Legislative Budget and Finance Committee

A JOINT COMMITTEE OF THE PENNSYLVANIA GENERAL ASSEMBLY

OFFICES: Room 400, Finance Building, Harrisburg, Tel: (717) 783-1600
Mailing Address: P.O. Box 8737, Harrisburg, PA 17105-8737
Facsimile: (717) 787-5487

EXECUTIVE DIRECTOR
PHILIP R. DURGIN

CHIEF ANALYST
JOHN H. ROWE, JR.

A PERFORMANCE AUDIT OF THE PA DEPARTMENT OF TRANSPORTATION

Pursuant to Act 1981-35

FINAL REPORT

June 1990

TABLE OF CONTENTS

A PERFORMANCE AUDIT OF THE
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TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

LIST OF TABLES AND EXHIBITS CONTAINED IN THIS REPORT

Exhibits

Tables

TABLE OF CONTENTS
(Continued)

Page

Tables (Continued)

I. INTRODUCTION

I. INTRODUCTION

A. Legislative Mandate for and Purpose of PennDOT Performance Audit

The Legislative Budget and Finance Committee is required by Act 1981-35, 75 Pa.C.S.A. §9701 (see Section IV, Exhibit P), to conduct, or cause to be conducted, a performance audit of the Pennsylvania Department of Transportation (PennDOT) during fiscal year 1983-84 and every six years thereafter. The audit is to be carried out in accordance with standards of the United States General Accounting Office (GAO).

The purpose of the performance audit is to determine whether the Department is conducting authorized activities or programs in a manner consistent with accomplishing the objectives intended by the General Assembly and whether the programs or activities and expenditures of funds are carried out in a faithful, efficient, economical, and effective manner.

B. Scope and Methodology

During the preliminary survey phase of the audit, LB&FC staff identified 33 issues for review. These issues, which were outlined in Volume I of the LB&FC interim report issued in October 1989, represented elements from all major program areas within various bureaus under each of the deputy secretaries. Aspects of both highway and non-highway programs were included in the review which covered the Department's activities and programs at both the Central and district office level. This review covered primarily the period 1984 through 1989. The audit was conducted in accordance with generally accepted government auditing standards and included:

1. Follow-up on the status of recommendations contained in the previous PennDOT performance audit (1983-84) and eight other LB&FC reports on PennDOT programs issued subsequent to the 1984 performance audit. (See Volume II of the October 1989 interim report.)

2. A review of the Department's progress in attaining its major objectives for both the 1983-1986 period and the 1988-1990 period.

3. Identification and assessment of select and significant internal controls.

4. An assessment of compliance with applicable requirements of select laws and regulations.

Individual statements of methodology have been developed for each of the audit review areas. (See Section V.) No information has been omitted from this report because it is deemed privileged or confidential.

C. Report Structure

A brief summary of principle audit findings and recommendations is included in Section II of the report. That section also contains a status report of PennDOT's progress in meeting its current major objectives. The complete audit findings and recommendations are in Section III, which is organized by major program area sub-sections as follows: a) Highway Administration; b) Planning; c) Safety Administration; d) Local and Area Transportation; e) Aviation and Rail; and f) Administration. Section IV includes PennDOT background information such as legal background, expenditure trends, personnel complement, and organizational structure. The audit methodology is described in Section V. PennDOT's response to the audit is contained in Section VI.

D. Acknowledgements

Development of this report was facilitated through the excellent cooperation and assistance received from the Pennsylvania Department of Transportation. LB&FC staff expresses its appreciation to the Honorable Howard Yerusalim, Secretary of Transportation, for his support of the audit effort. LB&FC staff also acknowledges the special assistance provided by the following PennDOT staff: Parker Williams, Deputy Secretary for Administration; Walter E. Bortree, Director, Bureau of Operations Review; Gaylord Cumberledge, Bureau of Bridge and Roadway Technology; and Gerald Fritz, Director, Program Development and Management Center. In addition, the PennDOT Comptroller's staff has also been most supportive and helpful. LB&FC staff is also grateful for the special assistance provided by Walter P. Kilareski, Ph.D., Associate Professor of Civil Engineering, the Pennsylvania State University.

The LB&FC audit teams assigned to this project worked under the direction of Philip Durgin, Executive Director, and Keith Chase, Assistant Chief Analyst. The team leaders involved in the development of this report were Mark Reisinger, K. Nicolette Snell, and Robert Staver. Analysts assigned full-time to this audit project were Thomas Boone, Richard George, Marianne Guidos, Peter Halvorsen, Robert Hollings, Natalie Jacoby, Virginia Kuhn, Charles Perrine, and Scott Brubaker (Graduate Intern). Legal assistance was provided by attorneys Patricia Berger and Jonathan Nase and Krista Williard, Paralegal. EDP services were provided by Michael McKenna, EDP Manager. Clerical and administrative support services were provided by Terry Beam, Beverly Brown, Anne Gange, Shannon Opperman, Anne Ritter, and Charles Saia.

II. REPORT SUMMARY

II. REPORT SUMMARY

A. Principle Findings and Recommendations

The following is a synopsis of the principle audit findings and recommendations, grouped according to major program area (i.e., deputy secretary area of responsibility). The page numbers on which the full findings can be found are noted.

During the course of this performance audit, the Pennsylvania Department of Transportation (PennDOT) took action to address many of the concerns raised by LB&FC staff during the audit. Where appropriate, LB&FC staff attempted to include information on recent initiatives undertaken or being planned by the Department.

HIGHWAY ADMINISTRATION

-- Many of Pennsylvania's interstate highways are at or nearing the end of their original 20-year design life; an estimated $1.3 billion in restoration and repairs (exclusive of bridges) is needed. Deferred restoration (i.e., needed improvements in excess of routine maintenance) accounts for an estimated 86%, or $1.1 billion, of total interstate repair needs. (See page 24.)

-- PennDOT is meeting or is reasonably close to meeting its desired maintenance cycles with the exception of resurfacing bituminous (i.e., asphalt) roads. In addition, trend statistics on PennDOT's Surface Improvement Program show that, although the Department has been able to meet or exceed its overall surface improvement goals, the number of miles of roadway receiving major resurfacing treatments has been generally decreasing in recent years while the number of miles receiving less expensive surface treatments has remained relatively constant. (See page 36.)

-- In 1988 the PA Secretary of Transportation implemented a policy to control excessive and unnecessary use of speed limit signing in construction work zones. District compliance with the Secretary's policy is assessed as part of a work zone quality assurance review. A policy should also be developed to help ensure that work zone lane closures are not unnecessarily burdensome to the public. (See page 61.)

-- While the Department has achieved its goal of containing construction contract cost overruns within 5% of original contract bid, certain work order and claims processing procedures should be improved and documented to help ensure continued achievement of this goal. (See page 88.)

-- In response to an LB&FC questionnaire, local governments expressed a high degree of satisfaction with the Depart-

ment's efforts to coordinate six highway maintenance areas with municipalities. Seventy-two percent of all responses expressed general satisfaction. When "non-applicable/no response" answers were removed, over 90% of the responses were positive. (See page 109.)

PLANNING

-- PennDOT's Twelve-Year Transportation Program is a reasonably predictable planning vehicle. Approximately 70% of planned non-interstate highway projects have either progressed or are progressing toward construction as planned. Perceptions regarding the program's objectivity could be enhanced by improved procedures to allow the relative ranking of candidate projects against PennDOT's selection criteria. (See page 114.)

SAFETY ADMINISTRATION

-- PennDOT has implemented all but one of the recommendations from earlier LB&FC studies of the Motor Carrier Safety Assistance Program. The Department disagreed with the LB&FC recommendation to hire full-time "dedicated" MCSAP inspectors. (See page 128.)

-- PennDOT policy states that engineering districts are to field-review the top third high accident locations within their districts, but many of these sites are not reviewed. Performance measures and controls are needed to ensure district review of those locations with the highest accident rates. (See page 146.)

-- PennDOT's estimate of the number of uninsured drivers is based on auto insurance company responses to verification letters mailed by the Department. Improved procedures are needed to help ensure that insurance companies are properly responding to these letters. (See page 156.)

-- The Commonwealth Automated Registration and Titling System, implemented in December 1986, was designed to achieve, among other objectives, same day fee deposit, five-workday average document turnaround time, and an average document error limit of 1.0%. The Department has made progress but has not yet achieved all of these objectives. (See page 163.)

-- A 1984 PennDOT consultant study indicated that a decentralized approach to the provision of driver and vehicle services (e.g., driver licenses, vehicle registrations) is preferable to the current centralized system. Pennsylvania is one of only a few states that does not provide such services through local or regional offices. PennDOT is completing major enhancements to its driver and vehicle computer systems that could accommodate service decentralization. Decen-

tralization should be reconsidered when these improvements are implemented. (See page 173.)

-- PennDOT has not implemented certain Environmental Protection Agency (EPA) audit recommendations concerning the Vehicle Emission Inspection Program. These include recommendations to conduct covert inspection audits, not allow violating stations and mechanics to serve multiple suspensions concurrently, and increase the vehicle waiver rate. (See page 179.)

-- Manufacturers of emission analyzers are not, in some cases, abiding by the requirements of the Emissions Inspection Program to service the machines and pick up the cassette tapes on which test results are recorded on a quarterly basis. A penalty schedule should be developed by PennDOT to assist in enforcing these requirements. (See page 192.)

LOCAL AND AREA TRANSPORTATION

-- Inaccurate estimates of restoration costs and the Department's policy which allows municipalities to keep unspent restoration funds adversely impact on the cost-effectiveness of the road turnback program. The Department should examine its policy on unspent funds and standardize the cost estimation process across all districts. (See page 202.)

-- PennDOT's monitoring of grantees in the Shared-Ride Program should be improved to help prevent reimbursement for ineligible rides. PennDOT should increase field visits to grantees and strengthen its follow-up on compliance problems. (See page 208.)

-- Although the cost of providing transportation service to senior citizens is much less through the Free Transit Program than it is through the Shared-Ride Program, PennDOT does not require shared-ride grantees to establish and apply criteria to determine under what conditions passengers should use free transit versus shared-ride services. Replacing only 10% of the shared-ride service with free transit rides in Philadelphia and Allegheny Counties could result in a one-year savings of over $2 million. (See page 215.)

-- Rural transportation needs may be underserved by the Shared-Ride Program. PennDOT and the Department of Aging should assess rural transportation needs and, in particular, the current reimbursement limits placed on shared-ride providers operating in rural areas. (See page 218.)

-- Outdated local road mileage information is resulting in inaccurate liquid fuels tax payments to municipalities. An estimated $800,000 in liquid fuels tax payments could be misallocated to municipalities in the current fiscal year

due to these inaccuracies. Attention should be given to municipality resurveys and annual updates. (See page 221.)

-- State operating subsidies to local transit agencies have increased by approximately 29% since FY 1984-85, but "farebox" revenue (i.e., non-subsidy) has increased by only 21%. In 1988 the PennDOT Comptroller recommended that the Department conduct on-site reviews of local transit agencies. Such operating and efficiency reviews are carried out in a number of other states. The General Assembly should consider amending the state transit law to require PennDOT to conduct periodic operating reviews of local transit agencies. (See page 224.)

AVIATION AND RAIL

-- Municipal compliance with the Airport Hazard Zoning Act is only about 8%, even though PennDOT has assisted municipalities in enacting airport hazard zoning to meet the requirements of the law. The act should be amended to designate PennDOT as the administering agency, add a penalty as an enforcement mechanism, and delete zoning requirements in favor of a broader set of ordinances/regulations. (See page 228.)

-- The awarding of rail freight assistance project grants could be improved by broadening the selection criteria. Factors such as rail line preservation needs, transportation initiatives, and intermodal strategies should be considered as additional funding criteria. (See page 233.)

ADMINISTRATION

-- PennDOT has made a major effort during the 1980s to encourage participation in the Department's management through its employee involvement programs. These programs, however, need to be evaluated to assess whether they are achieving their desired purposes. (See page 45.)

-- PennDOT issued 234 sole source service purchase contracts between July 1, 1989, and December 31, 1989. LB&FC staff reviewed a 15% sample of these contracts and found nothing to indicate that the Department was not in substantial compliance with Management Directive 215.1 (Contracting for Services Manual) and provisions of the Administrative Code of 1929 pertaining to sole source purchases. (See page 99.)

-- PennDOT's management of non-highway consultant contracts appears to be generally effective in ensuring that contract requirements are fulfilled. (See page 242.)

-- PennDOT has implemented various security measures to prevent a computer virus infection of personal computers. However, the Department's PC environment could be enhanced by implementing additional security measures, such as user identifications and passwords. (See page 245.)

B. PennDOT Major Objectives: Status Report

Department Goals	Major Accomplishment Toward Goal*/	LB&FC Comments
RESTORATION:		
Maintain acceptable pavement condition on interstates and other four-lane expressways.	- Determined condition of interstate system and other expressways and reported to PMC for FY 1988-89.	Overall interstate dollar need as indicated by the Department's pavement management system (STAMPP) has decreased 9.73% between 1984 and 1989 due to completed restoration. Deferred restoration need, as a percentage of overall interstate need, has increased each year since 1984. Deferred restoration now accounts for 86.5% of the $1.3 billion interstate need. (See page 24.)
	- $125 million interstate restoration program projects let for FFY 1989 and $128.9 million interstate restoration program project advanced for FFY 1990 with $50 million let through 2/90.	
Revitalize Pennsylvania's transit infrastructure	- Helped prioritize and approve over twenty Act 1988-113 capital assistance grants which authorize about $50 million of state aid to SEPTA, PAT, and selected urban and rural transit systems.	

*/Source: Progress Report, Action Agenda Goals and Objectives to 1990, March 1990.

PennDOT Major Objectives: Status Report
(Continued)

Department Goals	Major Accomplishment Toward Goal	LB&FC Comments
	- Proposed FY 1990-91 Governor's budget recommends state capital funding of $50.7 million for mass transit capital improvement projects.	The General Assembly has not yet authorized the capital projects that PennDOT requested for FY 1989-90. (See page 198.) Public transit agencies do not receive state capital funds at regular and predictable intervals that coincide with the federal funding cycle. Delays in the state capital budget process result in tranist agencies being forced to turn to their local governments for additional matching funds while awaiting state assistance. (See page 198.)
Develop and achieve acceptable maintenance cycles.	- May 1989 - Developed a revised set of recommended maintenance performance measures for the Blue/Green/Red books (performance management reports for the Department, districts and counties, respectively). Revised cycle and cycle calculation guidelines developed.	Maintenance cycles establish a guideline of uniform measurement between districts. A "desired cycle" is a planning factor based on the average life of the various treatments. PennDOT is meeting most of its desired maintenance cylces with the exception of resurfacing of bituminous roads. (See page 36.)

PennDOT Major Objectives: Status Report
(Continued)

Department Goals	Major Accomplishment Toward Goal	LB&FC Comments
Preserve Pennsylvania's rail freight network.	- Letting to rehabilitate 15 state-owned rail lines totaling $10.8 million anticipated for 4/16/90. - Agreement to implement change of ownership for 19 mile York rail line sent to York County for their execution. - Executed agreement with the D&H to provide up to $225,000 in emergency operating assistance to ensure continued rail service.	The process of selecting rail freight assistance project grants relies on a limited criterion (cost-per-job-impacted). A broader set of selection criteria would improve the selection process. (See page 233.)
ECONOMIC DEVELOPMENT:		
Upgrade service and facilities at Pennsylvania airports.	- Apron expansion, loading bridges and concourse constructed at HIA. - Established 40 weather information systems by March 1989. - Completed shuttle parking at HIA in November 1989. - For FY 1988-89, 37 aviation improvements projects in process for $4.6 million. $5.0 million FY 1989-90 program approved by PMC in 10/89.	

PennDOT Major Objectives: Status Report
(Continued)

Department Goals	Major Accomplishment Toward Goal	LB&FC Comments
	- Implemented $1.5 million in project improvements to business airports for 35 projects for FY 1988-89. $2 million FY 1989-90 program approved by PMC in October 1989.	
Provide a safe and efficient transportation system for goods movement.	- Motor Carriers Advisory Committee (MCAC) established November 1988.	The Department has implemented recommendations made by the LB&FC to improve truck transportation in Pennsylvania. (See page 128.)
	- Completed scope of work for five additional port improvement projects totalling $19 million, forwarded to General Services for implementation.	
	- Analyzed all rail vertical clearances to be raised across Pennsylvania to accommodate double stacked containers.	
	- FY 1988-89 executed 20 rail economic development project agreements worth $3.2 million. FY 1989-90 PMC approved 19 projects for $3.2 million.	

PennDOT Major Objectives: Status Report
(Continued)

Department Goals	Major Accomplishment Toward Goal	LB&FC Comments
Ensure schedule adherence and cost control on major projects.	- Prepare monthly status/progress report on major projects for all modes. - Prepare quarterly report identifying significant cost changes on major projects.	PennDOT is meeting its goal of holding cost overruns below 5% of original bid contract cost. (See page 88.)
Strengthen the transportation partnership process.	- Master Policy Statement draft prepared 2/90. - May 1989, annual seminar with districts, Central Office personnel, other state agencies, regional planning agencies and other interested parties. Workshops scheduled for May and June 1990.	
Expand/improve welcome center and rest area facilities and services.	- FY 1989-90 Safety Rest Area Renovation Program totalled $1.5 million with $800,000 in construction projects to date. - Rest area quality assurance review process developed.	
Develop and implement intermodal transportation management strategies to ease congestion.	- Greater Valley Forge Transportation Management Association (TMA) met on 1/18/90 and 2/2/90. The TMA was incorporated on January 11, 1990.	The pilot TMA has demonstrated its effectiveness at relieving traffic congestion, according to a regional planner. (See page 122.)

PennDOT Major Objectives: Status Report
(Continued)

Department Goals	Major Accomplishment Toward Goal	LB&FC Comments
	- Department is pursuing intermodal congestion management initiatives thru pilot projects on I-95 and US 202 in the Philadelphia area, and on various routes in the Harrisburg areas.	PennDOT has established a modal integration committee for the Philadelphia region and has plans to establish two more in Pittsburgh and the Lehigh Valley. (See page 122.)
Repair/replace 800 bridges during 1987-1990.	- 425 bridge projects let in 1988. 272 bridge projects let in 1989. 45 bridge projects let to date in 1990.	
Manage air quality program to avoid impediments to economic development.	- Ongoing reports presented to the Department's Strategic Management Committee showing cooperation between PennDOT, DER and Commerce to pursue Governor's objectives for clean air.	The Environmental Protection Agency audited PennDOT's emission inspection and maintenance program in 1986 and 1989. Several key recommendations have not been implemented by PennDOT. (See page 179.)
TURNPIKE:		
Identify issues of mutual interest and implement cooperative ventures.	- MBE/WBE program implemented 12/88. - Signs in place at HIA. - Construction began 1/90 on interchange between Turnpike and Mid-County Expressway (I-476).	

PennDOT Major Objectives: Status Report
(Continued)

Department Goals	Major Accomplishment Toward Goal	LB&FC Comments
Work with Turnpike Commission to implement turnpike system expansion.	- Mahoning River Bridge let 7/89.	
SAFETY:		
Develop and implement a major transportation safety initiative.	- 11 corridor safety projects let with 2 projects being completed to date.	Meaningful performance measures are needed for district accident location reviews to assure that the most critical accident sites are addressed. (See page 146.)
	- Act 1990-6 (Governor's Automobile Insurance Initiative) enacted into law.	For FY 1990-91, a five-fold increase in funding has been proposed to expand the random sampling process to identify uninsured vehicles. (See page 156.)
	- Driver License and Control System phase I and II enhancements begun; implementation slated for 11/90.	DL&CS is expected to reduce turn-around time from 7.4 days to 5 days, reduce fee depositing time from 8.8 days to less than 2 days, and reduce data entry errors. (See page 160.)
Develop a safer work environment for our employees.	- Established Health and Safety Steering Committee 3/89.	
	- Manual developed for proper handling, storage and disposal of maintenance waste products.	

PennDOT Major Objectives: Status Report
(Continued)

Department Goals	Major Accomplishment Toward Goal	LB&FC Comments
	- Annual safety inspections of all PennDOT facilities and selected work operations conducted.	
Provide signing which meets safety and economic development needs.	- 25 out of 28 qualifying airports have received directional signing. - As of 2/90, 18.039 miles (44%) of non-Interstate highway sign deficiencies corrected.	
PEOPLE:		
Communicate Department goals and objectives to our employees	- Expanded communication efforts implemented to emphasize goals. - Goals and objectives incorporated into budget process.	
Hire, train and retrain qualified people in accordance with affirmative action principles.	- From 12/86 to 12/89, PennDOT had an increase of 48 minority employees, 33% of the total Commonwealth's increase of 147 employees.	
Strengthen labor/management relations.	- Managers receiving training in contract review, discipline and grievance handling. - Labor relations objectives/standards included in performance evaluation of key managers.	

PennDOT Major Objectives: Status Report
(Continued)

Department Goals	Major Accomplishment Toward Goal	LB&FC Comments
Increase employee participation in Department Management	- Employee Involvement Master Policy Statement published 8/89. - Conducted Department-wide Employee Involvement Conference in April 1989 with one planned for April 1990. - Quality Breakthrough training implemented in District 10-0 and Bureau of Office Services by 6/89.	PennDOT needs to evaluate its Employee Involvement processes in order to assess program benefits and costs. (See page 45.)
DEPARTMENTAL:		
Shape future federal transportation legislation to address Pennsylvania's priorities.	- In 1/90, SMC identified and endorsed 14 federal priorities for 1990. - FY 1990 Transportation Appropriation Bill included $6.35 million in Interstate Substitute Discretionary Funds for Pennsylvania and $18.2 million for 3 highway demonstration projects in Pennsylvania.	
Establish an Information Systems Strategic Plan.	- Final plan published December 1988. - Quarterly status reports presented to Automated Technology Steering Committee.	

III. REPORT FINDINGS AND RECOMMENDATIONS

A. HIGHWAY ADMINISTRATION

A-1. ROADWAY AND BRIDGE CONDITIONS

A. Pennsylvania's Major Highway Networks Will Continue to Require Extensive Restoration Work

Many miles of interstate highway are at or near the end of their design life, and much of the improvement needed on Pennsylvania's interstate and Priority Commercial Network (PCN)[1] highway systems cannot be addressed through routine maintenance or lesser rehabilitative treatments. Deferred restoration (projects that require more than routine maintenance, but are not critical to the point of requiring major 4-R construction) as a percentage of total interstate dollar need has continued to grow, and in 1989 accounted for 86.5% of the estimated $1.3 billion in interstate need. PCN major repair needs are approximately $386.1 million, or 61.4% of total estimated PCN needs.

The Department has recently made substantial progress in decreasing total interstate need through its Interstate 4-R Program.[2] Total interstate dollar improvement need decreased 17.6% between 1987 and 1989. Pavement smoothness data also indicates that PennDOT has generally been able to maintain or improve the smoothness of the road surface on interstate, PCN and other state roads since the early 1980s.

Discussion

Using Department data, LB&FC staff reviewed road conditions on Pennsylvania's most important roads, the Interstate Highway System and the Priority Commercial Network. This review is based on two primary sources of PennDOT condition data. The first is improvement "needs" data from the Department's pavement management system--STAMPP (Systematic Technique to Analyze and Manage Pennsylvania Pavements). Through STAMPP, PennDOT surveys every mile of state highway to assess conditions, identify treatment needs, and estimate the associated improvement costs. These improvements can range from routine maintenance to major reconstruction. Since STAMPP data can be aggregated on a statewide basis, it was used to arrive at estimates of the needed road improvements.

1/The Priority Commercial Network is the 11,187 miles of road that PennDOT has designated as critical to the movement of goods. As referred to in this audit finding, it does not include the 1,169 miles of interstate highway. As such, "PCN" refers to non-interstate PCN, which is 10,018 miles.

2/Work of major scope consisting of resurfacing, restoration, rehabilitation and reconstruction as authorized by the Federal Aid Highway Act of 1976 and the Federal Highway Act of 1981.

The second source of condition data used in this review is a measurement of road smoothness or rideability known as Present Serviceability Index, or "PSI." PSI is obtained by a calibrated instrument known as a Mays Meter which measures road roughness. In sum, the STAMPP needs data provides an estimate of the total maintenance and improvement needs, while the PSI measure provides a gauge of road performance in terms of ride quality.

Road Smoothness

Analysis of PSI values for the three main categories of roadway (Interstate, PCN, and non-PCN) indicates that PennDOT has been generally successful in maintaining highway network rideability (smoothness). Samples of mileage measured for each of the three networks indicates little change in average PSI roughness ratings from the early 1980s to the late 1980s (see table below). PSI is measured on a scale of 0 to 5. Zero indicates an "impassable" pavement, while 5 represents a "perfect" pavement. The Department's current standard of acceptability for both Interstate and PCN highways is 3.0.

Roadway Rideability
Network PSI Comparison

	Segment[a/] Miles Sampled	Mean PSI Score
Interstate		
1983	2,185	3.45
1989	2,346	3.53
PCN		
1983	13,385	3.44
1988	17,499	3.42
Non-PCN[b/]		
1984	25,925	2.94
1989	14,398	2.98

a/Segment miles include all lane miles as opposed to linear or "straight line" mileage.
b/Other state roads not on either the interstate or PCN systems.

The primary conclusion to draw from the above table is that PennDOT has been able to maintain overall ride quality of Pennsylvania's roads. For the interstate system, which requires the greatest standard of performance, rideability actually improved over the 1983-89 period.

In its July 1989 reissue of the Roadway Management Manual which establishes policies and procedures for the construction and repair of pavement structures, the Department lowered the PSI acceptability standard for both the interstate and the PCN from 3.3 and 3.2 respectively to 3.0 for both systems. Analysis of ride quality data provided by PennDOT for interstate mileage measured during 1989 indicates that 20.6% of interstate mileage would fall below the old PSI standard of 3.3, whereas only 4.3% falls below the newer, less rigorous standard of 3.0. Likewise, 25.4% of the PCN sample mileage covered in 1988 would fall below the old standard, but only 13.2% falls below the new standard.

Pavement Restoration Needs

Many of the Commonwealth's interstate and non-interstate Priority Commercial Network highways are at or have outlived their original design life of approximately 20 years, and the pavement quality and structural integrity of many highways is now at the point that expensive reconstruction is necessary. The highways forming the bulk of the state's interstate system were built during the 1960s and early 1970s. While they account for less than 3% of PennDOT maintained highway mileage, they carry over 16% of daily traffic.

Exhibit A, "Interstate Dollar Needs," summarizes the Department's STAMPP condition data. The exhibit shows various categories of road improvement need ranging in extensiveness from routine maintenance to "Major 4R" (see footnote 2). The following conclusions can be made from this exhibit:

-- Based on 1989 STAMPP data, Pennsylvania's interstate system requires improvements at an estimated total cost of $1.3 billion.

-- The most severe need category--major 4R--has decreased significantly since 1984. In that year, estimated 4R needs stood at $489.5 million. By 1989, the estimated need for 4R decreased by 66.1% to $165.9 million. PennDOT has been very successful among the states in obtaining federal interstate discretionary funds for this type of improvement.

-- Total interstate dollar need decreased 17.6% between 1987 and 1989. This decrease, again, is largely attributable to the decreasing need for major 4R. The following shows PennDOT's annual expenditures for this major repair work:

Interstate 4R Program Expenditures ($ in millions)	
Year	Expenditure
FY 1983-84	$ 24.9M
FY 1984-85	138.5
FY 1985-86	271.3
FY 1986-87	186.1
FY 1987-88	166.9
FY 1988-89	203.6

-- Interstate deferred restoration needs as of 1989 totaled an estimated $1.15 billion--86.5% of the $1.3 billion in total interstate improvement needs. Deferred restoration needs are more extensive than routine maintenance, and since 1984, the dollar needs for deferred restoration have increased by about 24%.

-- While many stretches of interstate are in need of repair work that is beyond the scope of routine maintenance, preservation or even concrete rehabilitation, they may not meet PennDOT's criteria for inclusion in the Interstate 4-R Program, which is reserved for the most deteriorated stretches. Major repairs to these segments of interstate are then typically "deferred" until they qualify for and obtain I-4R funding.

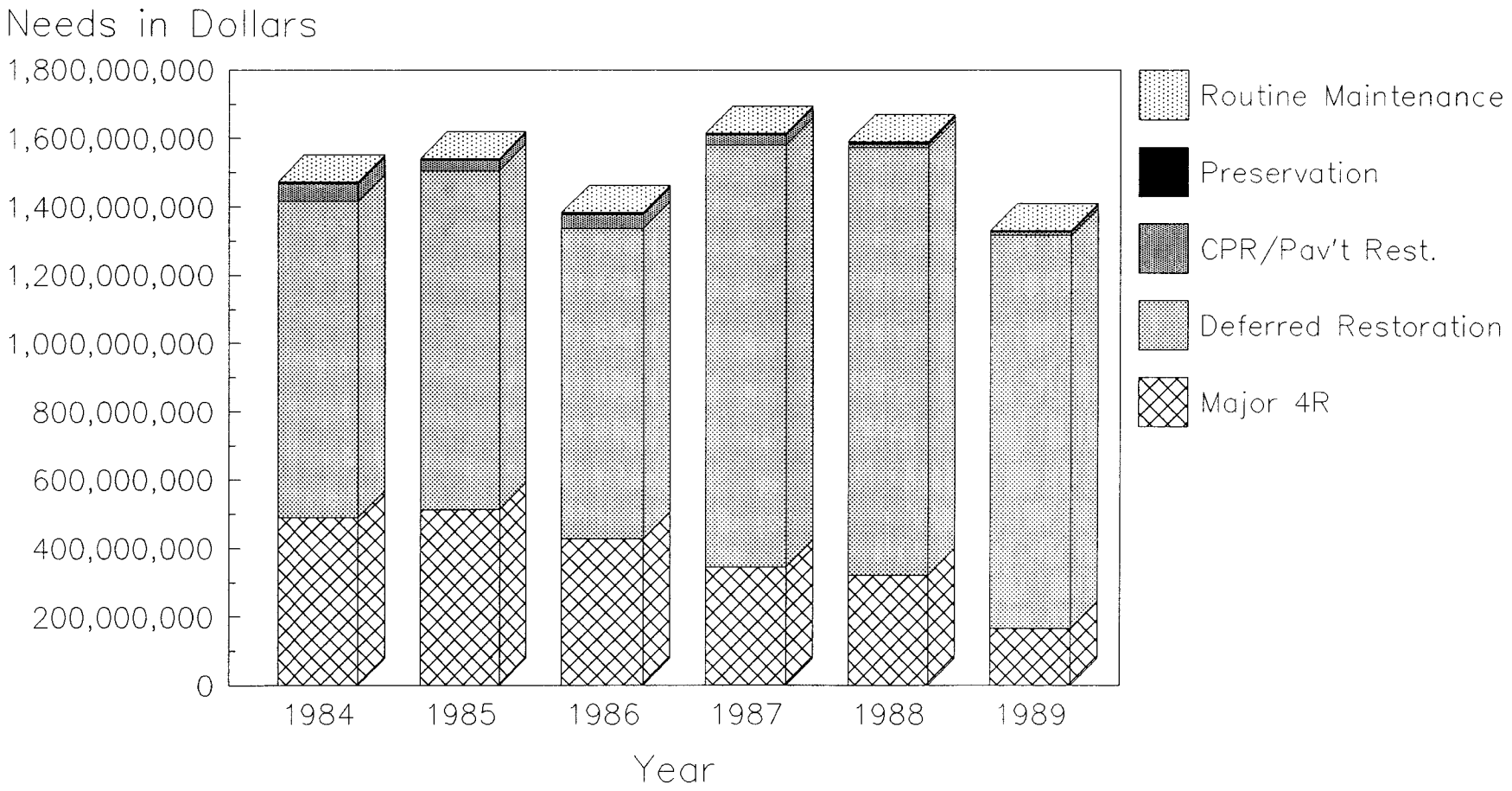
STAMPP data was also used to identify repair needs for the Priority Commercial Network. The STAMPP system identifies 33 categories of various improvement needs, including specific items related to pavement, shoulder, guiderail, and drainage. Of these 33, four items represent major roadway improvements: a) bituminous major rehabilitation, b) concrete pavement restoration, c) concrete "deferred" restoration, and d) concrete major 4R. As of 1989, PCN major repair needs for these four categories are estimated to be $386.1 million, or 61.4% of total estimated PCN improvement needs.

Conclusion

PennDOT has been successful in maintaining overall ride quality on Pennsylvania highways. The Department, through its efforts in maximizing federal interstate 4R dollars, has also made notable progress in reducing the need for major interstate reconstruction. Due to highway aging, though, substantial restoration needs continue to exist for many major highways.

