the 15 transit systems in Virginia during FY 1980. The division has thirteen staff, one-half of whom are paid from federal funds.

In contrast to its administration of grants, the division does not appear to fully meet legislative intent for conducting efficiency studies or needs assessments of public transit. The division has had little involvement in highway activities directly tied to public transit, such as the development of suburban park-and-ride lots or commuter rail funding. Both activities were handled by other units

without consulting the public transportation division. In addition, the division appears to have had little impact on DHT's budget; the division was approached for an estimate of transit needs after the 1982 budget was already prepared.

Although the public transportation engineer is included in regular department staff meetings, he is not regularly involved in department decision-making or involved in suggesting alternatives to new highway construction. Interviews with Highway and Transportation Commission members revealed that they were generally unaware of the activities of the public transportation division.

It appears that several actions could be taken to give transit issues more visibility within the department. First, the public transportation division could become a directorate within DHT reporting to the deputy commissioner. This move would provide both visibility and an appropriate degree of participation in DHT decision-making. Second, a commission subcommittee should be organized that would be concerned with policies and problems in the public transportation area. Finally, one member of the highway commission should be designated to represent transit concerns and chair the committee.

Should the General Assembly decide it wishes even greater visibility for public transportation needs and issues, the public transportation division could be abolished and a separate agency established, as originally proposed by the Hopkins Commission. This commission recommended the creation of a separate public transportation agency to administer grants and help ensure that public transit issues received adequate attention. An expanded State public transportation role would require additional staff and additional funding.

Rail Division. The rail transportation division was established administratively by DHT in 1979. The major activity of the division is development of the State rail plan, which is required for obtaining federal funds under the Rail Continuation Assistance Program. The division also administers the expenditure of federal funds under the Rail Assistance Program.

The rail transportation division has a dual reporting relationship. Under an agreement with the Secretary of Transportation, the division reports to the secretary on matters of rail policy and to DHT's director of planning for general administrative direction and guidance. In a recent review of the rail transportation division, the management services division made the following observation:

Neither the Secretary nor DHT has adequately defined their respective areas of responsibility. Since no definite direction has been established by the Secretary, the Rail Transportation Division has had to assume the task of deciding which subject is a policy consideration and which is general administration. Thus, with the current reporting structure that exists, DHT is in a position to review State Rail Policy prior to its submission to the Secretary.

This lack of clear responsibilities reflects the fact that the division, according to the management services report, "was incorporated into DHT with no defined purpose other than to comply with Federal regulations in developing a State rail plan."

The lack of a clear reporting relationship and a change in the responsibilities of the division have hindered the Rail Transportation Division. In order to strengthen the State's role in rail transportation, the relationship between the rail transportation division and the Secretary of Transportation should be clarified. The secretary could identify rail policy topics on which the division could conduct research and recommend actions. Expanding the division's role should also be considered. Specifically, the management services report identified five activities for rail division participation:

1. Providing assistance to local officials relative to rail line acquisition/preservation;
2. Assisting localities that have acquired rail property in planning rail services;
3. Providing improved rail liaison with local public and private agencies (for example, Industrial Development Commissions, State Rail Advisory Committee);
4. Assisting industrial complexes to obtain rail service;
5. Helping railroads improve their ability to meet Virginia's future coal shipment needs.

Two factors may also alter the responsibilities of the rail division. The Eastern Shore rail line has been the primary recipient of federal funds administered by the rail transportation division. However, in October 1981, the Transportation District Commission (comprising representatives of Accomac and Northampton counties) took over the operation of the Eastern Short Line, freeing the division from most of its previous duties regarding the line. But pending legislation at the federal level may provide the division with increased responsibility. While railroad companies now apply to the federal government for loans, Congress is currently considering legislation that would transfer this loan program to the states.

Another option is to establish the division as a separate State agency under the Secretary of Transportation. This option would require enactment of legislation and additional funding.

Environmental Quality Division. In 1971 the technical demands of environmental impact statements caused DHT to create the environmental quality division. Currently the division has 61 personnel in two sections. One section plans the landscaping for new highway construction, while the other section prepares and reviews environmental assessments. About 250 assessments are performed by the staff each

year. Approximately \$1 million is spent annually to conduct environmental assessments. This sum represents about one-half percent of the value of construction contracts awarded for FY 1980 and FY 1981.

The environmental quality division has had two organizational placements since its origin, neither of which has been ideal for the execution of its preconstruction function. According to the environmental engineer, the division was originally located in the administrative directorate because Federal Highway Administration personnel wanted to separate it from the engineering function. It was later placed under the director of planning where it is currently located. The separation was intended to prevent engineering concerns from over-riding environmental concerns.

As DHT designers have become more familiar with environmental regulations, however, design practices have changed and the need to separate the functions has lessened. Further, the Federal Highway Administration environmental coordinator recently expressed no preference as to the environmental quality division's placement within DHT as long as the function was not eliminated. Because increased coordination of the preconstruction functions would occur if the environmental quality division were placed under the engineering directorate, this change should be made.

Division of Program Management. Programming is essentially a continuation of the planning process. Programming translates legislative policies and long-range plans into work programs which link available funds with specific construction projects. Three divisions are currently involved in the programming process. Staff reductions and increased coordination could result from consolidating the three divisions into one program management division.

The programming and scheduling division links specific primary and interstate projects with available funds and schedules project construction. The secondary roads division programs projects for that system, and the urban division works with projects within city and town boundaries. The divisions' responsibilities were originally assigned during a period of rapid construction and abundant funds. Now, however, the construction program is receiving much less funding and the divisions' workloads have either already decreased or will soon decrease. The urban engineer, for example, stated in July 1981 that his division was overstaffed and that by August most of his staff would have little to do.

Because each division provides visibility for and has special knowledge of its programs, the functions of these two divisions should be retained. However, the functions should be consolidated within a program management division comprising all three programming divisions. Also, staff should be cross-trained to assist in the other sections when their own section is less active. This change would allow the combined division to operate with fewer people than the original three divisions.

Further reductions in staff could be realized if the programming and scheduling section automated one of its processes. The secondary roads section uses the automated program development and management system (PDMS) to set preconstruction target dates. But the programming and scheduling division sets these dates for primary roads without the aid of the computer, a cumbersome process requiring several people. The PDMS could facilitate more efficient setting of target dates.

Geographical Structure

In an organization such as DHT, responsibilities sometimes are directly tied to specific geographical and demographical features of the State. Each of the eight construction districts encompasses varying terrain, population, and traffic characteristics, and thereby poses differing problems for the State's chief transportation agency.

While some changes have been made, the department's two basic management units--districts and residencies--have changed very little over the years. District boundaries have not been adjusted since they were first established in 1923, and the number of residencies and their boundaries have been almost as static. Since the State's population has more than doubled since the districts were established, boundaries of the districts, residencies, and area headquarters should be re-examined.

Previous Studies. Over the years a series of studies has suggested altering the geographical structure of the department, but none of the studies considered realigning all eight districts. Based on various factors, the studies identified Northern Virginia as placing the greatest strain on the department's structure, and each recommended altering the existing geographical organization of DHT by creating a ninth district in Northern Virginia (Figure 11).

The department responded to the most recent study by establishing a Northern Virginia division (encompassing Fairfax and Arlington counties, and the cities of Alexandria, Fairfax, and Falls Church) in July 1981. The division administrator reports directly to the chief engineer. The Northern Virginia division appears to be a partial response to the transportation needs of that area. The chief engineer and other DHT staff acknowledge that creating this division is probably a step toward establishing a ninth construction district in Northern Virginia, although the commissioner maintains that the division is a full response to that area's needs. Organizationally a ninth district would be less anomalous than the new division, whose administrator reports to the chief engineer instead of to the director of operations, as do the eight district engineers.

Figure 11
STUDIES OF THE FEASIBILITY OF A NINTH CONSTRUCTION DISTRICT

| <u>Date</u> | <u>Study Group</u> | <u>Recommendation</u> |
|-------------|--------------------------------------|---|
| 1971 | DHT Management Services Division | Include Fairfax, Manassas, and Leesburg residencies in a 9th district |
| 1976, 1977 | Governor's Council on Transportation | Include Arlington, Fairfax, Prince William, and Loudon counties and their cities in a 9th district. |
| 1979 | DHT Management Services Division | Either establish an Assistant District Engineer for Fairfax or include the cities and counties of Arlington, Fairfax, Loudon, and Prince William in a 9th district. |
| 1980 | R. J. Hansen Associates | Include Fairfax residency in an urban district, and phase in other contiguous urbanized counties. |

Three key factors identified by the various studies suggest the need for a ninth district. First, the Northern Virginia localities are experiencing extremely high rates of growth in population, vehicle registration, and traffic volume. The following characteristics of Fairfax County were noted, for example, in the 1979 DHT study:

- Population increased by 16.5 percent between 1970 and 1977, while the State's population increased by only 8.3 percent.
- The number of registered vehicles increased 64 percent compared to a Statewide increase of 45 percent.
- Daily vehicular miles of travel on all highway systems increased 53 percent between 1970 and 1977, while the supporting roadway system increased by just 14.5 percent.
- The county generated fourteen percent of the vehicle miles travelled in the entire State, yet it has only 3 percent of the State's roadway system.

Another major reason for creating a ninth district was identified by R. J. Hansen Associates. While acknowledging workload trends in Northern Virginia, Hansen also found "apparent widespread public dissatisfaction relative to highway construction, fund allocation, long lead times, and other factors--calling for concentration on developing and maintaining an aggressive and positive public information/ public involvement program." The extent and complexity of the area's transportation needs also require increased emphasis on planning and coordination, according to the Hansen report. The need for an improved public

image and for added emphasis on planning and coordination could best be ensured by adding a new district, according to the study.

A third major reason identified by the studies for establishing a construction district in Northern Virginia is the belief that increased levels of funding for highway maintenance and construction activities would result. For example, the 1979 DHT study found that FY 1979 construction allocations to a ninth district, based on three different geographical configurations, would have increased between \$1.4 and \$3.2 million over the allocation actually made to the localities in the area. DHT staff have stated, however, that a multi-year study would show that in some years the localities in the proposed new district would receive less in primary allocations than if they remained in the Culpeper district. This could occur because allocations are driven by project readiness and funding availability, both of which can vary substantially from one year to the next. Although a ninth district would be assured of some amount of allocations while the existing localities are not, it is not clear that they would consistently receive more construction allocations than at present.

Alternatives to a Ninth District. DHT should take a broader look at its geographical structure before adding a ninth district. Annual operating costs to staff a new district would probably range between \$540,000 and \$860,000, the range of expenditures made for the existing districts. Legislation would be necessary to establish the new headquarters, and an additional member would be required on the Highway and Transportation Commission.

Additionally, the existing districts do not have well-balanced workloads. For almost 60 years district boundaries have remained static while population centers have shifted and grown. As a result, for each of eight broad indicators of district workload, the range between the lowest and highest districts exceeds 50 percent. In some cases the difference is as much as 500 percent, as shown in Table 12.

Two districts appear most consistently as highest and lowest across these workload indicators. Culpeper district has the highest vehicle miles travelled, population, vehicle registration, lane-miles, and primary allocations, while Fredericksburg district is the lowest on these factors. Adding a ninth district in Northern Virginia would not affect the workloads of the smaller districts like Fredericksburg, for example.