EXHIBIT A

INTERSTATE DOLLAR NEEDS



Source: Provided by the Bureau of Bridge and Roadway Technology, Pennsylvania Department of Transportation

B. Public Safety Bridge Initiatives

Deficient bridges[1/] make up 38% of the 23,040 state and locally-owned bridges greater than 20 feet in length. These include bridges with obsolete designs as well as bridges with deteriorated decks and structural members. As of January 1990, 54 state-owned bridges were closed because of structural weaknesses and 1,451 had posted weight limitations. Although the number of deficient bridges in Pennsylvania has increased by 27% since 1984, PennDOT has undertaken a number of initiatives to identify and correct those bridges with the most serious structural deficiencies. In particular, PennDOT has identified and given increased inspection emphasis to 21 "pin and hanger" bridges similar in design to the Interstate 95 bridge which collapsed in Connecticut in 1983. Auxiliary supports for all 21 of these bridges are to be installed by 1992.

Discussion

The number of bridge closings and weight postings has risen since 1983 because many of the Commonwealth's bridges are aged and have been subjected to traffic volumes and vehicle weight far greater than anticipated at the time of design. Between 1983 and 1989, the number of closed bridges increased by 78, rising from 209 to 287. During this same period the number of weight posted bridges increased by 906, rising from 3,473 to 4,379. This figure accounts for 19% of the state's bridges.

Heavier traffic flow, new design technologies, and changes in user expectations also mean that many bridges are now classified as functionally obsolete even if they are structurally sound. Each of the above factors has contributed to an increase in the number of bridges rated as deficient.[1/] The impact of

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1/Deficient bridges fall into two categories. Structurally deficient bridges are inadequate for existing traffic due to deterioration in their decks, supporting members, or superstructures. Many of these bridges are posted for reduced vehicle weights or are closed to traffic. Functionally obsolete bridges cannot adequately handle current traffic due to too few or too narrow lanes, poorly aligned approaches and restrictive overhead clearances. A recent U.S. DOT policy report notes, "The fact that a bridge is 'deficient,' either structurally or functionally, does not imply that it is likely to collapse or that it is unsafe. With proper load posting and enforcement, most structurally deficient bridges can continue to serve traffic when restricted to the posted maximum loads. Some functionally obsolete bridges have geometric deficiencies (for example, they may be narrower than modern standards require) that can be mitigated, but not eliminated, by the use of roadway striping, signs, signals, and crash cushions."

aging on the number of deficient bridges in Pennsylvania is demonstrated by the following table. Thirty-six percent of the bridges in Pennsylvania were built prior to 1936 and are more than 50 years old.

Deficient Bridges by Year Built
(Bridges 20 Feet and Greater in Length)

Year Built	Total Bridges	Percent Deficient	Percent of Total Bridges	Cumulative Percent
- 1900	1,461	67.7%	6.5%	6.5%
1901 - 1925	3,528	67.9	15.6	22.1
1926 - 1935	3,146	58.2	13.9	36.0
1936 - 1945	2,789	50.2	12.3	48.3
1946 - 1955	2,641	28.6	11.7	60.0
1956 - 1965	3,784	18.3	16.7	76.7
1966 - 1975	3,302	10.9	14.6	91.3
1976 - 1985	1,472	5.1	6.5	97.8
1986 - 1988	498	2.0	2.2	100.0
Total	22,621	37.6%	100.0%	

Source: Bridges in Pennsylvania Summary BMS Report, December 1988, Pennsylvania Department of Transportation

The following table shows that the percentage of total bridges classified as deficient has increased steadily each year between June 1980 and January 1990.

Deficient Bridges in Pennsylvania
(Bridges 20 Feet and Greater in Length)

Data as of	No. of Deficient Bridges	Total No. Bridges	% of Bridges Deficient
June 1980	3,717	17,425	21.3%
June 1981	4,902	20,409	24.0
Dec. 1981	6,070	21,200	28.6
Dec. 1983	6,521	21,511	30.3
Dec. 1984	6,975	21,725	32.1
Dec. 1985	7,420	22,217	33.4
Dec. 1986	7,817	22,407	34.9
June 1987	8,218	22,430	36.6
Dec. 1987	8,362	22,448	37.3
June 1988	8,448	22,553	37.5
Dec. 1988	8,489	22,621	37.5
Jan. 1990	8,832	23,040	38.3

Source: Bridges in Pennsylvania Summary BMS Report, December 1988, PennDOT, and from January 1990 updated information provided by the Bureau of Bridge and Roadway Technology, PennDOT.

PennDOT has taken steps to ensure that weight-posted bridges are included on biennial updates of its Twelve-Year Program (see Finding B-1) and that a prioritization formula is used to allocate available funds to these bridges within its engineering districts. These priorities are used to target bridges eligible for federal aid and to ensure that state funds for bridges authorized under the Billion Dollar Bridge Program are expended in accordance with prioritized need.

Bridge Safety Initiatives

PennDOT has been an active participant in two important Federal Highway Administration (FHWA) initiatives over the past several years to curb potential safety problems with fracture-critical[2/] and scour-critical[3/] bridges.

Responding to the 1983 Mianus River bridge collapse on Interstate 95 in Connecticut, PennDOT began its own extensive review of fracture-critical bridges in May 1986, two years before the Federal Highway Administration's required review took effect. PennDOT's Bridge Management System (BMS) was used to identify 923 bridges with fracture critical characteristics. District bridge engineers identified the pinpoint location of potential fractures on smaller bridges, and 341 larger bridges were referred to consultants for detailed study. PennDOT is reviewing the inspection schedules of these bridges to determine if more frequent inspection (i.e., more frequent than PennDOT's normal two year intervals) is required.

Since undertaking its fracture critical bridge initiative, PennDOT has given particular emphasis to the more vulnerable two girder pin and hanger[4/] designs of the type which failed in the Connecticut bridge collapse. The PA Secretary of Transportation ordered the development of a cost-effective means of providing additional structural support for the 21 bridges of this type in Pennsylvania. Of these, six are on interstate highways and another 11 are on other major state highways. Installation of auxiliary supports on all of these bridges has been programmed in the first four year segment of the 1988-2000 Twelve Year Program, and completion of all 21 projects is expected by 1992.

2/Fracture-critical bridges contain structural members or components subject to tension under load, the failure of which could be expected to result in collapse.
3/Scour is defined as the removal and transportation of material from the bed and banks of rivers and streams as a result of the erosive action of running water.
4/Pin and hanger bridges connect two or more spans using a series of pins, washers and bolts to hold a hanger in place which suspends a major portion of the structure.

The scour critical bridge initiative, begun in November 1989, is aimed at identifying bridges which are vulnerable to foundation erosion, the potential for which increases greatly under flooding conditions. District bridge engineers have completed a preliminary screening of bridges in their districts using profile lists developed from BMS to determine which bridges are scour prone. This screening has been accomplished for state bridges and PennDOT's Bureau of Bridge and Roadway Technology (BART) is working with municipalities to complete similar studies for local bridges. Bridges identified as vulnerable will be referred to FHWA for detailed consultant study and are to be monitored by PennDOT with greater frequency.

C. Steel Bridge Inspections for Cleaning Needs Could Be Improved

PennDOT inspection of steel bridges may not provide reasonable assurance that buildups of corrosive debris harmful to structural steel members are being removed from hard-to-reach areas. Corrosion from a long-term buildup of dirt and bird droppings saturated with salt water led to a potentially dangerous weld cracking of a structural steel box member[1/] on the Vanport Bridge (Route 60, Beaver County) causing closure for three days until it could be determined that the cracking did not threaten immediate structural integrity. The closure of this key Ohio River crossing, traveled by an estimated 30,000 vehicles each day, was a substantial inconvenience for area commuters, who were forced to take a ten mile detour. This bridge cost $261,000 in emergency repairs to correct, and an additional $2 million will be needed to complete all corrosion related repairs. The problem could apparently have been prevented by detailed periodic inspection, proper cleaning, and protection from water intrusion into the hard-to-reach box member susceptible to corrosion buildup.

Discussion

Over 29% (7,462) of Pennsylvania's 25,646 state and local bridges eight feet or greater in length have steel structural members. Of these steel bridges, 1,253 (16.8%) were identified as being in need of cleaning and flushing during their last inspection. The purpose of cleaning and flushing bridges is to periodically remove materials such as bird droppings, accumulated dirt, debris and salt. Buildups of such debris can result in the formation of corrosive masses which are potentially harmful to structural integrity.

Certain types of steels used in the structural connections of various bridges are particularly vulnerable to corrosion. Bridge cleaning and flushing needs are to be considered by bridge inspectors during biennial inspections.

1/A box member is a steel beam or girder, with a rectangular or trapezoidal cross section, composed of plates and angles or other structural shapes united by bolting, riveting, or welding, and having no interior construction except stiffeners, diaphragms, or other secondary bracing parts.

Failure to perform periodic cleaning and flushing of the Vanport Bridge contributed to the growth of a cell of corrosive material inside a hard-to-reach structural connecting girder called a box member. The resulting high stress which the corrosive cell exerted on welded joints caused longitudinal cracks to develop along a weld line. According to a prominent bridge structural expert who examined the situation, this corrosive cell was the result of debris buildup over time which could have been avoided by proper routine cleaning and flushing of the affected area. According to this expert, considering the amount of time it took for the corrosive cell to develop, it is "inconceivable" that bridge inspectors did not spot the corrosion problem earlier than the previous year, when small cracks were first detected.

Partially concealed and hard-to-reach areas are preferred nesting sites for birds and are therefore particularly vulnerable to the buildup of droppings. When combined with salt and water, the formation of corrosive cells can occur. Routine cleanings and flushings may not normally be done at these locations if they have not been inspected and the need specifically noted. Part of the problem is that such hard-to-reach areas on bridge structures may require a "snooper-type" inspection crane. PennDOT, however, does not have enough snooper cranes to use for each bridge inspection. The expert noted that the use of these cranes should be scheduled so that a thorough inspection occurs at least every four years, and recommended that steps be taken to prevent the intrusion of saltwater into the box members.

Once the Vanport problem was discovered, PennDOT's Bureau of Bridge and Roadway Technology issued an "Inspection Alert" memo addressing the problem to all district engineers. This memo listed 17 other bridges around the state with box members suspected of being constructed of the same type steels and having similar fillet-type welds. District engineers have evaluated these bridges and similar corrosive cell problems were not discovered. However, these bridges will be monitored on a continuing basis.

The seriousness of the Vanport situation was demonstrated by the fact that, once the extent of the weld cracking was observed PennDOT immediately closed the bridge to traffic pending the outcome of a detailed structural investigation. Although the bridge was closed for only three days, the closing significantly inconvenienced area commuters who were forced to take a ten mile detour. The bridge also serves as a vital link to the Pittsburgh International Airport and plays an important role in local disaster evacuation planning (e.g., the bridge is part of a major evacuation route in the event of an accident at the Shippingport nuclear plant). In addition to the public inconvenience, the Vanport Bridge repairs will be expensive. PennDOT has spent approximately $261,000 as part of an emergency effort

to correct these problems, and more than $2 million will be required to correct all corrosion-related problems on the bridge.

Recommendation

1. ***PennDOT should ensure that all hard-to-reach areas of steel bridges which are critical to structural integrity and vulnerable to the effects of corrosion are thoroughly inspected, with snooper cranes if necessary, at least once every four years to determine cleaning and flushing needs.***

A-2. HIGHWAY MAINTENANCE

A. Highway Maintenance Performance Measures

A 1976 special Transportation Advisory Committee report, "New Directions for PennDOT," indicated that PennDOT should provide a high standard of maintenance that provides for time-staged reduction of maintenance backlogs. As steps toward achieving this goal, PennDOT has developed a pavement management system which assesses needs against standards of road quality and is now using "maintenance cycles" which indicate the desired frequency of particular maintenance treatments. PennDOT's maintenance cycles show that, on a statewide basis, the Department is meeting or is reasonably close to meeting its desired maintenance cycles for all major activities except the resurfacing of bituminous roads.

Trend statistics on PennDOT's Surface Improvement Program show that, although the Department has been able to meet or exceed its overall surface improvement goals, the number of miles of roadway receiving major resurfacing treatments has generally been decreasing in recent years while the number of miles of roadway receiving less expensive surface treatments has remained relatively constant. As another measure of PennDOT's performance in maintaining state roadways, in 1988, Pennsylvania was in the top third of states in terms of maintenance costs per mile; however, Pennsylvania ranked in the exact middle when compared to the six states contiguous to Pennsylvania.

Discussion

The intent of PennDOT's highway maintenance program, as defined by the Department, is to provide for the preservation of the state highway system as closely as possible to its constructed or its subsequently improved condition. "New Directions for PennDOT," a 1976 Transportation Advisory Committee (TAC) report, which became the basis for many of the PennDOT improvements that occurred in the 1980s, recommended that:

> The Department should provide a high standard of maintenance that provides for time-staged reduction of maintenance backlogs and preservation of existing highways.

Among the recommended management and policy strategies, the report recommended that PennDOT ". . . immediately develop performance standards and a Department 'report card' with which to communicate the level of performance to the Legislature and the public."

Maintenance Cycles

PennDOT has established a goal to develop and achieve acceptable maintenance cycles. The purpose of maintenance cycles is to establish statewide guidelines for the desired length of time between maintenance activities (e.g, guiderail replacement, shoulder cutting, crack sealing, etc.). If maintenance cycles are not followed and maintenance is deferred over time, repair needs become more extensive and may require more costly rehabilitation or restoration.

The Department's Maintenance Cycle Task Force, which includes representatives from district and county offices, was established in mid-1988. The Task Force has worked at establishing a series of "desired cycles" based on the average life of various maintenance treatments to serve as a comparison guideline for uniform measurement among districts.

The following table presents PennDOT data comparing the average of two four-year cycle periods (FY 1984-85 to FY 1987-88 and FY 1985-86 to FY 1988-89) for major maintenance activities.

	Maintenance Cycles (Years)		
Activity	Actual Cycle 1984/85 to 1987/88	Actual Cycle 1985/86 to 1988/89	Desired Cycles
Betterment[a/]	25.3	26.3	30.0
Surface Seals	6.8	6.7	6.0
Leveling	13.2	12.8	12.0
Resurfacing (Bituminous)	24.3	21.2	10.0
Shoulder Cutting	2.6	2.6	3.0
Pipe Replacement	53.9	47.8	40.0
Joint Sealing	6.6	6.3	5.0

a/Performed on major roadways and includes resurfacing, rehabilitation and restoration, and roadside improvements such as guiderails, drainage, etc.

As the table indicates, the Department is meeting or is moving toward the desired maintenance cycles for most of the major maintenance activities. The notable exception is the resurfacing of bituminous roads. The desired cycle--resurfacing these roads every ten years--is not being met. On average, the resurfacing is occurring at twenty-one year intervals. While this is significantly beyond the prescribed cycle, the reduction (13%) from the previous cycle is noteworthy.

According to the Director of the Bureau of Maintenance and Operations, variation from the "desired maintenance cycle" may be justified, even desirable, based on a number of factors such as weather, extent of truck traffic, acid drainage, and soil conditions, among others.

Surface Improvement Goals

LB&FC staff also reviewed trend statistics for PennDOT's Surface Improvement Program. Surface improvements consist of resurfacing (i.e., activities which add strength to the pavement) and surface treatments (i.e., activities which are designed to preserve the pavement but may not necessarily improve ride quality or pavement strength). Each year PennDOT establishes surface improvement goals on a district and statewide level. The Department also reports on its progress in meeting these goals. Since FY 1984-85, PennDOT has made on the average approximately 6,700 miles of surface improvements per year.

Table 1 shows miles of surface improvement production for each of the eleven PennDOT districts as compared with each district's annual goal for FY 1984-85 through FY 1988-89. In the five-year period, 767 total miles were improved beyond those originally planned. District 1-0 (Erie/Franklin) had the greatest production in comparison to planned improvement, having improved 564 miles more than the plan called for during the five years. District 1-0 was followed by District 3-0 (Columbia/Montour) with 304 additional miles and District 2-0 (Clearfield) with 200 additional miles. Five other districts also went beyond their planned totals by lesser amounts (ranging from 17 to 68 miles).

On the other hand, District 6-0 (Philadelphia) failed to achieve its planned production for each of the five years (a total of 396 miles under plan). District 8-0 (Harrisburg) and District 12-0 (Fayette/Greene) were also under their planned totals by 53 and 70 miles respectively; these two districts, however, had the most ambitious goals for surface improvement during the five-year period (see Table 1).

The breakout of surface improvement miles by the type of treatment performed over the five year period suggests that there has been a general trend toward performing lower cost

surface treatment and cutting back on resurfacing. Surface improvement includes various measures which range from the lower cost surface repair activities to the higher cost resurfacing measures such as concrete pavement rehabilitation and betterment projects. Table 2 shows that, overall, resurfacing activities have accounted for 7.5% of surface improvement as compared with 92.5% for surface treatment. However, resurfacing as a percentage of all surface improvements dropped from 9.6% in FY 1984-85 to 4.6% in FY 1988-89. Distinguishing between the specific types of surface improvements, rather than focusing on the total miles of improved roads, is important to ensure that districts do not simply focus on low cost surface treatments to meet the district's overall surface improvement goals. Beginning in July 1989, revisions were made to the Department's District Performance Report (the "Green Book") to include specific goals for the major categories of surface improvement.

Comparison of State Highway Maintenance Expenditures

Table 3 shows highway maintenance disbursements per mile for 1988. The data, which is derived from Federal Highway Administration reports, relates maintenance expenditures to state mileage in order to compare the states on an expenditure per-mile basis.

The FHWA data provide a standardized means of consistently comparing all states. It should be noted, however, that the mileage figures, "state controlled miles," include all mileage under state control. As such, mileage controlled by agencies other than state highway or transportation departments (e.g., toll roads and state forest roads) is included.

On an expenditure per mile basis, Pennsylvania ranks twelfth among the states with its maintenance expenditure of $13,910 per mile. In comparison to states contiguous to Pennsylvania, three states spend more on a per-mile basis (New Jersey, Maryland, and New York), and three spend less (Ohio, Delaware, and West Virginia).

Recommendation

1. ***PennDOT should include in its annual report of highway program performance to the General Assembly:***

   a) ***Desired maintenance cycles and actual maintenance cycle trends for major highway maintenance activities.***

   b) ***Surface Improvement Program goals and goal attainment by type of improvement (e.g., surface treatment, resurfacing, etc.) for statewide and district totals and by major highway network (i.e., Interstate, Priority Commercial Network, etc.).***

TABLE 1

Goals and Actual Miles of Surface Improvement Production by District
FY 1984-85 Through 1988-89

	1984-85		1985-86		1986-87		1987-88		1988-89		Total	
District	Goal	Actual	Goal	Actual	Goal	Actual	Goal	Actual	Goal	Actual	Goal	Actual
1-0	724	899	518	701	638	728	761	809	773	841	3,414	3,978
2-0	765	767	467	506	674	735	487	542	605	648	2,998	3,198
3-0	836	918	706	886	855	881	599	594	632	653	3,628	3,932
4-0	767	746	378	457	574	581	480	475	507	515	2,706	2,774
5-0	369	454	423	398	454	465	461	456	457	433	2,164	2,206
6-0	463	328	431	356	432	304	361	343	295	255	1,982	1,586
8-0	804	845	866	838	912	852	744	729	821	830	4,147	4,094
9-0	608	636	586	600	712	685	627	645	684	679	3,217	3,245
10-0	441	425	285	315	458	476	427	422	371	407	1,982	2,045
11-0	325	288	448	457	547	575	445	439	405	428	2,170	2,187
12-0	698	684	711	693	985	1,081	1,016	954	1,116	1,044	4,526	4,456
TOTAL	6,800	6,990	5,819	6,207	7,241	7,363	6,408	6,408	6,666	6,733	32,934	33,701

Source: District Management Summary Report (Green Book), for the months of 6/85 through 6/89.

TABLE 2

Miles of Surface Improvement Production
FY 1984-85 Through FY 1988-89

	FY 1984-85	FY 1985-86	FY 1986-87	FY 1987-88	FY 1988-89	Total	Percentage Statewide 5-year Total
Resurfacing							
3R Contract[a/]	602	435	581	426	285	2,329	6.9%
Concrete (Contract) ..	66	37	41	27	26	197	.6%
Subtotal (Resurfacing) ...	668	472	622	453	311	2,526	7.5%
Surface Treatment							
Surface Treatment (Contract)	2,178	1,624	1,787	1,771	2,035	9,395	27.9%
Surface Treatment (Department)	2,240	2,003	2,814	2,392	2,733	12,182	36.1%
Surface Repair (skin patching and mechanized patching) .	1,904	2,108	2,140	1,814	1,654	9,620	28.5%
Subtotal (Surface Treatment)	6,322	5,735	6,741	5,977	6,422	31,197	92.5%
TOTAL	6,990	6,207	7,363	6,430	6,733	33,723	100%

a/The 3R program refers to resurfacing, restoration, and rehabilitation.

Source: Management Objectives Report (Blue Book), for the months of June 1985 through 1989.

TABLE 3

Maintenance Disbursements 1988

State	Total $ (x 100)	State Controlled Miles[a/]	$ Per Mile
New Jersey	$ 237,657	3,200	74,268
New York	484,921	16,314	29,724
Maryland	144,937	5,391	26,885
California	491,275	18,377	26,733
New Hampshire	89,997	4,048	22,232
Alaska	108,685	5,135	21,166
Indiana	217,340	11,278	19,271
Florida	223,619	11,831	18,901
Connecticut	70,394	3,885	18,119
Hawaii	17,317	1,052	16,461
Illinois	261,610	17,459	14,984
PENNSYLVANIA	**625,927**	**44,997**	**13,910**
Vermont	37,064	2,802	13,228
Michigan	123,858	9,533	12,993
Tennessee	169,839	14,486	11,724
Colorado	109,186	9,328	11,705
Rhode Island	13,264	1,145	11,584
Alabama	127,049	11,005	11,545
Iowa	108,382	10,152	10,676
Georgia	186,036	17,788	10,459
Wisconsin	128,155	12,513	10,242
Ohio	205,841	20,474	10,054
Maine	85,258	8,538	9,986
Utah	52,603	5,745	9,156
Oregon	99,315	10,884	9,125
Minnesota	121,613	13,397	9,078
Delaware	43,152	4,791	9,007
Oklahoma	113,890	12,944	8,799
Nevada	44,300	5,205	8,511
Idaho	42,594	5,112	8,332
Washington	147,986	18,332	8,073
Arizona	51,420	6,380	8,060
Wyoming	50,853	6,673	7,621
Virginia	422,203	55,465	7,612
Kansas	77,370	10,677	7,246
Texas	545,633	76,434	7,139
Missouri	208,624	32,353	6,448
Arkansas	95,604	16,170	5,912
Kentucky	141,993	25,197	5,635
New Mexico	67,209	12,012	5,595
North Carolina	372,281	77,366	4,812
North Dakota	34,615	7,351	4,709
West Virginia	145,972	31,406	4,648
Mississippi	46,763	10,422	4,487
South Dakota	33,487	7,936	4,220
Nebraska	42,206	10,301	4,097
South Carolina	156,307	40,903	3,821
Louisiana	45,372	16,570	2,738
Montana	9,835	7,901	1,245
Massachusetts	--	3,636	--[b/]
Dist. of Col.	--	1,102	--[b/]
Total	$7,480,811	793,396	$9,429

a/Also includes mileage under control of state agencies other than state departments of transportation (e.g., toll roads, state forest roads, etc.).
b/There was no disbursement data given.

Source: Highway Statistics, FHWA, 1988.

A-3. PRODUCTIVITY

A. PennDOT Is Taking Steps to Expand Its Productivity Measurement of Highway Maintenance Operations

One of PennDOT's 'Action Agenda Goals and Objectives to 1990' is to measure maintenance performance through the Red Book/Green Book monthly reports--the county and district management performance reports, respectively. Productivity measures are important because they allow the Department to evaluate, monitor, and compare the actual efficiency of its various maintenance operations. A consultant hired by the Department to examine the feasibility of developing a productivity measurement system for highway maintenance concluded, however, that only 20.2% of maintenance work is "really measured and controlled." In particular, only 28 of 132 work activities were identified as having measurable output/input criteria such as manhours per mile.

The consultant concluded that a productivity measurement system for highway maintenance was possible and has subsequently developed a prototype computer-based productivity measurement system which appears to have the potential to provide viable productivity measures for maintenance work activities and organizations. The Department's use of such a system would improve its ability to evaluate the efficiency of its maintenance operations. Testing of this system has already begun in five counties and will continue through 1991. Its statewide implementation depends on the test results and the integration of the data base and software with the Department's management information system.

Discussion

Highway Maintenance Performance Measurement

Productivity measures increase an organization's ability to analyze its performance by enabling it to account for an operation's input as well as its output. Productivity measures are usually expressed as "indices" which compare the measured period to a base period. In order for an organization's performance to be analyzed using productivity indices, it is necessary that its operations be expressed in standard output/input measures. This allows the various output/input measures to be combined to produce a composite productivity index. Such an index may then be used to evaluate the overall productivity of an activity or organization, or may be broken down into major component activities. Productivity indices may be used to either identify operations and organizations which need improvement or to identify outstanding performance techniques which may be shared with others.

The Department measures maintenance performance through the "Red Book" and "Green Book" monthly reports. The "Red Book" presents 11 or 12 work activities for each county by month and year. Each work activity is expressed both as a production and productivity measure. However, as noted by the Department's consultant, some of the output measures use different numerators (e.g., gallons and tons of material applied versus miles of highway repaired) and thus cannot be aggregated into a single productivity index.

There are a total of 186 cost functions in the Maintenance Foreman's Manual, 132 of which were considered to be actual work activities (work-units) by the consultant. Of the 132 work-units, only 28 were determined to have performance standards which could be aggregated. As a result, a viable productivity measurement system was not deemed possible without some redefinition of work-units. The consultant also concluded it was possible to set standards for all work-units and that a productivity measurement system could be developed.

PennDOT accepted the recommendations of the consultant and awarded a contract to provide guidance on selection of work units, to apply work measurement techniques to highway maintenance work units, and to design a productivity measurement system for highway maintenance. As of February 1990, a computer-based productivity measurement system has been designed, a data base has been established for five counties, and test programs have been run and distributed for analysis. The consultant will now assist county maintenance managers in the interpretation of the productivity indices.

When finally developed, the system would appear to have the potential to produce well-defined productivity measurement indices for highway maintenance. Such a system would allow PennDOT managers to compare the overall productivity of different county maintenance districts and the productivity of key maintenance activities to determine if any counties are underperforming and, conversely, to identify techniques being used by high performing counties which might be used elsewhere in the state.

Recommendation

1. ***PennDOT should continue testing the model productivity measurement system and implement the system statewide as soon as practical.***

B. Evaluation of Employee Involvement (EI) Programs Is Needed

PennDOT has an active Employee Involvement (EI) program. Its Quality Circle program was recognized in 1986 as being "likely the most extensive public sector program in the nation." In addition to providing tangible savings for an organization in the form of project savings, Employee Involvement programs offer the potential for important intangible benefits such as improved employee-supervisor and labor-management relations, improved communications and morale, and improved employee skills.

The Department's EI program costs have increased significantly each year since the program's inception in 1982. In FY 1988-89, total program costs were $689,391. PennDOT has not evaluated its EI programs from a cost/benefit standpoint. The last formal assessment of the program's intangible benefits was conducted in 1985-86. Evaluation is important in that it can identify program areas needing improvement, provide justification for the use of public resources and promote increased program participation. Recently the Employee Involvement Steering Committee initiated a study on measuring employee involvement, and the Productivity Center issued an internal assessment instrument designed to assist the districts in evaluating their own EI programs.

Discussion

The Department's Master Policy Statement (#204) states "the goal of employee involvement is to encourage internal communications, participation in decision-making and problem-solving, and contributions to improving Department operations among all members of the organization."

PennDOT began its EI program in the early 1980s with a decision by top management to promote a more participative management style. Quality Circles (QCs) were begun in 1982 and Quality Breakthrough Teams (QBTs) in 1986. QCs and QBTs are employee teams trained in problem-solving techniques who meet to solve organizational problems. Quality Circles meet on a continuing basis whereas a Quality Breakthrough Team normally meets only for the duration of its assigned project.

The number of Quality Circles increased from 17 in 1982 to a high of 75 in 1989. Currently there are 68 Quality Circles functioning in 9 districts and the Central Office. The number of Quality Breakthrough Teams increased from 10 in 1986 to 55 by January of 1990. In addition to QCs and QBTs, there are numerous other PennDOT EI activities and forums designed to encourage employee participation.

Cost of Quality Circles and Quality Breakthrough Teams

Program costs have increased each year from FY 1982-83 to FY 1988-89. The total cost of QCs and QBTs since 1982 has been $2,135,349. Of that amount, $2,014,577 (94%) is associated with personnel costs, i.e., employees' salaries paid while attending program meetings. The remaining expenditures pay for outside training facilities, outservice training, newsletters, materials, and conference costs.

EI Program Costs

Fiscal Year	Total Program Costs	Change In Pgm Costs	% Change In Pgm Costs
1982-83	$2,417	0	0%
1983-84	$119,249	+$116,832	+4,834%
1984-85	$152,816	+ $33,567	+ 28%
1985-86	$241,272	+ $88,456	+ 58%
1986-87	$331,778	+ $90,506	+ 38%
1987-88	$598,426	+$266,648	+ 80%
1988-89	$689,391	+ $90,965	+ 15%

Wide variance exists in the costs expended on EI programs by the different districts. For example, in FY 1988-89, the QC and QBT personnel costs for districts 2-0 (Clearfield) and 3-0 (Montoursville) were $181,321 and $200,233, respectively, while the costs for districts 6-0 (Philadelphia) and 11-0 (Pittsburgh) were $0 and $164.74, respectively.

Evaluation of Employee Involvement Programs

To date, the Department has not attempted to evaluate its EI programs from a cost/benefit basis. The Director of the Operations Review Group indicated to LB&FC staff that a strict cost/benefit analysis may tend to underestimate the value of the Department's EI programs because intangible benefits affecting communication, employee skill development, self-esteem and motivation, while difficult to quantify, are as important as cost savings and process improvements.

At the request of LB&FC staff, the Department provided summaries of projects they believed resulted in "cost savings/improvements" over the past three years. Of the total of 238 projects submitted for review, 88 (37%) did not report information on dollars saved. A total of $1,222,183 in savings versus $586,307 in costs was reported for 150 of these 238 projects (a savings-to-cost ratio of approximately 2 to 1).

Forty-eight submissions had missing or inconsistent cost/savings data. For example, one project reported the cost of a new vehicle washer as $200,000 with no resultant savings, while another project reported a savings of $20,353 from the purchase of new copying machines at no reported cost. In reviewing the procedures used to develop the project summaries, LB&FC staff found the Department has not developed standardized guidance for what should be included as tangible and intangible benefits, the length of time for which savings may be claimed, or a standard methodology to perform a cost/benefit analysis.

The last analysis of the Department's EI programs was the Clark Associates evaluation of the Department's Quality Circle program in 1985-86. The report noted that "our sense of quality circles and other participative management mechanisms at PennDOT is of programs that have been well designed and implemented over a very short time." The report also noted, however, that documentation of project outcomes is not routinely planned or accomplished.

In addition to evaluating cost/benefit ratios, the more intangible benefits of an EI program can be measured by a variety of indirect methods such as attitudinal surveys, absenteeism, tardiness, grievance, turnover and accident rates. Quality Circles performance can be measured by length of time in existence, extent to which members are retained, the number of projects which are accepted, the number of tangible and intangible projects, project effectiveness, the complexity of problems solved, the extent to which projects contributed to organizational objectives, and the continuity and regularity of meetings.

Recent Initiatives

Although the Department does not have any formal process in place to evaluate its EI programs, the Deputy Secretary for Administration believes that the anticipated positive results of program evaluation could be used to increase employee participation in EI. The District 2-0 Engineer who piloted both the QC and QBT programs also concurs with this belief.

There are several initiatives underway to begin evaluating the Department's EI program. In February 1990 the Department issued an Employee Involvement assessment instrument "to help you [districts and bureaus] to determine the present state of employee involvement processes and the systems to support them within your organization. It should be used as the basis for planning future employee involvement strategies and assessing progress on a continuing basis."

In addition, the EI Steering Committee has recently directed the formation of five subcommittees to study several important program improvement topics. These include:

-- Methods to share ideas.

-- Educating all employees in the EI concept.

-- Improvements in program publicity.

-- Measurement of EI contributions.

-- Alternative EI approaches.