The boundaries of all eight construction districts should be reconsidered. One way of addressing the problem of workload imbalance and the different growth rates of localities would be to redraw the boundaries of the eight existing districts. For example, by establishing a district in Northern Virginia and redistributing the Culpeper district between Staunton and Fredericksburg districts, a ninth district could be avoided. Figure 12 illustrates alternative boundaries which would create a Fairfax district while retaining a total of eight construction districts statewide. Under this proposal, the Fairfax

Table 12
DISTRICT WORKLOAD INDICATORS

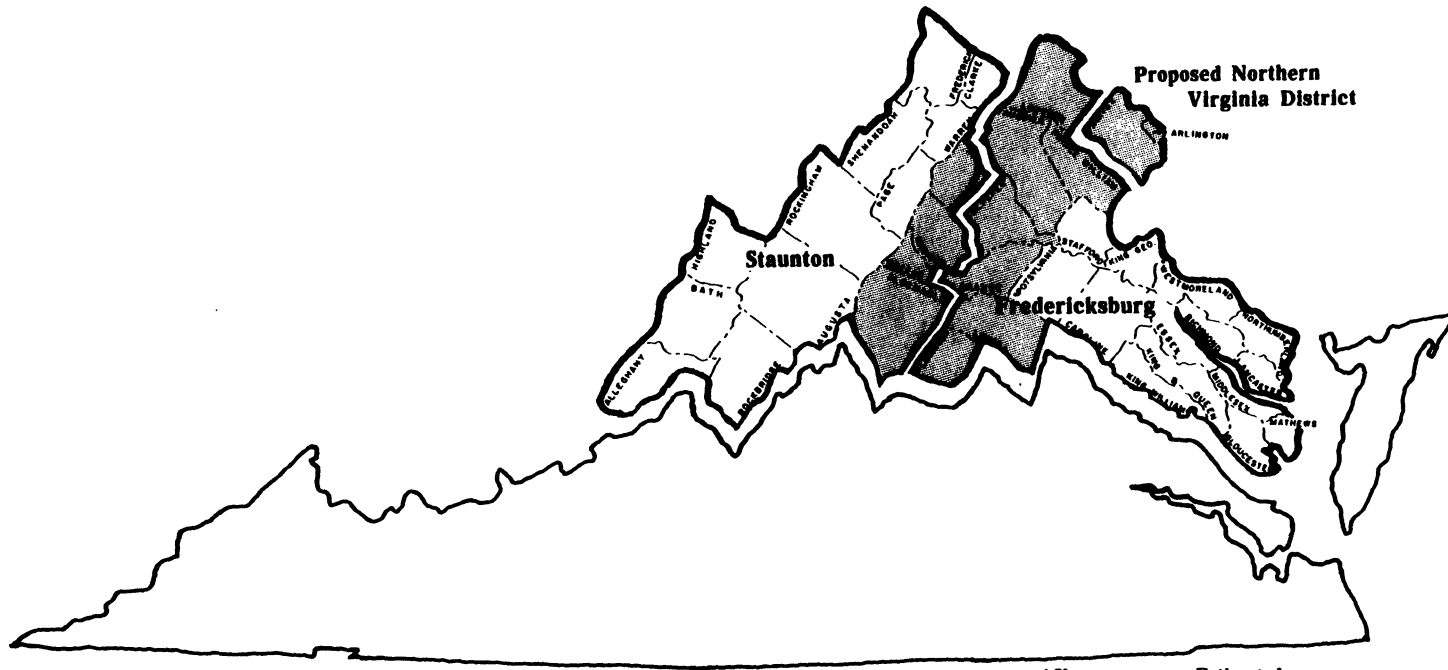
| | <u>Average Daily Vehicle Miles</u> ¹ | <u>%</u> | <u>Population</u> ² | <u>%</u> | <u>Vehicle Registration (1980)</u> ³ | <u>%</u> | <u>Total Lane-Miles</u> ⁴ | <u>%</u> | <u>Area</u> ⁵ | <u>%</u> | <u>Preliminary 4-yr Primary Allocations</u> ⁶ <u>(Thousands)</u> | <u>%</u> |
|----------------|---|-------------|--------------------------------|------------|---|------------|--|-------------|--------------------------|-------------|--|------------|
| Bristol | 5,397,301 | 9.4 | 383,913 | 7.2 | 242,670 | 6.9 | 15,051 | 13.5 | 5538 | 13.6 | 31,001 | 11.6 |
| Salem | 6,206,627 | 10.8 | 567,353 | 10.7 | 395,577 | 11.3 | 16,502 | 14.8 | 5530 | 13.6 | 36,645 | 13.8 |
| Lynchburg | 3,737,603 | 6.5 | 363,009 | 6.8 | 238,190 | 6.8 | 14,752 | 13.3 | 5385 | 13.2 | 33,184 | 12.5 |
| Richmond | 8,937,336 | 15.6 | 840,132 | 15.8 | 558,235 | 15.9 | 14,870 | 13.4 | 5403 | 13.2 | 32,812 | 12.3 |
| Suffolk | 7,732,199 | 13.5 | 1,258,189 | 23.6 | 733,946 | 20.9 | 9,581 | 8.6 | 4755 | 11.7 | 43,145 | 16.2 |
| Fredericksburg | 4,932,654 | 8.6 | 217,931 | 4.1 | 157,238 | 4.5 | 9,708 | 8.7 | 3632 | 8.9 | 20,677 | 7.8 |
| Culpeper | 14,694,565 | 25.6 | 1,325,331 | 24.9 | 915,593 | 26.1 | 17,351 | 15.6 | 5035 | 12.3 | 44,141 | 16.6 |
| Staunton | <u>5,742,855</u> | <u>10.0</u> | <u>365,577</u> | <u>6.9</u> | <u>264,035</u> | <u>7.7</u> | <u>13,509</u> | <u>12.1</u> | <u>5540</u> | <u>13.6</u> | <u>24,508</u> | <u>9.2</u> |
| Total | 57,381,140 | 100.0 | 5,321,435 | 100.0 | 3,510,484 | 100.0 | 111,324 | 100.0 | 40818 | 100.0 | 266,113 | 100.0 |

Sources:

1. Average Daily Traffic Volumes, 1980-Traffic & Safety Division.
2. "1981-82 3 Factor Formula", Programming and Scheduling Division.
3. Department of Motor Vehicles data for calendar 1980. Taken from "Primary Allocation Formula Factors," Programming and Scheduling Division document dated 2/19/81.
4. Maintenance Division & Traffic & Safety Division.
5. "1981-82 3 Factor Formula", Programming and Scheduling Division.
6. 4-year construction program, primary system, Programming and Scheduling Division document, dated 4/23/81.

Figure 12

FAIRFAX COUNTY PROPOSAL



| Proposal | Average Daily Vehicle Miles | % | Population | % | Vehicle Registration 1980 | % | Total Lane-Miles | % | Area | % | 4-Year Primary Allocations (Thousands) | % | Estimated Mileage from District HQ To Farthest Point | Number of Residencies |
|----------------|-----------------------------|-------|------------|------|---------------------------|------|------------------|------|-------|------|--|------|--|-----------------------|
| Fredericksburg | 10,386,817 | 14.84 | 707,888 | 10.2 | 473,049 | 10.6 | 20,117 | 16.7 | 7,106 | 16.3 | 71,536 | 26.0 | 100 | 8 |
| Staunton | 7,363,884 | 12.83 | 484,668 | 9.1 | 322,138 | 9.2 | 17,257 | 15.5 | 7,037 | 17.2 | 53,276 | 20.9 | 100 | 7 |
| 3 Counties | 6,886,391 | 12.01 | 878,823 | 16.5 | 419,567 | 11.9 | 4,487 | 4.0 | 457 | 1.1 | 21,768 | 8.6 | 20 | 1 |

district would have a higher traffic volume than three existing districts and serve more registered vehicles than four districts. Fredericksburg would become one of the largest rather than one of the smallest districts.

A second option, illustrated in Figure 13, is to include the counties of Loudon (Leesburg residency) and Prince William (Manassas residency) with Fairfax in a separate district. The balance of Culpeper district would be divided between Fredericksburg and Staunton districts. The three-county Northern Virginia district would then become one of the largest districts in terms of population, traffic volume, and registered vehicles.

Residency and Area Boundaries. The 44 residencies carry out highway maintenance and construction activities. Organized along county lines, each residency contains one to four counties. Few changes have been made since residencies were consolidated in the 1940s. The most recent adjustments were made in the early 1960s when the Manassas and Williamsburg residencies were created.

Each residency is divided into maintenance areas, with a crew assigned the responsibility for performing the needed highway maintenance. Area headquarters are located in counties and have facilities for housing maintenance crews and equipment and storing materials and other supplies. A headquarter may house one or more crews. Statewide there are 241 areas at 225 locations.

The interim JLARC report noted that DHT could achieve savings through consolidation and elimination of some area headquarters. This finding was based on a comparative analysis of the number of high and low volume lane-miles maintained per employee in Virginia and North Carolina. Virginia was found to maintain fewer adjusted lane-miles per employee (27) than North Carolina (33). A portion of this difference was attributed to North Carolina's more highly centralized field organization and the resulting reduction in timekeeper positions.

Since the interim report, the director of operations has stated that two areas will be eliminated and six areas will be consolidated. However, further review by JLARC staff indicates that greater savings should be possible through more systematic review by DHT and changes in the staffing of area headquarters.

The maintenance division reviews requests from the field for creating areas and locating new area headquarters, and it is conducting the current review for opportunities to consolidate areas. The maintenance engineer has indicated that workload and travel time are considered in assessing the need for areas. According to the maintenance engineer, the objective is to have about 240 miles of road assigned to each area, travel times to work sites within 20 minutes, and areas located close to their workload. In addition, each area superintendent should supervise approximately 20 maintenance personnel. Adjustments are made on judgemental basis to accommodate greater workloads in urban areas and on the interstate system.

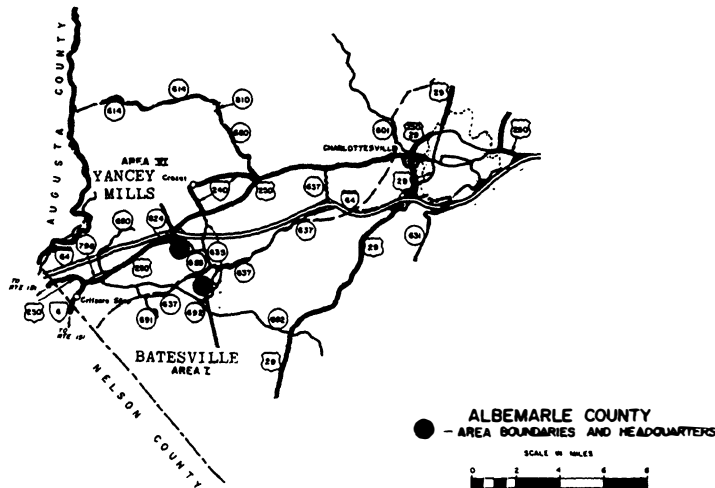
Although the division is reviewing areas for consolidation, all the information necessary to perform a rigorous review is not available. For example, when JLARC staff requested data on the number of miles maintained by each area, the maintenance division could only supply incomplete records. This data covered one district and two other residencies; most of the State was excluded.

There appear to be many headquarters that should be considered for consolidation or elimination since at least half of all headquarters are located within ten miles of another. One example is shown in Figure 14. In many cases the consolidation of nearby headquarters will not substantially increase crew travel times in their areas. Residency boundaries appear to be a factor in locating some headquarters within ten miles. For example, the adjoining counties of King William and King and Queen are in two separate residencies, and each county has two area headquarters. All four headquarters are within about 15 miles of each other.

Figure 14

AREA HEADQUARTERS IN ALBEMARLE COUNTY

In Albemarle County, two headquarters--Batesville and Yancey Mills--are located within ten minutes of one another. According to the resident engineer, this resulted from the opening of Yancey Mills as a Batesville subarea near the interstate, and its subsequent upgrading to an area headquarters. The two areas average 20 percent fewer miles than the next smallest area in the county.



Source: Department of Highways and Transportation.