PennDOT's submission of a research proposal to the National Cooperative Highway Research Program to determine the productivity impact of EI programs in transportation organizations is another attempt to assess the effectiveness of their programs. Thus, it appears that PennDOT recognizes the need to begin a serious evaluation of its EI programs.

Recommendations

1. ***PennDOT should evaluate both the tangible and, to the extent feasible, intangible benefits of its EI program using measures such as the cost/benefit ratios of approved projects, attitudinal surveys, and personnel trends such as absenteeism, tardiness, safety and turnover rates. Quality Circles and Quality Breakthrough Teams should be evaluated using measures such as participation rates, attendance rates, project completions, degree of complexity of projects, project approval rates, and cost/benefit ratios of approved projects.***

2. ***PennDOT should prepare, develop and document standardized definitions and procedures to help ensure the consistent application of cost/benefit and other forms of analysis to judge the value of its employee involvement programs.***

C. PennDOT Managers' Responses to Productivity Questionnaire

Based on a 1983 comparative review of federal agency and private sector productivity program efforts, the General Accounting Office (GAO) identified seven elements of an effective organizational productivity management effort. As part of its methodology, GAO developed a productivity questionnaire to be completed by program managers. LB&FC staff adapted this questionnaire and distributed it to 188 PennDOT managers, including deputy secretaries, bureau heads, division chiefs, district engineers and their assistants, and county maintenance managers. One hundred forty of the questionnaires were returned, for a response rate of 74%. The results yielded a generally positive picture of the success of PennDOT's efforts as they relate to five selected elements of an effective productivity management effort.

- ***Managers were aware of the organizational focal point of productivity management within the Department.***
- ***Information concerning productivity efforts appears to be communicated consistently throughout PennDOT.***
- ***Some confusion exists concerning the difference between production and productivity.***
- ***Managers did not exhibit a strong awareness of the use or monitoring of productivity measures.***

Discussion

This analysis is focused on PennDOT managers' responses to questions which related to five selected elements of an effective productivity management effort.[1/] Each of the five selected elements is described briefly and an analysis of the questionnaire responses for that element is provided.

A Manager Serving As A Focal Point For Productivity

An organization needs a focal point for productivity to institutionalize and highlight the productivity effort, to accumulate and disseminate information on productivity to managers and employees, and to provide top management with data on productivity performance.

1/Two elements--manager accountability for productivity and a process to identify productivity problems and share productivity initiatives--were not evaluated because the questions relative to these topics in the GAO questionnaire were not adaptable to the PA Department of Transportation.

The Operations Review Group (ORG) is the focal point for productivity in PennDOT. Managers were asked to identify organizational elements responsible for monitoring, assessing or improving productivity throughout the Department. ORG was identified by 119 (86%) of the 138 managers who responded to this item. Additionally, 50% of the respondents associated the Deputy Secretary for Administration with productivity improvement responsibilities.

Top Level Support And Commitment

Top level support and commitment requires top managers to periodically review the productivity performance of the organization and its managers and to hold employees accountable for improved productivity. Top level support can develop and maintain the legitimacy and effectiveness of the entire productivity effort.

Eighty-eight of the 136 responses to this item (65%) indicated that top management places "great" to "very great" importance on the accomplishment of productivity goals relative to other factors used in appraising the performance of managers. The type of management position did not significantly affect the response. There was also a strong perception that productivity is emphasized as a performance factor relative to production, quality, safety and employee involvement. When asked to prioritize performance factors of the Department, the managers ranked them in the following order: 1) safety, 2) quality, 3) productivity, 4) employee involvement, and 5) production.

In the context of all other objectives and responsibilities of top management, productivity improvement was judged to be an "average" priority by 40% of the managers, but an additional 48% of them thought it was either a "high" or "very high" priority.

Written Productivity Objectives And Goals And An Organization-Wide Productivity Plan

An organization must have clear goals and objectives to have an effective productivity effort. These goals can be broad or detailed, but the overall goals and objectives and the methods to achieve them should be brought together in a productivity plan.

The Department does not have a formal organization-wide productivity plan as defined by GAO, since there is no document which assigns productivity goals to the Department's organizational elements. The Department's goals as measured in management performance reports are almost exclusively production rather than productivity goals.

Because the Department does not make a clear distinction between production and productivity, it is understandable that confusion might exist over whether or not the Department had an organization-wide productivity plan. Indeed, while most of the Department's managers (74%) thought that the Department did have an organization-wide productivity plan, 38% of the Central Office managers thought that such a plan did not exist.

Eighty-three of the 107 responses to this item (78%) and 30 of the 36 responding county maintenance managers (83%) replied that productivity plans (or their interpretation of what constituted a productivity plan) contained specific goals. Fifty-seven percent of the managers reported that the Department had productivity goals which are at least relatively well-developed.

Productivity Measures That Are Meaningful To The Organization

Productivity measurement is an essential element of an effective productivity improvement effort. These measures need not be complex. Often, a series of simple, easy to understand measures are more useful to managers.

The degree to which managers thought employee output could be quantified by a productivity measure (i.e., output/input) appeared to depend on the position classification of the employee.

-- Eighty-seven percent of the responding managers thought the output of maintenance/trades employees was measured by productivity measures.

-- Twenty-four percent of the responding managers thought the output of clerical/administrative employees was measured by productivity measures.

-- Twenty-three percent of the managers thought the output of technical and professional employees was measured by productivity measures.

When asked to evaluate how the Department accomplished certain productivity functions, the managers replied as follows:

-- Sixty-nine of 135 respondents (51%) stated that Department measurement of productivity is either "high to moderate" or "high."

-- Fifty-eight managers (43%) reported the Department development of productivity measures is either "high to moderate" or "high."

-- Fifty-five managers (41%) believe the Department's monitoring of the use of its productivity measures is either "high to moderate" or "high."

Awareness Of Productivity's Importance Throughout The Organization And Involvement Of Employees In The Productivity Effort

Because productivity is a commonly misunderstood concept, management must initiate awareness campaigns and help employees recognize their importance to the productivity effort. Employees should also participate in company activities aimed at developing ideas on how to improve productivity.

Overall, 65 of 136 managers (48%) stated that nonsupervisory employees do not participate in the setting of unit productivity goals. Likewise, 27 of 40 county maintenance managers (68%) said their nonsupervisory employees do not participate in setting unit productivity goals. Of those managers who reported that their employees participate in setting goals, participation was either direct (27%), through employee involvement organizations (16%) or both (56%). The predominant method of participating in setting goals identified by these managers was "commenting on goals set by management" (47%) whereas "suggesting goals to management" was indicated by 34% of these managers.

When asked to identify techniques used in productivity improvement projects undertaken in their work organizations during the past three years, 85% of the PennDOT managers identified "technology improvement" followed by "human resource development" (74%), "change in the level of automation" (73%), "employee involvement programs" (70%) and "changed work methods" (70%). The next highest ranking was "productivity training" (44%).

Analysis of the questionnaires indicated that, in general, there was no significant difference in responses to questions made by managers located at the Central Office or managers assigned to field locations. There was some variance in responses within these groups, particularly among division chiefs and assistant district engineers. Thus, it appears that information concerning the Department's productivity program is communicated in a fairly consistent manner throughout the Department.

A-4. CERTIFICATION ACCEPTANCE REVIEWS: FEDERAL-AID LOCAL PROJECTS

A. Certification Acceptance (CA) Reviews Have Caused Delays on Certain Construction Projects

Certification Acceptance (CA) is a procedure that allows the Federal Highway Administration (FHWA) to delegate the review and authorization of certain federal-aid projects to the state DOT, including local road and bridge projects that are federally funded. For this type of design and/or construction project, the local government is responsible for preparing the Plans, Specifications, and Estimate (cost) (PS&E) for PennDOT review and approval. PennDOT's review entails district and Central Office review and approvals.

Although the Department is providing most municipalities with timely PS&E package reviews of CA local projects, it is experiencing difficulty providing the same timeliness for the city of Philadelphia and, to a lesser extent, Allegheny County. As a result of delays in these areas, projects have been postponed to the following construction season resulting in increased cost. While several factors account for the delays, one reason appears to be the lack of centralized departmental control/monitoring of the timeliness of the district review process. Late in the audit, LB&FC staff were informed by PennDOT's Chief Engineer that Philadelphia CA reviews are expected to be more timely as a result of the resolution of specification inconsistencies.

Discussion

PennDOT's Bureau of Design has the responsibility to review and approve the Plans, Specifications, and Estimate of costs for state and local federally-funded road and bridge projects. PennDOT also authorizes advertisement for project bids, and coordinates with the FHWA and district offices in accomplishing the objectives of the Certification Acceptance procedure. The CA process can be applied to all projects on the non-Interstate Federal-Aid System, as well as all projects using federal funds. In 1989 the Department had a total of 277 CA projects (state and local) with a total cost (based on low bids) of $392.1 million. Twenty-seven of these projects were local CA projects with a total low bid of $25.2 million, $10.1 million of which was for two Philadelphia local road/bridge projects.

The FHWA alerted LB&FC staff to possible avoidable delays in CA reviews during the preliminary survey phase of the audit. As a result, the processing of PS&E packages submitted by municipalities was examined to determine a) if delays existed in construction authorization and b) the extent to which delays were impacting construction costs.

The examination demonstrated that PennDOT generally conducts PS&E package reviews in a timely manner, with the exception of projects submitted to PennDOT by the city of Philadelphia and, to a lesser extent, Allegheny County. In addition, Department coordination was expressed as very good by most of the municipal officials contacted.

Each of the last seven Philadelphia projects submitted for CA review lapsed into the following construction season before necessary PennDOT approvals had been received. One of the projects, which was submitted in January 1987, had not yet been authorized as of March 1990. In Philadelphia, the 57th Street bridge project had taken the Department 7½ months to review, approve, and advertise and an additional six months to issue a Notice to Proceed.

A long review can delay a project to the next construction season and increase its cost by 8-10%. Because most of the federal-aid projects for the city of Philadelphia range from $1 to $4 million, project delays forcing construction to the following season can increase costs by approximately $80,000 to $400,000. Total delay costs in Philadelphia for four bridge projects is estimated by the city of Philadelphia to be approximately $370,000, and delay costs for three highway projects is estimated at $394,000. Similarly, Allegheny County had a highway project which had a five month review period from the date of submittal to District 11-0 and an additional four month review by the central and district offices before the project was let (i.e., bid opening). This delayed construction into the next season (additional costs as a result of this delay were not available).

A number of external factors beyond PennDOT's control contribute to delays in CA project authorization, including:

-- According to Department and FHWA spokespersons, certain specifications developed by the city of Philadelphia had not been approved by FHWA. However, as of January 1990, the FHWA agreed to accept the standards, with the understanding that certain items are still to be addressed. According to PennDOT's Chief Engineer, the specifications issue has recently been resolved and should no longer contribute to CA delays.

-- Incomplete project package submissions by municipalities and design consultants, consultant delays; and

-- Variation in project package complexity.

Conversely, several factors within PennDOT's control can also contribute to CA project delays including:

-- Not assigning standards for timely review at the district or central levels.

-- Not establishing district level review priorities or explicit assignment of review responsibility.

-- The lack of monitoring/tracking of district review project status by the Bureau of Design.

PennDOT's Central Office does not monitor or control the processing time of PS&E packages by the districts. Time frames for advertising for bid or for scheduled letting dates are also not established in either the districts or PennDOT's Central Office. Without a system for monitoring progress or established time frames the Department has little control over the timeliness of the CA review process.

A review of four other states with the same full CA procedure status as Pennsylvania found that three (Virginia, Georgia, Illinois) of the four have time frames established for scheduled advertisement for bid or scheduled letting dates in order to help ensure timely review of local projects. In Georgia, review revisions must take no longer than six weeks. PennDOT has expressed reservations about time frames for CA project review because of external delay factors beyond their control. However, this concern would not appear to preclude assigning a reasonable review time frame for a project after resolution of the external factors.

Virginia and Maryland allow certain large metropolitan areas to conduct their own reviews in order to further expedite the process. These two states have found that large municipalities with a greater volume of CA projects are capable of utilizing their own engineering staff to perform package review in accordance with FHWA regulations. By delegating review authority in this way, the pace of review can be largely controlled by the municipality itself.

Permitting capable municipalities to conduct their own reviews may help expedite the review process because local PS&E package reviews are currently conducted exclusively by PennDOT district staff, who review both district (state) and local packages. According to one district spokesperson, it is difficult for PennDOT district staff to give priority to local projects when district projects have to be completed as well.

Recommendations

1. ***Working in conjunction with FHWA, PennDOT should give consideration to granting large municipalities authorization to conduct their own CA reviews. The Department could initially assume an active role in guiding those municipalities through the self-review process then subsequently assume a limited monitoring and coordinating role to ensure***

that steps have been taken according to established guidelines. FHWA expressed reservations concerning any quick movement toward self-review, fearing the loss of valuable review quality.

2. *If the Department elects to remain in its present administrative function of reviewer, approver, and authorizing agent for the construction PS&E package for large municipalities, local CA projects should be assigned to designated district staff who would have explicit responsibility/accountability for their review.*

3. *A monitoring/tracking system should be established to keep the Central Office informed of the review status of local CA projects, particularly for projects in the city of Philadelphia and Allegheny County. Such a tracking system should include estimated time frames for major tasks at both the district and central offices.*

A-5. WORK ZONE TRAFFIC CONTROL AND SAFETY

A. Issues Concerning Promulgation of Work Zone Traffic Control Regulations

Certain strike-off letters (short-term directives/policies) issued by PennDOT for work zone traffic control may be regulatory in nature and therefore may need to be promulgated as regulations. Additionally, work zone traffic control directives are not reviewed for determination of the appropriate manner of promulgation. Therefore, the Department does not have reasonable assurance that directives are being promulgated as regulations, if necessary, or are appropriately issued as strike-off letters or other types of policy documents. In addition, the regulations for work zone traffic control, found at 67 Pa. Code Chapter 203, sunsetted on January 1, 1989, and have not been officially readopted.

Discussion

A PennDOT master policy statement (MPS 310) identifies and provides guidance for the use of certain documents in the administration of Department programs. The policy states that the promulgation and revision of regulations will be limited ". . . to that which is absolutely necessary to the safety and convenience of the public." Also included in this policy are definitions and designated uses of PennDOT circular letters and strike-off letters which are used for communicating internal policies.

Use of Strike-Off Letters in Lieu of Regulations

In addition to the regulations which are promulgated for work zone traffic control, the Department uses a series of strike-off letters which are, according to MPS 310, ". . . temporary documents used for the rapid dissemination of short-term policy, procedure, or related information." Strike-off letters for work zone traffic control have covered topics such as shadow vehicles for moving operations[1/] and temporary pavement markings. These documents have been in effect since September 1987 and April 1988, respectively.

1/A shadow vehicle is a vehicle positioned in advance of a work area or work vehicle to provide advance information to approaching drivers and/or protection for the workers and/or work vehicle.

These strike-off letter topics are specifically addressed in Chapter 203 and, therefore, should be included in the work zone traffic control regulations as they appear to be amending existing regulations. Regulations may only be amended through the regulatory process, therefore, the use of strike-off letters is inappropriate as a permanent means to change the requirements of the regulations. For example, the provisions of the strike-off letter concerning shadow vehicles, in effect since 1987, make mandatory the use of the shadow vehicle on operations utilizing figure 23 of Chapter 203 (a diagram which provides requirements for moving short-term operation on a divided highway, one-way highway, or two or more lane approach of an undivided highway with a work area in the left or right lane) for the maintenance and protection of traffic. Prior to this, the use of shadow vehicles had been optional. The strike-off letter figure is to be used in lieu of figure 23, in effect, replacing that provision of the regulations. The strike-off letter states that this provision will be sent to the Office of Chief Counsel for inclusion in amendments to Chapter 203.

According to PennDOT counsel, documents such as internal policy letters generally are not reviewed by the Office of Chief Counsel prior to promulgation. These documents may be reviewed by the Office of Chief Counsel if the bureaus subsequently determine to incorporate the substance of the policy in a Department regulation. The documents are typically submitted to the Office of Chief Counsel only if the responsible bureau believes there is a problem or issue which requires a legal opinion.

Adequacy of Formal Involvement of Legal Staff with WZTC Directives

The Work Zone Traffic Control Task Force was formed to review safety concerns after the fatal injury of a PennDOT employee in a work zone traffic control area. This task force includes Department personnel from engineering districts, maintenance districts, the Bureau of Personnel and the Traffic Engineering and Operations Division, and representatives from the PA State Police, the PA Turnpike Commission, and the Associated Pennsylvania Constructors. Task force discussions and recommendations have resulted in work zone strike-off letters being issued or amended.

While counsel for the Department meets with members of the Traffic Engineering Division on a weekly or more frequent basis, the Office of Chief Counsel is not formally involved with the task force. Although the Counsel believes members of the Bureau are usually aware of legal issues and concerns and bring them to the attention of the Office of Chief Counsel, he did note a recent instance where such a concern was not identified. Additionally, many of the recommendations discussed by the task force would appear to require changes to the regulations and address matters which may affect the Department's liability to

the public or its contractors. These discussions may require the involvement of legal staff in order to understand fully their implications.

Work Zone Traffic Control Regulations Have Sunsetted

The Department has promulgated regulations at 67 Pa. Code Chapter 203, which set forth basic principles and prescribe guidelines for the control of traffic within construction, maintenance, and utility work zones on highways within the Commonwealth. These guidelines are to ". . . help ensure safe and efficient traffic movement through work zones, and . . . also provide safety for the work force" (67 Pa. Code §203.1). The Chapter 203 regulations are in substantial conformance with national standards.

The work zone traffic control regulations took affect on January 1, 1984, and at the time they were adopted in the Pennsylvania Bulletin, a sunset date of January 1, 1989, was included. Unless readopted before that date, these regulations would be automatically rescinded at that time. While the Department has given notice of its intent to readopt Chapter 203, in the June 17, 1989, volume of the Pennsylvania Bulletin, the sunset date of the regulations had already caused this chapter to lapse. Therefore, technically, the provisions of Chapter 203 are not in effect. These regulations may, however, still be practicably enforced through the use of contract provisions which require contractors to perform their work consistent with Publication 408 (specifications) which, in turn, requires compliance with Chapter 203. Additionally, these requirements are enforced through employee handbooks and the FHWA Manual on Uniform Traffic Control Devices which are required to be followed by PennDOT employees. There is currently a draft of Chapter 203 which includes several changes to the chapter which the Department plans to propose.

Recommendations

1. ***The Department should review all work zone traffic control strike-off letters prior to the submission of draft Chapter 203 regulations to determine which strike-off letters would more appropriately be included in the regulations. This review should include the involvement of the Office of Chief Counsel. In addition, future strike-off letters which concern topics related to work zone traffic control should be reviewed by the Office of Chief Counsel prior to their distribution.***

2. ***The Office of Chief Counsel should be provided with a formal agenda prior to the meetings of the Work Zone Traffic Control Safety Task Force to allow the Office of Chief Counsel the opportunity to provide input should a topic appear which is identified as requiring legal consultation and review.***

3. *The Department of Transportation should finalize and submit for promulgation the work zone traffic control regulations it has started drafting to replace those which sunsetted January 1, 1989.*

B. Further Attention Needed in Work Zone Traffic Control Regarding Lane Closures

Motorist disregard of work zone speed restrictions has, in the past, been exacerbated by the presence of temporary signs unnecessarily left in place when work was not actually underway. The Secretary of Transportation addressed this problem in late 1988 by setting forth a policy which stipulates that work zone speed limit signs be employed only when absolutely necessary (see Exhibit B). Trends in work zone accidents provide evidence that this continued management attention is warranted as work zone accidents, fatalities and injuries, which declined from 1985 through 1987, increased by 23% in 1988. While PennDOT has a policy on reduced speed limit restrictions, there is no similar policy regarding extent and duration of lane closures. Such a policy on lane closures could help minimize public inconvenience during major construction and extensive contract maintenance projects.

Discussion

The primary function of work zone traffic control procedures is to move vehicles and pedestrians safely and expeditiously through or around work areas while protecting on-site workers and equipment. A generally recognized problem in work zone traffic control planning is the difficulty in balancing the competing needs of safety and convenience. Unless reasonable care is used in establishing reduced speed signing and lane closure measures, public respect for exercising caution through work zones will be eroded. Inattention to these planning factors could result in increased work zone accidents, injuries and fatalities.

A 1986 conference, sponsored by the Federal Highway Administration (FHWA), on Corridor Traffic Management for Major Highway Reconstruction underscored a number of concerns of highway departments and motorists alike related to high traffic volume highway reconstruction. A post-conference report pointed out the problem of motorist confusion and frustration and noted the importance of sensitizing contractor and state highway agency personnel to the needs of work zone safety planning. For example, the report stated that "sometimes the sheer number of signs . . . adds to the highway user's perceptions that work crews are out merely to inhibit traffic flow." The report recommended that highway departments attempt to correct this misperception by improving ". . . the way they advise drivers about construction activities and how they are expected to drive in work zones."

Recognizing that unnecessary work zone speed restrictions have a negative influence on motorist compliance, Pennsylvania's Secretary of Transportation issued a policy statement in the fall of 1988 which stressed the importance of using reduced speed limits on construction projects only under certain conditions (see Exhibit B). This policy statement was followed by the development of a special contract provision which applies to all projects where reduced regulatory speed limits are required. In accordance with PennDOT's policy, the provision states that the contractor is to:

> Remove, cover, fold or turn all reduced regulatory Work Area Speed Limit signs installed within the limits of the project so that they are not readable by oncoming traffic except when workers are actually present and adjacent to a travel lane without a positive barrier between the vehicles and workers . . . .

The Traffic Engineering and Operations Division of the Bureau of Maintenance and Operations conducts ongoing quality assurance reviews of work zone traffic control schemes. To enforce the Secretary's policy, a specific checklist item is included to ensure that conflicting signs are removed, properly covered, or turned from view of traffic. The checklist also includes an item to substantiate that the PennDOT field inspector-in-charge has made at least one daily inspection to ensure satisfactory conditions and contractor compliance.

Concern about aggressive driving behavior in work zones is addressed in PennDOT's "Give 'Em a BRAKE" program which was implemented in 1987. According to PennDOT, this campaign is initiated in the spring of each year and runs for the duration of the highway construction season, which concludes in late fall. The object of Give 'Em a BRAKE is to prevent injuries and fatalities to PennDOT and contractor workers in highway work areas by increasing public awareness of the importance of driving slowly and carefully through work zones.

PennDOT is also aware of motorist concerns and perceptions about the inconvenience created by work zones. The Department has developed several informational handouts and a Give 'Em a Brake program brochure which answer frequently asked questions. In the brochure, PennDOT points out that long-term projects and certain types of special operations require speed restrictions at places where actual work may not be visibly evident. Noted, too, is the fact that some projects cover many miles and that traffic flows more safely in a consistent pattern.

Media communication is also a key element in PennDOT efforts to inform the public. LB&FC staff reviewed press releases and news bulletins concerning highway work zones and found that they typically gave notice of affected locations, type of work being

performed, and dates and times when motorists were likely to confront lane closures or other inconveniences. In the case of a large project, the information campaign may be quite extensive. The campaign undertaken for the Schuylkill Expressway reconstruction utilized a toll-free hotline, as well as brochures directed at truckers and long distance travelers. Other public relations tools for this project included press conferences, radio and television interviews, and special media events.

LB&FC staff examined statistics on work zone accidents on state highways from the period 1985 through 1988 and found that the number of accidents declined by 37% from calendar years 1985 through 1987, but then increased in 1988 by 23%. Preliminary data for 1989 suggests that the number of work zone accidents has not changed much since the previous year. Vehicle collisions and persons being struck by vehicles have been the most frequent types of accidents. Reflecting the overall decline in accidents, the number of persons killed and injured in work zone accidents has also declined from 1985 levels, except that the number of injuries has risen since 1987. From calendar year 1985 through 1989 (preliminary data), a total of 148 persons died, 13,190 persons were injured and 23,894 other persons were involved (but not injured). PennDOT's Bureau of Personnel tracks employee work zone incidents/fatalities. The Bureau's data show that fatalities and injuries have been relatively constant since FY 1986-87.

LB&FC staff also examined PennDOT policies/practices related to length and duration of lane closures. Unlike reduced speed limit signing, PennDOT does not have specific written policies intended to limit the length and duration of lane closures and hence no quality assurance review to ensure compliance with a standard. However, district offices have frequently included special "road users liquidated damages" provisions in construction contracts whereupon specified per diem dollar amounts may be deducted from money due the contractor for each day the road is not opened to unrestricted traffic after the required completion date. In some cases, per hour liquidated damage clauses are used where a contract specifies that there will be unrestricted traffic within certain hours of a given day.

Determinations as to length of lane closures as well as use of road users liquidated damages are made at the district level. The contracts are the sole basis for district control in these matters. The contracts are reviewed by the PennDOT Bureau of Design, Contract Management Division. However, no specific central office guidelines have been developed to evaluate the length and duration of lane closures nor to identify when the inclusion of a road users' liquidated damages clause is appropriate. In the absence of such guidelines, uniformity among districts cannot be assured regarding the exercise of reasonable control over contractor lane closings.

Recommendation

1. *PennDOT should develop a written policy for determining reasonable limits on the extent and duration of contractor lane closure on construction and extended contract maintenance projects. Like the Department's policy on work zone speed restriction signs, the lane closure policy should also be included in the work zone quality assurance review to ensure district compliance.*

463-88-27

EXHIBIT B

OS-735 (12-78)

COMMONWEALTH OF PENNSYLVANIA
Department of Transportation
Harrisburg

SEP 7 1988

SUBJECT: Reduced Regulatory Speed Limits in Work Areas

TO:
District Engineer, Dist. 1-0
District Engineer, Dist. 2-0
District Engineer, Dist. 3-0
District Engineer, Dist. 4-0
District Engineer, Dist. 5-0
District Engineer, Dist. 6-0
District Engineer, Dist. 8-0
District Engineer, Dist. 9-0
District Engineer, Dist. 10-0
District Engineer, Dist. 11-0
District Engineer, Dist. 12-0

FROM: Howard Yerusalim, P.E.
Secretary of Transportation Howard Yerusalim

I have personally driven through construction projects during evening hours and on weekends when no work was being done on, or adjacent to, the roadway and observed reduced regulatory speed limit signs through the area which, in my opinion, were not needed. These reduced speed limits were not being obeyed and were probably not serving to improve the Department's image.

Many of the reduced regulatory work area speed limits were in areas where work had not yet started or had been completed or at least completed to where there were no potential hazards on or along the roadway that had been created by the construction projects. Moreover, there were no physical restrictions through the area such as: narrowed travel lanes; lane shifts; etc.

Based on my reviews of reduced regulatory speed limits on construction projects, I want to stress the importance of complying with our policy that reduced speed limits on construction projects should only be established when conditions dictate a need for the reduction to protect workers, because of potential hazards on, or adjacent to, the roadway, to improve construction quality or because of restrictive geometrics.

The Department's policy in this matter is:

- Speed limit reductions in work areas should not be reduced greater than is necessary. Large unrealistic speed limit reductions normally only generate driver disrespect and may cause an undesirable wide range of speeds through the area.

- Establish a reduced regulatory speed limit in work areas only where it is needed. Long stretches of reduced regulatory speeds should be avoided, especially where there is no activity going on and there is no valid reason for having a reduced speed limit in effect for the entire project.

- When work is not in active progress and workers are not present, all reduced regulatory speed limit signs in work areas must be covered, removed or turned from the view of drivers unless there are potential hazards in or adjacent to the roadway, restrictive geometrics exist or the reduced speed is desirable to improve construction quality.

In order to promote a greater credibility of our reduced regulatory speed limits in work areas, I expect each district to take this matter by the hand and police the use of reduced regulatory speed limits in work areas.

Your cooperation in this matter is expected.

463/AKS/ks 8-443-6080

A-6. LITTER

A. PennDOT Has Developed Recent Initiatives to Help Control and Prevent Litter

Litter is not only unattractive but is also recognized as having significant negative impacts upon tourism and agriculture. The Pennsylvania Farmers Association has estimated its annual cost to the State's farmers at $45 million in the form of crop contamination, damage to equipment, and injury to livestock. In addition, foreign objects have caused accidents and highway fatalities.

The Department recently established its 1990 Highway Beautification Initiatives to address the problem of litter on Commonwealth highways. One key activity in this effort is implementation of an Adopt-a-Highway Program in which civic groups make a volunteer commitment to periodically conduct litter and trash pick-up on designated stretches of roadway. For this program to be effective, clear program objectives and performance measures should be developed to ensure accountability for the expenditure of personnel and money.

Discussion

PennDOT has complied with its statutory mandate to place trash receptacles along State highways as a way of encouraging citizen compliance with anti-littering laws. As required by statute, the Department also prints the prohibition against littering on driver's licenses and learner's permit applications and on motor vehicle registration cards. Although not specifically required by law, PennDOT has placed approximately 100 "Keep Pennsylvania Beautiful/Do Not Litter" signs on highways throughout the Commonwealth (see Finding B for further discussion). Numerous recent articles and letters to the editor in newspapers across the State demonstrate the public's concern over litter. Comments received by the LB&FC staff as part of its preliminary survey questionnaire process also indicate that litter is linked to perceptions of highway travel quality. PennDOT also engages in litter pick-up activities using Department personnel, contract labor, and citizen volunteers in the effort.

The Department's policy on using its own personnel for litter pick-up is found in the Maintenance Manual, which states that routine weekly trash cleanups should be held at each interchange. The Manual also indicates that expressways and major local service highways should be cleaned three times per year and that other local service roads should be cleaned annually. The Department's performance standard for this activity, however, makes no reference to the need for weekly trash cleanups at interchanges, nor does it differentiate between types of high-

ways and their priority for periodic pick-up. It states that litter pick-up should be a "rainy day" or "down-time fill-in" activity. Several county maintenance managers contacted noted that conducting weekly cleanups at interchanges is not feasible given other priorities and manpower limitations.

Over the past six years the number of Department force man-hours spent on litter pick-up has more than doubled. Volunteer efforts have also augmented Department manpower. Keep Pennsylvania Beautiful (KPB) has been PennDOT's major volunteer litter control program. KPB is a statewide effort which includes an annual litter pick-up day for volunteers of all ages and an educational component for children in kindergarten through fourth grade. Between 1985 and 1989, annual volunteer participation in KPB Day has increased from 225,000 to 500,000.

Highway Beautification Initiatives

Adopt-a-Highway is PennDOT's newest litter control program. Community service groups are asked to participate in two-year agreements to pick-up litter at least four times per year on stretches of highway two or more miles in length. Safety training, trash bags, and safety vests will be provided to participants, as well as warning signs to alert motorists of ongoing cleanup activity. The program is being implemented on a statewide basis and was recently launched with a two-day training session in Harrisburg attended by PennDOT coordinators and representatives from across the state. A program operations manual has also been distributed.

The Litter Brigade is another element of the Department's litter control efforts. This is a county-based program in which PennDOT contracts with intermediate units and juvenile probation offices for litter control services on a cost per mile basis. Juvenile offenders receive the minimum hourly wage, up to 75% of which may be applied to restitution. The Litter Brigade has been limited to Tioga, Blair, Dauphin, and Lackawanna counties, although interest has been expressed across the state. However, PennDOT's latest update of its 1990 Highway Beautification Initiatives calls for holding off on expansion of the Litter Brigade program until the impacts of the new Adopt-a-Highway Program can be assessed.

Meetings were held with staff from the Pennsylvania Commission on Crime and Delinquency (PCCD) to discuss the use of juvenile and adult offenders in litter pick-up activities. Although the use of prison labor for litter pick-up is not permitted under state law, the Executive Director of the PCCD pointed out that expanded use of litter pick-up would be both an allowable and practical sanction for certain categories of unincarcerated less-serious offenders and for DUI offenders in cases where community service is deemed appropriate by the courts. The PCCD

would be willing to work with PennDOT to identify other target groups that could participate in such a community service program and in helping to provide coordination services with law enforcement agencies and the judiciary.