Additional evidence that many areas should be considered for consolidation comes from a review of the mileage maintained by areas in each district. For example, the number of miles maintained in each county by an area in the Bristol district ranges from 137 miles per area in Smyth County to 223 miles per area in Russell County. In both Lee and Smyth counties, an area could be eliminated and the mileage maintained per area would still fall within the district range. Similarly, if one area were eliminated in Patrick County, the mileage per area would equal the mileage maintained by each area in Henry County, the other county in the residency.

Area boundaries infrequently cross county lines--and then usually just to include a section of road inaccessible to areas in the other counties. One notable exception, however, is the Louisa Residency where one area maintains over 100 miles of road in each of two counties, Fluvanna and Louisa. If similar arrangements were used elsewhere, residency workloads could be more evenly distributed and some areas could be eliminated.

A major motivation for eliminating and consolidating area headquarters is to reduce the number of timekeepers employed and charged to the maintenance program. Timekeepers hold clerical positions and are responsible for recording labor, equipment, and materials used and work performed on sections of road. They also answer telephone calls to the area and staff the headquarters throughout the day.

Staffing practices in the field raise questions about the need for the number of timekeepers employed. When two or more area crews share a headquarters, for example, one timekeeper is used in some cases while several timekeepers are employed in others.

Two area crews operate out of one headquarter in Lee and Roanoke counties. The resident engineers maintain that two timekeepers are needed in each county because each handles a special crew.

In contrast, one timekeeper in Montgomery County handles all records for all three areas in the county, plus the work for three special crews in the residency. The resident engineer believes this arrangement works very well. In each of five additional instances of shared headquarters, only one timekeeper is used for recordkeeping.

This arrangement, furthermore, works not only with shared headquarters but also with residencies which require all areas with separate headquarters in a county to report to one timekeeper in one headquarters. If this practice of using one timekeeper in each county were used throughout the State, the complement of timekeepers could be reduced from approximately 233 to about 100. With salary and benefits for each of these positions exceeding \$10,000 annually, this reduction would save approximately \$1.5 million annually.

On the basis of actual organizational practices and patterns in the field, it appears that greater savings may be possible than currently envisioned by DHT. The department should more carefully review the need for maintenance areas and consider more extensive consolidation of areas. In addition, the number of timekeepers currently employed should be greatly reduced.

Roles and Responsibilities

A major characteristic of the current organization is uncertainty about the roles and responsibilities of the various entities concerned with highway maintenance and construction activities:

- The roles of the divisions in the central office and the field units;
- The role of preconstruction staff in the central office and the districts; and
- The responsibility of the resident engineer.

Relationships Between Divisions and Field Units. Divisions in the operations directorate oversee work at the district and resident office levels. The operations directorate contains three divisions--construction, maintenance, and equipment--which develop policies and procedures. Also located within this directorate are eight construction district offices and 44 residency offices which implement the policies and procedures. This organizational arrangement requires division and field managers to have a clear understanding of their respective roles. But interviews with DHT central office and field personnel revealed that they do not, and weakened control over field units results, as these examples illustrate:

The equipment division sets policy on equipment maintenance. But the division has not monitored or enforced its preventive maintenance policy. As a result, in FY 1980 the preventive maintenance programs in residencies varied from no program at all to the practice of shutting down operations for one-half day a week to wash, lubricate, and inspect all vehicles.

* * *

One district engineer in effect overruled the equipment division as to the role of the district equipment superintendent. The equipment division specified duties of the equipment superintendents, although in one district the district engineer also determined the superintendent's duties. For example, the superintendent does not routinely review residency requests to hire equipment. Equipment

superintendents in the other districts play an active role in reviewing such requests to hire equipment.

* * *

The maintenance division is responsible for monitoring spending at the residency level, but its role to curb overspending is not clear. During the 1978-80 biennium 18 residencies overspent their budgets for ordinary maintenance. In each of the last three years, residencies have exceeded their budgets for expendable equipment purchases.

At the present time there is no consensus in the department as to whether division formulated policies and procedures take precedence over field judgements. Operating in a resource-constrained environment requires increased control over operating decisions. With the projected increases in maintenance spending, central office control over maintenance activities should be strengthened. The monitoring and controlling roles of the equipment and maintenance divisions should be defined clearly so they can effectively carry out these roles.

Preconstruction Roles and Responsibilities. Preconstruction activities such as surveying property, designing roads, and acquiring right-of-way are carried out by divisions in the central office engineering directorate and by sections in each of the district offices. Dispersing preconstruction activities to the districts reduces travel time and facilitates the performance of such activities as bridge safety inspections.

The preconstruction divisions located in the central office are generally viewed as having authority over the technical quality of preconstruction. The district engineer, on the other hand, is generally considered to have administrative authority over district preconstruction sections, determining such factors as productivity, priorities, and staffing levels. In effect, district section heads report to both the central office division and to the district engineer.

This dual reporting relationship has been the source of problems for years. The 1970 DHT self-study identified the problem in the following manner:

The prime role of the central office staff divisions is to plan and to render advice and assistance to the line operations; the secondary role is to perform such functional work which can best be done at a central point. To function properly as a truly decentralized organization, the staff divisions must have no line authority over the operating Districts.

There still remains no consensus on the appropriate authority and responsibilities of the district and division engineers. Central office personnel believe it is their role to maintain the quality of the districts' work by monitoring, to coordinate the workload across the districts, and to provide technical assistance when needed. The district engineers and many of the districts' section staffs believe that the central office should function primarily as a source of technical assistance and that the field should set priorities and have the final quality determination. Lines of authority are not always clearly understood, as in these cases.

The question of who is responsible for making the final quality determination was raised by location and design staff (one of six preconstruction divisions) in several districts. They were concerned with the review of and changes made in their plans by central office divisions. Central office divisions claim to check only for compliance with design standards on major projects. District staff perceive the changes as major and point to several projects as examples. Consequently, the extent of review by central office appeared to the districts to vary, indicating a lack of understanding of the central office role.

* * *

Within one district, two preconstruction sections follow two different lines of authority. If the location and design section in one particular district disagrees with the central office division over a technical decision, the district section engineer figures out what he thinks is the best solution. He then takes the solution to the district engineer who, after reviewing it, will argue the case with the central location and design division.

In the same district, the environmental section takes its conflicts with other district sections to the central environmental quality division. The division then intervenes in the affairs of the district. In this case, the district sections seek final decisions from the individual they view as the most influential.

* * *

The right-of-way section head in a third district expressed concern over not knowing the extent of authority and responsibility of the district and central office division engineers with regard to right-of-way acquisitions.

Personnel in a fourth district section expressed similar concerns over the relationships governing the traffic and safety section.

In a fifth district the assistant district engineer voiced the same concerns about the uncertain relationships between the preconstruction engineering sections and central divisions.

The dual reporting structure is viable for the preconstruction sections and continues to offer the advantage of centralized quality control with decentralized responsibility. The department should clarify the role and responsibility of the division and district in preconstruction activities.

Despite this confusion, over the years the district preconstruction sections have taken on additional functions. District section heads also supervise specialized district maintenance and construction crews, like the landscaping and line-painting crews. In addition, DHT recently began using more minimum- and no-plan designs to reduce costs on rural secondary roads. Resident engineers who are responsible for the construction of minimum- and no-plan projects view the district sections as a technical resource. Finally, the gradual decentralization of the design workload has increased the ability of the district sections to handle larger, more complex projects. In sum, central office preconstruction divisions are important because they make final determinations on major projects, and district preconstruction sections are important because of increased use of minimum and no-plan designs. Both central office and district preconstruction units should therefore be retained.

Resident Engineer. The authority and responsibility exercised by the resident engineer vary across districts and with the resident engineer's interpretation of his job description. An organization such as DHT which has an extensive network of field offices must depend to a high degree on policies, guidelines, and other controls to provide direction to field managers. DHT has provided such policies and controls in a number of areas such as issuing permits, local purchasing, and preventive equipment maintenance. In addition to the specific department-wide guidelines, the district guidelines and job descriptions specify the extent of field responsibilities and authority.

Even so, there is considerable variation in the guidelines for resident engineers established by districts. For example:

- Although most resident engineers have authority to initiate State force construction, one district engineer decided to curtail the use of State force construction.
- In a second district, resident engineers are required to sweep interstates hourly for snow, although other department guidelines would permit less frequent sweeping.

- In a third district, resident engineers cannot issue land use permits as specified in the permit manual.

These variations may lead resident engineers to exercise differing degrees of authority.

Despite the guidelines, resident engineers must use their own judgement in areas not covered by department or district guidelines. To decide whether the judgement is within his authority, the resident engineer must fall back on his position description. However, the position description for resident engineers is imprecise. Examples of duties characteristic of a resident engineer "A" are shown in Figure 15.

Figure 15

DUTIES CHARACTERISTIC OF RESIDENT ENGINEER A

- (1) Instructs and supervises inspectors and superintendents regarding methods of construction, suitability of materials, quality and progress of contractor performance, traffic flow, and safety and field reporting or recordkeeping.
- (2) Plans work and submits a budget to the highway district engineer for maintenance work to be done in highways in the area; suggests major work to be let to contract.
- (3) Consults with the highway district engineer, survey party chief and agency staff engineers in regard to the proper locations for road surveys; studies plans in the field and makes recommendations for change or adoption.
- (4) Checks field and office records for accuracy and adequacy.
- (5) Interviews applicants for permits to perform work such as construction of entrances, pipelines, overhead lines, and drains, or heavy hauling on State rights-of-way in the residency; makes investigations, draws up permit agreements including sketches, and makes final inspections to assure adherence to the agreements.
- (6) Prepares or supervises the preparation of cost estimates for proposed construction and maintenance work.
- (7) Plans for and supervises emergency work necessitated by snow, sleet, and high water.
- (8) Investigates complaints and accidents; attends county board meetings; accompanies local officials on field trips, discussing with them proposed work and traffic problems as a direct representative of the Department of Highways and Transportation.

Source: DHT.

No resident engineers interviewed felt they had received a full explanation of their duties and responsibilities. All had learned their job by observing the resident engineers they worked with while serving as assistant resident engineers. This practice was identified as a problem in the 1970 self-study:

It is an accepted fact that a common cause of inadequate performance is that the employee may have a totally different concept of what is expected of him as compared to what his supervisor expects. Frequently, a newly promoted employee may have only the knowledge of his predecessor's actions to guide him in his new responsibilities, not a likely basis for obtaining peak performance.

As highway maintenance becomes more important, so will the role of residencies in performing maintenance activities. To ensure that judgements made by resident engineers are in accord with departmental goals, resident engineers should receive training in the scope of this authority, and their job descriptions should specify the extent of their authority and reflect more accurately the characteristics of the position.

Organizational Communication

Internal communication is widely perceived by DHT staff as a problem, as reported by both the 1980 study by R. J. Hansen Associates and the JLARC interim report. Since these studies were released the department has begun to make some improvements in internal communications through staff meetings and staff committees.

Staff Meetings. A routine forum for discussing important issues and suggesting solutions is provided through frequent and regular staff meetings. Some divisions hold no staff meetings and others hold them only infrequently. Seven districts hold regular staff meetings. Significantly, departmental issues and decisions are not always discussed, in part because central office divisions do not consistently use the districts as a channel for communicating decisions. Department staff have learned about such major decisions as salary regrades and layoffs through external sources.

Employees in one district read about DHT layoffs in a Richmond newspaper before the district engineer had been informed of the layoffs. Because he felt he needed more timely information, the district engineer subsequently subscribed to the Richmond paper. Two division engineers in the central office also reported learning of the layoff announcements through newspapers instead of through the department.

* * *

Residencies throughout the State reported finding out about the 1980 salary regrade from other State agencies such as the State Police. One resident engineer stated that obtaining information through rumors contributed to lower field morale by creating uncertainties in the minds of the employees.