Recommendations

1. ***To take advantage of the interest expressed in the Litter Brigade Program, further expansion of this program should be considered for those areas of the state which have expressed interest in establishing such programs.***

2. ***District goals and objectives should be established for PennDOT's 1990 Highway Beautification Initiatives and especially for the Adopt-a-Highway program. PennDOT needs to determine how district performance will be measured and should ensure that each district's litter performance be meaningfully brought under the maintenance quality assurance certification program.***

3. ***PennDOT should clarify its Maintenance Manual statement and its performance standard for litter and trash pick-up. The Maintenance Manual should clearly and realistically state performance expectations and should be written to reinforce the stated performance standard for this activity.***

B. PennDOT Could Take Additional Steps to Increase Effectiveness of Anti-Litter Signing

As part of what it termed an effort to "reduce sign clutter" in the early 1980s, PennDOT discontinued installing the "$300 Littering Fine" sign. The Department has placed approximately 100 "Keep Pennsylvania Beautiful/Do Not Litter" signs in recent years. However, the Department has not identified criteria for the placement of these signs to ensure they are placed in optimal locations. PennDOT plans to review signing efforts as part of the 1990 Highway Beautification Initiatives. This effort should include a review of both the strategic placement of signs and message content, two important factors in conveying the anti-litter message to the motoring public.

Discussion

In the early 1980s, the "$300 Littering Fine" sign was phased out as an effort "to reduce sign clutter." The goal was to remove unnecessary signs, thereby reducing roadside obstacles and making standard regulatory warning and guide signs more prominent. PennDOT is not statutorily required to place and maintain anti-littering signs.

In recent years the Department has developed a "Keep Pennsylvania Beautiful/Do Not Litter" sign. It is estimated that there are approximately 100 such signs currently along state highways. However, PennDOT has not developed criteria to determine the most effective placement of these signs. Without criteria to determine where anti-littering signs are most effective, the benefits of such signs may not be maximized.

LB&FC staff contacted eight states to review their anti-litter activities, including information on signing strategy. This review indicated that strategic placement of signs is considered important in several states. California, for example, has identified its high volume litter areas and has placed 750 signs in these locations. Message content was also identified as an important element of these states' litter control strategy. Texas and California vary the content of their sign messages to improve their effectiveness. Texas, for example, uses six different messages. Exhibit C contains sign messages used by the states sampled.

In addition to the use of roadside anti-littering signs, public service messages may also provide an opportunity to raise public consciousness. Groups such as forest fire prevention and anti-drug and alcohol awareness organizations use this method to increase public awareness.

PennDOT reported it will review the effectiveness of current anti-litter signing for possible changes as one of its 1990 Highway Beautification Initiatives. In this regard, the strategic placement of additional signs with a statutory fine message will be considered (see Finding A for further discussion on the 1990 Highway Beautification Initiatives). As the Adopt-a-Highway Program is implemented, signs will be placed along state roads to identify those stretches which have been adopted for cleanup by volunteer groups. PennDOT anticipates that these signs will also have a positive impact in reducing littering.

Recommendations

1. ***PennDOT's planned 1990 initiative to review the effectiveness of its anti-litter signing strategy should include the possibility of varying message content and posting "advertising type" public service billboards to increase public awareness.***

2. ***PennDOT should identify criteria for determining strategic locations for sign placement. These criteria should include areas of tourism concentration, access points at major interchanges and areas of high litter volume, such as stretches of highway near or adjacent to concentrations of fast-food establishments.***

EXHIBIT C

State Anti-Litter Signing

California	750 "Maximum Fine for Littering $1,000" signs are placed in high volume litter areas. Has also instituted a series of "Care for California" signs.
Colorado	"$1,000 Fine for Littering Enforced" sign placed at state entry points and at various locations.
Maryland	No signing policy.
Michigan	No statewide anti-litter signing program, though Michigan does use advance signs noting the locations of roadside litter barrels.
Ohio	Uses "$500 Fine for Littering" sign, but does not have any specific policy on sign message or placement.
PENNSYLVANIA	Has 100 "Keep Pennsylvania Beautiful/Do Not Litter" signs placed throughout state.
New York	"Unlawful To Litter $100 Fine" signs placed as needed.
Texas	Six signing messages: "No Dumping Allowed," "Littering Prohibited $10-$1,000 Fine State Law," "Litter Barrel One Mile," "Save Taxes Use Litter Barrels," "Littering is unlAWFUL," and "Cleaning Up Litter on Your Highway Costs You."
Vermont	Has 121 "$500 Fine for Throwing Trash on Highways and Streams." Six are in French.

Source: Provided to the LB&FC staff from the departments of transportation of the states surveyed.

A-7. TRUCK PERMIT PROGRAM

A. Truck Permit Program User Fees Cover Program Administrative Costs

PennDOT's Truck Permit Program regulates overweight and oversize vehicle traffic in order to facilitate the movement of these loads and other traffic and to protect the condition of the Commonwealth's highway and bridge system. This regulatory process is carried out through the issuance of special hauling permits. One objective of PennDOT's special hauling permit fee structure is to recover the administrative costs associated with reviewing applications, issuing permits, and maintaining records.

For the past three fiscal years permit fee revenues have exceeded program administrative costs by an average ratio of approximately 7 to 1. Current program administrative costs, however, do not take into account the program's information management support costs. The extent to which these costs would lower the revenue-to-cost ratio cannot be determined from available data.

Discussion

LB&FC staff compared revenues generated by permit and user fees with program administrative costs over a three year period to determine if program revenue was adequate to cover the costs of administering the program.

In order to regulate overweight and oversize vehicles, PennDOT administers a special hauling permit program (67 Pa. Code Chapter 179). The purpose of this program is to control the passage of these vehicles and loads in order to:

-- Promote the public interest and welfare.

-- Facilitate the movement of these loads.

-- Facilitate the movement of traffic.

-- Protect the structural integrity of the highway and bridge system.

-- Encourage the economic growth of commerce and industry.

The general issuance fee for each permit by law is $15. An additional 3¢ per ton-mile is charged for the number of tons which exceed the vehicle's registered gross weight. Additionally, separate fees are collected for special purpose or oversize vehicles, for vehicles which require an escort, and for special administrative requirements. For example, chemical and fertilizer vehicles and mobile homes require higher permit fees.

Salaries, wages, travel and other employee expenses involved in processing special hauling permits are included in the Department's definition of program administrative costs. These cost items are accounted for in the Department's Financial Management Information System and include expenses incurred by Central Office and engineering and maintenance district employees.

As a matter of policy, PennDOT does not include computer support costs within its definition of program administrative costs. There are twenty computer programs in the Department's Information Management System which provide support for the entire permit operation. These programs assist in the management of the highway occupancy, utility, driveway access, and special hauling permit programs. Incorporation of these support costs would increase the actual administrative costs of the special hauling permit program.

All program revenue from truck permitting is deposited in the Motor License Fund. Revenue and administrative cost data for the past three fiscal years is presented below:

Truck Permit Program
Comparison of Fees and Administrative Costs

Fiscal Year	Permit and User Fees	Administrative Costs	Ratio of Revenue/Costs
1986-87	$ 6,708,409	$1,027,766	6.5:1
1987-88	8,334,667	987,575	8.4:1
1988-89	8,306,944	1,283,658	6.5:1
Total	$23,350,020	$3,298,999	7.1:1

PennDOT's truck permitting program is meeting one of its objectives in that administrative costs are covered by the program's fee structure. To the extent permit and user fees exceed administrative costs, these amounts are directed to the Motor License Fund. As Motor License Fund dollars provide for road and bridge improvements, these fees serve to at least partially offset the cost of these infrastructure improvements.

B. Inequitability of Book Permit Fines

Book permits are available for haulers who make multiple, single trip deliveries of oversized loads. An example of such a hauler would be a mobile home dealer. An LB&FC review of citations issued to permitted vehicles found an apparent inequity in the fine structure for violations involving haulers using book permits. A hauler who secures a book permit and is cited for an administrative or safety violation is subject to a $500 fine--75 Pa.C.S. §1945(b). However, a hauler who did not acquire a permit and committed the same violation with the same load would be subject to a fine of no more than $100 (75 Pa.C.S. §4907). Thus, the hauler who secured the book permit is potentially liable for a $400 greater fine.

Discussion

LB&FC staff reviewed PA State Police reports of investigation of incidents where citations were issued to haulers who also possessed permits. The inequity cited above was noted in discussing the results of this review with the Chief of PennDOT's Permit Office.

Recommendation

1. ***PennDOT should review and recommend changes to the statutory fine structure for book permit violations to the General Assembly in order to correct inequities in fines assessed for haulers under book permits.***

C. Special Hauling Permits Appear to Be Issued in a Timely Manner

PennDOT authorizes the travel of overweight and oversize vehicles and loads through special hauling permits. In addition, the Department may designate alternate routes for these vehicles due to highway/bridge or traffic conditions. PennDOT issues approximately 1,000 special hauling permits per workday.

To monitor the efficiency of the permit process, the Department has established performance standards for issuing permits in a timely manner. The informal objective for processing "routine" applications is four hours, and the objective for processing applications requiring bridge unit review is one workday.

Spot checks of permit processing by LB&FC staff indicate the Department is meeting its performance standards for issuing permits and that alternate routes are selected in accordance with prescribed procedures. Moreover, the Executive Director of the PA Motor Truck Association informed LB&FC staff that PennDOT's special hauling permit program has improved significantly and that there are no major problems with either delays in issuing permits or in rerouting. However, PennDOT cannot monitor its performance factors in a practical manner because of the volume of permits processed. It is impractical to monitor these standards manually and the computer programs which currently support the permit program do not have the capability to compute permit processing times.

Discussion

PennDOT has the authority to permit the travel of vehicles in excess of authorized gross weights or sizes. The Department may also designate alternate routes for overweight/oversize vehicles when access to highways or bridges is restricted. The Bureau of Maintenance and Operations is responsible for providing overall direction and guidance for exercising this authority, and the engineering and maintenance district permit offices have responsibility for issuing permits. The Permit Section in the Traffic Engineering & Operations Division is the Central Office focal point for special hauling permitting operations. The Department's efficiency in issuing permits and rerouting trucks has an economic, safety, and public relations impact on its relationship to Commonwealth industries.

Processing Times

PennDOT guidelines suggest that "routine" permits should be issued within four work hours of receipt of a properly completed

application. However, the Department recognizes that the complexity of a permit application can vary considerably based on several variables such as load weight and dimensions, vehicle weight and dimensions, and location and length of the desired route. The more complicated these variables are, the more review and coordination is required by the permit office.

An LB&FC spot check of two district permit offices indicated that "routine" permits were processed within the four hour standard.

Rerouting

Vehicles often need to be rerouted due to bridge restrictions. The Department's standard for reviewing applications which require bridge unit approval is one workday.

The sample of permit applications requiring bridge unit review which were processed during the LB&FC spot check was not large enough to draw a firm conclusion concerning processing times. However, all permit applications reviewed by the bridge unit during the spot check were processed in accordance with prescribed procedures.

Performance Monitoring

PennDOT issued 256,818 permits in FY 1987-88 and 292,703 permits in FY 1988-89, an average of over 1,000 permit issuances per workday. The Department's computer programs which support the special hauling permit application process are not configured to calculate and monitor permit processing turnaround times. Therefore, in order to monitor its permit issue turnaround time performance, the Department either needs to adopt a sampling technique or enhance its computer program capabilities.

One way in which the Bureau of Maintenance & Operation's Permit Section does monitor the performance of field permit offices is through its Quality Assurance (QA) program. Using checksheets for the different types of permits processed, Central Office personnel review district permit operations each year. Both Central Office and field personnel report that these reviews have improved permit processing. The number of review items on the special hauling permit checksheet has increased from 18 in 1987 to 42 in 1989, as additional items have been added after the need for them has been identified by other reviews, audits, and agencies. The Department's QA rating of its special hauling permit operations increased from 84.8% in CY 1988 to 88.2% in CY 1989 (i.e., in 1989, 88.2% of the 42 checklist items used in the QA review process to monitor special handling permit operations were noted as satisfactory).

Recommendation

1. *The next enhancement of the computer programs which support PennDOT's permit operations should include programming to calculate special hauling permit issuing times. With this enhancement the Department could easily monitor its performance standards for permit processing.*

A-8. CONTRACT QUALITY ASSURANCE

A. Penalty Procedures for Contractors Providing Deficient Strength Concrete Need to Be Documented

PennDOT does not have an established written procedure for contractor price penalty assessment in situations where the Department decides to keep in place structures produced wholly or partially with substandard concrete. A draft policy statement has been submitted internally and to appropriate interested parties for review and comment. This draft is intended to clarify an informal PennDOT policy which has apparently existed for some time but has never been explicitly established in appropriate documents governing contractor/Department responsibilities. In the absence of a clearly stated policy, inequities and irregularities may occur in the treatment of contractors when substandard workmanship is detected.

Discussion

Construction firms which contract with PennDOT are required to use materials and produce work which conforms to specifications. The primary document that contractors are to follow is Publication 408, Specifications. It is the responsibility of Department engineers to determine the acceptability of material and construction based on inspections and test results.

In some cases, particularly as it applies to concrete construction, it is possible that the material used and tested may not be within specified limits but that the resulting construction may be deemed acceptable and the work allowed to remain in place. Such decisions necessarily involve the application of sound principles of engineering judgement.

Publication 408, Section 105.03(b)2, states in part as follows:

> . . . the engineer will determine the limits of reasonably close conformity . . . .
>
> If it is determined that material or the finished product in which material was used is not within reasonably close conformity, but that reasonably acceptable work has been produced, the engineer will then determine if the work will be accepted and remain in place. In this event, written documentation will be provided for acceptance by required contract modification, and/or to provide for an appropriate adjustment in the contract price for such work or material. [Emphasis added.]

If it is determined that material or the finished product is not within reasonably close conformity and has resulted in an inferior or unsatisfactory product, remove or replace it.

The focus of the LB&FC staff's inquiry was the application of this general policy of material and workmanship acceptance, particularly as it relates to how and what contractors are paid in such cases. The staff undertook activities in this specific area when it learned that several structures on Interstate 476, known as the "Blue Route," located in PennDOT's Engineering District 6-0 in Southeastern Pennsylvania, had experienced certain problems:

-- Portions of two bridges were pockmarked with a condition known as "honeycombing," a failure of the concrete to uniformly fill column molds to their edges.

-- A portion of a "pier cap," a triangular wedge that helps support the deck of a bridge, had failed concrete strength tests.[1/]

In pursuing the matter of PennDOT's procedures for penalizing contractors for material or workmanship that fail to meet PennDOT's specifications, LB&FC staff learned that PennDOT has employed a methodology for contractor payment reduction which is not documented.

PennDOT officials informed LB&FC staff that an "unwritten but generally known formula" has been used to assess contractor penalties for cases in which concrete fails strength tests but where the structures are nevertheless structurally sound enough to remain in place.

This unwritten formula takes into account such factors as the actual tested strength of the concrete and its relationship to the specified mixture and structural design strengths and was applied, for example, to the acceptance of the aforementioned pier cap on the "Blue Route." In this case, the Department agreed that the pier cap was structurally adequate, although the concrete strengths did not meet the project specifications. The contractor was assessed a penalty of approximately $18,000 and was also required to perform additional protective work to the pier cap at no additional cost to the Department. When work and/or material is declared defective such that it needs to be repaired or replaced, work is to be performed at no expense to the Department in accordance with Publication 408, Section 105.12.

1/As reported in the Philadelphia Inquirer, November 19, 1989.

Without a written and well-defined procedure for assessing contractor penalties in such situations, the possibility is increased that PennDOT construction managers might misconstrue or misapply instructions they have received. This could result in contractors being overpaid or underpaid for work which failed to meet strength requirements.

A draft policy letter for deficient strength concrete was circulated in late 1989 for review and comment within and outside the Department. The draft policy covers circumstances under which core samples are to be taken, formulas for reduced payment, and criteria for leaving deficient concrete in place.

Recommendations

1. ***PennDOT should establish a target date for finalization and implementation of a written policy that describes the procedure and methodology to be followed in determining the contractor price penalty in cases where PennDOT engineers determine that work which contains substandard material is to remain in place.***

2. ***When adopted, this policy should be placed in Publication 408, Specifications, and any other official PennDOT documents which specify requirements in the relationship between the Department and its construction contractors.***

B. PennDOT Procedures for Review of Consultant Inspector Qualifications Need to Be Established as Permanent Policy

In a sample of records examined at one construction site, consultant inspector resumes were present, but interviews or reference checking were indicated for only a relatively small proportion of the sample. Such inspectors are employed by firms performing consultant inspections on PennDOT construction projects. The procedure to evaluate the qualifications of inspectors is outlined in a 1983 "strike-off" letter which, according to a PennDOT master policy statement, is a temporary document intended for the rapid dissemination of short-term policy or procedure. The strike-off letter does not appear to be the appropriate policy vehicle for the function of qualifying consultant inspectors who provide important services in the quality assurance of highway construction projects. Over a period of time, such a policy documented in this manner may receive inadequate attention. Therefore, publication of this policy in an appropriate policy manual would help underscore its importance and may help bring about a more conscientious approach to compliance and documentation.

Discussion

A PennDOT policy letter (known as a "strike-off letter") for "Evaluation and Approval of Consultant Inspection Personnel," dated May 3, 1983, provides for the procedure PennDOT engineering districts are to follow to assess the qualifications of consultant inspection personnel. The basic policy is that "Inspection personnel furnished by consultants must be fully qualified and pre-trained to perform the work for which they were hired."

The major elements of the procedure to implement this policy are as follows:

-- All consultant inspection personnel will be evaluated and approved by the District Construction Division prior to their assignment.

-- The consultant shall be directed to furnish a written resume (outlining education, experience and training) of each individual proposed to work on the project.

-- Inspectors shall be interviewed by the Assistant District Engineer for Construction.

-- The qualifications and experience level of inspectors shall be equivalent to that required of Department force inspectors.

In a visit to a District 6-0, construction project in Southeastern PA (Interstate 476, known as the "Blue Route"), LB&FC staff examined files containing records related to the placement of individual inspectors employed by two firms performing construction inspections for PennDOT. Resumes were on file in all cases for a sample of 60 inspectors who had been selected by their employer to do inspections for PennDOT. However, evidence that either an interview or reference check had taken place was indicated for only nine persons in the sample. LB&FC staff also found that, in the case of this construction site, the responsibility for conducting interviews had been delegated to the Inspector-in-Charge (a PennDOT employee) who works under the direction of the Assistant District Engineer for Construction.

PennDOT's total consultant inspection costs for construction have increased from $11 million in FY 1984-85 to about $36 million in FY 1988-89. These expenditures are intended as a means of protecting an approximately $1 billion annual investment for the construction, reconstruction and rehabilitation of Pennsylvania's highway infrastructure. As the authorized representatives of PennDOT engineers assigned to make inspections of contract performance and of material furnished, consultant inspectors have an important responsibility for the protection of the public safety and welfare, including the prudent use of public funds.

Thus, a well documented and specified policy/procedure to ensure the qualifications of consultant inspectors is important. However, PennDOT's policy and procedures for reviewing consultant inspector qualifications are set forth in Department "strike-off" letters.

According to PennDOT Master Policy #310, Paperwork Management, strike-off letters ". . . are temporary documents used for the rapid dissemination of short-term policy, procedure or related information." Given the importance and apparent permanency of the Deparment's "strike-off" letter establishing procedures for reviewing the qualifications of consultant inspectors, it would appear that the procedures should be established as permanent policy.

Recommendations

1. ***To provide a greater degree of assurance that persons employed by firms under contract with PennDOT are qualified to perform highway construction inspections, PennDOT should publish its policy/procedure regarding the evaluation and approval of individual consultant inspectors in an appropriate publication of unlimited duration, such as the Master Policy Manual or Publication 408, Specifications.***

2. ***Following publication, the Department should take steps to ensure that the policy is followed by PennDOT personnel within each of the eleven engineering districts.***

C. Problems Identified in Comptroller Review of Bureau of Construction and Materials Not Yet Fully Resolved

A 1987 Comptroller review of the Bureau of Construction and Materials made a number of recommendations for improving materials quality assurance functions performed by the Materials Testing Division (MTD). In follow-up of selected findings and recommendations, LB&FC staff found that MTD had complied with many, but not all, of the recommendations. Deficiencies, if not corrected, may lead to materials or manufactured products being used in PennDOT construction products which have not met specifications. For example, continuing deficiencies appeared to exist regarding certain structural steel inspectors not following appropriate documentation procedures, inadequate documentation of lab report corrections, and instances of certain products being listed as approved in Department publications which may not in fact be meeting Department specifications.

Discussion

A review of the activities of the Bureau of Construction and Materials was conducted by the Comptroller's Office and reported in an 'Advisory Memorandum' issued in April 1987 (covering the period July 1985 to February 1987). Among the areas addressed in this review was the quality assurance of materials carried out by the Materials Testing Division (MTD). Fifteen findings and three observations were made in the report. In reviewing the Department's response to the Comptroller report, the five findings judged to be most important by LB&FC staff were selected for follow-up verification activities.

LB&FC staff follow-up activities and conclusions in relation to each of the five selected findings of the Comptroller's report are described below.

(1) **Comptroller Finding #1 - Improvement Needed in Inspection of Steel Fabrication Plants.** The Comptroller report noted instances of inspectors neglecting to mention in their reports if shop drawings had been approved. Review and approval of shop drawings is important to ensure that the drawings conform to design and specification requirements.

In its response to the finding, PennDOT stated that shop drawings had been approved for each of the cases noted in the Comptroller's review but that inspectors henceforth would be required to document the status of shop drawings (not approved/approved) in the narrative section of the fabrication report.

LB&FC staff reviewed a sample of four construction projects involving six separate fabricators. In two of the projects

(both of which involved multiple steel items), the inspectors did not mention the status of shop drawings. In another project involving multiple inspectors, one of the inspectors' reports reviewed did not indicate status of shop drawings.

Following these LB&FC staff audit activities, PennDOT's Structural Materials Section staff contacted Robert W. Hunt Company, the consultant inspection firm for structural steel, regarding the findings of the LB&FC staff review of inspector reports. As a result, the R.W. Hunt Company modified the narrative report form for their inspectors to help ensure that the status of the shop drawings are included and can be easily identified in the inspector reports.

(2) **Comptroller Finding #2 - Improvement Needed in Documentation of Monitoring by Steel Unit.** The Comptroller's report noted that the policy followed by PennDOT's Materials and Testing Division's Structural Steel Unit to monitor the performance of consultant inspectors did not require PennDOT personnel conducting plant visits to prepare written documentation of consultant activities and/or findings. As a result, feedback documentation on the effectiveness of the Department's monitoring of consultant inspectors is lacking.

LB&FC staff found that a Fabrication Plant Inspection Report is now in use and is reviewed by supervisors including the section chief. Thus, the recommendation appears to have been implemented.

(3) **Comptroller Finding #3 - Improvement Needed in Requests for Lab Report Corrections.** The Comptroller's report noted in a sampling of corrected lab reports issued by PennDOT's Materials and Testing Division's Bituminous Lab that changes to lab report results were documented by route slips without presenting factual support for the revised test results. Without adequate support, the accuracy of revised test results cannot be assured and, as a result, the Department may be paying more than is required for material not meeting specifications.

PennDOT stated that in the cases reviewed by the auditor, there was a memorandum which, in its view, provided factual evidence of the request, the identity of the requestor, and a brief description of the reason for the request. The Department, however, planned to issue a revision to the policy letter to add a date and initial of the Engineer of Tests or staff approving the correction to the lab report.

An LB&FC staff review of nine lab report changes showed seven requests did provide an indication of factual support for the change. For two other change requests, however, reasons were not documented on the request memorandum. This limited

review suggests that problems may still exist in documenting changes to lab reports.

(4) **Comptroller Finding #4 - Improvement Needed in Monitoring Bulletin 14 Requalifications.** The Comptroller's report noted that requalification samples had not been obtained for more than two years for 35 of 422 sources listed in Bulletin 14, "Aggregate Sources." Bulletin 14 states that requalification material samples are to be obtained biennially. This procedure helps ensure that sources are providing acceptable materials.

PennDOT indicated that a tickler system was originally designed to alert the engineering district materials engineers whenever the two-year limitation was nearing expiration for the listed aggregate sources. However, this procedure is entirely computer dependent, and no resources in terms of computer support have been approved to date to accomplish this task.

LB&FC staff analyzed the draft of the April 1990 edition of Bulletin 14. The bulletin was last published in January 1988. Of the 1,161 samples indicated (according to Lab number) in the 1990 edition, 247 (21%) were based on tests taken prior to 1988. This analysis indicates evidence that the Department continues to experience problems in performing requalification samples in compliance with their two-year standard.

(5) **Comptroller Finding #5 - Improvement Needed in Supporting Documentation for Bulletin 15 Listing.** Bulletin 15 is a list of pre-qualified materials, manufacturers, and producers that have satisfied PennDOT's specification requirements and are eligible to be considered for preliminary acceptance for use on Department construction projects. The Comptroller's report noted that, of 253 materials and companies sampled from Bulletin 15, "Approved Construction Materials," documentation (e.g., lab or inspection reports or quality assurance reviews) was on file to support only 128 of the listings. Without evidence of a manufacturer or producer's ability to meet PennDOT specifications, the assurance that Bulletin 15 is intended to provide is undermined.

In its response to the Comptroller report, PennDOT indicated that laboratory test results and documentation relative to monitoring of products will be included in the Bulletin 15 files.

The Federal Highway Administration (FHWA) recently completed a draft report evaluating PennDOT's sources and materials approval and quality assurance practices, including many of the policies and procedures related to Bulletin 15. A PennDOT response to the FHWA report was expected by the end of May 1990.

In this report, FHWA commended the Department for improvements which it had made in its Materials Certification Program.

In particular, the report took note of extensive efforts to implement and to notify manufacturers and suppliers about changes in materials certification specifications. The FHWA review also found, however, that MTD files identified a number of problems with materials where a particular firm's products were not approved but were included as approved materials in Bulletin 15 (January 1990). A product of another firm was found deficient in tests conducted in early December 1989. Although the firm was promptly notified that the product would not be approved, the product was still listed as currently approved in Bulletin 15. Because the FHWA's draft report was issued in April 1990, LB&FC staff were unable to assess the Department's implementation of the FHWA's report recommendations. The FHWA also identified the following areas as needing improvement:

-- PennDOT does not include any specific minimum quality control (QC) plan requirements or format for products.

-- Historically, many firms and their products were approved without the current requirement for submission of quality control plans. Therefore, the Materials Testing Division (MTD) does not have the firms' QC plans on file in the event a problem with any of these products surfaces.

-- Quality Assurance is in the process of developing a system to require a QA review of any in-state source when any MTD test failure occurs. This is currently the practice for all asphalt and cement manufacturers within the state.

-- It appears that the Bureau of Construction and Materials is not routinely providing FHWA construction inspection reports involving material problems to either MTD or QA for appropriate follow up action.

Recommendation

1. ***PennDOT should determine what additional steps, if any, are warranted to ensure that the concerns raised in the Comptroller's 1987 review have been properly addressed.***

A-9. COST OVERRUNS

A. Construction Contract Cost Overruns Being Held to Under 5 Percent[1/]

PennDOT's management of construction contract cost overruns is commendable in that cost overruns have not exceeded the Department's informal, internal objective of 5% for the past four fiscal years. However, the Central Office and districts do not have written, standardized procedures to ensure uniformity in the processing of work orders and claims. Such standardized procedures would give the Department greater assurance that cost overrun performance data can be assessed in time to control its impact on the current budget.

Discussion

Cost overruns result from work orders (approved modifications to construction contracts) and contractors' claims (requests from contractors for additional time or money) which are also paid via work orders. Work orders authorize either "additional work" (i.e., more or less of an item already included in a contract) or "extra work" (i.e., the addition of an item not included in a contract).

The Central Office has not established a formal organization-wide measurable objective for cost overruns. Rather, there exists an informal objective that cost overruns not exceed 5% of the original contract amount. This "informal" objective, however, does serve as a personnel evaluation criteria for some of the Assistant District Engineers for Construction.

Work Orders

The Department's Project Office Manual (Section 3, Part B) provides guidance concerning the preparation and processing of work orders. The engineering districts are responsible for the initiation of all work orders and, depending on the funding source and/or the magnitude of the project, both Central Office and Federal Highway Administration approval of the work order may be required.

LB&FC staff compared the magnitude of work orders from both completed and open contracts. The following table indicates the Department's performance for both categories of contracts:

1/This issue is related to the 1983-84 performance audit finding concerning a trend in cost overruns which increased from 3.1% in 1981 to 6.7% in 1983.

Completed and Open Work Orders

Fiscal Year	Completed Contracts Net Work*/ Net Work Order Volume ($ Millions)	Completed Contracts Net Work*/ Order Volume as an Average % of Contract	Open Contracts Net Work*/ Net Work Order Volume ($ Millions)	Open Contracts Net Work*/ Order Volume as an Average % of Contract
1985-86	$ 11.6	2.1%	$ 46.5	2.9%
1986-87	18.1	2.4	34.6	2.6
1987-88	14.1	2.3	43.5	4.6
1988-89	8.2	2.0	56.5	1.7
Total	$52.0	2.2%	$181.1	2.5%

*/Net Work Order Volume is defined as the mathematical difference of work order additions and work order deductions.

As shown in the above table, the Department has fulfilled its unwritten objective of not exceeding a 5% increase in original contract costs for either completed or open contracts. The table also shows that the net value of work orders corresponding to open contracts is significantly higher than the net value of work orders corresponding to completed contracts. However, the Department only monitors cost overruns on completed contracts. Large construction contracts may take several years to complete, and the cost overrun activity associated with these contracts is not formally reported until the contract is completed. Thus, by analyzing only completed contracts the Department is missing a major portion of work order activity in any given fiscal year.

Work Order Oversight

As indicated above, the work order process is decentralized, with the districts responsible for the majority of the processing and approval activities. At the Central Office, all work orders with a net value of over $500,000 must be approved by the Program Management Committee, which is chaired by the Secretary of Transportation. In FY 1988-89, these work orders totaled $37,916,028, which was 67% of the value of all work orders. Additionally, work orders requiring both FHWA and Central Office approval receive a thorough technical editing and administrative review by the Work Order Engineer.

The following table shows the number of work orders processed, by approval level, for the past four fiscal years:

Work Orders Processed by Approval Level

Approval Level	FY 1985-86	FY 1986-87	FY 1987-88	FY 1988-89
Central Office ...	812	896	945	941
District	3,186	3,547	3,558	3,226
Total	3,998	4,443	4,503	4,167

A 1987 Federal Highway Administration (FHWA) audit (42-87-CN-1) noted that the procedures for Central Office oversight of district approved work orders were not well defined and that these work orders accounted for 77% (3,226 of 4,167) of all work orders processed by the Department in FY 1988-89. To date, the Department has not established written procedures to address this deficiency.

District Work Order Processing Procedures

Five PennDOT districts were visited to survey work order processing procedures and to review the degree of management involvement in cost overruns. District processing of work orders varies considerably in the number and sequence of process steps as well as in the responsibilities for the staff assigned these activities. However, these processing differences do not appear to adversely affect the districts' awareness of the causes and consequences of work orders and contractors' claims. Based on LB&FC staff interviews, district managers demonstrated concern with the significance of the cost of work orders and claims and appear to manage aggressively to minimize their impact.

However, in spite of the attention being paid to cost overruns, work order processing procedures could be improved to help ensure that timely action is taken when problems first arise. For example, the districts are not required to maintain cumulative cost overrun data on a project-by-project basis which would indicate potential problems, and district work order processing procedures were not documented in writing at any of the five districts visited.

Claims

As with the work order process, the procedures for processing contractor claims in the districts varies in the number of process steps involved. Districts also differ in their interpretation of when a claim exists. One district defines a claim to exist when it becomes aware of a problem with a contractor, while another district does not identify a claim until a request is made for a Construction Claim Review Committee[2/] meeting (see Table 4). While these differences may not substantively impact upon the management of the claims process or costs, they do affect the comparability of claim activity and data between districts. For this reason, comparable figures on the number of claims currently existing at the district level were not available.

The Department's Highway Contract Claims policy letter addresses the claims process through to the Construction Claim Review Committee, and Publication 408, PennDOT's construction specifications manual, briefly describes the process for the settlement of claims at the district level and the appeal procedure to the Construction Claim Review Committee or to the Board of Claims.[3/] These policies, however, do not establish detailed procedures for claim processing. For example, a log is not maintained of claims received by the district office when a letter of intent to claim is sent to the district engineer. Additionally, no log is maintained at the bureau level when the contractor's letter of intent to claim is sent to the Director of the Bureau of Construction and Materials. Therefore, at a given point in time, neither the district nor the Central Office can provide a list of outstanding claims.

Although separate files are maintained at both levels on each contract, cumulative information related to claims outstanding is not readily available. Information on only those contractor claims which have proceeded to the Construction Claim Review Committee level or to the Board of Claims is available at the Central Office. A file on each claim to be presented to the Construction Claim Review Committee is maintained by the Bureau of Construction and Materials. Those files, however, do not necessarily include dollar amounts sought. Prior to reaching

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2/The voting members of the Construction Claim Review Committee are the District Engineer, the Director of the Bureau of Construction and Materials (or designee), and the Chief Counsel (or designee). The committee serves as a hearing board to resolve claims prior to filing with the Board of Claims.