* * *

Another frequently cited communication breakdown concerned scheduling of preconstruction and construction activities. Seven districts complained that changes were made in the advertising schedule which altered their scheduled work activities without the districts being informed. One district felt it received inconsistent advertising schedule information from the central office engineering divisions. According to this district, the advertising date for a project seemed to vary, depending on which division gave the information to the district. The study by R. J. Hansen Associates pointed out that changes in the advertising schedule also impact district work schedules.

In these cases, district, division, and resident engineers were not informed of departmental decisions and rationales, and they believed their credibility with their own staffs was weakened.

Information about department actions has sometimes been mailed to field staff without prior notice or discussion. When policy matters are mailed, copies sometimes go to both districts and residencies. Mailing policies and procedures directly to the residency effectively cancels any significant district role in communicating departmental actions to residencies.

The department should ensure that staff meetings are useful forums for disseminating information about agency actions as well as for gathering comments from staff members. Meetings should be held before public announcements of major department actions, and meetings at the district level should be the primary channel for communicating between the central office and residencies. In this manner policy and procedure statements could be relayed from divisions to the districts, which in turn would convey the information to the residencies.

District engineers should attend the monthly meetings of the Highway and Transportation Commission. District engineers should subsequently meet with their staffs and resident engineers. In addition, department-wide meetings should be held at least semi-annually.

Committees. DHT uses staff committees and task forces as devices for recommending action on specific issues. For example, DHT uses standing, long-term committees for selecting resident engineers and for determining amounts of equipment to be purchased. These committees essentially provide a way of bringing special knowledge and skills from several divisions to focus on specific problems.

Because committees are used to address issues of significance to field staff, committees could be expected to have at least one field representative. However, a review of committee membership revealed that central office personnel outnumber field representatives by about five to one. Field representatives usually are chosen from districts, but there appears to be a tendency to select committee members from field offices close to Richmond. This practice results in under-representation of more distant parts of the State in DHT's decision making process.

Also, few resident engineers have served on a committee. Increasing their representation on committees would help alleviate the feeling of isolation from DHT policy-making reported by some resident engineers.

Recent improvements to internal communications within the department include the following:

- The annual two-day conference for directors, district engineers, division engineers, and resident engineers was reestablished.
- Important decisions are released to the districts in written form via the districts' computer line printers from central office.
- The public relations department now mails news releases to the districts before they are released to the newspapers.
- The department has hired a consultant to investigate communications problems and recommend further changes.

These are useful steps toward improving communications.

PERSONNEL

The R. J. Hansen consultant study concluded that DHT could undergo staff reductions of 1,500 positions over the next several years because of declining revenues and corresponding reductions in services or workloads. The study made the following forecasts:

- A decrease in construction inspectors from 965 in FY 1979 to fewer than 800 by the 1984-86 biennium;

- A decrease in preconstruction staff from 1,860 positions in FY 1981 to 1,270 positions in FY 1984; and
- A decrease in maintenance service levels and staffing of as much as 756 positions by FY 1984 if revenues continue to decline.

The Commissioner of Highways and Transportation has stated that the personnel target during FY 1982 falls between 10,000 and 11,000 filled positions. While the department has 11,818 authorized positions, funds are available for only 11,605. As of August 31, 1981, 732 positions were vacant, leaving 10,873 on the payroll.

The 1982-84 budget proposal represents funding for 10,671 positions during the first year of the biennium and 10,177 positions for the second year--a reduction of 202 and 696 positions respectively below currently filled positions. These requested positions are based on the assumption that construction funding will decline by 22 percent in each year. If this funding assumption proves incorrect, different position totals may be possible.

To effect staffing reductions, the department will need to implement its established layoff procedures. And with a reduced workforce, greater emphasis will have to be placed on managing employee workload and training. Manpower planning and a staff training and development program can assist the department in strengthening its personnel management function.

Layoff Procedure

Although the department began experiencing signs of major revenue reductions in late 1979, a layoff policy was not used until July 1981. In using the policy, DHT has encountered procedural problems related to an employee's "bumping rights" and to identifying surplus personnel.

In late 1979, the department was aware that declining revenues would have a severe impact on its construction programs and workload. But a layoff policy established in 1976 was not used to reduce staff until 1981, and at least one district kept staff on the payroll longer than necessary.

In fall 1980, an assistant district engineer for construction identified a surplus of 50-55 inspectors in his district, with additional surplus positions in the right-of-way and location and design sections. Twelve were temporarily transferred to work in other districts, but the assistant was given no further direction about what to do with the remaining surplus positions until preparations were made for the July 1981 layoff.

Department officials agreed that statewide surplus positions were on the payroll longer than necessary, because they expected that additional funding would be available.

The establishment of a layoff procedure is an important step in controlling position cutbacks. Of the 126 employees who received termination notices effective July 1, 1981, 61 actually left the employ of DHT, while 65 are still employed. Of these 65, 50 exercised "bumping" rights under the layoff policy, and 15 transferred (3 permanently and 12 temporarily) to another location.

Although a position may be eliminated when an employee is given notice of termination, the department cannot currently ensure that the employee will in fact be terminated. "Bumping" procedures provide that employees holding a position declared surplus could, instead of terminating employment and if qualified, take one of the following positions:

- Any similar vacant position within the State;
- Any vacant position in the district at or below their current level;
- Any similar but lower position in the district; or
- Any previously held position.

In the last two instances, the position's current occupant who has less seniority, could be replaced or "bumped" by the person initially terminated. The procedure is designed to eliminate surplus positions while maintaining the most senior and best-qualified employees.

Monetary savings under the bumping procedure may not be as great as the size of a layoff suggests. A lower-paid employee may actually terminate employment when a more highly-paid employee is laid off. For example, if a survey party chief is notified that his position is surplus, he may be able to bump a survey crew member. The outcome is that while a \$14,600-a-year crew chief is declared surplus, a \$9,000-a-year survey crew member actually leaves employment.

Department officials are delaying the layoff of some surplus staff until there are clear indications about department funding. Because keeping surplus staff on the payroll is a costly decision, however, alternatives should be considered. For example, using temporary layoffs or cutting back to three- or four-day work weeks may be feasible. These options would provide the department with access to needed personnel and would also provide some savings.

Manpower Planning

Although a layoff policy is now in place, its long-term effectiveness depends on the ability of DHT to accurately identify surplus personnel. There are presently no guidelines for determining which positions are surplus, and past determinations may not have been made on a consistent basis. Developing an effective manpower planning

capacity will require standards for linking staffing patterns to workloads as well as the data and financial resources to develop such standards.

Development of Standards. Manpower planning is important to management because it provides a method for matching the number and type of staff with workloads. A significant part of the plan should provide for reductions in staff size along with workload. With a manpower plan, managers can adjust staffing patterns to changing workloads and ensure that necessary work is accomplished.

The need for manpower planning by DHT was identified as early as the 1970 self-study. That study recommended "that the Manpower Planning System be implemented at the earliest practical date and be expanded to include all major areas of the Department's manpower requirements." Manpower planning has not been expanded much beyond the units in which it was initially installed in the early 1970s. The location and design division and the maintenance division have implemented portions of a manpower planning system. The maintenance division's system covers about two-thirds of all DHT employees and identifies how staff cuts will affect specific highway maintenance objectives. The location and design division has the most fully developed system of all the preconstruction units, one which ties staffing to highway construction projects. No other division, however, has a formal, systematic method for linking staff reductions to workload.

Although the location and design division has used this system for ten years, subsequent review has revealed that the standards were inaccurate. By reconsidering the guidelines for completing a rural interstate design, the division increased the standard from 3,080 hours to 4,460 hours between FY 1980 and FY 1981--an increase of 45 percent. The guidelines for completing an urban interstate design increased during the same period from 4,436 to 5,447 hours--an increase of 25 percent. The division argues that these increases are primarily the result of changing the statistical techniques for calculating the guidelines. However, the standards remain suspect because they employ statistical measures which do not adequately account for the range and variation in projects. The personnel division in conjunction with the location and design division should take steps to refine location and design workload planning measures.

Some central office divisions have developed guidelines to use in forecasting staff needs based on anticipated workload. One problem with making projections from these guidelines, however, is that some are not sufficiently refined to make accurate projections, as in these examples:

The materials division uses a staffing guideline of 600 staff-hours per mile of two-lane road. This figure includes geological surveys, engineering, and construction materials testing. However, the last item is not a preconstruction activity and

should not be counted when planning the preconstruction use of materials staff.

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The bridge division uses a staffing estimate of 2,000 staff-hours per bridge design. This estimate does not take into consideration the size and scope of a bridge, which could range from a complicated interstate interchange to a secondary stream crossing.

The information included in these guidelines about the preconstruction tasks performed by either division provides insufficient detail to estimate staff needs accurately. The bridge division is currently breaking the per-bridge estimate into time estimates for each of the more specific activities involved in bridge design. Each preconstruction division should develop time estimates for staff activities in this fashion.

Data Adequacy. A second major reason for weak manpower planning is that few divisions have adequate records on which to calculate staffing standards. Standards typically are defined in terms of the time necessary to complete each major staff activity. In the case of some divisions, such as environmental quality, records have never been kept of the staff time required for each activity. And in the location and design division, staff do not believe that the information is accurate:

Currently there are two timesheets that location and design staff must fill out. One timesheet goes to the fiscal division for payroll, and the other is used by location and design's manpower system. Reportedly staff take much more care filling out the form that paychecks are based on than the form for the division's manpower planning system. Employees who are also members of a survey crew will fill out an additional timesheet.

** * **

In the construction division, detailed time records of inspectors' activities have been kept, but the records have not been used to calculate staff time for each type of activity. The North Carolina Department of Transportation has developed inspector staffing standards which should be reviewed by the construction division. Record-keeping procedures should be reviewed and modified in order to develop an inspector staffing system.

Despite these data problems, preconstruction sections in some districts have developed manpower projection techniques. For example,

the environmental quality section and the traffic and safety section in the Richmond district have begun recording the staff time necessary to complete various tasks. This data can be developed into a manpower planning system for statewide use. The Staunton district materials section has recorded data suitable for developing staffing standards, although the data is aggregated too broadly. The data should be broken down in more detail.

Organizational Commitment. A final reason that the department has not developed a satisfactory manpower planning function is that adequate organizational resources have not been committed to the task. The development of manpower planning systems has rested with individual operational units. Generally, the unit lacks the time and the expertise for developing a manpower planning system. The responsibility for the development of additional manpower planning systems should rest with the personnel division. The personnel division should assist other organizational divisions in developing and implementing manpower planning systems.

Training and Staff Development

Staff training and development are especially important because of the department's increasing need for employee efficiency and effectiveness. DHT has recently acknowledged the importance of training by adding eight trainer positions and assigning one position to each district. While these trainers will focus on skills training for operating staff, some DHT managers have also expressed a need for training in specific skills as well as in management practices.

Skills Training. Skills training is primarily district-initiated for lower level personnel and self-initiated for management levels. DHT financially supports employees who attend night classes at educational institutions to develop skills in such areas as computer programming and drafting. However, significant training needs have yet to be addressed. JLARC's operational review found areas throughout the entire organization where skills training is needed:

- Program planning and budgeting skills of division heads, district engineers, and other key managers should be improved.
- Some residency staff who regularly receive maintenance management system reports have never been instructed in the use of the reports and consequently made little use of the reports. Other users of data processing reports lack knowledge about the potential uses and advantages of computer processing.
- Some stockroom clerks and their supervisors were unaware of procedures for correcting inventory errors, issuing stock,

and making inventories of the stockroom. The need for training of equipment operators was identified by a majority of the resident engineers and district equipment superintendents interviewed.

- Area superintendents, maintenance supervisors, resident engineers, and project engineers are required to schedule work and staff. Training has not adequately addressed this responsibility.

The training section and the district trainers should survey the organization to determine areas where skill improvements are most needed. The trainers and the appropriate divisions should then create the necessary skills programs.

Management Training. Potential DHT managers are primarily recruited from major educational institutions in Virginia, although some recruitment has been done outside the State. No graduate engineers have been recruited since 1979, however, because of revenue shortfalls.

The department has two basic types of management training. New graduate engineers become acquainted with the department by rotation through the major engineering divisions. The engineers spend from two weeks to six months in each division for a total of two years before their first permanent assignment. This is an excellent training method.

The second form of management training is a week-long seminar for engineers. However, engineers typically participate in the course only once, early in their careers. Course content is primarily concerned with personnel techniques, such as effective communication and motivation. Although the program is basically sound, there are three areas that could be improved.

First, interviews with field staff indicated that DHT managers often were unaware of department policies and procedures. In order to increase awareness of and adherence to policies and procedures, training sessions should include both introductory and refresher units on these matters. In addition, management training sessions should include training in budgeting, scheduling, performance appraisals, hiring, and disciplinary interviewing. These skills are not generally taught in engineering programs but are a routine part of residency and district responsibilities. These skills should be the focus of specific training.

A third needed improvement is continuing management training. Because newer employees usually participate in training, veteran employees may not receive new information and techniques that are explained at the training session. A requirement for employees at all levels of management to participate in in-service training on a three- or five-year basis would allow established managers the chance to brush up on old skills and learn new ones.

CONCLUSION AND RECOMMENDATIONS

DHT has established a complex organization and employed thousands of highly-skilled persons to accomplish its highway and transportation mission. Certain actions should be taken by the department to achieve this mission more efficiently and effectively.

Organization Structure and Communication

Recommendation (33). The existing central office structure should be revised in the following ways to provide an improved framework for more efficient and effective management.

- a. Establish a deputy commissioner position distinct from the chief engineer position to oversee policy research, planning, programming, budgeting, and administrative functions. The chief engineer should oversee operations and engineering, including district and residency operations. This will require a change in statutes.
- b. Create a policy research and statistics team in the management services division to conduct policy studies at the request of the commissioner and deputy commissioner. The division's responsibilities should also include value engineering, methods improvements, and engineering research.
- c. Establish an internal audit unit which reports to the highway commissioner. All financial and internal audit-related reports should be transmitted to the Highway and Transportation Commission. The commission should actively participate in selecting topics and endorsing recommendations.
- d. Clarify the reporting relationship between the rail division and the Secretary of Transportation. Rail policy matters should be reviewed by the secretary prior to department review. In addition, expansion of the division's scope of activities should be considered.
- e. Change the reporting relationship of the environmental quality division to the director of engineering to facilitate the coordination of the preconstruction process.
- f. Consolidate the programming and scheduling, secondary roads, and urban divisions into one division because of the decreasing workload of the three divisions. Staff reductions could be realized.

- g. Change the reporting relationship of the public relations division to the director of administration.

Recommendation (34). The organizational relationship of the public transportation division should be reconsidered. A directorate for public transportation could be established under the new deputy commissioner as well as a commission subcommittee on public transportation.

Recommendation (35). Before creating a ninth district, the department should review boundaries of the existing eight districts and make necessary adjustments. Adjustments should be made to reduce workload disparity and to achieve operating efficiencies through consolidation of facilities. A separate Northern Virginia construction district should be considered. This should be accomplished by realigning the eight existing districts without adding a ninth district.

Recommendation (36). The maintenance division should thoroughly assess the need for existing area headquarters. Criteria such as workload and travel time should be consistently applied during the review. Priority should be placed on consolidating areas and on eliminating timekeeper positions.

Recommendation (37). With the projected increases in maintenance spending, central office control over maintenance activities should be strengthened. The monitoring and controlling roles of the equipment and maintenance divisions should be clarified so they can effectively carry out these roles.

Recommendation (38). Although the dual reporting structure is viable for district preconstruction sections, the roles and responsibilities of the central office division and the district should be better defined. Procedures for resolving conflict between division and district staff should be developed, and responsibility for ensuring compliance with design standards on minimum- and no-plan projects should be specified.

Recommendation (39). While the authority currently exercised by resident engineers is adequate, job descriptions for resident engineers should specify their duties and decision-making authority. Resident engineers should be provided with copies of their job description and trained in the scope of their authority.

Recommendation (40). Staff meetings to disseminate information should be held before the public announcement of major department actions. District staff meetings should provide a primary channel for communicating between central office and residencies. District engineers should attend the monthly meetings of the Highway and Transportation Commission and meet subsequently with their staffs and resident engineers. In addition, department-wide meetings should be held at least semi-annually.

Recommendation (41). Representation of resident engineers and of field staff from regions outside the Richmond area on committees should be increased. For example, the departmental committees on resident engineer selection and equipment should include field staff.

Staffing.

Recommendation (42). Guidelines for identifying surplus positions should be developed. Each division should identify potentially surplus positions and their impact on workload. A series of options for further staff reductions should then be developed for each division.

Recommendation (43). Because it is important to retain qualified personnel within funding constraints, the department should consider alternatives to full-time employment of surplus staff. Placing surplus staff on a shorter work week or using temporary layoffs should be considered.

Recommendation (44). A department-wide manpower planning system should be established. All operational units should be required to participate in the system. The responsibility for operating the system should be assigned to the personnel division.

Recommendation (45). The training section and the district trainers should survey the organization to determine priority areas where skills need to be improved. An appropriate skills program should then be developed.

Recommendation (46). All DHT managers should be required to participate in management training on a regular basis.

V. Inmate Labor

Inmates have worked on Virginia roads since 1906. Originally, inmates provided labor for highway construction. To better meet this need, field camps operated by the Department of Corrections (DOC) were located near highway facilities in 23 residencies. Over the years, however, field camps have taken on tasks in addition to road work, and field camp farms, for example, now provide a large percentage of the food for the entire penal system.

As new types of equipment were developed, highway construction became less labor-intensive and the need for manual labor declined. In addition, as a condition of using federal funds for highway construction, the State was not permitted to use inmates on federal aid projects, further reducing the need for inmate labor.

DHT currently uses inmates primarily on maintenance activities. Cleaning ditches and controlling vegetation are the most common activities, and inmates are generally restricted to tasks that do not require the operation of machinery (Table 13). In 1973 DHT and DOC agreed that statewide at least 905 inmates would be employed on the roads. DHT also agreed to pay DOC \$1.50 for each hour an inmate was employed on highway work. Although DHT may employ up to 1,026 inmates, only 500-600 are used on a daily basis. Inmates receive 40 to 90 cents for each day they work, and DOC uses the remaining funds to offset the operating expenses of the field camps. DHT paid \$2.09 million to DOC for the use of inmates in FY 1981.

Table 13

USE OF INMATE LABOR ON HIGHWAY ACTIVITIES

| <u>Activity</u> | <u>Percent of Activity</u> | <u>Percent of Total</u> |
|-------------------------|----------------------------|-------------------------|
| Ordinary Maintenance | | 77.5% |
| Surface Maintenance | 7.4% | |
| Ditches and Drainage | 44.1 | |
| Roadside Maintenance | 10.6 | |
| Vegetation Control | 27.9 | |
| Snow Removal | 5.0 | |
| Maintenance Replacement | | 5.9 |
| Incidental Construction | | 8.9 |
| Project Construction | | <u>7.7</u> |
| | | 100.0% |

Source: DHT

Using inmates on highway activities provides benefits to both agencies. While day-to-day management of the inmates has proven difficult for DHT in some parts of the State, important highway maintenance tasks are accomplished in some areas where DHT claims its employees would not perform the tasks. On its side DOC claims to experience fewer discipline problems when inmates are removed from correctional facilities to work on the roads. These important benefits seem sufficient to justify the program, although the cost of the program to DHT can be reduced. Several options for restructuring work crews and for funding the use of inmates should be considered in order to ensure maximum benefits to both agencies.

Benefits to Department of Corrections

The primary benefit to the corrections department is that the highway program helps reduce violent outbursts by inmates in the field camps. Although the extent of this benefit cannot be documented by DOC, terminating the program would idle substantial numbers of inmates, and other types of work are not available at many of the field camps because of facility and program limitations. DOC field unit staff have reported increased number of violent outbursts when inmates cannot work on the roads because of inclement weather. These staff anticipate more disciplinary problems if idle time were increased.

An additional benefit of using inmates for highway work is the cost offset provided by the DHT payment. The DHT payment for work performed by inmates averages \$823 annually, or approximately 10.5 percent of the \$7,833 per year incurred for the inmate's incarceration in a field unit (Table 14).

Table 14

OFFSETS OF INCARCERATION COSTS (FY 1980)

| | <u>Offsets Per Inmate</u> |
|--|-------------------------------|
| Value of Farm & Dairy Products* | \$3,386 |
| Work Release Program | 1,025 |
| Inmate Labor - Department of Highways | 823 |
| Inmate Labor - Cities | 53 |
| Inmate Labor - Other | 6 |

*Estimated value of agricultural products from field camp farms. This is not money paid to DOC, but the value of products produced if the products were bought on the open market.

Source: Department of Corrections' 1980 Annual Report.

Cost and Benefit to DHT

The benefits to DHT of using inmates appear marginally important. The primary benefit is that work which DHT employees allegedly dislike, such as hand cleaning ditches, is nonetheless performed by inmates. However, the 22 residencies which do not have access to inmate labor appear to have no problem performing such tasks with DHT employees.

Supervising Inmates. DHT residency staff have reported problems in supervising inmates. JLARC staff visited 13 residencies that use inmates, and personnel at ten of the residencies reported that inmates were undependable and sometimes presented substantial discipline problems.

An area superintendent observed an inmate taking very small, very slow steps as he swept a bridge. The area superintendent asked the inmate to move faster and the inmate replied, "What's the hurry? I've got thirteen years to sweep this bridge."

* * *

An inmate convicted of second-degree murder was placed on a highway work crew. The inmate fled the crew, prompting the DHT supervisor to fire two pistol shots at him.

* * *

Inmates working in gun gangs are difficult to utilize fully for such projects as cleaning around culvert openings. There is limited room to work, and the gang cannot be split up to clean both ends at the same time because the guard cannot adequately oversee more than one group. The result is that a few convicts work and the rest sit watching.

* * *

At times, DOC field camps are not always cooperative in providing DHT with inmate labor. Several area superintendents reported frequently sending their trucks for inmates and the trucks returning empty. In these instances the foreman and the truck driver waste two hours of time, the area's maintenance schedule is thrown off, and the two DHT employees must be rescheduled for work elsewhere.

* * *

In some regions, if one member of a gun gang is sick, the entire gang has to return to camp since the guard must accompany the sick inmate back to camp. When this happens soon after travelling and setting up at the work site, DHT pays for nearly one half day's work without the inmates working at all. DHT is required to pay for the number of hours inmates are away from camp.

A contributing factor to the problem of supervising inmates is that DHT employees do not receive adequate training. Although DHT employees are required to be sworn in and to function as a surrogate guard at times, currently only one day of orientation and training is provided DHT employees by DOC in some regions of the State. By contrast, new guards employed by DOC receive a two-week training program on the supervision of inmates. Better training of DHT employees may help reduce discipline problems.

Cost Analysis. The annual total cost to DHT for inmate labor is substantially higher than the direct payment of \$2.09 million made by DHT. Indirect costs may amount to as much as \$1.8 million. The DHT maintenance division calculates that \$951,000 in indirect costs are incurred for salaries and utilities. And JLARC estimates that as much as \$800,000 more is spent for transporting inmates to and from the work sites. Overall, the estimated total cost of the inmate program incurred by DHT amounts to \$3.8 million annually.

Personnel at seven residencies stated that DHT did not get enough work from the inmates in return for the expenditures. Some residency staff believed that DHT employees would accomplish more work for a lower total expenditure. DHT could hire 565 full-time employees at the minimum wage for the \$3.8 million that DHT spends annually to employ inmates.