3/The Board of Claims is an independent administrative board responsible for arbitrating claims against the Commonwealth arising from contracts entered into by the Commonwealth.

that level, the claims may or may not be identified as claims by the district involved. Because complete information is not readily available, PennDOT does not have the capability to identify its potential liability for outstanding claims at any given time. Therefore, a potential exists for claims to exceed the available budget without the Department having adequate time in which to react. While the Office of Chief Counsel maintains a contractors' claim report, it only addresses those claims which proceeded to the Board of Claims (see Table 5 for the status of contractor claims).

As with work orders, settlements for claims of $500,000 or more must be approved by the Program Management Committee. However, the Highway Contract Claims policy letter indicates that the Construction Claim Review Committee may, by unanimous agreement, settle a claim for over $500,000. Once the claim reaches the Construction Claim Review Committee level, PennDOT's Office of Chief Counsel becomes involved in the process and sits as a member of the Committee (although prior involvement may occur). The Assistant Counsel-in-Charge of the Claims Section has noted that in the instance of a substantial claim the Department will have an outside firm audit the costs claimed by the contractor. A substantial claim is defined as $200,000 to $250,000 or more, or if the claim has a statewide implication. The Department will additionally seek an outside engineering evaluation if it is a large claim using the same criteria above and will use that evaluation at the Construction Claim Review Committee level. This procedure, although currently utilized by the Assistant Counsel-in-Charge of the Claims Section, is not defined in official Department policy.

The Department does not have well-defined procedures to provide reasonable assurance that problems with claims will be analyzed and disseminated in an effort to reduce future claims liability. While the Central Office has occasionally made changes to policies or procedures based on a specific claim to preclude similar claims from occurring again, the procedures for the review of claims does not require this analysis. The policy letter regarding highway contract claims states that the Bureau of Construction and Materials is to receive and review changes recommended by the Construction Claim Review Committee and implement appropriate action to eliminate and reduce the chance of recurrence of similar claims. The policy letter does not, however, direct the Committee to make this type of an analysis during the review of the claim.

Recommendations

1. ***The Department should formally establish written objectives for cost overruns, e.g., a 5% limit on cost overruns. This would ensure that all Department personnel are aware of the objectives and process work orders and claims with the purpose of meeting the stated objectives.***

2. *The Department should develop a policy to clarify the authority of the Construction Claim Review Committee to settle claims for over $500,000. Additionally, this policy should:*

   a) *Establish criteria for the use of consultant engineers and accountants in preparation for a Construction Claim Review Committee meeting or a hearing before the Board of Claims. Such criteria would provide the basis for a consistent approach concerning when and how to use consultants in the claim review process.*

   b) *Develop control logs and assign district responsibility for maintaining cost overrun data. The enhancement to the contract management system (CMS 2) has the potential to provide much of this information. Control logs at the district level would assist in the identification of potential cost overrun problems.*

3. *To help ensure that cost overruns are identified in a timely manner, establish procedures to identify magnitude of cost overruns at the end of each quarter for all open contracts. For example, compare net value of all work orders processed in the previous four quarters with dollar value of all open contracts at the end of the most recent quarter.*

4. *Establish written procedures for Central Office oversight of work orders approved at the district level. This same recommendation was made by the FHWA in a 1987 report (42-87-CN-1). Written procedures would ensure that Central Office oversight of district approved work orders is thorough and consistent.*

5. *Establish written procedures at the districts and Central Office defining the responsibility and flow of work order and claims processing. Written procedures would provide a reference for uniform processing of work orders and claims.*

6. *Require analysis by the Construction Claim Review Committee of claims to identify possible corrective action for the cause of valid claims and identify responsibility at the Central Office for corrective action based on that analysis.*

7. *Clarify the definition of claims at the district and Central Office level so that the Department can identify and analyze its outstanding claims liability at any level.*

TABLE 4

Claims at Construction Claim Review Committee Level*/

Bureau of Construction and Materials	Denied	Settled	Appealed to Board of Claims	Pending	Total
Quality Assurance "East"	16	9	0	8	33
Quality Assurance "West"	10	6	1	3	20
Total	26	15	1	11	53

*/This represents requests for Construction Claim Review Committee meetings filed in CY 1989 or Construction Claim Review Committee meetings held during CY 1989.

Source: Compiled by LB&FC staff based on information provided by PennDOT.

TABLE 5

Status of Contractors' Claims as of February 20, 1990

Year	# Claims Filed	Amount of Claims Filed	Amount Awarded Board of Claims	Amount Pending
1984	15	$ 2,780,988.58	$ 970,700.00	$ 516,380.22[a/]
1985	12	3,076,228.51	36,902.84	2,721,610.49[b/]
1986	26	50,575,747.61	574,384.37	49,760,279.27[c/]
1987	25	15,190,229.67	183,507.98	14,210,933.93[d/]
1988	20	16,637,076.13	65,203.55	16,516,111.32[e/]
1989	17	16,681,650.47	N/A	16,681,650.47[f/]
1990	4	8,162,880.57	N/A	8,162,880.57[g/]
TOTAL ...	119	$113,104,801.54	$1,830,698.74	$108,569,846.27[h/]

a/Three cases pending; one withdrawn by contractor.
b/Four cases pending; three withdrawn by contractor; one case appealed to Commonwealth Court; one case pending after 3/10/89 trial before Board of Claims.
c/Ten cases pending; five cases withdrawn by contractor.
d/Twelve cases pending; one case withdrawn by contractor.
e/Eighteen cases pending; one case withdrawn by contractor.
f/Seventeen case pending.
g/Four cases pending.
h/Potential liability of pending cases.

Source: Pennsylvania Department of Transportation.

A-10. CONTRACTING PROCEDURES

A. Fifty Percent Classification Requirement for Prequalification of Bidders Appears Justified

PennDOT requires that bidders be prequalified as eligible to perform at least 50% of specified work on highway construction, betterment, and maintenance projects, exclusive of work to be performed by subcontractors. Although the Federal Highway Administration (FHWA) allows states to use a minimum requirement of 30% for federally funded projects, PennDOT believes the 50% requirement is necessary to ensure prime contractor accountability. Based on information supplied by the Department for the period from July 1, 1985, through December 31, 1989, LB&FC staff determined that the potential savings associated with using a 30% limit would have been minimal ($92,152) in relation to the risk of incurring greater expense due to decreased accountability. Thirty-five other states also use the 50% requirement.

Discussion

In June 1985 the LB&FC released a report addressing low bid contract rejections in the Department of Transportation. The report noted that the FHWA had recently allowed states to reduce requirements for the amount of work that prime contractors must accomplish with their own resources to 30% in order to encourage greater competition. PennDOT chose not to adopt this change due, in part, to concerns over the extent to which the Department could hold prime contractors accountable if they were not able to perform at least 50% of the work on a project with their own resources.

PennDOT regulations provide that contractors must be prequalified by the Bureau of Construction and Materials to bid on classified types of work which must constitute at least 50% of bid price. "Classifications" are formal categories established for general work areas. Earthwork, for example, is split into the classifications of clearing and grubbing, building demolition, and excavating and grading. Designated "specialty items" which general contractors typically do not produce are not included in the 50% determination, nor are the costs of subcontracting work deemed necessary to fulfill minority, disadvantaged, and women-owned business enterprise (MBE/DBE/WBE) participation requirements. LB&FC staff estimated at that time that the Department could have saved $133,800 from January 1, 1982, through March 31, 1985, if PennDOT had followed the FHWA minimum classification requirement and had not rejected eight low bids which fell between the 30% and 50% classification range.

The June 1985 LB&FC report identified five states as having classification requirements lower than 50%. Two of the states had a 40% requirement, and three had a 30% requirement. In order to determine if any changes had taken place since 1985, LB&FC staff conducted a phone survey of regional FHWA offices. As of February 28, 1990, state classification requirements were as follows:

-- Thirty-six states, including Pennsylvania, had a 50% requirement.

-- Eleven states and the District of Columbia had a 30% requirement. These include the state of Washington, which formerly had a 40% requirement, but reduced it to 30%.

-- Three states had a 40% requirement.

-- Two states (one with a 40% requirement and another with a 50% requirement) may go as low as 35% to secure the requisite level of MBE/DBE/WBE participation through subcontracting. An unspecified number of states, including Pennsylvania, exclude the price of MBE/DBE/WBE subcontracting from their 50% qualification determinations.

Updated Information on 50% Low Bid Rejections

LB&FC staff obtained updated information from PennDOT on bid rejections for the period July 1, 1985, to December 31, 1989 (see Table 6). Only eight of the 78 low bid rejections during this period were due to the 50% classification requirement. Of these, four involved prequalification percentages of between 30% and 50%, and three were for percentages below 30%. The one remaining case involved a firm that was not prequalified to do any of the work.

The total cost savings that PennDOT could have realized if a 30% minimum was applied would have been $92,152. In three of the four cases involving classification percentages of between 30% and 49%, the contract was awarded to the next bidder resulting in higher costs of $101,904. In the remaining case, all other bids were rejected and the project was rebid, resulting in cost savings of $9,753.

Thus, the savings to be gained from lowering the 50% classification appear quite small in comparison to the total dollar amount of competitively bid construction contracts, which amounted to an estimated $743 million in FY 1988-89 alone. Because the more restrictive 50% requirement may result in better contract management control, lowering the requirement may not be worth the risk of incurring greater expense due to decreased accountability.

TABLE 6

PennDOT Contracting and Bid Rejection Information
(July 1, 1985, to December 31, 1989)

Year	Number of Contracts Let[a/]	Dollar Value of Contracts	Number of Lettings All Bids Rejected	Number of Lettings Low Bid Rejected	Number of Low Bid Rejections For 50% Requirement
1985[b/]	248	$ 419,180,771	17	7	1
1986	726	981,781,508	39	12	2
1987	601	1,010,450,816	22	11	1
1988	566	958,403,118	28	23	4
1989	585	655,609,481	34	25	0
TOTALS	2,726	$4,025,425,694	140	78	8

a/Includes highway construction, betterment, and maintenance projects.
b/Figures are for the period July 1, 1985, to December 31, 1985.

Source: PA Department of Transportation, Bureau of Design.

B. Sole Source Contracts for Services Appear to Be in Compliance With Commonwealth Requirements

During the 30-month period from July 1987 through December 1989, PennDOT had 4,446 service purchase contracts (SPCs) in effect, with a total value of approximately $57 million. Of these 4,446 service purchase contracts, 19.9% were sole source contracts which accounted for approximately $17.9 million of the total value of all SPCs.[1] To determine whether the Department is in compliance with sole source contracting requirements, LB&FC staff sampled 15% of the 234 sole source SPCs in effect from July 1 through December 31, 1989.[2] The LB&FC staff's review of this sample found nothing to indicate that the Department was not in substantial compliance with Management Directive 215.1 (Contracting for Services Manual) and provisions of the Administrative Code of 1929 pertaining to the use of sole source purchases.

Discussion

Generally, services purchased by Executive Branch agencies must go through an advertised bid procedure. There are, however, exceptions provided in the Contracting for Services Manual (Management Directive M215.1) issued by the Office of the Budget to provide standards, provisions, definitions, guidelines for preparing contracts, and procedures for processing contracts. While contracts are normally awarded on a competitive basis, contracts may be awarded on a sole source (noncompetitive) basis when:

-- Only a single contractor is capable of providing the service.

-- A state or federal statute or regulation exempts the service from the competitive procedure.

-- The total cost of the services is less than $300.

1/Figures based on SPCs by type of competition counted upon completion of central procurement review prior to actual award.

2/The 15% sample consists of four separate samples consisting of the seven contracts with the highest dollar amount, and random samples of seven contracts from engineering districts, seven contracts from county maintenance districts, and 14 contracts from Central Office organizations.

-- It is clearly not feasible to use the competitive proposal procedure.

-- The services are for expert witnesses or attorneys.

Additionally, Section 507 of the Administrative Code of 1929, 71 P.S. §187(c)(1) and (2), allows agencies to purchase repairs or repair parts for its equipment from the manufacturer of such equipment or the manufacturer's authorized dealer and also allows them to contract for utility service furnished by public utility companies, political subdivisions, authorities, and electric cooperative corporations. When a sole source contract is utilized, however, justification for the use of sole source is to be provided in writing.

During the period July 1, 1989, and December 31, 1989, the Department issued 234 sole source contracts for services with a total value of approximately $8.9 million.[3/] The contracts were for various types of services, including expert witnesses, medical examinations, and telecommunications. Based on a sample[2/] of these contracts, it was determined that the Department is in substantial compliance with the sole source requirements for contracts provided in the Contracting for Services Manual. Written sole source justification sheets were attached to the SPCs, in most cases, explaining the use of sole source procurement for the particular contracted service. In the instances where the sole source justification form was not attached to the contract copy kept by the Bureau of Office Services, it was available from the Comptroller's Office as part of its copy of the contract. The justifications provided for the use of sole source fell within the exceptions provided by the Contracting for Services Manual and Section 507 of the Administrative Code of 1929. For example, in several cases expert witness services were required and in one case, the SPC cost was less than $300 as allowed in the Manual.

3/Post-award figures based on Bureau of Office Services printout of approved SPCs by category effective between July 1, 1989, and December 31, 1989.

A-11. NEW CONSULTANT SELECTION PROCESS

A. New Selection Process for Consultant Engineer Services May Yield Both Advantages and Disadvantages

A new consultant selection process (Brooks Act) was recently implemented by the Department to acquire consulting engineer services. A review of the early stages of the new process indicates that it may allow engineering consultants greater opportunities for project design innovation and more timely project completions by reducing the number of design changes during the project. However, early experience suggests the new process may also have the effect of increasing initial proposal prices, extending the length of contract negotiations, and favoring large consulting firms.

Discussion

PennDOT initiated a revised consultant selection procedure in August 1989 for all consultant engineer services. This new procedure was developed in compliance with the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17). This law, requires states to comply with the Brooks Act (40 U.S.C.A. §§541-544), which places new requirements on contracting for engineering and design services for federally-funded projects.

The Brooks Act provides that engineering and architectural service contracts are to be negotiated on the basis of demonstrated qualifications and competence and at fair and reasonable prices. The general procedure in procurement consists of evaluating the qualifications of prospective firms, ranking them based on their qualifications, and negotiating price starting with the top ranked firms. Although compliance with the Brooks Act is only mandated on federally funded projects, the same procedure is also being used by the Department for 100% state-funded projects.

Prior to the Brooks Act, the selection procedure used by the Department consisted of an evaluation of firms based upon a combination of both technical and price proposals. Technical proposals were reviewed by the districts and subsequently by the Consultant Selection Committee and percentages were assigned to indicate the degree of difference between proposals. The price proposals of the firms were then reviewed by the Consultant Selection Committee. Using a combination of the price and percent differential in the technical proposal, a contract was then awarded (e.g., a firm that submitted a price proposal which was five percent higher than the low bid may have been awarded the contract if its technical proposal was more than five percent better than the low bidder's).

Preliminary Effects of New Consultant Selection Process

LB&FC staff reviewed the new selection procedure through interviews with Department officials, the Federal Highway Administration, and large design consulting firms. Contact was limited to large consulting firms, since small firm experience with the new selection process is assessed in Finding A-12, Small Engineering Firms.

In order to assess differences between the old and new selection processes, LB&FC staff utilized the findings of an internal PennDOT review of the new process which compared "old" process contract assignments from January 1989 to July 1989 with "new" process assignments from August 1989 to March 1990.

Sixty-nine project assignments have been made by the Consultant Selection Committee under the new process since its implementation. Of that number, 48 have had negotiated agreements completed through March 1990.[1/] Although the recency of the new selection process precludes any firm comparative conclusions between it and the old process, several preliminary observations can be made. Under the new selection process:

-- Consultant original proposal prices exceeded Department estimates by 28%--a 25.4% increase over the old process rate of 2.6%.[2/]

-- Consultant original proposal prices for the 48 negotiated agreeements exceeded Department estimates by 19%. The executed amount after negotiation, however, is only 5% over the Department estimate. According to the Department, a possible reason for the large variance is that consultants may initially inflate their proposals by over-representing what is required to accomplish the project. A large firm representative, however, attributes the variance to outdated baseline data used by the Department to estimate costs. According to the firm representative, dated figures generated through the bidding process lock the Department into inaccurate estimates.

1/Proposals consist of either design/miscellaneous or construction inspection/management (oversight by consultant during project construction; the number of project hours are designated by the Department). Included within these agreements are open-ended contracts, where the Department's estimate and consultant's proposed prices are identical.

2/Firms compared under the old procedure are those ranked number one in technical quality, not necessarily those receiving the assignment. Open-end contracts are eliminated.

-- Contract negotiations by the Consultant Selection Committee are taking approximately one month longer. Consultants contacted by LB&FC staff attributed the longer negotiations to inexperience with the new process and the wide discrepency between consultant and Department estimates which, in order to resolve, requires additional negotiations.

-- Consultants expressed the opinion that they are afforded greater opportunities for design innovation. Under the new process the Department is offered various options, as well as associated optional costs. Since price is a secondary factor in consultant selection, the focus of preparation of a proposal is not on presenting the "basics" but rather on preparation of a technically superior proposal.

-- Expectations are that the timeliness of project completion will be improved since fewer project supplements will be needed. (Department officials caution that more time is needed before any conclusions can be made.)

-- Large firms may be favored in contract assignments since they have the ability to "showcase" their large resources initially, to be awarded the contract, and then can more easily absorb reductions during negotiations. Small firm reaction and experience with the new selection process is discussed in Finding A-12.A, Small Engineering Firms. Large firms noted that there was no particular bias in the awarding of contracts. They generally cited that the new process recognizes firms which had performed with distinction in the past, since selection is based on both performance and technical proposal.

In the course of conducting this review, several further efforts to review and enhance the new consultant selection process were identified and are briefly noted below:

-- The Federal Highway Administration (FHWA) recently initiated a process review study scheduled for completion in July 1990 to assess the effect of the new consultant selection procedure. The review will involve assessments of four district offices (1-0, 5-0, 8-0, and 9-0) in addition to the Central Office. The Department is expected to respond to the recommendations within one year after the report is released.

-- In order to assist in the development and evaluation of more accurate cost estimates under the new procedure, the Department recently contacted the Consulting Engineer Council of PA to solicit their assistance in developing

an updated estimate guide to reflect the recent changes stemming from the Brooks Act. The guide would detail the approximate number of man-hours necessary for different project phases in large projects. Further, it would assist the Department in evaluating their estimates to determine if they approximate the consultants' estimate. Although no definite time frames had been established for the initiation or completion of the manual, work is tentatively scheduled to begin this summer.

A-12. SMALL ENGINEERING FIRMS

A. Small Engineering Firms Success in Obtaining Design and Inspection Contracts

It has been alleged that small engineering firms are at a disadvantage when competing for construction design and inspection contracts with PennDOT. Recent implementation of the Brooks Act, which requires that contract awards for federally funded highway projects be based on qualifications, not price, has also been cited as a contributing factor. LB&FC staff analyzed consultant selection data on firm size, letters of interest, shortlistings and contract awards--both before and after Brooks Act implementation--in order to evaluate the equitability of PennDOT's consultant selection process.

Based on this analysis it appears that:

-- *Small firms are at a disadvantage in being selected as final candidates (shortlisted) for design projects.*

-- *Once shortlisted, firm size does not appear to be a major factor in selection for either design or inspection projects.*

LB&FC review of this topic indicates that multi-project contract packaging places small firms at a disadvantage, since several discrete projects individually well within the scope of small firm capability are often grouped together. PennDOT announced in May 1990 that it will take steps to enhance the competitive standing of small engineering firms.

Discussion

To support the Commonwealth's policy of promoting the growth of small business, PennDOT encourages its engineering districts to give full consideration to small engineering firms which provide design and construction inspection services. However, it has been alleged that small firms are at a disadvantage in competing for Department design and inspection contracts.

Several reasons have been offered to explain why PennDOT prefers to award contracts to larger engineering firms:

-- The Department often groups small discrete projects into larger package contracts, reportedly to minimize contract administration costs.

-- The Department prefers to deal with familiar individuals. These persons are often associated with larger firms which are experienced with the Department's specifications.

-- Some PennDOT employees prefer dealing with larger firms because they believe that fewer problems will arise during contract execution.

Limited participation of small engineering firms in the consultant selection process has reportedly been exacerbated by amendments to the Brooks Act (40 U.S.C. §§541-544), which made federal procedures governing consultant selection applicable to the states on federally funded highway projects. The Act, which was implemented in Pennsylvania on August 1, 1989, eliminated pricing as a consideration in the initial phases of the consultant selection process, i.e., selection must now be based on qualifications, with pricing negotiated at a later date.

Analytical Technique

Because PennDOT does not have an operative definition of small firms, LB&FC staff used the Small Business Administration (SBA) definition, which sets the upward annual gross receipts limit for small engineering design firms at $2.5 million, and employed an industry standard which sets the average employee's contribution to annual gross receipts at $50,000. Accordingly, this defines a small engineering firm as one which employs 50 or fewer persons. Medium-sized firms were defined as having between 51 and 100 employees, and large firms as having more than one hundred employees.

In the consultant selection process, firms are first required to submit "letters of interest" to the engineering district. Each letter expresses the firm's interest in the project and provides information demonstrating the firm's qualifications. PennDOT's Consultant Selection Committee (CSC) "shortlists" at least three firms which it judges to be most qualified. Final selections are made from the shortlist and depend on the Department negotiating a satisfactory price with a firm in the order of its ranking on the shortlist.

LB&FC staff examined small engineering firm success in the two major phases of the consultant selection process--selection for shortlisting and selection for contract award. Letters of interest, shortlistings and contract awards were analyzed to determine the magnitude of small firm interest, the extent to which small engineering firms become viable candidates through shortlisting, and the degree of small engineering firm success in receiving design and inspection contract awards. It was assumed that if firm size is not a biasing factor, the percentage of selection for each firm size category (small, medium, and large) at each stage of the process should approximate the percentage of firms in competition (by size category) at that stage. Success at the first stage is shortlisting from the competing letters of interest, and at the second stage, project award from competing firms on shortlists. Data from before and

after implementation of the Brooks Act were also compared to analyze the Act's effect on the selection process.

Letter of Interest to Shortlist Phase

Design and inspection projects considered by the CSC during 1988 and 1989 were randomly selected. A 10% sampling was analyzed for the period before implementation of the Brooks Act (January 1, 1988, through July 31, 1989) whereas a 50% sampling was taken for the period after Brooks implementation due to the shortness of this latter period.

Prior to the Brooks Act changes, small firm shortlisting for design contracts, as a percentage of total shortlistings, was considerably lower than small firm letters of interest as a percentage of total letters of interest. Since Brooks, the data suggest that this situation has been further exacerbated--larger firms are obtaining a relatively larger percentage of the shortlistings. Small firm participation in submitting letters of interest also appears to have fallen sharply. These results are consistent with the "discouragement factor" voiced by small firms concerning the Brooks Act.

For inspection projects, the percentage of small firm shortlistings did not change drastically from before to after implementation of the Brooks Act. Although small firm interest has been somewhat lower during the post-Brooks period, the observed drop may be due to small sample size and seasonal influences. Since Brooks, small firms are more frequently being shortlisted.

Shortlist to Contract Award

LB&FC staff examined design and inspection project data covering the five-year period from January 1, 1985, through December 31, 1989. The periods before and after implementation of the Brooks Act were evaluated separately.

For each of the three firm size categories, contract award percentages for design projects in the period before implementation of Brooks were comparable to shortlisting percentages. Since Brooks there has been a decrease in the percentage of small firms awarded design contracts. Since Brooks Act implementation, fewer small firms are participating in the competition for design projects. This could reflect a "discouragement factor" if there is a perception among the small firms that they are at a considerable disadvantage in competing with larger firms.

For inspection projects, the data indicated virtually no relationship between firm size and project inspection awards in either the period before or after the Brooks Act implementation.

It appears that small firm interest and awards for inspection projects may have actually increased somewhat. However, due to the smaller sample size and the fact that seasonal influences may account for some fluctuation, no definite conclusions can be reached.

Contract Size

Contract size appears to be a potential hindrance for small firms in the competitive selection process. While small firms may not be suited to handle some large projects, many PennDOT contract proposals currently group small projects together. Many of these projects were for small bridge designs and roadway betterment projects which, if taken individually or in smaller groupings, may well be within the scope of work able to be accomplished by small firms. LB&FC staff reviewed PennDOT advertisements for design services in the PA Bulletin and identified 40 package contracts which grouped a total of 127 different projects in 1988, and 17 package contracts which grouped a total of 59 projects in 1989. Of these, the average advertisement grouped at least three projects, and groupings of five or more were not uncommon.

In May 1990, PennDOT district engineers were instructed by the Deputy Secretary for Highway Administration to note in PA Bulletin contract advertisements that small firms are encouraged to submit letters of interest for specific smaller projects. District engineers will be expected to make shortlisting recommendations consisting primarily of small firms to the CSC on such projects. The Deputy Secretary also informed LB&FC staff that the districts are being encouraged to do less multi-project contract packaging. PennDOT believes these steps will help to enhance the competitiveness of small engineering firms by correcting some of the inequities in the competitive process.

Recommendation

1. ***PennDOT should monitor the impact of its recent steps to encourage small firm participation in PennDOT projects and to limit the extent of multi-project contract packaging. If these steps are not effective in promoting the competitive standing of small engineering firms, consideration should be given to formalizing these initiatives as written Department policies.***

A-13. COORDINATION WITH LOCAL GOVERNMENTS

A. Surveyed Municipalities Expressed a High Degree of Satisfaction With PennDOT Maintenance Coordination Effort

Discussion

To assess PennDOT's coordination of routine maintenance activities with municipal governments, LB&FC staff sent a questionnaire to 660 municipalities chosen at random. The table below reflects the responses received which indicate a high degree of satisfaction with PennDOT's effort to coordinate maintenance activities with local governments.

PennDOT Coordination of Maintenance Activities With Municipal Governments: LB&FC Questionnaire Results[a/]

Coordination Activity[b/]	Generally Satisfied	Generally Unsatisfied	Not Applicable/ No Response
Road/Bridge Improvements	302 (75%)[c/]	33 (8%)	70 (17%)
Traffic Coordination	303 (75%)	48 (12%)	54 (14%)
Permits	286 (71%)	20 (5%)	99 (24%)
Traffic Signals	236 (58%)	27 (7%)	142 (35%)
Traffic Signs	344 (85%)	35 (8%)	26 (6%)
Highway/Bridge Postings for Weight Limits	268 (66%)	20 (5%)	117 (29%)

a/A total of 660 questionnaires, 60 to each of PennDOT's 11 districts, were sent randomly to municipalities. A response rate of 61% was achieved, representing almost 16% of the 2,572 municipalities in the Commonwealth.
b/See Exhibit D for questions asked of municipalities and general descriptions of coordination activity areas.
c/May not add to 100% due to rounding.

The questionnaire was sent to municipalities statewide (60 randomly selected from each of PennDOT's eleven engineering districts) to ensure a geographic balance and diversity of municipal type. The six maintenance coordination areas (see Exhibit A) represent the major facets of maintenance coordination between PennDOT and the municipalities.

The questionnaire results demonstrate that the level of municipal satisfaction with the Department's maintenance coordination is very high. Overall, PennDOT's general coordination efforts--notification, responsiveness, communication, and performance of assigned responsibilities--was judged by municipalities to be very satisfactory.

Of those responding municipalities, 72%[1/] of all responses were "generally satisfactory" and only 8% of the responses were "generally unsatisfactory" (21% of the responses were either not applicable or had no response). Municipal satisfaction is even higher when "not applicable/no response" answers are omitted. Of all municipality respondents who expressed an opinion, 91% of the responses expressed general satisfaction and only 10% were generally unsatisfied.

The "generally satisfactory" responses ranged from a high of 85% in the traffic signs area to a low of 58% in the area of traffic signals. In the former area, although a number of respondents expressed the opinion that Department sign maintenance and installation was either slow or non-responsive, a greater number commented that the response has been very satisfactory and cooperation excellent. In the area of traffic signals, negative concerns (only 7%) expressed by respondents centered around slow response times and concerns that PennDOT was shifting responsibility to them in the area. However, in commenting on their ratings, the vast majority of respondents expressed very helpful to outstanding cooperation.

The "generally unsatisfied" responses ranged from a high of 12% in traffic coordination to a low of 5% in highway/bridge postings for weight limits and permits. A number of municipalities expressed they have never been notified prior to traffic disruptions or that notification was too late. Only 5% expressed dissatisfaction in highway/bridge postings for weight limits, and the only negative comments focused on sign replacement, maintenance of posted signs, and notification of sign changes. Negative comments regarding permits centered largely on the timeliness of issuance.

1/Percentages do not add to 100% due to rounding.

In addition, favorable comments were frequently expressed in relation to the district municipal services staff. PennDOT municipal service staff provide various advice and assistance to municipalities. A number of municipalities commented that the quality and dedication of these representatives was outstanding.

Special Department Coordination Efforts

In the course of conducting this audit, several PennDOT special efforts to enhance municipal coordination were identified and are briefly noted below:

-- The Rural Technical Assistance Program (RTAP): RTAP is a partnership effort among the Federal Highway Administration (FHWA), PennDOT, and the Pennsylvania State University, available without charge to all municipalities. As a technology transfer program, RTAP is intended to disseminate information to local governments to improve their road and bridge management. This program provides cost-saving and time-saving technology transfer information and other resources through workshops, roadshows (RTAP engineer and mini-van equipped with audiovisual material and publications), technical assistance, newsletters, and publications. Representatives from 1,313 municipalities attended the roadshows in 1989, and there were an additional 115 requests for technical assistance.

-- "Getting to Know PennDOT" Sessions: Held in four districts in 1989 for the first time in conjunction with RTAP in order to meet and acquaint municipal officials with Department personnel and functions. There are tentative plans for approximately three to four such sessions in 1990.

-- Emergency Management Meetings: In 1989 a wide range of meetings were conducted in 10 of the districts[2/] to acquaint municipal officials with emergency management contacts and to discuss municipal problems with hazardous spills. Four regional meetings are scheduled for 1990. These meetings will include local emergency management coordinators, PennDOT, state and local police, and the Department of Environmental Resources, in an attempt to resolve any problem areas involving emergency response.

2/According to a Department spokesperson, District 9-0, Somerset, did not conduct an emergency management meeting.

EXHIBIT D

LB&FC QUESTIONNAIRE QUESTIONS

1. Road/Bridge Improvements: PennDOT is to notify local governments when closings or long-term lane restrictions are required for road and bridge improvements. For emergency closings, county emergency offices are to be notified. PennDOT's coordination with your municipality in this area is:

2. Traffic Coordination: The effect of PennDOT projects on traffic flow in municipalities should be considered. Major traffic disruptions should be minimized by coordinating projects with municipalities. PennDOT's coordination with your municipality in this area is:

3. Permits: Has PennDOT been generally responsive to your requests for coordination involving permits--e.g., oversize/overweight vehicles and driveway accesses on local and state highways?

4. Traffic Signals: Determination of the need to install, revise or remove a traffic signal is to be based on a thorough engineering and traffic study of roadway and traffic conditions. PennDOT's coordination with your municipality in this area is:

5. Traffic Signs: PennDOT and local governments are to carry out their respective responsibilities for signs as provided for in state law and regulation; examples include the installation of speed limit, stop, and parking signs and their associated engineering studies. PennDOT's coordination with your municipality in this area is:

6. Highway/Bridge Postings for Weight Limits: PennDOT is to erect and maintain restriction signs (i.e., vehicle weight limits) at each end of a bridge or portion of highway restricted. Advance posting (warning) is to be provided at the nearest intersection in advance of the actual posting. As part of this requirement, PennDOT should publish an advance notice of the posting in one or more newspapers of general circulation in the county in which the restriction is located. PennDOT's coordination with your municipality in this area is:

Other: Please feel free to comment on any other coordination activities, such as general maintenance and winter service agreements. Are there any other comments you would like to offer regarding how coordination can be improved?

B. PLANNING

B-1. TWELVE-YEAR TRANSPORTATION PROGRAM

A. Project Predictability and Selection Criteria

PennDOT's $18.2 billion Twelve-Year Transportation Program[1/] is a reasonably predictable planning vehicle. The majority of planned projects either have advanced to construction or are moving to construction within a planned twelve-year period.

Despite the general predictability of the Twelve-Year Program, perceptions exist that project selection is affected by parochial interests or partisan concerns. An improved method of "scoring" projects to permit comparison of the relative merits of competing projects would improve the Department's ability to justify projects and would enhance decision-making accountability.