Compliance with Statute. Although the program is valuable to both agencies, DHT is currently out of compliance with two statutory provisions governing the use of inmate labor on Virginia roads. Section 53-109.1 of the *Code of Virginia* requires DHT to pay the director of the bureau of correctional units \$300,000 annually as an advance for monthly convict labor payments. No advances have been issued by DHT since 1969.

The same statute also sets the rate of reimbursement to DOC for inmate labor. DHT is required to pay at least 75 percent of the local hourly rate for similar labor for each hour the inmates are employed. This amount is paid directly to DOC and covers part of the cost of the field operations. It seems reasonable to assume that the "local hourly rate" would not be less than the prevailing minimum

wage--\$3.35 per hour. Because DHT actually pays a lower amount, the department has not been in compliance with the statute since 1975. The amount by which DHT has been out of compliance totals \$4 million (Table 15). However, DOC has chosen not to insist on full payment because of the need to keep inmates working. If the current compensation is adequate, the General Assembly may wish to consider amending the statute to permit DHT to pay an amount "not more than" 75 percent of the local hourly rate.

Table 15

ESTIMATED AMOUNT OUT OF COMPLIANCE

| <u>Fiscal Year</u> | <u>Amount</u> |
|--------------------|----------------|
| 1975 | \$ 153,191 |
| 1976 | 91,127 |
| 1977 | 680,906 |
| 1978 | 211,546 |
| 1979 | 896,623 |
| 1980 | 1,044,371 |
| 1981* | <u>916,727</u> |
| Total | \$3,994,491 |

*Through March 1, 1981.

Program Options

DHT and DOC both want to retain the use of inmate labor on State highways, and each agency has offered proposals to modify the current program. However, neither agency is satisfied with the other's proposal. As a result, they have reached an impasse in their negotiations.

DHT's Position. DHT has proposed a substantial cutback in the number of prisoners participating in the program--from 1,026 to 640. The department also has suggested that inmates be used more flexibly than at present. DHT would prefer contracting with DOC for inmate labor in areas of the State where labor may otherwise be unavailable. Under this proposal, if DOC would be required to provide the trucks and tools used by the inmates, they would incur a substantial capital outlay. This outlay could be avoided, however, if DHT provided trucks and tools for use by the inmates.

DOC's Position. DOC has proposed that one inmate in each crew be permitted to operate a truck, a change which would free the DHT operator for work elsewhere. This option has possible inmate control problems.

Additional Options. Savings in wages to DHT over the present crew structure could be substantial in either of two additional options, as shown in Table 16. At the current rate of \$1.50 an hour per inmate, the proposal to shift to a crew composed only of eight inmates and two DOC guards would produce a reduction in ongoing program costs of approximately \$800,000. In this case, one guard would drive the truck to a work site chosen by DHT and the work would be performed without direct DHT supervision. However, the proposed crew structure consisting of two guards would significantly increase DOC's costs. This alternative to restructuring the crews could require additional funding for DOC.

Table 16

WAGE ESTIMATES OF PROPOSED INMATE CREW STRUCTURES*
FY 1982

| | <u>Estimated Cost to DHT</u> | <u>Estimated Cost to DOC</u> | <u>Total</u> |
|---|----------------------------------|----------------------------------|--------------|
| <u>Proposal 1:</u> 2 DOC guards, 8 inmates | \$2,457,600 | \$3,296,000 | \$5,753,600 |
| <u>Proposal 2:</u> 1 DOC guard, 8 inmates, 1 DHT foreman | 3,833,008 | 1,648,000 | 5,481,008 |
| <u>Current Crew:</u> 1 DOC guard, 8 inmates, 1 DHT equipment operator, 1 DHT foreman | 4,880,384 | 1,648,000 | 6,528,384 |

*Costs are figured on the basis of 128 crews working 200 days.

A second option appears preferable, namely for the DHT foreman to drive the truck and supervise the work, while DOC supplied a guard. This proposal would achieve a \$1 million reduction in program costs to DHT and would not increase DOC costs.

The General Assembly also may wish to fund the use of inmates on roads from sources other than the highway maintenance and construction fund. As Table 16 indicates, this would shift an estimated \$4.88 million out of the highway maintenance and construction fund. The Joint Subcommittee on Economic Productivity of the Prison Population and on the Work Release Programs should examine the language and intent of *Code of Virginia* Section 53-109.1 regarding the reimbursement paid to the Department of Correction by the Department of Highways and Transportation for inmate labor.

CONCLUSION AND RECOMMENDATIONS

Several recommendations and options concerning the use of inmate labor should be considered.

Recommendation (47). DHT and the Department of Corrections should restructure the crews of inmates and agency employees with the goal of reducing costs. For example, one truck driver position on each crew could be replaced by a DHT foreman. Any alternative requiring additional DOC guards may require additional funding.

Recommendation (48). The General Assembly may wish to consider funding the use of inmates on the highways from sources other than the highway maintenance and construction fund.

Recommendation (49). The Joint Subcommittee on Economic Productivity of the Prison Population and on the Work Release Programs should examine the language and intent of *Code of Virginia* Section 53-109.1 regarding the reimbursement paid to the Department of Correction by the Department of Highways and Transportation for inmate labor.

Recommendation (50). Better training should be provided to DHT employees who supervise or accompany inmates. A modified version of the training course provided by DOC to new guards should be considered for the DHT employees.

VI. The Conflict of Interests Act and the Virginia Highway and Transportation Commission

At the request of the study committee, a special review was authorized of the Virginia Conflict of Interests Act as it applies to the highway commission. This report summarizes our review of the conflict of interest problems experienced by members of the Highway and Transportation Commission. Our study was limited to a review of the Act and its specific application to the commission. Some of our conclusions and recommendations, however, may extend to other governing bodies which have substantial administrative or rulemaking duties.

Fact finding took place during the period September through November, 1981. Financial disclosure statements were obtained for all but one commission member. Each member serving on the commission as of September 1981 was interviewed. Agency officials representing the Attorney General, Secretary of Administration and Finance, Secretary of the Commonwealth, and Department of Personnel and Training were consulted about legal and procedural aspects of the Act.

This chapter outlines study findings and suggests several recommendations concerning administration of the conflict of interests statute including:

- requiring Virginia Highway and Transportation Commission members to file annual financial disclosure statements under Section 2.1-353.2, *Code of Virginia*;
- stepping up efforts by the attorney general to (1) educate commission members about the Conflict of Interests Act, and to (2) review the completeness of information included on disclosure statements; and
- requesting the attorney general to provide more guidance and consultation to the department on matters dealing with conflict of interests.

Virginia Highway and Transportation Commission

The Virginia Highway and Transportation Commission is one of the most powerful and prestigious governing bodies in the Commonwealth. Legislation assigns it broad policymaking and administrative duties. The commission is statutorily responsible for locating highways, letting construction and maintenance contracts, reviewing and approving departmental policies and objectives, monitoring and approving actions taken by the public transportation division, and ensuring the coordination of public transportation plans with highway plans.

The commission is composed of eleven members. Eight members are appointed to represent one of the State's eight construction districts. One member is appointed at large from a rural area, and one is appointed at large from an urban area. The Highway and Transportation Commissioner acts as chairman of the commission as well as chief executive officer of the department. Members of the commission generally meet monthly and are authorized under Section 2.1-20.3, Code of Virginia, a per diem allowance of \$50 plus actual expenses, subject to a limitation of \$2,000 plus expenses per year. Members serve four-year terms. They are appointed by the Governor and confirmed by the General Assembly.

The 1981 commission consisted of a banker, a retired physician, a petroleum executive, an engineering firm executive, a furniture store owner, a coal company executive, a lawyer, a retired public utilities executive, and two equipment distributors. Recently, the governor appointed two new commission members--a retired funeral parlor director and a vice-president of an international consulting firm.

Appointees to the commission are usually selected because they have been successful business executives; they often have extensive economic interests in real estate, business firms, and financial institutions. Because they have established such diversified investments and business ties, there is also great potential for a commission member to find himself in a conflict of interests predicament. It is essential, therefore, that members be cognizant of the law's requirements and it is prudent for them to take extraordinary efforts to comply with it.

VIRGINIA CONFLICT OF INTERESTS ACT

The fundamental purpose of the conflict of interests law is to prevent public officials from advancing a private interest at the expense of the public interest. Virginia's Conflict of Interests Act provides a commission member with three broad guidelines for avoiding possible conflicts.

- (1) A member is required to file a financial disclosure statement if he believes he has a material financial interest that will be substantially affected by a decision of the commission. In that event, he is required to make a written disclosure to the attorney general and highway department, in January of each year.

It should be noted that it is the responsibility of the commission member to make this determination and to obtain a copy of the appropriate disclosure form. Members are not currently required to file annual disclosure forms.

- (2) A member is not permitted to have a contract or a material financial interest in a contract with the highway department.
- (3) A commission member cannot have a contract, or a material financial interest in a contract, with another governmental agency, unless (a) he makes prior written disclosure of his interest to both agencies, and (b) the contract is let after competitive bidding or the contracting agency makes a determination of public record that the public interest would not be served by competitive bidding.

A member who willfully violates the Act is guilty of a misdemeanor. A violation constitutes malfeasance in office which can result in removal from the commission. The attorney general is responsible for enforcing the Act at the State level. He is also authorized to render advisory opinions to State officials concerning the applicability of the law to them.

During the course of this review, two commission members resigned as a result of conflict of interests investigations involving inadequate disclosure of information on land holdings and governmental contracts. (Subsequently, one other commission member resigned for reasons related to the conflict of interests subject.) Key provisions of the Act and its application to two of the three resignations are discussed below.

Material Financial Interest

Under Section 2.1-353 any member of the commission who has a material financial interest which he believes, or has reason to believe, may be substantially affected by an action of the highway department must make a written disclosure of this interest to the attorney general and to the highway department in January of each year. This is a self-disclosure requirement. A commission member has a material financial interest in a business if he, his spouse, or other relative living in his household owns five percent or more of the business, or has aggregate annual income, excluding dividend and interest income, of \$5000 or more from the business.

Under another provision, Section 2.1-352, a commission member who knows, or may reasonably be expected to know, that he has a material financial interest in any transaction, not of general application, in which the department is in any way involved must disclose his interest and not become involved in any way in the transaction on behalf of his agency. In the event that such a situation arises a member must disclose his financial interest before a commission vote is taken. That member must refrain from considering or voting on any such transaction.

Two examples may help to illustrate the notion of general application. Adoption of a Statewide transportation plan would be a transaction of general applicability because it benefits nearly every resident of the Commonwealth. A transaction not of general application might involve approval of an industrial access road which is only planned to serve a limited number of firms. If a commissioner owned a business establishment which would be the principal beneficiary of the road, he must disclose his business interest and abstain from voting on the matter. Most cases involving general application fall somewhere between these two examples.

On one occasion this year a commission member did not adequately disclose his financial interest in property located near the planned location of a major highway facility. The facts as alleged are that,

The member owned five parcels of land in the vicinity of a proposed highway location in Northern Virginia. A commission vote on the planned highway was scheduled for an August 20, 1981 meeting. The commission member had not filed a disclosure statement in January. At public hearings dealing with the highway proposal he did not disclose his real estate interests.

On August 9, 1981 a financial disclosure statement was submitted but real estate interests were not identified. Five days later, however, the member wrote the commissioner of the highway department informing him that he owned four parcels of property near the proposed route; a fifth parcel was omitted. In an August 19 reply to the member, the commissioner indicated that he did not view the member's land holding as significant enough to constitute a conflict. The deputy attorney general reported that he was not aware of the request or the commissioner's reply.

The Highway and Transportation Commission adopted the location recommended by department staff on August 20. The commission member in question joined with the other commission members in approving the location. At the meeting he did not publicly disclose his land holdings before the vote was taken.

The deputy attorney general assigned to the department investigated the incident and concluded that the commission member did not willfully violate the Conflict of Interests Act because he did not disclose the fifth land parcel. However, the deputy did find that the member's property holdings could be considered a material financial interest and should have been disclosed in January.

All commission members who were interviewed said that they were not aware of the commission member's property holdings until they read about them in the newspaper. Nonetheless, they were in total agreement that the decision to approve the highway alignment recommended by department staff was the right one.

Governmental Contracts

A third provision prohibits commissioners from engaging in (1) contracts with the department and (2) contracts with other State and local agencies without proper disclosure.

In the first case, Section 2.1-349 (a)(1) forbids any commissioner from having a contract, a subcontract, or material financial interest in a contract or subcontract with his own agency. This prohibition applies even though the contract may be let by the department after competitive bidding.

In the latter case, Section 2.1-349 (a)(2) prohibits a highway commissioner from having a contract or a material financial interest in a contract with another governmental agency, unless (a) he makes prior written disclosure of this interest to both agencies and (b) the contract is let after competitive bidding or the contracting agency makes a determination as a matter of public record that the public interest would not be served by competitive bidding. A commission member was allegedly out of compliance with this statutory provision in September 1981.

That member owned a survey engineering firm and had contracted for certain engineering services with several local and State agencies. The engineering services were not related to any highway department activities. Still, the commission member did not disclose in writing to the contracting agency that he was a member of the Highway and Transportation Commission. Nor did he make prior written disclosure to the department of his business interests.

This lack of disclosure was later determined by the attorney general to be a technical violation of Section 2.1-349 (a)(2).

In this incident, the commission member did not disclose his position on the commission to State and local authorities who were clients of his business firm.

Within the last several months, a third commission member raised a question concerning whether his business activities with local authorities could constitute a conflict if he had not disclosed his membership on the commission.

The deputy attorney general is currently investigating the matter.

DISCUSSION OF PROCEDURAL PROBLEMS

A number of procedural problems exist with the conflict of interests law as it is currently applied to the highway commission. However, some of these problems may not be unique to the commission since other governing bodies may be experiencing them as well.

Critics of the law say that it is ambiguous, complicated, and not effective because it lacks strong policing provisions. On the other hand, the law does serve as a useful guide for identifying and preventing potential conflicts. If the law is diligently applied it can prevent a public official from becoming involved in conflict of interests situations.

The highway commission, however, has paid little attention to the conflict of interests law in the past. Many commission members say they do not understand the law. They claim they are confused by its provisions and frustrated with the disclosure process.

Submission of Disclosure Forms

Commission members are not required to file disclosure statements under Section 2.1-353.2. Under this statutory provision the Governor designates public officials to be under the mandatory disclosure provisions of the Conflict of Interests Act. The Governor has not designated the highway commission (or any other general commission or board membership) to come under the Act although he is authorized to do so.

Nonetheless, department staff strongly encourage members to file disclosure statements regularly. One of two disclosure forms, sometimes both, are sent to commission members around the first of the year. A short form (two pages) is used by officers and employees of governmental and advisory agencies to meet the self-disclosure requirements of Section 2.1-353. It is filed in January with the attorney general. A longer form (three pages) is submitted by public officers and employees designated by the governor to meet the mandatory reporting requirements of Section 2.1-353.2. This statement is sent to the attorney general in December. Since no single agency of State government is responsible for mailing disclosure forms to agency governing bodies, the forms are sent by the department's director of administration.

The processing of completed forms is cumbersome. Members might return completed forms to any one of three organizational units--the director of administration, highway commissioner's office, or the deputy attorney general assigned to the department. Forms received by

the director of administration and highway commissioner are forwarded to the deputy attorney general who sends them to the attorney general for eventual filing. It is not surprising then that forms may be lost or misplaced.

In March 1981 a reporter was preparing a story on a commission member. He requested copies of the disclosure statements filed by all members from the attorney general's office. Four forms could not be found. According to the commissioner, the original 1981 disclosure statements were misplaced and new disclosure statements had to be resubmitted during the spring of 1981.

Persons interviewed believe that the financial disclosure forms designed and prepared by the attorney general could be substantially improved. Most members felt the forms were written for a lawyer and not a lay person. Suggestions were made that forms be accompanied with a brochure which explains the Conflict of Interests Act in laymen's terms, include a return address, and include pointed questions about governmental contracts or other conflict situations.

A review of disclosure statements submitted by commission members found seven short forms and four long forms on file--one member did not file either. By sending the longer form, the department may be misleading commissioners into believing that they are required to submit a disclosure statement. The form states very clearly that "As a person designated by the Governor, you are required to complete this form and return it to your agency head by November 30. The form will then be submitted to the Office of Attorney General during December of this year." Furthermore, a person requesting a copy of the commissioner's disclosure form will likely obtain the mistaken impression that all commission members are required to file annual statements under Section 2.1-353.2.

Adequacy of Information

A review of financial disclosure statements filed by commission members revealed vast differences in the quality of information supplied. Disclosure statements seldom include information that can be used to identify possible conflicts. Two members did not have any reportable economic interests. One did not file a disclosure statement. However, several members simply listed their home and business addresses, stock interests, and business partnerships. Most commission members tended to give general statements about their land holdings. For example, one member cited "numerous real estate holdings in Chesapeake," (which is not sufficiently detailed to monitor potential conflicts). On the other hand, a former member, whose term expired in July 1981, filed a lengthy statement specifically disclosing numerous real estate interests.

Monitoring

Although Section 2.1-356 authorizes the attorney general to "review disclosures" submitted under Section 2.1-353, a spokesman for the attorney general states that they have no legislatively assigned monitoring responsibility. The burden rests with the individual to voluntarily disclose possible conflicts. Consequently, hundreds of forms have been filed annually with the attorney general but have not been reviewed for completeness of information or possible conflicts.

In the case of the highway commission, no one individual is responsible for reviewing disclosure statements once they are filed. In our study, for example, we found two disclosure statements that were unsigned--and one was missing the last page.

One member filed a disclosure statement in April 1981, reporting that he had provided services to localities. To the best of our knowledge, there was no follow-up to determine whether the member had complied with Section 2.1-349 (a)(2), requiring disclosure of governmental contracts. In fact, that commission member contends that when he was completing the disclosure statements in March 1981, he consulted the deputy attorney general. At no time during the conversation were his contractual relationships with local governments questioned. (However, in 1978 the deputy attorney general did respond in writing to an inquiry from the commission member concerning consultant services provided localities.)

Educational Requirements

Most commission members do not appear to have an adequate understanding of Virginia's Conflict of Interests Act. Prior to June 1981 no effort was made to educate the commission about the Act. A newspaper reporter's investigation of one commission member in March 1981 did apparently spur the attorney general and department staff to initiate a series of informational sessions dealing with the statute. According to one commission member, "nobody took the law seriously until this summer."

Section 2.1-356 (a) authorizes the attorney general to establish an appropriate procedure for implementing the disclosure requirements of Section 2.1-353 pertaining to agency governing bodies. This provision has been interpreted narrowly since the adoption of the law in 1970. The extent of the procedures developed by the attorney general is a two-page disclosure form. No pamphlet or booklet describing the conflict of interests law has yet been prepared for appointees to boards and commissions. The position of the office of the attorney general was described by a deputy attorney general in the following words--"we assume that people know the law. Perhaps they don't have as good a grasp as we thought."

To counter the general lack of knowledge about the Act among highway commissioners, the department and the deputy attorney general

assigned to the department recently have held a series of informational meetings for the highway commissioners. In June, July and October commission members were briefed on the conflict of interests statute. Members who have served on the commission a year or longer indicated that this was the first orientation they had ever had to the law. Materials handed out at the meetings seem to be informative and understandable. They generally felt the meetings represented an excellent start toward making commission members more aware of the statute's requirements.

Advisory Opinions

Interpretation of any conflict of interests is made complex by the infinite variety of situations which are applicable. For this reason, the attorney general is directed to provide advisory opinions upon request. The attorney general has issued well over 200 official opinions to date.

Members of the highway commission have not consistently sought legal advice from the deputy attorney general assigned to the department. Two examples stand out. On the occasion identified earlier, a member advised the commissioner of the department that he owned property near the proposed location of a highway. The department commissioner, without consulting the deputy attorney general, replied that he had no problem with the member voting on the highway proposal. Later, as a part of his investigation into this episode, the deputy attorney general stated ". . . had I been asked to express my opinion at the time that the issue arose prior to August 20, 1981, I would have voiced my concern and counseled the commissioner that although it technically was not a violation, nonetheless because of the appearance of conflict, it would have been more prudent if the commissioner had abstained from voting."

On a second occasion a member asked the department commissioner if being a member of a newly created toll authority would pose a conflict. According to the member, he was advised that it would not be. The deputy attorney general stated that he was not consulted on this matter.

Commission members should rely more on the attorney general and his staff for legal advice regarding potential conflicts of interest. The highway commissioner should always consult with the deputy attorney general on matters involving interpretation of the conflict of interests statute.

Clarity of the Act

Commission members and staff of the department of highways and attorney general's office believe the statute is ambiguous and complicated. Admittedly, some portions of the Act are difficult to understand--especially the provision dealing with governmental

contracts. However, the requirement that members of boards and commissions refrain from voting on matters affecting personal interests seems clear enough.

The terms "material financial interest" and "general application" are two key phrases in the Act that are most often described as ambiguous or vague and may need better definition and illustration. However, it would seem nearly impossible to specifically identify all potential conflict of interest situations. Thus general phrases of this type are necessary and desirable.

CONCLUSION AND SUGGESTED RECOMMENDATIONS

Many of the commission's conflict of interest problems have been caused by a lack of explanation, awkwardly administered disclosure procedures, misunderstandings and poor judgements. Until a conflict situation arose this summer, the commission, the department, and the attorney general's office took a matter-of-fact approach to the conflict of interests law.

In order to ensure the commission members fully comply with the conflict of interests statute, the following recommendations are suggested.

Recommendation (51). The General Assembly may wish to amend Section 2.1-353.2 and require members of the highway and transportation commission to annually file financial disclosure statements. (Consideration should be given to requiring any commission or board having substantial authority to conduct state business and who receive compensation and expenses under Section 2.1-20.4 to file disclosure statements on an annual basis.) Short of legislative enactment, the Governor might wish to designate highway commission members as subject to annual filing provisions.

Recommendation (52). To assist voluntary compliance with Virginia's Conflict of Interests Act, financial disclosure forms should be sent annually to all members of boards and commissions identified in Section 2.1-20.4 by the Secretary of the Commonwealth. The secretary maintains names and addresses of all appointees to these bodies. New appointees should be sent an informational packet on the conflict of interests law before they assume their duties.

Because members of the highway commission are particularly vulnerable to the appearance of conflict of interest, the governor should require that new appointees be thoroughly briefed on Virginia's conflict of interests law. The deputy attorney general assigned to the department could perform this function.

Recommendation (53). Commission members should be advised to disclose the specific location of all real estate and highway related business contracts prior to their confirmation by the General Assembly.

Commission members should also provide the public with notification of property holdings that might be affected by proposed highways during location and design public hearings. Staff presentations at commission meetings might identify the location of commission members' land holdings in relation to proposed highway corridors. This process would ensure that the location would be made public before any commission action.

Recommendation (54). Although not specifically required by the Conflict of Interests Act, the attorney general might wish to play a more active role in educating highway commission members (and other governing bodies) about the Act's provisions. Informational brochures or pamphlets could be prepared by the attorney general explaining the law's disclosure requirements. A standard briefing package could also be developed and presented to public officials and agencies on request.