Discussion

The Department of Transportation is required by Act 1970-120 (71 P.S. §511 et seq.) to develop and submit (in even-numbered years) to the State Transportation Commission (STC) a program of transportation projects to be undertaken during the next twelve fiscal years. The Twelve-Year Program is extended every two years after a process of review, revision, and re-prioritization by PennDOT's Center for Program Development and Management ("Program Center"), the Secretary of Transportation, and the STC, which provides primary citizen oversight and authorization of the program.

Project Predictability

The Twelve-Year Program is organized into three four-year segments. According to PennDOT, the first four-year segment represents those top transportation priorities which are virtually assured funds for construction within four years. Projects listed in the second and third four-year segments are expected to reach construction within the next five to twelve years as scheduled. Having been adopted for the Twelve-Year Program, however, these projects are considered meritorious.

Two-year updates of the Twelve-Year Program allow completed projects to be removed, current projects to be advanced, and new projects to be added. Projects proposed for inclusion or advancement on the update are the product of interaction between Metropolitan Planning Organizations (MPOs), local planning agencies,

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1/The estimated cost of all projects, including non-highway modes, is $18.2 billion on the 1988-2000 Twelve-Year Program.

elected officials, and PennDOT. For each update, a final decision is made to advance, hold, move back or drop each project.

The time-phased structure of the program suggests that projects should generally progress from the third segment, through the second and first segments, to construction within 12 years. To examine the predictability of project movement, LB&FC staff reviewed project progress data for three major components of the Department's highway program: non-interstate highway construction, Interstate 4-R (I-4R),[2/] and Bridge Bill I[3/] and II[4/] projects.

Non-Interstate Highway Projects. LB&FC staff analyzed information on the status of all 200 non-interstate highway construction projects on the 1980, 1982, and 1984 program updates (see Table 7). All of these projects were tracked through 1988 to determine whether reasonable progress toward construction was being achieved. Many of the projects experienced a circuitous pattern of movement. Consequently, the percentages below do not total to 100%.

-- 140 projects (70%) were either completed or were moving toward construction at a pace consistent with the program's assumption of moving to construction within twelve years.

-- 118 projects (59.0%) experienced at least one instance of accelerated movement, in contrast to spending the expected four years in each segment.

-- 37 projects (18.5%) were dropped altogether.

-- 75 projects (37.5%) were confined to one segment longer than the expected four years.

-- 14 projects (7.0%) experienced at least one backward movement to an earlier segment.

While 70% of the projects were either completed or moved toward construction at a pace consistent with the twelve-year assumption, many of these projects were initially placed on the

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2/Work of major scope consisting of resurfacing, restoration, rehabilitation, and reconstruction as authorized by the Federal Aid Highway Act of 1976 and the Federal Highway Act of 1981.
3/Highway-Railroad and Highway Bridge Capital Act for 1982-1983 (Act 1982-235) supplemented by Act 1983-38 and amended by Act 1984-161.
4/Act 1986-100, amending Act 1982-235, cited in footnote 3.

first or second segment. However, many of these projects did not then progress to construction or the next segment, and some were moved back to the second or third segment. This suggests that an improved application of project selection criteria might result in projects being initially slotted in more appropriate four-year segments (see discussion of criteria below). This would allow for a more orderly process of study and review, with the anticipated result being an improvement in the consistency of project progression.

Interstate 4R Projects. Since I-4R projects are 90% federally funded, all are placed in the first four-year segment to take advantage of available federal funds. PennDOT provided project status information for all I-4R projects on the 1986 Twelve-Year Program update. Of the 127 interstate projects involved:

-- 83 projects (65%) progressed predictably to construction within the four-year period.

-- 44 projects (35%) did not advance to construction.

-- 25 projects not originally scheduled were added and advanced to construction within the first four years of the 1986 update. PennDOT attributes this relatively high number of "substitute projects" to rapidly deteriorating pavements which required priority attention.

It should be noted that PennDOT has aggressively pursued, and has been successful in obtaining, federal I-4R discretionary funding. Federal fiscal year 1989 discretionary funding was approximately $16.4 million, and an additional $16 million is anticipated for federal fiscal year 1990. PennDOT's success in obtaining these funds has made possible many projects that would otherwise go unfunded.

Bridge Bill I and II Projects. LB&FC staff analyzed information provided by the Program Center on Bridge Bill I and II projects to compare current status to expected progress (see Table 8 for detailed categorizations of status). Most projects included on the 1984 and 1988 updates progressed at a rate equal to or faster than anticipated. Of the 687 Bridge Bill I projects on the 1984 Transportation Program update, 482 (70.2%) were completed on or ahead of schedule, while 199 (29.0%) have not progressed and 6 (0.9%) have been dropped.

Significantly less progress was made for these projects on the 1986 Twelve-Year Transportation Program update. Of the 2,560 programmed projects on the 1986 Twelve-Year Program update, 1,343 (52.5%) either failed to advance on the Twelve-Year Program, moved back, or were dropped. According to PennDOT, a large number of new bridge projects--many of them local--came on line during 1986-88, necessitating an extensive reassessment of priorities.

According to PennDOT, the Twelve-Year Program is a process as well as a plan, and statistics showing how many projects are deferred or do not progress may actually demonstrate that the process is working satisfactorily. The Department holds that the process of attrition demonstrates both flexibility and responsiveness by allowing new projects with demonstrated need to be accommodated. The number of accelerations and delays of non-interstate projects, however, suggests that some of the inconsistencies in project movement may be due to inappropriate initial placement on the first and second four-year segments of the program. This may raise false expectations, and when legitimate setbacks occur because further studies are needed or because of displacement by higher priorities, loss of faith in the process may result.

Selection Criteria

While the above analysis demonstrates that the Twelve-Year Program is a generally predictable plan, perceptions exist that the twelve-year planning process is affected by parochial interests or partisan concerns. To some extent this perception may be the result of inadequate documentation of the criteria used in project selection.

PennDOT's approach has been to set forth broad goals and objectives as policy and to spell out the specific criteria in guidelines provided to district engineers, mass transit and aviation agencies. A list of twenty-three criteria used in this process was provided to LB&FC staff (see Exhibit E). These criteria are associated with economic development, safety, and system preservation needs.

The Department, however, does not score or rank candidate projects with respect to how these criteria are applied. As such, while the Department can justify selected projects on an individual basis, it is unable to show how candidate projects compare to one another.

The need to document project selection criteria is important for several reasons. Without some way to show the relative merits of competing projects, it is difficult to demonstrate the objectivity of the Twelve-Year Program decision-making process.

A second reason for improving the documentation of criteria is that, by law, the ultimate decision-making for project selection rests with the State Transportation Commission, not with PennDOT. The technical complexity and sheer volume of information associated with the process places extensive responsibility with PennDOT staff. As noted above, the selection criteria used by the districts in proposing candidate projects are not documented by the PennDOT planning staff. In approving the projects proposed by the Department, therefore, the STC does so without the benefit of being able to compare projects against standardized criteria.

Finally, PennDOT's own management of the twelve-year planning process could be enhanced through greater standardization of the applied project criteria. Conceivably, this could result in improved rankings of the priority of projects, thus yielding better segment placement of projects on the program and more predictable movement toward construction.

The project selection process is complex and does not lend itself to the simple scoring of projects, since every project is unique in various ways. PennDOT and the STC, therefore, must have some reasonable degree of flexibility in selecting and approving projects. As such it is not reasonable to expect decisions to be based solely on the results of the rigid application of standardized criteria. Still, the use of documented quantifiable and non-quantifiable criteria may improve the decision-making process and should serve to enhance public perceptions of the Department's Twelve-Year Transportation Program.

Recommendation

1. ***The Center for Program Development and Management should maintain both qualitative and quantitative information which enables relevant comparisons of competing projects. This information should be made available in a summary form to the State Transportation Commission.***

EXHIBIT E

Criteria for Project Selection, Twelve-Year Program

Economic Development	Safety	System Preservation	Criteria
X			1. Missing link or system continuity
X			2. Jobs - Economic Development potential
X	X		3. Urban Mobility
X	X		4. Goods movement - Interstate/Intercity Commerce
X	X	X	5. Modal Interface
	X	X	6. Preservation needs - Pavement and Structural Consideration
X	X		7. Existing Traffic and Congestion
	X		8. Reduce Accidents and Save Lives
X			9. Leveraging funds - Partnerships
X	X	X	10. Available Federal Categorical funding
X	X	X	11. Local/Regional/State Consensus (also MPO, STC, Legislative)
X	X	X	12. Return on Investments - Cost Effectiveness
X	X	X	13. Project Need (Environmental Process)
X	X	X	14. Project Development Schedule
X	X	X	15. Environmental feasibility
		X	16. Experimental project
X	X	X	17. Legislative priorities (e.g., Demonstrations)
		X	18. Posted and closed network bridges
	X	X	19. Emergency
X			20. Tourism potential
	X		21. Air Quality
	X	X	22. National Defense
		X	23. Historic Preservation

Source: PA Department of Transportation, Center for Program Development and Management.

TABLE 7

Predictability of Projects on Twelve-Year Program
(Non-Interstate Construction)

	Frequency	Percentage of Total
1. Progress as Planned ..... (4 years in each segment)	24	12.0%
2. Projects Dropped From Twelve-Year Program		
From 3rd Segment	15	
From 2nd Segment	12	
From 1st Segment	10	
	37	18.5%
3. Accelerated Movement		
Directly to 2nd	34	
Directly to 1st	74	
3rd to 1st	9	
2nd to Construction	1	
	118	59.0%
4. Backward Movement		
1st to 2nd	11	
1st to 3rd	0	
2nd to 3rd	3	
	14	7.0%
5. Frozen Longer Than 4 Years in One Segment		
1st Segment	44	
2nd Segment	22	
3rd Segment	9	
	75	37.5%
6. No Net Loss (Can be completed within 12 years)	140	70.0%

Total of 200 projects listed. Any one project may have fallen into one or more of the above categories.

TABLE 8

Current Status of
Bridge Bill I and II Projects on the Twelve-Year Program

	Progress as Planned	Accelerated Movement	Backward Movement	Frozen in One Segment (+ 4 Yrs.)	Dropped	Total[a/]
1984 TYP						
BB I	482 70.2%	-	-	199 29.0%	6 .9%	687 100.0%
BB II	159 91.4%	1 .6%	-	14 8.1%	-	174 100.0%
1986 TYP						
BB I	200 56.0%	-	-	157 44.0%	-	357 100.0%
BB II	932 42.3%	85 3.9%	137 6.2%	556 25.2%	493 22.4%	2,203 100.0%
1988 TYP						
BB I	178 87.3%	26 12.8%	-	-	-	204 100.0%
BB II	1,555 94.7%	87 5.3%	-	-	-	1,642 100.0%

a/May not add due to rounding.

B-2. INTERMODAL PLANNING

A. Need for Commonwealth Intermodal Transportation Plan

State and federal statutes require that the Department adopt intermodal policies and develop plans and programs for coordinating transportation systems. Although PennDOT has addressed non-highway modes of transportation in Departmental goals and objectives, its project planning and development is generally single-modal, reflecting the separate funding programs (typically, federal categorical grants) for the specific modes. In particular, PennDOT's Twelve-Year Transportation Program reflects a compartmentalized planning approach, containing transit, rail, and aviation projects that represent the predicted availability of funds for each category rather than the product of a statewide intermodal strategy.

A Governor's Economic Development Partnership report characterized the need for a statewide multimodal transportation plan as vital to the long-term economic growth of the Commonwealth. PennDOT is currently piloting Transportation Management Associations and Modal Integration Committees as integrated approaches to solving transportation problems. The Department is also enlisting the assistance of Metropolitan Planning Organizations to integrate mass transit and automobile travel. Finally, as an important start toward improved intermodal planning, last fall the Secretary of Transportation convened a workshop on modal issues for the State Transportation Commission.

Discussion

Act 1970-120, as amended, 71 P.S. §511 et seq., assigns PennDOT powers and duties for all modes of transportation, both as separate programs and as integrated systems. Specifically, Act 120 identifies the need for PennDOT "to develop intermodal transportation policies and programs . . . with full and appropriate consideration of the needs of the public, users, carriers, industry and labor." PennDOT is to coordinate planning and development and has "overall responsibility for balanced transportation policy, research, planning and development."

Intermodal Initiatives

PennDOT is pursuing a number of intermodal initiatives. These efforts include a reliance on regional processes and the promotion of cooperative endeavors.

State Transportation Commission Modal Workshop - As a start toward improving intermodal planning, PennDOT conducted a modal workshop for the State Transportation Commission in November 1989. The agenda included background reports and issue identification for the transit, aviation, rail freight, and ports and waterways programs.

Modal Integration Committees - PennDOT has identified the three regions with the worst air quality conditions in the state--Philadelphia, Pittsburgh, Allentown/Bethlehem--as locations for modal integration committees. The regional committee meetings bring together planners, transit providers, and PennDOT representatives to expedite projects that integrate mass transit and automobile travel to reduce congestion and improve air quality.

Traffic Management - A Greater Valley Forge pilot Transportation Management Association (TMA), incorporated in January 1990, provides the framework for a cooperative attempt to offer transportation options--parking management, car and van pooling programs, transit and paratransit services, and alternative work hours. PennDOT is pursuing other intermodal congestion management initiatives through pilot projects in the Philadelphia and Harrisburg areas.

Intermodal Freight Movement - The Rail Freight Advisory Committee is studying the potential impact that proposed rail line improvements could have on the competitive position of the Port of Philadelphia and other distribution centers.

Metropolitan Planning Organization Cooperation - Pennsylvania already has in place the potential components of a cooperative planning process to address intermodal needs. The MPOs and the transit agencies do the mobility planning that determines the need for the public transportation projects in the Twelve-Year Transportation Program (TYP).

PennDOT Intermodal Approach

Despite these efforts, the Department's planning process has generally resulted in a separate-modes approach to meeting transportation needs. PennDOT divides the TYP, the Commonwealth's primary transportation planning document, into separate sections for highway programs and non-highway programs. The non-highway section has separate modal divisions with programs for airport development, rail preservation, and transit assistance.

The PennDOT Master Policy Manual defines a priority programming process separated along organizational unit lines for highways, public transportation, airports, and rail freight. The non-highway programs fall into a priority area described as "the completion of other highway and non-highway projects critical to community conservation and commerce in the Commonwealth." The policy does not include procedures for considering intermodal linkages or alternatives.

Single-modal planning typifies the approach that most states have taken, as described in a U.S. General Accounting Office (GAO) report. The December 1989 report defined intermodal planning as the "serious examination of trade-offs and interactions

between competing and complementary transportation modes, such as highway and mass transit." The GAO stated that "present funding mechanisms and organizational structures, however, are geared to individual transportation modes."

The categorical nature of federal funding has generally led state transportation departments toward single-modal planning processes. Federal capital funding has inflexible requirements and program implementation has a single-mode orientation, as described in the GAO report. These characteristics will likely change over time to reflect the recently-announced national transportation policy. Recognizing the need to focus on programs to move people and goods instead of accommodating vehicles, the new national policy calls for replacing categorical grants and rigid standards with more flexible funding and performance criteria.

The current roles of the State Transportation Commission (STC) and the State Transportation Advisory Committee (TAC) lend themselves to assessing specific projects or studying issues as they arise rather than developing a comprehensive planning process. The STC heard public testimony on the 1988-2000 TYP at nine public hearings. Only 31 of over 300 people at the public hearings commented on non-highway projects. The TAC uses a task-force approach to study various transportation financing and management issues but has not addressed multi-modal issues from a statewide policy perspective.

The lack of a statewide multimodal transportation plan creates an impediment to long-term economic growth in the state, according to the Pennsylvania Economic Development Partnership (EDP). A 1988 EDP report recommended the establishment of an authority to develop and implement a statewide intermodal plan as a preliminary step to creating a Philadelphia regional port authority.[1/]

Other States

Other states are working toward modal integration in their planning processes. Florida utilizes a Strategic Transportation Plan to identify strategies and facilities needed. The concept involves having modal system plans drive the development of projects instead of having discrete projects form the system

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1/The Philadelphia Regional Port Authority was established by Act 1989-50. Its general purposes and powers, among others, are to acquire, hold, develop, construct, improve, operate, and own port facilities and port-related projects within the port district.

plans. Each modal system plan includes an analysis of institutional, physical, operational, and financial linkages with other transportation modes.

The State of Washington recently developed an ongoing policy planning process with a "comprehensive and balanced statewide transportation plan" as its goal. Formal testimony, written statements, and a public opinion survey provided input for the policy plan that the Washington State Transportation Commission adopted in January 1990. The resulting implementation plan emphasized a cooperative effort by the Washington State Legislature, the Department of Transportation, other state agencies, Metropolitan Planning Organizations (MPOs), local governments, industry, and transportation providers.

Recommendation

1. ***PennDOT should develop a statewide intermodal plan and planning process. As an integrated plan, it should be used to guide program decision-making for the individual modes. For example, the planning process for highway projects should meaningfully examine non-highway alternatives and intermodal linkages. PennDOT should involve the State Transportation Commission, the Transportation Advisory Committee, and the Metropolitan Planning Organizations, among others, in the development of the statewide intermodal plan.***

C. SAFETY ADMINISTRATION

C-1. MOTOR CARRIER SAFETY ASSISTANCE PROGRAM

A. PennDOT Implementation of LB&FC MCSAP Recommendations

In January 1986, the LB&FC reported on PennDOT's administration of the Motor Carrier Safety Assistance Program (MCSAP). Follow-up studies which addressed MCSAP program monitoring were released in June and September 1987. Of the 24 MCSAP recommendations contained in these reports, 23 have been fully or partially implemented by the Department. The Department disagreed with one recommendation, which was to hire full-time "dedicated" MCSAP inspectors. The Department indicated that the current arrangement between the three agencies (PennDOT, the Public Utility Commission, and the Pennsylvania State Police) provides a large pool of trained personnel with which to cover the state's highways. For a detailed discussion of each recommendation see the October 1989 Interim Report to this audit (Volume II, pp. 100-113).

Discussion

The federal Motor Carrier Safety Assistance Program (MCSAP) was implemented in Pennsylvania on August 18, 1985, through Act 1985-20. The purpose of MCSAP is to reduce the number and severity of accidents involving commercial motor vehicles through an increased level of inspection/enforcement activity by the Pennsylvania State Police, the Public Utility Commission, and PennDOT. In 1985 the Governor designated PennDOT as the lead agency, charging it with administering and coordinating all MCSAP activities, in addition to administering the enforcement plan.

The Secretary of Transportation provided an update on 12 recommendations which had not been fully implemented by PennDOT when the LB&FC released its interim report (October 1989). The other recommendations not addressed in the Secretary's letter had been implemented except for one recommendation, which was to hire full-time "dedicated" MCSAP inspectors. The status of the 12 recommendations, as provided by the Secretary and independently verified by LB&FC staff, are as follows:

1. PennDOT should continue development of planned semi-permanent weigh stations, consider developing permanent MCSAP inspection sites and develop written criteria for MCSAP inspection site selection (October 1989, pp. 100-101).

The Secretary reported that a pilot semi-permanent weigh station[1/] and safety inspection site is being developed in

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1/Semi-permanent weigh stations have no building to house weigh scales. Rather, scale facilities consist of weight sensors placed in the pavement and command centers brought to the site.

Westmoreland County on US Route 22. This site is scheduled to be constructed and in operation by FY 1990-91. There currently are 20 semi-permanent weigh stations operating in the state and one permanent weigh station[2/] located in Clarion County. The Department plans to build an additional 14 semi-permanent weigh stations by the end of 1992.

Other than the pilot site in Westmoreland County, no permanent MCSAP inspection sites are currently under development. According to a Department official, no formal plan has been developed to identify the number of additional permanent sites that need to be constructed. However, MCSAP Central Office staff are working with district and county maintenance personnel to identify potential permanent site locations.

PennDOT identified the lack of MCSAP inspection sites on non-interstate highways as a problem in a report sent to the federal government in August 1989. The Department made a commitment in the report to "critically evaluate the potential for establishing additional low cost roadside inspection sites along selected non-interstate routes."

2. Amend the Vehicle Code to make motor carrier vehicles of 10,000 pounds or over subject to MCSAP inspections (October 1989, pp. 101-102).

The Motor Carrier Advisory Committee (MCAC) formed a subcommittee to investigate the best way to implement changes to the inspection weight thresholds. The Committee recommended that current regulations be revised rather than pursuing changes to the Vehicle Code. The regulatory approach was seen as a faster method of achieving compliance with this recommendation. The Department is currently in the process of developing changes to the regulations. The Department staff, however, were not able to estimate when the new regulations might go into effect.

3. Address appropriate equipment procedures and other safety measures in a MCSAP procedures manual (October 1989, p. 102).

The Department's MCSAP procedures manual now addresses equipment and safety procedures. The Department in March 1990 revised the manual to more clearly define appropriate safety measures. LB&FC staff reviewed these changes and noted that inspection site operations and the inspection process itself were addressed. Specifically, direction was given to inspectors in the areas of site selection, physical altercations, cargo leaks and undercarriage inspections.

2/Permanent weigh stations have a building that houses weight scales and provides telephones and comfort facilities.

4. Implement procedures to provide inspection equipment to enhance enforcement personnel safety (October 1989, pp. 103-104).

A policy memorandum on the procurement and issuance of inspector safety equipment was to be developed in March 1990. However, the memorandum had not been adopted as of May 1990. A draft memorandum was provided to LB&FC staff. It included the responsibilities of PennDOT as lead agency for the MCSAP program. It also included the responsibilities of the other MCSAP participating agencies (the Pennsylvania State Police and the Public Utility Commission). Guidelines were also provided in the area of equipment allowances. PennDOT anticipates that the final adoption of this policy memorandum will occur before July 1, 1990.

5. Establish a Motor Carrier Advisory Committee to promote uniformity, safety and efficiency within the commercial vehicle industry (October 1989, p. 105).

The Motor Carrier Advisory Committee, established in 1988, met for the third time in January 1990. Reports have been developed which address safety, commercial driver licensing, roadway access and taxation issues related to the trucking industry. The report recommendations were forwarded to the Governor on February 26, 1990. PennDOT has begun to implement several recommendations and has forwarded the remaining recommendations to the Pennsylvania State Police and the Department of Revenue for their consideration and possible adoption.

6. Establish an organized informational campaign regarding safe driving practices (October 1989, p. 105).

According to a Department official, a consultant was retained to develop a commercial vehicle campaign to promote truck safety. The study is expected to be completed by July 1991. Recommendations are expected to address educational and program efforts which would provide for safer truck operations.

In a related area, the Federal Commercial Motor Vehicle Safety Act of 1986, which the Department must implement by April 1, 1992, will require all commercial drivers to pass a written and a driving exam before being allowed to drive trucks or buses in Pennsylvania. The Act is designed "to improve driver quality by insuring that commercial drivers are properly trained and physically qualified to operate the vehicles they drive, to identify and remove problem drivers, and to establish a national information system to prevent commercial drivers from having more than one driver's license."

7. Develop MCSAP performance objectives and a system to measure their attainment. It was also suggested that PennDOT report annually to the House and Senate Transportation Committees on the attainment of these objectives (October 1989, pp. 106-107).

A report on the status of the Department's implementation of the Comprehensive Truck Safety Plan was forwarded to the General Assembly in January 1990. The status report addressed the latest actions taken by the Department in the areas of highways, education, regulatory and legal changes, enforcement, hazardous materials and commercial driver licensing.

8. Develop inspection production standards for each of the three MCSAP agencies and systematically compare the number of inspections performed to the established production standards (October 1989, p. 107).

The Department has distributed a series of reports to each MCSAP participating agency. These reports provide information on MCSAP inspectors' production levels and selected information on the types of violations and inspections being done. Each MCSAP agency (PennDOT, the Public Utility Commission, and the Pennsylvania State Police) was to review these reports and provide PennDOT with a written response on how to improve the MCSAP inspectors' performance standards. The initial response was to be provided by March 15, 1990. PennDOT was not satisfied with the responses, thus, additional information was requested. For those inspectors performing below average, the participating MCSAP agencies will be expected to develop strategies to improve their performance.

9. Enforce the 15-day time period as required by Act 1985-20 for the reporting of correction of violations identified as a result of MCSAP inspections (October 1989, p. 108).

In December 1989, PennDOT instituted a procedure to monitor carrier compliance with the 15-day rule. This procedure involves the mailing of a "tickle" letter to those carriers who fail to respond to inspection report violations within the 15-day time limit. PennDOT is currently in the process of initiating procedures that would be followed if a motor carrier failed to contact the Department. This follow-up monitoring will be included in procedures the Department is developing to identify unsafe motor carriers.

Non-compliance with the 15-day repair certification requirement is one of six factors which the Department is using to evaluate a motor carrier's safety record. If a motor carrier's safety record is below average, that motor carrier's trucks would receive additional inspections to identify truck safety deficiencies. The procedures have not been finalized and the Department is unsure when the procedures will take effect.

10. Develop and implement the Commercial Vehicle Safety Alliance (CVSA) inspection decal program to maximize MCSAP enforcement personnel resources (October 1989, pp. 108-109).

In January 1990, PennDOT implemented the CVSA decal program.[3/] All MCSAP inspectors have been instructed on the appropriate procedures for issuance of CVSA decals. In the first quarter of 1990, a total of 2,425 stickers were issued to the inspectors of the three MCSAP participating agencies. Only 76 (3.1%) of the decals were distributed. According to a Department official, decal distribution is expected to rise. In the second quarter of 1990, 4,850 decals have been issued to MCSAP inspectors. A CVSA decal on a truck "indicates to" the inspector that the truck has recently passed an inspection.

11. Provide uniform MCSAP inspector reviews for all participating MCSAP agencies. A continuous and uniform procedure for MCSAP inspection reviews would be beneficial, efficient, and effective (October 1989, p. 109).

Data systems have been developed to provide a series of reports on inspector performance. The reports include statistics that measure inspectors' adherence to critical inspection procedures, such as the total number of trucks placed out-of-service because of faulty brakes or because the driver exceeded the maximum number of operating hours. If a MCSAP inspector's performance is below average, the inspector is evaluated for potential procedure or knowledge deficiencies. The Pennsylvania State Police and the Public Utility Commission are to provide written reports to PennDOT explaining how these performance deficiencies are to be corrected (see item 8).

A series of quality assurance checklists was developed for use in this effort. These checklists measure each inspector's performance of and familiarity with safety practices, driver documentation, vehicle components, hazardous materials, and follow-up activities. The participating MCSAP agencies will use this checklist to track the performance of individual inspectors.

12. Define and solidify the role, responsibility, and authority of PennDOT as the MCSAP lead agency (October 1989, pp. 112-113).

3/The goals of CVSA are "[to] bring about an overall improvement in commercial vehicle and hazardous materials transportation safety; to avoid duplication of inspection efforts by the various jurisdictions; to minimize delays for the operating industry; to increase the number of on-highway inspections; and to improve the safety of equipment being operated on our highways."

The Department has entered into interagency agreements with the participating MCSAP agencies (the Pennsylvania State Police and the Public Utility Commission). The Department is in the process of developing program policy memorandums which will detail the specific procedures and responsibilities for most program activities. According to PennDOT, these policy memorandums will address, among other items, safety, complaints, training, interagency coordination, and quality assurance.

C-2. TRANSPORTATION OF HAZARDOUS MATERIALS

A. PennDOT Has Partially Implemented Its Five-Year Plan to Promote Safe Transportation of Hazardous Materials

In June 1988 PennDOT released a five-year plan identifying needed improvements in its oversight of trucks transporting hazardous materials. Despite having made progress in implementing portions of this plan, the number of truck accidents involving hazardous materials increased by 65% from 1987 to 1989.[1] The Department plans to take steps to determine the cause of this increase but has not yet established a timetable for completing this analysis.

Discussion

PennDOT is designated by law to administer the hazardous materials transportation program in Pennsylvania.[2] The Department has promulgated regulations found at 67 Pa. Code Chapter 403. These regulations, along with federal regulations,[3] set forth the requirements that hazardous materials motor carriers must meet to operate in Pennsylvania. The regulations allow for the issuance of special permits to carry certain materials in non-specified containers, require carriers of marked or placarded loads to annually register with PennDOT, and require the reporting of accidents and/or hazardous materials releases to the Department within 30 days.

LB&FC staff found that PennDOT appears to be substantially in compliance with its statutory and regulatory responsibilities under the Hazardous Materials Transportation Act, 75 Pa.C.S. §8301 et seq. To measure such compliance, LB&FC staff examined

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1/The LB&FC staff review pointed to data collection problems that, when corrected by the Department, could increase the number of reported hazmat truck accidents (although not substantially). The Department is taking steps to resolve this accident reporting problem.

2/Other state agencies (PA Emergency Management Agency, Department of Environmental Resources, Public Utility Commission, Department of Agriculture, PA Turnpike Commission, and Department of Labor and Industry) have responsibilities in the area of hazardous materials transportation. For a listing of these responsibilities, please see the LB&FC Interim Report, Volume I, pp. 84 and 85, that was released in October 1989.

3/Federal Hazardous Materials Regulations, 49 C.F.R. Parts 171 to 178, and the Motor Carrier Safety Regulations, 49 C.F.R. Parts 390 to 397.

policies and procedures established to administer the hazmat program, interviewed Department officials responsible for implementing such policies, and reviewed statistical reports on the number and types of hazmat inspections conducted.

The Department also regulates hazmat truck transportation through the Motor Carrier Safety Assistance Program (MCSAP) inspection process (see Finding C-1.A of this report). This includes a limited number of inspections of motor carrier terminals by MCSAP and Federal Highway Administration personnel.

Hazardous Materials Initiatives

The Department's June 1988 Highway Hazardous Materials Transportation in Pennsylvania Five Year Plan identified 14 hazmat transportation concerns, including:

-- Hazardous transporter accidents occur nearly once every day in the Commonwealth.

-- Local emergency response capabilities are not known.

-- There is confusion at some hazmat accident/release locations regarding who should be responsible for hazmat cleanup.

-- Nearly 60% of all hazmat transporter accidents occur in 15 high-population counties.

-- The terminals of hazmat transporting companies in northeastern Pennsylvania are inspected about once every three years. In other areas of the state, there are no such inspections.

-- Detailed data on highway transportation of hazardous materials is insufficient.

The Department's 1988 five-year hazmat plan included 26 initiatives to address these concerns. PennDOT was identified as the lead agency for 21 of these initiatives, while the Pennsylvania State Police and the Pennsylvania Emergency Management Agency were assigned lead responsibility for the others.

One PennDOT initiative was to investigate all hazmat cargo accidents. This initiative, however, has not been implemented. Before such investigations can occur, the Department must first design an inspection process that provides reliability as to the exact cause of the accident (e.g., did the accident cause the valve to open and thereby release hazardous material or was it open prior to the accident?). Development of this inspection process was requested by those MCSAP participating agencies (PennDOT, the Pennsylvania State Police, and the Public Utility Commission) which would be responsible for assigning personnel to conduct such investigations. It is believed that, at present,

the personnel of these agencies do not possess the necessary expertise regarding hazmat release causal factors. In addition to the need to train inspection staff, the Department also indicates that it must develop safety and administrative procedures before hazmat investigations can begin. No time frame, however, could be provided by Department officials as to when such an inspection process would be adopted.

Another PennDOT initiative focused on developing inspector retraining schedules. Regular retraining helps ensure that inspectors are kept up-to-date on all regulatory and program requirements established by PennDOT Central Office staff. LB&FC staff, through interviews with Department staff and a review of training materials, determined that each MCSAP participating agency (PennDOT, the Public Utility Commission, and the Pennsylvania State Police) had begun such retraining.

LB&FC staff determined that seven of the 21 initiatives on the five-year plan were completed as planned (see Exhibit F). The remaining 14 initiatives were either not implemented, are awaiting the outcome of a special research project the Department awarded in February 1990, or are not scheduled to be completed until a later date.

Hazardous Material Accidents Initiative

Four of the initiatives contained in the five-year plan focus on identifying known causes behind hazmat accidents. These initiatives and their current status are as follows:

-- Increase the number of driver inspections.[4/] Inspectors involved in the MCSAP program have been directed to increase the number of driver inspections. Approval had to be first obtained from the Federal Highway Administration for such inspections to be increased.

-- Develop a training program which is available to professional organizations and private companies about the proper way to store, handle and ship hazardous materials. Instructional material has been developed and is being provided to motor carrier companies by the Department. Such material will continue to be provided to all qualified organizations or companies that request it.

-- Review hazmat accident location by county and reassign inspectors so that the 15 counties with the most accidents receive more inspections. This initiative has not yet been implemented.

4/The Federal Highway Administration, in a report released in October 1986, reported that "driver failure" is the cause of 94.5% of preventable accidents.

-- Increase the number of information contacts with motor carriers and drivers. Such contacts have begun and the Department plans to continue them on a regular basis.

Despite progress having been made on many of the initiatives on the five-year plan, the number of heavy/medium truck accidents[5/] involving hazardous materials increased from 256 in 1987 to 423 in 1989. This represents an increase of 65%. During the same period, the number of accidents involving medium/heavy trucks decreased from 10,188 to 8,760, a decrease of 14%. According to the Manager of the Motor Carrier Safety Division, statistics relating to traffic accidents involving hazardous materials trucks are being reviewed. Upon completion of this review and analysis, additional initiatives, if warranted, are to be developed to address this problem. The Department has not set a specific time frame for the completion of this analysis.

Hazardous Materials Trucks Bypassing Turnpike Tunnels

Trucks transporting most hazardous materials on the Pennsylvania Turnpike are not permitted to use turnpike tunnels. LB&FC staff reviewed PennDOT's program for inspecting these trucks, which are detoured around turnpike tunnels. Safety inspections on the turnpike are normally carried out by the State Police. Once a truck exits the turnpike, the inspections can be carried out by PUC, PennDOT, or State Police inspectors. From meetings with PennDOT officials, it was determined that there is no targeted enforcement for hazardous materials trucks which exit off the turnpike to detour the tunnels.

According to the Director of the Center for Highway Safety, the only complaints PennDOT has received concerning hazmat trucks exiting the turnpike to avoid tunnels concerned the Allegheny Tunnel in Somerset County. This official believes complaints have been generated in the Somerset area because it is the only tunnel which is located near a substantial urban center. Since 1984 there have been 19 accidents involving hazardous materials in Somerset County. Three of these accidents occurred on the turnpike, while two others occurred on U.S. Route 30, the state route used by trucks exiting off the turnpike to bypass the Allegheny Tunnel.

LB&FC staff attempted to determine the actual number of hazmat trucks exiting off the turnpike in Somerset County to avoid the Allegheny Turnpike Tunnel. The Turnpike Commission

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5/A hazardous materials event is considered an accident when a person is killed or injured to the extent that hospitalization is required or if total damages to property exceed $4,400.

reported that 249,253 trucks exited off the Somerset Exit (Exit #10) in 1989. Assuming the federal estimate that 5 to 15% of all truck traffic is transporting hazardous materials, then up to 37,000 of these trucks were transporting hazardous materials.

Despite the high volume of trucks carrying hazardous materials which are detoured around the Allegheny turnpike tunnel, the Motor Carrier Enforcement Team assigned inspection responsibilities in Somerset County has been directed to spend 85-95% of its inspection time in Westmoreland County.[6/]

Moreover, according to criteria developed by PennDOT for its MCSAP and truck weight inspection teams, each inspection team is to spend 10-20% (2 to 4 days a month) of its time performing truck safety inspections. The remaining 80-90% (16 to 18 days) of its time is spent performing truck weight enforcement activities. Thus, a low priority appears to have been given to the inspection of trucks carrying hazardous materials in Somerset County.

PennDOT has recently initiated efforts to work jointly with the PA Turnpike Commission to locate MCSAP and truck weight inspectors at turnpike plazas in order to identify trucks for possible safety and weight violations, and to generally improve communications in the area of truck weight and safety enforcement. These efforts are explained in greater detail in Exhibit G.

Recommendations

1. ***PennDOT should establish a specific time frame for completing its analysis of the increase in hazardous materials truck accidents since 1987 and the identification of any needed initiatives stemming from this review.***

2. ***PennDOT should provide a status report (and periodic updates) on its five-year hazmat plan initiatives to the House and Senate Transportation Committees.***

3. ***Until arrangements are made with the Turnpike Commission for inspections near turnpike plaza areas, PennDOT should consider the need for additional safety inspections on state routes in proximity to turnpike exits used to detour tunnels, especially in populous areas such as in the vicinity of the Somerset Turnpike Exit.***

6/PennDOT Motor Carrier Enforcement Teams consist of two PennDOT employees and one Pennsylvania State Police trooper. There currently are twenty-six motor carrier enforcement regions statewide. An additional two teams inspect trucks only at semi-permanent inspection sites on interstate highways and one other team inspects trucks from a permanent inspection site located in Clarion County.

EXHIBIT F

Initiatives Identified in June 1988 by PennDOT to
Improve the Safe Highway Transportation of Hazardous Materials

Initiatives and Implementation Cost[a/]	Action Taken		No Action	Comments
	Completed	In Process	Taken/Planned	
A. Essential Hazmat Data Collection				
1. Investigate all accidents involving hazmat cargo and hazmat spills to determine causes. ($100,000)			X	Planned implementation was 1989. Not implemented because an inspection program has not been devised which sets up a logistical approach to identify causes behind hazmat accidents. Investigation of "selected" accidents is now to be implemented by 1991.
2. Collect detailed information on hazmat spills and releases. ($50,000)			X	Not implemented for the reasons noted above.
3. Investigate existing sources of hazmat traffic flow data. Determine how such data systems can be standardized. (No cost)		X		A research project was awarded in 1988 to the Virginia Technical Institute in order for a review of all sources of hazmat data to be conducted. Review will be finished in September 1990.

a/A "No Cost" notation indicates that this activity can be conducted within PennDOT's present administrative structure. Only the 21 initiatives for which PennDOT was the lead agency in terms of implementation were reviewed.

EXHIBIT F

Initiatives Identified in June 1988 by PennDOT to Improve the Safe Highway Transportation of Hazardous Materials
(Continued)

Initiatives and Implementation Cost[a/]	Action Taken: Completed	Action Taken: In Process	No Action Taken/Planned	Comments
B. Focus on Known Causes of Hazmat Accident				
4. Increase hazmat driver inspections. (No cost)	X			Completed. Inspectors have begun conducting driver inspections statewide.
5. Develop a training program on the predominant reasons for hazmat accidents for professional organizations and private companies. (No cost)	X			Instructional materials are being sent to companies concerning identified hazmat violations and how training may help reduce these violations.
6. Review hazmat accident location by county and reassign MCSAP inspectors to concentrate on 15 highest counties. (No cost)			X	Not implemented as planned.
7. Increase number of information contacts with motor carriers and drivers. (No cost)	X			Such informational contacts will continue on an ongoing basis.
C. Strengthen Current Hazmat Program				
8. Develop MCSAP inspector retraining schedule and proficiency testing time frame and goals. ($10,000)	X			Inspectors will continue to receive refresher training on an ongoing basis.
9. Bring state hazmat regulations up to date and adopt before November 1988 sunset date. (No cost)	X			

EXHIBIT F

Initiatives Identified in June 1988 by PennDOT to
Improve the Safe Highway Transportation of Hazardous Materials
(Continued)

Initiatives and Implementation Cost[a/]	Action Taken: Completed	Action Taken: In Process	No Action Taken/Planned	Comments
10. Evaluate inspections of hazmat and CVSA[b/] decal pilot groups to determine if the programs should be continued. (No cost)	X			The pilot group will not be expanded. The CVSA program has been implemented statewide.
11. Expand terminal inspection effort to cover the entire state so each intrastate carrier is inspected at least once every three years. ($20,000)		X		PennDOT has not implemented because training to conduct such inspections must first be provided by the Federal Highway Adminstration. Such training will be provided in 1990.
12. Terminal inspection procedures should be revised so that follow-up inspections occur within 30 days. Any violations not corrected will result in issuance of citations. (No cost)		X		PennDOT is reevaluating this initiative to determine if it can be realistically achieved given MCSAP inspector staff constraints.
13. Increase the percent of hazmat inspections to at least 10% of total inspections. (No cost)		X		For FY 1988-89, hazmat inspections represented only 6.7% of total inspections.
14. Develop an information system to collect data on hazmat violations and fine amounts. (Not known)			X	Such a system has not been developed yet. However, PennDOT is still planning to implement.

b/The Commercial Vehicle Safety Alliance (CVSA) is an interstate alliance of motor carrier companies and state governments, which have adopted a uniform safety inspection decal. The decal allows state enforcement personnel to identify those commercial vehicles which have been recently inspected.

EXHIBIT F

Initiatives Identified in June 1988 by PennDOT to Improve the Safe Highway Transportation of Hazardous Materials
(Continued)

Initiatives and Implementation Cost[a/]	Action Taken: Completed	Action Taken: In Process	No Action Taken/Planned	Comments
15. Bring SAFETYNET[c/] system to full operation to track repeat offenders. (No cost)		X		A system to track hazmat offenders is being developed, but will be independent of SAFETYNET.
16. Develop information packet to distribute to all magistrates reviewing various hazmat violations and their severity. ($5,000)	X			PennDOT's Chief Counsel developed the packet.
17. Discuss with President Judges the possibility of designating one or two magistrates per county to handle all hazmat cases because of the complexity of the regulations and to develop judicial expertise. (No cost)			X	This initiative was not advanced by the Department as it was not seen as practical to only train one or two magistrates.
D. Strategic Actions to Improve Hazmat Program				
18. Develop strategy to identify high risk sites, conduct risk assessments, and prioritize mitigation measures. ($250,000)		X		A research project to identify high risk areas has been initiated. Will be finished in September 1990.
19. Prioritize mitigation measures and add to budget and appropriate work schedule. (Not known)		X		After the research project is released (see #3 and #18), this initiative will be addressed.

c/SAFETYNET is an automated method for the states to transmit motor carrier data to the Federal Highway Administration.

EXHIBIT F

Initiatives Identified in June 1988 by PennDOT to Improve the Safe Highway Transportation of Hazardous Materials (Continued)

Initiatives and Implementation Cost[a/]	Action Taken: Completed	Action Taken: In Process	No Action Taken/Planned	Comments
20. Conduct an analysis to determine if arterial roads used to reroute trucks around the Turnpike and the Pittsburgh area tunnels are adequate. (No cost)		X		Will be completed after research project is finished (see #3 and #18).
21. Coordinate MCSAP enforcement with Department of Environmental Resources (DER) hazardous and and infectious waste program and provide cross-training and information sharing. (No cost)			X	Due to different emphasis in PennDOT's and DER's programs, cross training would not improve programs.
22. Distribute information letter to hazmat transporters reviewing the most common violations. Use to obtain support in improving safe transport.[d/] (No cost)	X			Will continue on an ongoing basis.
23. Develop brochures to distribute to small businesses on the requirements for complying with the hazmat regulations.[d/] (No cost)		X		Will be completed in 1990.

d/Initiatives #22 and #23 were not included in the original June 1988 "Five-Year Plan." They were added, however, to the revised plan in March 1990.

Source: Developed by LB&FC staff from information reported in PennDOT's hazardous materials five-year plan.

OS-2 (2-85)

EXHIBIT G

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

March 19, 1990

IN REPLY REFER TO
Legislative Budget and Finance Committee Report
Motor Carrier Enforcement Division

Mr. John L. Sokol, P.E.
Chief Engineer
Pennsylvania Turnpike Commission
Administration Building
P. O. Box 8531
Harrisburg, PA 17105

Dear Mr. Sokol:

In December 1987, the Legislative Budget and Finance Committee completed an exhaustive review of our motor carrier enforcement efforts in the PA Department of Transportation working in association with the PA State Police. Their report contains 16 specific recommendations.

In the ensuing two years, we have diligently been working on completing most of these recommendations. One of those recommendations was to develop a memorandum of understanding between the Turnpike, the PA State Police and the PA Department of Transportation. Since the LB&FC report was issued, we have worked with your agency to provide us with classification data of truck traffic exiting the Turnpike. This information has been invaluable to us in developing our deployment strategies.

However, we would now like to begin the process of formalizing an agreement with the three agencies. Specifically, we would like to focus on truck traffic exceeding 80,000 pounds that may be exiting the Turnpike onto various state highways. Other matters for consideration in this agreement would be: 1) procedures on improving communications, 2) the use of your right of way outside of the toll booths for systematic weight checks and safety inspections, and 3) permitting our Motor Carrier Enforcement Officers in the toll booths to monitor truck traffic as it exits the Turnpike. These are some of the key items that we would like to discuss with your organization.

I will be contacting you shortly to arrange a meeting of our respective staffs to discuss these and other pertinent topics that you may have in mind.

Sincerely,

Michael M. Ryan, P.E.

Michael M. Ryan, P.E., Director
Bureau of Maintenance and Operations

C-3. SAFETY PROGRAMMING

A. Performance Measures and Controls Are Needed for Engineering District Review of High Accident Locations

PennDOT has identified safety as one of its top five priorities; and highway accident trends in Pennsylvania, when measured against miles traveled, have improved in recent years. The Department also recently implemented a nationally-recognized Safety Corridor Initiative Program, which is intended to result in major safety enhancements on 55 road corridors throughout the state. However, PennDOT's reporting and control system for assessing the adequacy of district review of high accident locations could be improved to help ensure that attention is given to priority sites.

Discussion

Safety is one of PennDOT's five top priorities as reflected in its "Action Agenda" (Goals and Objectives Report). The Department addresses highway safety in various ways including educational/informational campaigns, road and bridge construction and maintenance programs, and signing improvements.

During the 1980s most of the key indicators of highway safety were moving in favorable directions.

PA Highway Accident Statistics

Safety Measure[a/]	1980	1985	1988	1980-1988 % Change
Accident Rate	199.75	189.91	188.12	-5.8%
Injury Rate	187.46	185.70	189.49	+1.1%
Fatality Rate	2.96	2.40	2.38	-19.6%

a/Rates are calculated per 100 million vehicle miles.

PA Truck-Related Accident Statistics

Safety Measure[a/]	1985	1988	% Change
Accident Rate	1.62	.95	-41.4%
Injury Rate	1.36	.90	-33.8%
Fatality Rate	.06	.04	-33.3%
Truck Related Accidents as a % of Total Accidents	3.83%	3.58%	- 6.5%

a/Rates are calculated per million vehicle miles. Data not available for 1980.

PennDOT also recently received national recognition for its Safety Corridor Program. That program identified $50 million of highway safety improvements to be implemented on 55 road corridors by June 30, 1991. The U.S. Department of Transportation cited it as a model program, encouraging replication in other states. The Director of the Center for Highway Safety also received an award from the American Association of State Highway and Transportation Officials (AASHTO) for his role in developing the program.

While the overall indicators noted above suggest that highway safety is improving and the Department has taken special initiatives with its corridor program, PennDOT's reporting and control system for assessing the adequacy of district review of high accident locations needs improvement.

Each district is responsible for reviewing high accident locations from accident lists developed in the Central Office. The lists rank accident locations by a severity rating which is a product of the accident types and their associated dollar estimates of loss/damage.

According to Department policy, each district should field-review the locations that are ranked in the top third of the district location priority lists. However, most districts cannot review all of the top third locations due to staffing limitations, and the Department's reporting system does not provide information on which of these locations are actually reviewed.

Data from the district four-year plan indicates eight of the 11 districts did not review one-third of the high accident locations for FY 1988-89. For example, District 5-0, Allentown, reviewed only 7% of the 1,500 identified high accident locations.

District 6-0, Philadelphia, site-reviewed only 11.5% of the 5,214 sites identified. Overall, in FY 1988-89, only 2,539 (18%), of the 14,057 high accident locations identified statewide were site-reviewed. Moreover, the district four-year plans do not specify the extent to which the accident sites reviewed were those from the top one-third of the accident lists.

Beyond reviewing the locations, the districts are to determine what needs to be done (if anything) to reduce or eliminate accidents. These actions or "dispositions" can take many forms ranging from nonphysical corrective action (e.g., providing information to the public of the dangers associated with a particular location), minor maintenance, temporary improvements or other mitigation measures such as signing, or proposing larger scale projects to Central Office as candidates for its Safety Improvement Program.

LB&FC staff attempted to review the disposition of the district reviews of high accident locations, but found that this data is not maintained by the Center for Highway Safety. In their four-year plans, the districts recently began reporting some limited information on their high accident location reviews. The general nature of this information, however, does not allow the reader to determine if the most critical locations have been addressed nor does it provide a meaningful categorization of the outcome of these reviews (e.g., the number of high accident locations improved through signing, routine maintenance, temporary mitigation measures, etc.).

LB&FC staff also looked to the Department's monthly Management Objectives Report, the Blue Book, for district safety performance measures. The only Blue Book measure of safety activity is the number of accident records created in the Accident Record System. The Blue Book, however, does not include measures on district (or statewide) performance for reviewing and correcting high accident locations.

Comparison to Maryland Accident Review Process

LB&FC staff met with Maryland Department of Transportation officials to compare the two state systems.

Identification of Review Locations - Maryland's Office of Traffic, which is a branch of the Central Office, performs a statistical analysis of high accident locations in order to narrow down the list of accident locations to a number that is manageable for each district to review.

Meaningful Performance Objectives - Maryland requires the districts to study all the locations identified through the statistical analysis process. This requirement becomes an objective that the districts must adhere to--each location must be reviewed.

District Reporting - Each of Maryland's seven engineering districts must report to the Central Office its disposition of each site they were required to review. In contrast, Pennsylvania has no such reporting of district review. The only location reviews reported to the Central Office are those locations recommended for Safety Improvement Program funding which is a very small fraction of all high accident locations.

The Maryland process, therefore, is one that provides feedback to give management assurance that safety problems are being addressed. Maryland has also dedicated more staff for these site reviews. Between four to six staff in each district are assigned to accident location review, as compared to Pennsylvania where the number of district staff assigned ranges from one to four.

In 1988 Maryland identified 295 high accident locations that districts were required to review while PennDOT guided its districts to review 3,338 locations. As such, Pennsylvania has "identified" about eleven times the number of locations than did Maryland with significantly less staff devoted to the review of these locations. Maryland has more staff and maintains a road system of about 5,400 miles, which is about one-eighth of the Pennsylvania road network.

Recommendations

1. ***PennDOT should establish the necessary internal controls and district reporting process/system to ensure the following:***

   a) ***Establishment of specific objectives for district high accident location reviews that reflect criticality of locations and district capacity for doing the reviews.***

   b) ***Establishment of standards for review timeliness based on location severity. The standards should vary by accident severity rating, with those locations having the highest severity ratings being reviewed first.***

   c) ***Establishment of a district reporting process (based on the objectives and standards to be established) that clearly demonstrates and categorizes the number of sites actually reviewed, the disposition of these reviews, and justification for any sites scheduled for review which are not reviewed.***

2. ***The Department should incorporate these measures once they are established--at least at a meaningful summary level--in its monthly Management Objectives Report, the Blue Book.***

C-4. TORT LIABILITY/RISK MANAGEMENT[1/]

A. District Risk Management Activities Could Be Improved Through Increased Accountability/Oversight

Risk management is a planned approach to protect an organization's resources from accidental loss or damage from natural or man-made occurrences. PennDOT expended $100 million to settle tort cases between FY 1979-80 and FY 1987-88. Broadly, the Department's current risk management approach gives its districts wide discretion in risk reduction activities. Given its large tort liability, it would appear prudent that the Department take steps to ensure that certain fundamental risk management recommendations are implemented in a uniform manner by each engineering district.

The responsibility for coordinating PennDOT's risk management efforts rests with the Risk Management Engineer who ultimately reports to the Deputy Secretary for Safety Administration. Although the Risk Management Engineer recommends risk reduction activities to the eleven district offices, neither the Risk Management Engineer nor the Highway Administration bureaus monitor or assess district implementation of these recommendations. Further, a PennDOT Comptroller review found that only two district offices had all of the Risk Management Engineer recommendations on file.

Discussion

PennDOT's Risk Management Engineer is responsible for the identification and evaluation of the physical features of roadways that present risk and potential liability. This review process is intended to direct resources in ways that will best prevent and mitigate future liability losses.

The Risk Management Engineer analyzes those factors that contribute to tort actions. He studies trends and frequencies, such as highway features commonly associated with tort actions (e.g., guiderails and potholes), settlement payments, locations, and the extent of fatalities. On the basis of this review, the Risk Management Engineer recommends ways that the districts and counties can minimize risk.

Risk management recommendations that affect statewide policy or procedure are made to the deputy secretary responsible for the

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1/Please see special note on p. 154 regarding statutory provisions affecting tort liability and risk management.

affected activity. As such, most recommendations go through the Deputy Secretary for Highway Administration. In this advisory capacity, the Risk Management Engineer has no direct authority over district implementation. Moreover, the Risk Management Engineer is under the Deputy Secretary for Safety Administration, even though most of the risk management/tort liability activity is in the Highway Administration area. Risk management recommendations are generally in the form of strike-off memos that suggest, rather than require, risk management activities for consideration by the districts.

A February 1990 PennDOT Comptroller review of the engineering districts found that only two districts (District 1-0, Erie/Franklin, and District 3-0, Columbia/Montoursville) had all of the Risk Management Engineer's FY 1988-89 recommendations on file. Two districts (District 6-0, Philadelphia, and District 11-0, Pittsburgh) did not have any of the letters on file, while the remaining districts had some of the letters on file. (Note: District 8-0, Harrisburg, was not included in this review.)

The Comptroller also found that each district takes its own approach to risk management. Six of the districts developed a risk management manual, each unique to the particular district. Such variation is to be expected given the decentralization of the highway program, which reflects the diversity among the districts. In light of the potential costs of PennDOT's tort liability, however, some common statewide "baseline" policies and procedures would appear desirable for all eleven districts.

The need for some common risk management practices is suggested in the Risk Management Engineer's job description. It includes the responsibility "to develop and maintain a tort liability risk management manual." PennDOT claims, however, that a statewide manual has not been developed because it is neither necessary nor desirable. The agency's Comptroller disagrees, indicating that, because only one person is involved in the risk management process (the Risk Management Engineer), the amount of on-site monitoring is limited; thus, the need for specific written policy becomes even more necessary.

Finally, the Comptroller found only one district (District 10-0, Indiana) performing quality assurance reviews of risk management activities. As the Comptroller audit stated, quality assurance reviews are important to ensure that the initiatives and objectives are enacted as intended and to alert management of possible problems in the implementation of their risk management objectives.

It should be noted that the Department has taken some important actions to control risk management and tort liability. For example, risk reduction objectives have been incorporated into the performance evaluations of county maintenance managers and assistant county maintenance managers.

While a decentralized approach to risk management allows for needed flexibility at the district level, additional management oversight and reporting appears warranted. Such management controls would provide reasonable assurance that the districts are implementing the Department's risk management recommendations, particularly those recommendations deemed minimally essential for all districts.

Several sources stress the importance of establishing objectives and measuring their attainment as necessary elements of a risk management system. A U.S. Department of Transportation (DOT) handbook for public transit executives defines risk management as a management function requiring that "managers assess, enact, and support total system efforts to ensure safety and to prevent (control) losses." Exhibit H, taken from the U.S. DOT report, depicts the basic components of a risk management control system. As indicated above, PennDOT's approach appears weak with respect to the establishment of goals and objectives for district risk management performance and the evaluation of such performance.

The report says the following about these key steps:

> Formulate Basic Policy and Goals for Risk Management (Step 1) - [T]he establishment of goals and objectives is a necessary first step. Policy and goals for risk management should be formulated and supported as high in the organizational structure as possible.
>
> Analyze Data (Step 9) - Periodic analysis is part of the risk management process. Analysis should measure the program's effectiveness and, from time to time, formulate new and tighter objectives for the risk program. Review is necessary to spot trends, keep a close eye on exposures, and to constantly reevaluate each step of the risk management process.

Additionally, in 1985, PennDOT cooperated with Penn State's Transportation Institute (PTI) on a tort liability study. PTI found that some important management functions were severely constrained or left undone to the detriment of the Department's risk management program. One of the functions cited was the development of good management control procedures to assure compliance with the tort liability guidelines.

Recommendations

1. ***As stated in the Risk Management Engineer's job description, a risk management/tort liability manual should be developed. It should include standard procedures and policies for use by all the districts. This should be done at a level of detail commensurate with what the Department determines to be the essential elements of an effective district risk management program common to each district.***

2. *The Department should establish a risk management quality assurance process. Each district should be subject to the review on a periodic basis. The quality assurance process should have the flexibility to allow for the differences among districts but should at least be designed to ensure that all basic requirements (i.e., those policies and procedures that PennDOT develop pursuant to recommendation #1) are satisfactorily implemented.*

3. *The Department should consider moving the Risk Management Engineer's function from the Safety Administration Deputate to the Highway Administration Deputate. The visibility, authority, and accountability necessary for proper oversight and control over district risk management programs would most suitably be under the Deputy Secretary for Highway Administration.*

Special Note: Statutory Provisions Affecting Tort Liability and Risk Management

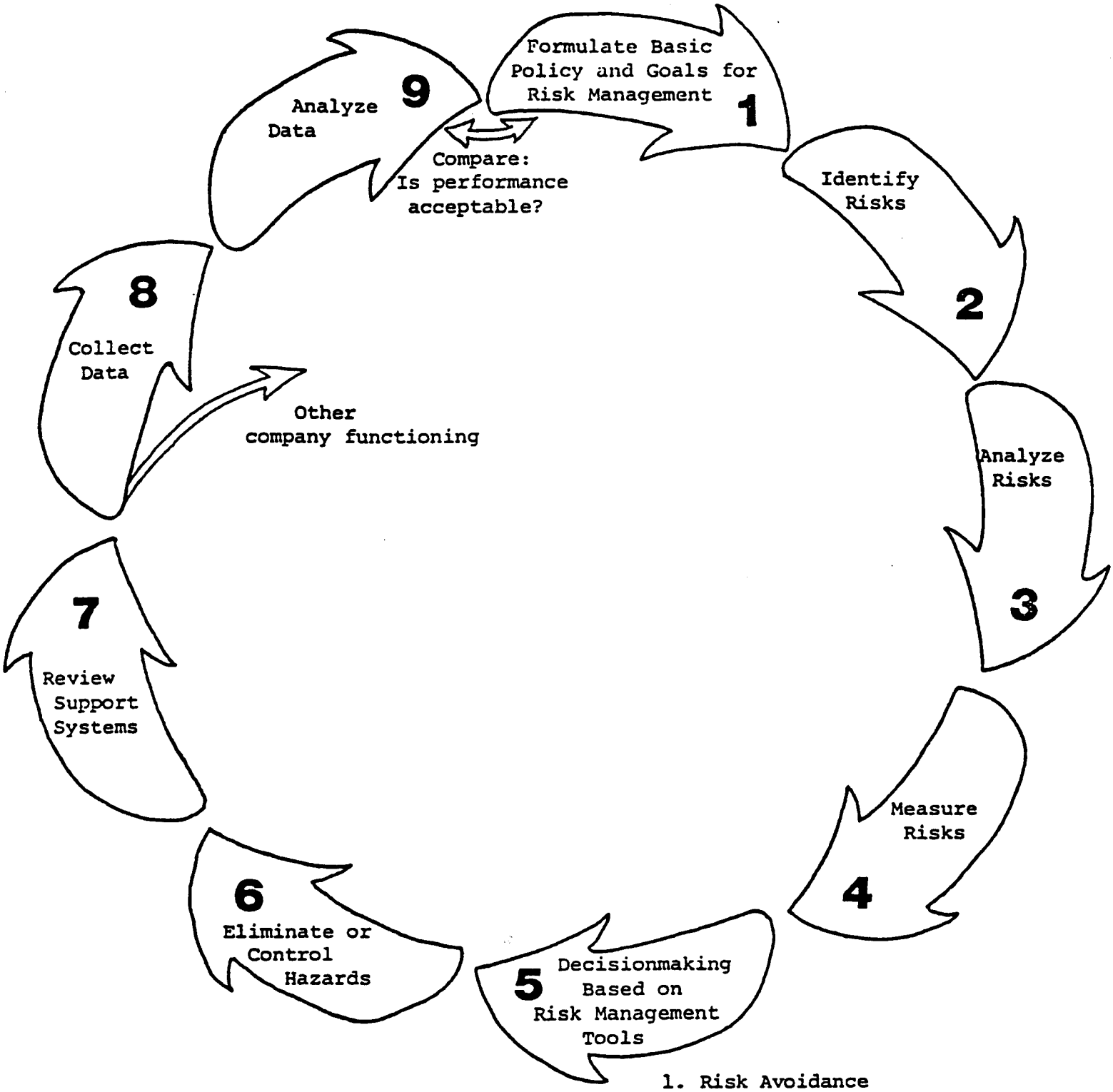
The importance of risk management is difficult to assess without an understanding of the statutory environment surrounding PennDOT's exposure to tort liability. The Sovereign Immunity Act, 42 Pa.C.S.A. §8521 et seq., waives immunity for the Commonwealth in nine specified areas limiting liability to $250,000 to each plaintiff for any one incident and an aggregate total of $1,000,000 for the incident. Four of those nine areas are related to PennDOT activities. These are vehicle liability, dangerous conditions of Commonwealth real estate (e.g., highways), potholes and other dangerous conditions of Commonwealth highways and care, custody, and control of personal property.

Additionally, a provision of the Comparative Negligence Act, 42 Pa.C.S.A. §7102(b), allows the plaintiff to recover the entire judgment from one defendant. This provision of the act is referred to as the joint and several liability doctrine and has often resulted in PennDOT bearing a disproportionate share of judgments. The Department may also be held to current highway design standards as Pennsylvania has not adopted a design immunity statute as other states, including New Jersey, have done.

An amendment to the Comparative Negligence Act was introduced in HB 1439 in 1989. The provisions of this bill would limit a defendant's liability for noneconomic damages (e.g., pain and suffering) if his responsibility is 10% or less of the total responsibility or less than the plaintiff's responsibility. If either of these two criteria are met, the defendant's dollar liability would be proportioned to his share of causal negligence. The Department's rough estimate is that this proposal could decrease annual tort payments by one-half the liability paid, thus potentially saving the Department millions of dollars.

EXHIBIT H

The Risk Management Process



Source: "Public Transit Risk Management," U.S. Department of Transportation, 1984.

C-5. MOTOR VEHICLE FINANCIAL RESPONSIBILITY

A. Insurance Companies Not Required to Respond to PennDOT Insurance Verification Letters

PennDOT's procedure for verifying the insurance coverage of randomly selected vehicle registrants does not include checks to determine if auto insurance companies are properly responding to PennDOT's verification letters. The insurance companies are asked to notify PennDOT only if the selected vehicles are not insured. In auditing terminology, PennDOT's verification procedure is described as "negative confirmation." Such an approach is comparably less effective in confirming results than a procedure that uses at least some positive confirmation (i.e., requiring confirmation regardless of insurance status).

The Department's September 1989 estimate of uninsured Philadelphia vehicles--9.5%--has been challenged as low. The difficulties associated with an insurance verification process which relies entirely on negative confirmation may contribute to a lower than expected estimate of the number of uninsured vehicles. For FY 1990-91, PennDOT has proposed a five-fold increase in funding to expand the level of sampling. Given such a commitment of resources, the insurance verification process should include minimum controls to attain a reasonable level of confidence that auto insurance companies are properly responding to the verification letters they receive.

Discussion

Motor vehicles registered under the Vehicle Code are required to have minimum levels of automobile insurance.[1/] PennDOT is charged by law, 75 Pa.C.S. §1704, to enforce the automobile insurance requirements. The Department's Bureau of Driver Licensing has developed procedures to measure public compliance with automobile insurance requirements.

Random Sampling Process

PennDOT samples a minimum of 6,800 vehicle registration renewals each week to verify auto insurance coverage.[2/] A letter is sent to the insurance company listing the names and policy numbers as reported on the vehicle registration renewal forms. The insurance companies are expected to notify PennDOT

1/The minimum insurance requirement applies to vehicles required to be registered under the Vehicle Code except recreational vehicles not intended for highway use, motorcycles, motor-driven cycles, or motorized pedalcycles or other similar type vehicles.
2/Of this number, 1,200 (17.6%) must represent vehicles registered in Philadelphia.

if any vehicles are not insured with the company as claimed on the registration form. PennDOT then requests by letter that the vehicle owner provide proof of insurance within 10 days. If an insurance company fails to return the letter, PennDOT assumes that all the vehicles listed on that letter have valid insurance. There are no provisions in law or regulation which require an insurer to respond to the Department.[3/]

LB&FC staff attempted to obtain information on the number of verification letters sent to various insurance companies and the number of letters subsequently returned to PennDOT indicating the vehicles which did not have insurance coverage. The purpose of doing so was to assess the response rates by insurance companies to the PennDOT verification letters. PennDOT, however, does not track the responses even though it might yield useful information to help determine whether insurance companies are faithfully responding to the verification letters.

PennDOT's procedure, therefore, relies on negative confirmation, which is comparably less effective than positive confirmation procedures. Under the current random sampling process, PennDOT has no assurance that the letter was actually received by the company or that, once received, any policyholder records were checked. Thus, the number of uninsured vehicles may well be higher than has been reported by PennDOT.