Recommendation (55). Forms currently used for disclosing financial information should be reviewed either by the attorney general or the department for clarity, completeness, and usefulness of information being supplied. Questions related to governmental contracts should be clearly stated on both forms. Relevant sections of the conflict of interest statute could be cited when requesting information of a public official. A return address should be included on the form.

Recommendation (56). The attorney general's staff should spot-check disclosure statements for completeness and possible conflicts. Assistant attorneys general assigned to agencies should review statements for signatures, missing pages, and obvious potential conflict areas such as business transactions with governmental agencies. Copies of statements submitted by highway commission members should be kept on file in the department to provide a secondary record of the statements sent to the attorney general.

Recommendation (57). The attorney general might wish to provide more guidance and consultation to the highway department on matters dealing with conflict of interest questions. Commission members should be advised to rely on the attorney general for legal advice regarding potential conflict of interests situations.

Recommendation (58). The commission should discontinue the practice of approving construction bids as part of a motion to approve several actions previously decided by mail or telephone ballot. Construction bids should be voted on one at a time, allowing time for the individual commission member to disclose information relative to the construction bid. This would also allow the member to abstain from voting on any particular construction contract without having to abstain from voting on the other items.

TECHNICAL APPENDIX SUMMARY

JLARC policy and sound research practice require a technical explanation of research methodology. The technical appendix for this report is available on request from JLARC, Suite 1100, 910 Capitol Street, Richmond, Virginia 23219.

The technical appendix includes a detailed explanation of the methods and research employed in developing this study and covers the following areas:

1. Equipment Maintenance. JLARC staff used several methods to evaluate the management of DHT's equipment maintenance program. Key methods included (1) a telephone survey of all residencies, (2) field reviews at ten residencies, (3) a survey on equipment repair parts, and (4) an analysis of equipment data regarding the appropriateness of maintenance expenditures.

2. Inventory Management. The review of DHT's inventory management system had several facets. These included (1) an analysis of DHT stock levels, (2) audits of selected DHT stockrooms, (3) a review of local purchases, (4) a review of inventory procedures, and (5) a review of physical security.

3. Maintenance Expenditures. Maintenance expenditures were based on a productivity analysis performed by JLARC staff as part of the report on Highway and Public Transportation Needs in Virginia. A comparison was made of the resources used by the various residencies to accomplish similar amounts of work.

4. Inmate Labor. JLARC staff used interviews conducted at three field camps and an estimating technique in the analysis of inmate labor management.

HAROLD C. KING, COMMISSIONER

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COMMONWEALTH of VIRGINIA

DEPARTMENT OF HIGHWAYS & TRANSPORTATION

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November 25, 1981

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IN REPLY PLEASE REFER TO

Comments on JLARC Report

Honorable Theodore V. Morrison, Jr.
Chairman, SJR 50 Subcommittee
c/o Joint Legislative Audit and Review Commission
Suite 1100, 910 Capitol Street
Richmond, Virginia 23219

Dear Mr. Morrison:

Submitted herewith for the Subcommittee's consideration are comments on the review draft of the Interim Report of JLARC's review of the organization and administration of the Department of Highways and Transportation which was presented to the Subcommittee on November 9, 1981.

I. PROGRAM DIRECTION

The first two recommendations deal with the Secretary of Transportation's role and, as such, are not addressed by VDHT except to state that the draft of a statewide plan is expected to be completed by July 1, 1982.

Highway and Transportation Commission

The recommendation calls for the establishment of a Standing Subcommittee to oversee public transportation planning and coordination roles assigned to the Commission.

Relative to expanding the role and involvement of the Commission, two additional committees will be established - one directed at the maintenance function and one to work with public transportation. The Commission Maintenance Committee will define the concept of maintenance and review the Department's proposed maintenance plan. A part of this review would be the determination of the amount of funds to be allocated to the maintenance activity.

The Commission Committee for Public Transportation will be charged with providing guidance and oversight in the continued progress of this function within VDHT.

Both Committees will report their findings/concerns to the remainder of the Commission.

II. BUDGETING

Construction Needs Assessment

The Department agrees that a more formalized construction needs assessment is in order. This will include the utilization of the existing allocation formula to insure equitable distribution to localities. At present, a Six-Year Critical Improvement Program is being developed specifically identifying highest priority needs.

Maintenance Needs Assessment

Recommendation #1 deals with the standards used in budgeting for routine ordinary maintenance. VDHT recognizes that, for any specific activity, substantial fluctuations are possible due to local conditions; however, overall, the standards are useful for "average cost" planning and fund distribution. It is further recognized that some of these standards may be inaccurate due to technological advancement, new equipment, and methods improvements. An ongoing program is being developed to evaluate the effect of such changes and modification to standards will be made, as appropriate.

Recommendations #2 and #3 address the development of "an annual maintenance program to provide the necessary level of accountability" and the Highway and Transportation Commission's review and approval of this program with the opportunity for consultation with appropriate legislative committees. VDHT concurs with this aspect of the recommendations and will utilize the Commission Maintenance Committee as the implementation vehicle.

The recommendations also call for alternative maintenance level programs to be submitted to the General Assembly for review. Strict acceptance of this portion of the recommendation would result in the General Assembly being involved in Department operational decisions. It is felt the interaction between the appropriate legislative committees and the Commission Maintenance Committee will satisfy the intent of keeping the General Assembly informed and provide opportunity for its input while minimizing the amount of detail. This, it is felt, is more in keeping with the General Assembly's overview function.

Recommendation #4 calls for full implementation of a pavement management system and it further recommends the 1982-84 Appropriations Act mandate such a program for completion by the start of the 1984-86 biennial budget preparation cycle.

VDHT generally concurs with the recommendation. However, such a program should be developed in a deliberate fashion, requiring computer programming lead time and careful determination of the factors to be considered. It is felt that a mandated time frame will constrain the effectiveness of program development. This program is being developed for the Interstate System, and the Department's position is that a cost benefit analysis should be performed prior to expanding it to other systems.

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Maintenance Needs Assessment (Continued)

Recommendation #5 - Greater emphasis should be placed on bridge condition rating. VDHT will increase its efforts to provide a more uniform methodology of performing bridge ratings.

Expenditure Controls

The maintenance overexpenditure cited in the report occurred due to maintenance replacement charges being incurred to reconstruct roads and bridges destroyed by flooding. Although, in actuality, these were construction and reconstruction expenditures, they were handled through the maintenance replacement code for purposes of cost control and accumulation. Construction funds were transferred into maintenance to cover these expenditures with the approval of the Secretary of Transportation and the Director of the Budget. Adequate funds existed in the construction fund to cover these charges; and as this transfer was authorized, based on the nature of the work, an overexpenditure beyond the authorized limit did not occur.

VDHT accepts the recommendation to establish separate control accounts; however, some technical difficulties with the Comptroller's Office must be resolved prior to implementation.

Recommendations #2 and #3 deal with clarification of allocations and expenditures. A plan is being developed to correct the current imbalances among highway systems, and further development of the Critical Improvement Program mentioned earlier will support this objective. The imbalance originally occurred as a result of efforts to capture available Federal Interstate Funding coupled with extraordinary storm damage incurred in past years. It is not unusual for the Urban balance to lag due to the high cost of projects, complexity of construction, utility adjustments, and need for consensus from local governing bodies.

Recommendation #4 addresses "bringing the program budget into compliance with established format and content requirements". This will be accomplished through the newly created Budget Division, and steps will be taken to increase training of managers on the budget process.

Capital Outlay

The two recommendations on this subject deal with increased control of capital outlay, coordination of the capital outlay budget with the development of the operating budget, and compliance with DPB procedures.

The Department is reviewing these recommendations with the Secretary of Transportation, and a revised set of procedures is being developed.

III. ORGANIZATIONAL STRUCTURE

Organizational Recommendations

Recommendation #1 calls for splitting the Deputy Commissioner/Chief Engineer position into two separate positions.

While there is agreement that some organizational changes are desirable, it is not felt at this time of retrenchment and austerity that another top level position should be created. In the Department's opinion, it is not unusual to have the Administration and Finance functions reporting to the Chief Executive Officer.

Recommendation #2 proposes creation of a policy research and statistics team. This function can be, and is being, carried out by the Research Council and/or the Management Services Division; therefore, the Department does not see any need to relocate the functions.

Recommendation #3 - "Establish an internal audit function which reports to the Commissioner". The current organizational alignment of the internal audit function has it reporting to the Commission Internal Audit Committee. The Department will expand its definition of internal audit to include all management reports; however, no advantage is seen in relocating a function that already has the necessary level of independence.

Additional recommendations dealing with the reporting relationship of the Rail Division, relocation of the Environmental Quality Division to the engineering directorate, and consolidation of the Programming and Scheduling Division with the Urban and Secondary Roads Divisions will require further study.

The recommendations to establish a Public Transportation directorate reporting to the Deputy Commissioner and the reporting of the Northern Virginia Division to the Director of Operations are being considered by the Department. The present Public Transportation Division reports to the Commissioner. Consideration is also being given to realigning the eight construction districts; however, further study is needed on this since there is potentially a large capital outlay requirement attached to such a change.

Delegation of Authority

The five recommendations in this section address the need for clarification of roles, communication efforts, and increased monitoring and control. The Department concurs that improvements can be made in these areas and accepts these recommendations.

Staffing

The recommendations in this section deal with guidelines for identification of surplus positions, manpower planning, and increased training. Action has already been taken to develop a more uniform method of evaluating required

Staffing (Continued)

staffing levels which the Department views as a critical portion of the development of an overall manpower management system. Efforts will be made to provide additional training both to VDMT managers and in areas where skills improvement are or will be required.

IV. MANAGEMENT CONTROLS

Inventory Management

A total of nine specific recommendations were made in this section, and the Department (as a result of the interim JLARC report) has begun to take the appropriate action to implement these recommendations.

Equipment Maintenance

Recommendation #1 calls for a review of the preventive maintenance policies and guidelines. Since this was initially pointed out by JLARC, policy and guideline changes have been made; and efforts are continuing in this area to improve the clarity of these instructions and insure uniform interpretation.

Recommendation #2 deals with improving the existing equipment information system by developing lifetime cost profiles for each age group on all major equipment classes. This recommendation is being considered.

Surplus Land

This recommendation deals with the completeness of inventory and the priority placed on disposal of surplus land. The Department concurs with this recommendation and is investigating ways to most effectively and economically place increased emphasis on this function.

Construction Engineering Costs

The recommendation addresses the need to monitor construction costs as they approach ten percent of project's value. Reports currently exist that provides this information; however, since construction engineering costs are inversely proportional to the size of the projects and short-term future inspector needs must be considered by location, a cost in excess of ten percent does not necessarily indicate improper staffing. The Department recognizes the intent of the recommendation and will strive to comply with the intent.

Construction Work Orders

The report recommends the Department maintain its \$25,000 limit on work order approval at the district engineer level. This limit was recommended by the Hansen Study to be revised to \$50,000 to take inflation into account. Management is satisfied that this maintains the desirable relative authority range necessary for a decentralized organization.

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V. INMATE LABOR

The Department accepts the recommendations relative to inmate labor. The possibility of restructuring work crews is being investigated.

The Department, due to revenue decreases, cannot maintain the current level of inmate labor and comply with the statutory requirements for wages. Therefore, it is recommended that legislation be enacted to permit the negotiation of a just wage with the Department of Corrections. The negotiated wage would be subject to approval by the legislature through the budgetary review process.

The Department is appreciative of the thorough and efficient manner in which the JLARC staff has conducted the review. A number of the recommendations have been quite helpful, and many are in the process of implementation.

Sincerely,

A handwritten signature in cursive script that reads "Harold C. King". The signature is written in black ink and includes a stylized flourish at the end.

Harold C. King, Commissioner

Copy - Members of the Highway and Transportation Commission
Mr. George M. Walters

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