In 1989, PennDOT estimated that approximately 492,000 vehicles were uninsured, or 6% of all registered vehicles. Since the percent of uninusured vehicles is arrived at through the random sampling/verification letter process, it is important that the Department have reasonable assurance that its estimates of the number of uninsured vehicles in Pennsylvania are valid. Thus, there should be some process, check, or control to assess the degree to which insurance companies are responding to the verification letters. The need for improved procedures for estimating the number of uninsured vehicles appears particularly pertinent in the Philadelphia area. The Department estimated in September 1989 that approximately 9.5% of vehicles registered in Philadelphia are uninsured. A February 1989 Philadelphia Magazine article, however, claimed that the percent of uninsured vehicles in Philadelphia is as high as 57%.

The Department has recognized the need for such assurance. According to the Assistant Director of the Bureau of Driver Licensing, the Bureau is considering a "tickler file" that would

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3/Act 1990-6, which substantially amends the Motor Vehicle Financial Responsibility Law, does, however, require insurers to notify the Department when an automobile insurance policy has been terminated or canceled (see special note, p. 159).

track verification letters mailed by the Department. This would entail, at the minimum, an agreement with the insurance industry that letters identifying uninsured vehicles would be returned within a specific time frame. Also, the Department intends to require compliance through regulation. According to the Director of the Bureau of Driver Licensing, however, the initial effort by the Department is to ask for compliance by insurance companies "because the lengthy regulatory process could not be completed by July 1, 1990." The Department has not, however, specified what "compliance" means.

The Governor's proposed budget for FY 1990-91, would increase the random registration renewal sampling process from 6% to 25% (except Philadelphia where it would be 50%) and includes a five-fold increase over current funding ($409,000) to cover computer development and other operating costs associated with this increase.

Recommendations

1. ***The Department should promulgate regulations under Act 1990-6 which would require insurance companies to return the random registration enforcement letter within a specific number of days indicating whether or not the vehicle(s) noted is (are) insured with the company.***

   Recommendation #2 offers an alternative that the Department could consider if resources or other considerations make recommendation #1 unreasonable.

2. ***The Department should begin to monitor and control responses to its verification letters through one or both of the following alternative approaches:***

   a) ***Determine which insurance companies are not responding or appear to be under-responding to the Department's verification letters based on estimates of the average expected number of responses. For those insurance companies that appear to be not responding to the insurance verification letters, develop a targeted system of follow-up or send some verification letters which require positive confirmation (i.e., the letters must be returned regardless of whether the vehicle is insured or not).***

   b) ***Require that some portion of the verification letters be returned regardless of the insurance status of the listed vehicle (i.e., positive confirmation).***

Special Note: Statutory Provisions Affecting Motor Vehicle Financial Responsibility Law Enforcement

Act 1990-6, signed into law on February 7, 1990, amended numerous provisions of the Motor Vehicle Financial Responsibility Law. While the most salient provisions of this act concern significant changes to the cost and types of automobile insurance coverage required of Pennsylvania motorists, new penalty and enforcement provisions impose additional responsibilities upon the Department of Transportation in the enforcement of the law. These include:

- Three-month suspension of operating privilege in addition to suspending the vehicle registration of a registrant who does not have proof of the requisite insurance.

- Surrender of registration plates and cards upon suspension or revocation of vehicle registration.

- Increase from $25 to $50 the fee charged for the restoration of operating privileges or the registration of a vehicle if the revocation is related to financial responsibility.

- Regular transmission to each municipal police department and sheriff's office a list of the names of persons residing within its jurisdiction whose operating privilege or registration has been suspended or revoked.

According to Department officials, PennDOT is in the process of revising its procedures and forms to comply with these and other requirements of the act.

C-6. TITLING, REGISTRATION AND LICENSING

A. New Computer System Should Improve Driver Transaction Processing

The Bureau of Driver Licensing (BDL) annually processes approximately 3.3 million driver transactions on a computer system designed in 1966 and 1967. Currently, the system deposits funds in 8.8 days, processes driver transactions in 7.4 days, and requires a time-consuming process of manual clerical checks to prevent data entry errors. Moreover, the computer's limitations have made the implementation of certain legislative and judicial actions increasingly difficult.

To improve the processing of driver transactions, the BDL plans to implement the $15.7 million Driver Licensing and Control (DL&C) System in November 1990. The DL&C System should allow prompt BDL response to legislative and judicial actions while improving the efficiency, timeliness, productivity, and quality of driver transaction processing. PennDOT expects the DL&C System to reduce the depositing time of funds to less than 2 days, the processing time of driver transactions to 5 days, and to reduce manual clerical checking of data entry errors. Additionally, the DL&C System should facilitate employee error rate monitoring through the implementation of a random sample quality control system.

Discussion

The BDL issues learner permits, driver licenses, and non-driver identification cards in accordance with Chapter 15 of the Vehicle Code. Each year, the BDL licenses two million drivers, processes one million conviction reports, and suspends the driving privileges of approximately 300,000 drivers. These transactions are processed on an outdated computer system developed in 1966 and 1967. According to the Department, the absence of a modern, integrated computer system has caused a reduction in efficiency, productivity, quality, and timeliness.

The current computer system is comprised of several non-integrated subsystems. Each subsystem performs a distinct and separate BDL function, such as operator licensing or conviction report filing. Each subsystem also maintains its own daily records. Every evening, the BDL must reconcile the subsystems' records to provide updated driver records. This non-integrated computer system delays fund depositing to 8.8[1/] days and results in multiple staff persons performing tasks that could be handled by one person on an integrated system.

1/This is the average fee deposit time for FY 1988-89. PennDOT has a standard depositing time goal of 11 days.

The lack of an integrated computer system has made it increasingly difficult for BDL to make computer system changes necessary to implement legislative and judicial actions which affect driver programs. The federal Commercial Motor Vehicle Safety Act, for example, is to be fully implemented by April 1992.[2/] Therefore, the Department has to modify its driver licensing system to support more extensive testing and record-keeping of commercial drivers.

The BDL plans to replace the current computer system with a new Driver Licensing and Control (DL&C) System. The DL&C System should be implemented in November 1990 at a cost of $15.7 million. The DL&C System, which is an integrated system, is expected to promptly accommodate legislative and judicial actions that affect driver programs. The system should also improve the efficiency, productivity, quality, and timeliness of driver transaction processing. The DL&C System is expected to:

-- Reduce transaction processing time from 7.4 days to 5 days through the use of on-line data processing. This would eliminate the time consuming current practice of batch and overnight processing.

-- Allow for 100% fund depositing time to be reduced to less than 2 days from the current 8.8 days through front-end check depositing. This will result in cash flow improvement and an increase in the interest income of the Motor License Fund.

-- Reduce data entry errors (e.g., incorrect names and addresses on driver licenses) through the use of a data entry validation system. The system is designed to reduce the burden of manual clerical checking and should improve the overall accuracy and quality of BDL products. (Error rates are not maintained under the current system.)

-- Result in an estimated annual labor cost savings of $1.2 million as a result of a complement reduction of 52 positions from a base of 294 positions. Operations that currently require several employees will be able to be combined into one position.

-- Accommodate decentralization of driver licensing services if the Department should decide to implement such a system.

2/The Commercial Motor Vehicle Safety Act of 1986 requires all commercial drivers to take a written exam before being allowed to drive trucks or buses in Pennsylvania. The act is an attempt to identify unqualified commercial motor vehicle drivers.

-- Implement a random sample quality control program to provide group and individual error rates for the identification of performance problems. Currently, the BDL has no overall quality control programs in place.

The implementation of the DL&C System demonstrates an effort by the BDL to improve the processing of driver transactions in an efficient and timely manner. The DL&C System should expedite the production of quality driver licensing products for the citizens of Pennsylvania.

B. Most System Objectives for the Commonwealth Automated Registration and Titling System Have Been Achieved

The Commonwealth Automated Registration and Titling System (CARATS) was implemented in December 1986 by the Bureau of Motor Vehicles (BMV) to reduce operating costs and application processing time while increasing data processing capability and quality. CARATS annually processes 13.5 million transactions (i.e., vehicle registrations and titles) and processes over $1.0 billion in fees. To efficiently process these transactions, the Department identified 17 design objectives for CARATS, of which 13 have been accomplished. (See Exhibit I.)

The Department has not fully achieved four of its objectives: (a) reducing affected employee complement by 25%, (b) depositing fees in one day, (c) reducing transaction turn-around-time to five days, and (d) maintaining a 1% error limit. The most current data[1/] provided to LB&FC staff indicates that affected employee complement has been reduced by 21%, 68% of fees were deposited in one day, average turn-around-time was 8.5 workdays, and 63% of data entry employees had error rates of 1.0% or more. The Department, however, considers its performance in these areas to be satisfactory in light of an increase in transaction volumes and an overestimation of employee productivity prior to system development.

Discussion

The Bureau of Motor Vehicles (BMV) is responsible for the titling and registering of all motor vehicles and the processing of driver license renewals in accordance with Chapters 11, 13 and 15 of the Pennsylvania Vehicle Code. The Commonwealth Automated Registration and Titling System (CARATS) was implemented in December 1986 at a cost of $8.7 million to improve the processing of vehicle registrations and titles. The Department's objectives for the system were to reduce operating costs while increasing system capability and providing Pennsylvania vehicle owners with higher quality vehicle and driver documents in shorter amounts of time.

The Department identified 17 design objectives in support of these goals. The Department's status report on CARATS implementation indicates that 13 of the 17 design objectives have been

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1/The data for each of the performance factors cover different time periods ranging from June 1989 to March 1990.

achieved. The 13 achieved objectives are system enhancements now in operation and new capabilities for potential future application. For example, the system can now accomodate decentralization of vehicle registration and titling services if the Department should ever opt to move in that direction.

The following four system design objectives relating to employee performance have not yet been achieved:

Reduce Affected Employee Complement - The Department's objective was to reduce the affected employee complement by 25% or 116 positions. The Department's status report indicates BMV has made substantial progress towards meeting its objective by abolishing 98 of the 116 positions (21%).

Reduce Fee Depositing Time - The Department's fee depositing objective was to deposit all fees on the same day of receipt. For the first three months of 1990, an average of 68% of the fees were deposited on the day of receipt. Within three working days, 100% of the fees were deposited. Although an increase in staff would allow 100% first day depositing, the Department believes that a staff increase would cost more than the extra interest income derived from first day depositing.

Reduce Transaction Turn-Around-Time - Turn-Around-Time (TAT) measures the amount of time it takes to fully process BMV documents (i.e., registrations and titles). The design objective established for TAT was five working days. During FY 1987-88, average TAT was 7.08 working days. During FY 1988-89, average TAT rose to 8.5 working days. The Department has stated that the increase of 1.42 days in TAT was due in part to an increase of approximately 65,000 vehicles that BMV must title and register.

Additionally, CARATS allows previously separate processing steps to be accomplished by one employee through task consolidation. The Department's task consolidation time and motion studies, however, overestimated the ability of some clerks to assume additional responsibilities, thus, TAT did not decrease to the extent anticipated.

Minimize Employee Error Rate - Employee error rate measures the quality of BMV products and specifically refers to the percentage of outgoing BMV documents containing data entry errors (e.g., incorrect name, address, or driver class). The design objective was to not exceed a 1% employee error rate.

BMV established error rate standards based upon employee performance during the first six month testing period (July 1988 through December 1988). The middle quintile was titled "meets standards" and ranged from 1.00% to 1.49%. For the six-month period ending June 30, 1989, 18% of data entry employees had

error rates of 1.50% to 1.99%, while another 18% of the data entry employees had an error rate greater than 2.00%, which the Department considers unsatisfactory. For the six-month period ending December 31, 1989, of the 43% of data entry employees who had error rates in excess of 1.49%, 28% of those employees had an error rate greater than 2.00%.

BMV will continue to conduct quality control reviews of all data entry operators every six months. An additional three month quality review will target those employees who exceed the 1.49% error limit. BMV also plans to retrain those employees who are performing unsatisfactorily. A full-time trainer has been hired to provide retraining. Any employee still performing unsatisfactorily after retraining will be transferred to another unit.

EXHIBIT I

Commonwealth Automated Registration and Titling System (CARATS)--Design Objectives' Status

	Design Objective	Status
1.	Reduce affected employee complement by 116 positions (25%).	Since July 86 BMV abolished 98 positions (21%).
2.	Same day fee deposit.	Sixty-eight percent of receipts are being deposited on the same day.[a/]
3.	Five workday average transaction Turn-Around-Time (TAT).	FY 1987-88: 7.08 workdays[a/] FY 1988-89: 8.5 workdays[a/]
4.	Decentralized service capability.	System capability is available.
5.	Recording of fee transactions in computer's memory at time of entry.	Available and operational.
6.	Combined data entry and document examining functions.	Available and operational.
7.	Consolidate work flows.	A 40% reduction has been realized in the processing steps of major work.
8.	Seven digit vanity license plates (previously, only 6 digits were possible).	System can accommodate issuance.
9.	Annual fee for any special or vanity tag.	System can accommodate this feature (but would require legislative authorization).

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a/Calculated by LB&FC staff from information provided by PennDOT.

Source: Exhibit developed by LB&FC staff from information provided by PennDOT.

Exhibit I

The Commonwealth Automated Registration and Titling System (CARATS)--Design Objectives' Status (Continued)

	Design Objective	Status
10.	Automated accounts receivable and payable.	Available and operational.
11.	Ability to process abandoned vehicles on computer system.	Available and operational.
12.	User-friendly and menu driven data entry.	Available and operational.
13.	Computer based training and on-line procedures.	Available and operational.
14.	On-line record update (i.e., changes to vehicle records are made the moment they are entered).	Available and operational.
15.	Ability to flexibly and cost-effectively accommodate legislative and judicial actions (e.g., registration fee increases).	Accomplished by use of modular software and user-maintained codes tables.
16.	Fleet subsystem (allows for single invoice registering of fleet vehicles).	Available and operational.
17.	Average document error limit of 1%.	January 1 to June 30, 1989: 36% over 1.49%.[17] July 1 to Dec. 31, 1989: 43% over 1.49%.[17]

C. Additional Controls Needed to Prevent Odometer Tampering and Fraudulent Issuance of Driver Documents

PennDOT appears to have the basic controls in place to detect odometer rollbacks and the fraudulent issuance of duplicate driver licenses; however, additional controls may provide improvements. The Department of Transportation has an ongoing program which involves the identification of and subsequent recall of titles which were issued based upon incorrect and/or fraudulent information presented by the title applicant. The Department also requests odometer readings on annual registration renewals which could be used to detect additional instances of odometer tampering.

The Bureau of Driver Licensing (BDL) detects and prevents fraudulent issuance of duplicate driver licenses by (a) comparing two forms of identification for matching signatures, (b) mailing the camera card to the address listed on the driver's record, and (c) utilizing a computer scanning system to verify driver record information. A planned upgrade of the Driver License and Control System will include additional controls to help prevent the fraudulent issuance of driver licenses.

Discussion

Odometer Tampering

The Vehicle Code, 75 Pa.C.S. §7132, prohibits persons from disconnecting, resetting, or altering the odometer of any motor vehicle with the intent to change the odometer mileage reading. Persons violating the provisions related to odometer tampering may be subject to a criminal or civil penalty (misdemeanor of the third degree, liable for civil damages up to three times the value of actual damages, respectively). In 1989, the Department recalled 144 titles bearing incorrect mileage readings out of 8.6 million registered vehicles.

Odometer tampering is the process of reducing or "rolling back" the vehicle odometer mileage to a significantly lower mileage reading. The major advantage of odometer rollbacks is that the seller can charge a higher price for the vehicle with the false lower odometer reading. According to a PennDOT official, a two-year-old vehicle with 60,000 to 80,000 miles is generally sold for approximately $3,500. Lowering the mileage to approximately 25,000 miles can increase the amount a consumer will pay to between $9,000 to $10,000.

The Department of Transportation has the following controls in place to deter odometer rollbacks:

-- PennDOT learns of odometer rollback cases through the Bureau of Consumer Protection in the Office of the Attorney General. Citizens will file complaints with the Bureau of Consumer Protection, and in turn, the Attorney General's office will ask PennDOT to investigate the case.

-- PennDOT has close and continuous contact with neighboring states on the titling activity occurring in these states. For example, an Ohio official notified PennDOT that a West Virginia dealer was rolling back odometers and obtaining titles on these vehicles. The dealer then sold the cars at auctions to Pennsylvania dealers. By notifying PennDOT about this dealer and the fraudulent titles, PennDOT officials were able to refuse titles to these vehicles.

-- A monthly computer printout produced from the Commonwealth Automated Registration and Titling System (CARATS) identifies odometer rollback suspects. This report lists each person applying for a title, the number of titles they received, the vehicle identification number (VIN), the title identification number, the number of miles on the car, and the state of origin. The VIN, which remains constant for the life of a vehicle, is used as the "password" for all titling and registration transactions on CARATS. Therefore, when a person applies for a title, the VIN is entered into CARATS, and the computer will report if a previous Pennsylvania title was issued for that vehicle. By reviewing this report, PennDOT is alerted to those dealers who are bringing vehicles into the state which were previously titled in Pennsylvania. According to a PennDOT official, this is a common scenario for odometer tampering.

-- Once an incorrect title has been identified, the Bureau of Motor Vehicles issues a letter to the vehicle owner requesting the title be forwarded to PennDOT. Once PennDOT receives the title, they will "brand" it. A "brand" indicates that the mileage listed on the title is not the vehicle's actual mileage. This "brand" informs all future purchasers that the vehicle's odometer reading is incorrect.

Despite the controls PennDOT has in place to identify odometer rollbacks, limitations exist in CARATS that prevent complete detection of odometer rollbacks. For example, when a registration renewal application is filled out, the vehicle

owner is requested to record the current odometer reading. However, the odometer reading is not required by law, and the registration renewal will be processed if the odometer reading is blank. The odometer reading is not recorded in CARATS; rather, the registration renewal cards are microfilmed. This annual odometer reading, if entered into CARATS, could be automatically reviewed each year for lower odometer mileage readings.

Additionally, CARATS can only compare a vehicle's odometer mileage if the vehicle has been titled more than one time in Pennsylvania. The odometer mileage is recorded in CARATS with the initial title application. With every subsequent title application, CARATS can compare the current odometer mileage with the previous reading. For example, if a vehicle is purchased with 45,000 miles, that mileage will be recorded in CARATS when the title is issued. If that vehicle is sold in the future, BMV will reject any future title applications if the mileage listed is less than 45,000 miles. Any reading greater than 45,000 miles will be accepted, even if it is incorrect (i.e., the odometer was rolled back, but it was not lower than the initial reading).

Duplicate Licenses

The Vehicle Code, 75 Pa.C.S. §7122, provides that a person is guilty of a misdemeanor of the first degree if he has possession of a driver's license knowing that it has been altered, forged or counterfeited. As investigated by the State Police, there are approximately 150 known misuse cases per year out of the 7.8 million licensed Pennsylvania drivers.

The majority of these fraudulent cases result from the issuance of a duplicate driver's license on another person's driving record. Duplicate licenses, for example, are fraudulently obtained for the underage purchase of alcoholic beverages or for the establishment of a credit record (e.g., an 18 year old person obtains a duplicate license on a 21 year old person's driving record).

The photo driver's license is widely recognized as a credible document for establishing proof of identification (ID). The Bureau of Driver Licensing (BDL) detects and prevents the fraudulent issuance of duplicate driver licenses on another person's driving record through the following selected measures:

-- Photo ID centers compare two forms of identification (e.g., camera card with passport, voter's registration, etc.) for matching signatures.

-- When an applicant at the Central Office or through a messenger service is unable to furnish acceptable identification, as specified in 67 Pa. Code Chapter 91, BDL does not immediately furnish a camera card application.

Instead, BDL mails the camera card to the address listed on the driver's record. Therefore, if someone was trying to use another person's driving record, the camera card would only be accessible to the offender if they had access to the driver's mail.

-- Each day the photo ID centers forward all the cancelled camera cards to BDL. Twice a week, BDL runs the cards through a computer scanning system, Input 80, to update the driver's record with the photo date. At the same time, the system compares the birth date and driver classes on the camera card with the information in the driver's record. If this information does not coincide, the scanner will "kick out" the record for BDL to investigate. If the investigation indicates that the camera card was altered, the photo center is assessed a $100 penalty for not identifying the alteration.

-- The contractor of the photo centers awards employees $25 for every altered camera card they identify.

Upon implementation of the Driver License and Control System (November 1990), the following revisions to the current controls will be used to help prevent the fraudulent issuance of driver licenses:

-- Currently, an applicant requesting a duplicate license who has all the required forms of identification, as specified in 67 Pa. Code Chapter 91, will receive his camera card immediately. However, upon implementation of the Driver License and Control System (November 1990), all duplicate photo applications will be mailed to the customer. The applicant needing a duplicate driver's license will be provided with an interim license that is valid for 15 days or until the camera card is received in the mail. Applicants should receive their mailed camera card within those 15 days. This control allows for all driver's documents to be forwarded to the address on the driver's record. Therefore, if someone was trying to use another person's record, the camera card would not be accessible to the offender unless the card was intercepted at the mailbox.

-- A regulatory change will reconcile the different identification requirements specified in 67 Pa. Code Chapters 73 and 91 so that PennDOT, the State Police, and the photo centers are operating consistently. This would prevent exploitation of any inconsistencies currently present in the regulations.

Recommendations

1. *The Department should consider the feasibility of including vehicle odometer data from registration renewals in the CARATS system. At minimum, this would allow for easier retrieval than the current microfilm system. It could also be the basis for detecting potential odometer tampering. For example, annual updates of the odometer mileage could be "flagged" if the title mileage is lower than that of the previous year.*

2. *The Department should consider recommending amendments to the Vehicle Code which would require vehicle owners to report the odometer mileage on the vehicle registration renewal form before the form could be processed--currently, this information is requested but is not required.*

D. Decentralization of Driver License and Vehicle Registration Services

In 1984, PennDOT contracted for a feasibility study on the decentralization of driver license and vehicle registration services. The consultant group, Genasys Corporation, recommended full-service decentralization using private sector agents and state employees which would allow for the issuance of operator license and vehicle registration and titling documents on an over-the-counter basis at sites located throughout the state. The consultant estimated that the costs for a full-service decentralized system would range from $254 million to $268 million from start-up through five years of operation, while the costs of maintaining the centralized system would be $277 million for the same time period. However, PennDOT has maintained its centralized system. According to a 1988 Pennsylvania American Automobile Association Federation survey, Pennsylvania is one of only six states that does not offer decentralized services.[1/]

Discussion

In 1984, PennDOT contracted for a study on the feasibility of decentralizing driver license and vehicle registration services. The consultant group, Genasys Corporation, considered six service approaches:

-- Maintaining the current centralized system.

-- Full-service decentralization using offices operated by state employees.

-- Full-service decentralization using contractors.

-- Operator licensing services offered at the 35 major Driver Examination Center Facilities (in existence in 1984), and vehicle registration and titling services offered at sites that would be established throughout the Commonwealth.

1/This figure is the result of a 1988 Pennsylvania American Automobile Association Federation survey. Of the 46 states that responded to the survey, 6 states do not offer decentralized services. The other 40 states are either fully or partially decentralized.

-- Full-service decentralization operated by private sector agents with the marketplace determining the location of the sites and the service fee amounts.

-- Full-service decentralization (except for actual photo license issuance) using the private sector with the marketplace determining the location of the sites and the service fee amounts.

To evaluate the six alternatives, the consultant developed a weighted matrix that measured service needs, financial needs, and management control needs. Service needs were a primary evaluation criterion as increased public accessibility to operator license and vehicle registration services is the explicit purpose of decentralization.

According to the consultant, "any alternative which does not improve service has no justification for adoption." Improved service needs include (a) the need to resolve motorists' operator license and vehicle registration/title problems without having to travel to Harrisburg, (b) the ability to receive service on a person-to-person basis from an individual who is authorized to resolve operator license and vehicle registration/titling problems for motorists, and (c) the need for not placing an unreasonable burden on the public (i.e., inconvenience).

Financial considerations included (a) the Commonwealth will not incur additional operating expenses, and (b) fees will be received, reconciled, and deposited in a timely manner.

The management control category included (a) the need for a strong approach to secure driver records and money, (b) the need for document control to prevent counterfeiting, and (c) the need for specific mechanisms through which management can exert control over the operations of the decentralized offices.

The evaluation of each decentralization alternative in terms of the identified needs is summarized in the following table.

Weighted Score of Non-Quantifiable Factors for the Six Decentralization Alternatives[a/]

	A	B	C	D	E	F
Service Needs	55	308	304	270	252	248
Financial Needs	210	113	142	247	283	263
Management Control Needs	299	246	236	205	172	172
Total Score	564	667	682	722	707	683

A = Current centralized system
B = Decentralization with state employees
C = Decentralization with contractors
D = Licensing at Driver Exam Centers, registration/titling at sites established by marketplace
E = Decentralization with private sector at sites determined by marketplace
F = Decentralization (except photo licensing) with private sector at sites determined by marketplace

a/The higher the score, the more "desirable" the alternative.

Source: Decentralization of Services Feasibility Study-Final Report (1984).

As can be seen from the table, "service needs" are best met through options B and C, largely because the Commonwealth would have complete control over the site locations, thereby ensuring the highest degree of access to services. The current centralized system, option A, ranked very low in all aspects of service. The "financial needs" measure shows that option E best met the criteria of not increasing operational expenses. "Management Control Needs" were best met through the current centralized system. The report noted "any decentralized alternative is less secure than the current system; the addition of sites multiplies the risk of a security breach." Each option had the needs categories totaled with the current centralized system ranking the lowest of all options. Option D, a full service decentralization approach, ranked first overall because of its relative strength in all three categories.

The consultant recommended a hybrid of alternatives "D" and "F" to provide the Commonwealth with the best characteristics of the top rated alternatives. This alternative is full-service decentralization using private sector deliverers and state employees. The state employees would be the only persons authorized to administer the driver exams. This system alternative would have the following features:

1. Full "one-stop" operating licensing and vehicle registration would be provided by private sector agents. This would allow for the issuance of finished products on an over-the-counter basis.

2. Marketplace demand would determine the location of the decentralized agent sites.

3. Agents would have to meet a set of performance standards more stringent than those currently established for agents and messengers' services. These standards would require a higher bond and a contractual provision imposing financial penalties on the agent for failure to comply with the performance standards.

4. Fees for driver licenses and vehicle registrations would continue to be fixed and controlled by the Commonwealth. The additional service fee charged by the private sector agents to cover their operating expenses would be subject to market demand without Commonwealth intervention.

5. The estimated five year operating costs of the recommended full-service decentralization alternative ranged between $254 million and $268 million, while the estimated five-year cost of maintaining the centralized system was $277 million.

The $277 million cost estimate for maintaining the centralized approach was done prior to the implementation of the Commonwealth Automated Registration and Titling System (CARATS) and the Driver Licensing and Control (DL&C) System. These major system enhancements are intended to decrease operating costs through various processing enhancements. Therefore, future cost estimates would need to reflect these system improvements if decentralization is ever again considered.

Analysis of Other States

The Genasys Corporation reviewed and compared transaction volumes and costs for six states with decentralized services. These states provide a distributed service network based on regional and/or local offices. Each state provides finished documents on an over-the-counter basis.

The following table compares costs per transaction for the six states surveyed. The number of transactions illustrates the overall volume of transactions for the state, and the costs are based on the operating budgets of the motor vehicle departments.

Comparison of Costs per Transaction[a/]

State	Operating Costs[b/]	No. of Transactions[b/]	Cost per Transaction
Virginia	$ 58	6.7	$8.60
Maryland	39	4.9	$8.00
California ...	230	31.3	$7.30
Wisconsin	31	5.9	$5.30
New Mexico ...	10	1.9	$5.30
Ohio	45	15.2	$3.00

a/The LB&FC staff was unable to obtain comparable data for Pennsylvania.
b/Reported in millions on an annual basis.

Source: Decentralization of Services Feasibility Study-Final Report (1984).

Department's Response to the Study

In explaining why the Department did not act on the consultant's recommendation, the Director of the Bureau of Motor Vehicles (BMV) indicated that the current centralized service system for driver licensing, vehicle registration, and titling is cost-effective. By having all operations in a central location, the Department keeps its overhead costs to a minimum. For example, only forty people process vehicle registration renewals under the centralized system. Under a decentralized system, PennDOT believes eight to ten clerks would be necessary at each location for counter services.

The BMV Director also stated that the current centralized approach guarantees the security of fees and documents. Currently all documents are stored in one warehouse, and the security on this inventory is tightly controlled. Additionally, all service and processing fees are collected in one central office allowing for security of fee depositing and fee reconciliation. Under a decentralized system, adequate procedures for controlling the transmission of documents and fees from the decentralized sites to Harrisburg would need to be developed.

PennDOT currently has no plans for further decentralization. However, the Department may consider installing automatic teller machines for processing vehicle registration and driver license renewals in the future.

Recommendation

1. ***The Department should reexamine opportunities for decentralizing license and registration services after the DL&C System has been satisfactorily implemented. The CARATS and DL&C System were each designed with capabilities to accommodate decentralization.***

C-7. EMISSION AND VEHICLE SAFETY INSPECTION PROGRAMS

A. Certain Key EPA Program Recommendations Have Not Been Implemented

PennDOT has not implemented certain key EPA-recommended enforcement measures to ensure that service station owners and mechanics comply with the Emission Inspection and Maintenance (I/M) Program requirements. Two reports released by the Environmental Protection Agency (EPA) in 1986 and 1989 identified specific areas of the I/M program which need improvement. Areas addressed included the need for covert audits of emission inspections, a stricter penalty structure, an increase in the vehicle waiver rate, and improved data collection methods. It is important to note, however, that since 1985 PennDOT has significantly increased audits and suspensions for program violations.

Discussion

The Pennsylvania emission inspection and maintenance law, 75 Pa.C.S. §4706, requires the Department to establish an Emissions Inspection and Maintenance (I/M) Program through the promulgation of regulations found at 67 Pa. Code Chapter 177. Station[1/] compliance with these regulations is assessed through semi-annual administrative and gas audits conducted by PennDOT's field investigative staff.[2/] From these audits, the field investigators prepare a report on station compliance with program regulations. Additional oversight is provided through statistical data generated from emission test data.

When program violations are identified, a hearing before a Department Hearing Officer may be scheduled. The purpose of the hearing is to present the evidence of noncompliance, to determine

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1/The terms "garage" and "station" are used synonymously throughout the findings on the I/M program.

2/During an administrative audit, field investigators verify that all stickers which have been issued to a particular station are accounted for and secure. Copies of test results, which are required to be kept for two years, are also checked. During the gas audit, a calibration of the station's emission analyzer is performed. If the analyzer is found to be outside the tolerance levels in which an accurate emissions test can be performed, the field investigator places it out-of-service. The analyzer remains out-of-service until the manufacturer recalibrates it. Table 9 presents information on the number of administrative and gas audits performed by PennDOT. Since 1986, the Department has increased the number of semi-annual gas audits by 6,095.

whether the violation could have been prevented, and to determine guilt or innocence. A hearing can result in suspension from the program. The percentage of hearings which resulted in station or mechanic suspensions was, respectively, 58.8% and 57.8% in 1989. In addition, in 1989 the Department scheduled 95% more hearings and issued 342% more suspensions than it had in 1985 (see Table 10). Violations that led to the suspension of stations and mechanics participating in the program are shown in Tables 11 and 12 of this report.

The EPA audited Pennsylvania's I/M program in 1986 and again in 1989 and made specific recommendations to improve station enforcement.[3/] LB&FC staff reviewed these reports and met with EPA and PennDOT to determine the status of these recommendations. The following discussion represents selected recommendations made by the EPA for improving program compliance/enforcement:

1. PennDOT should develop written covert audit procedures, conduct one covert audit per year at each emission inspection station, fix the (covert audit) vehicle to fail the covert audit, and conceal the identity of the covert auditor.

Covert audits are used to identify I/M stations that are not conducting emission tests according to regulations. Four months before the first EPA audit was undertaken in 1986, PennDOT initiated 11 covert audits. The EPA recommended that PennDOT continue these covert audits, and PennDOT agreed to do so. However, no covert audits have been initiated by PennDOT since November 1985. According to PennDOT officials it would cost approximately $200,000 to conduct initial covert audits at each emission inspection station and approximately $160,000 for each year thereafter. In May 1989, the EPA performed 14 covert audits in Pennsylvania. Violations of program testing requirements were identified at 11 of the 14 stations audited.

2. PennDOT should continue to develop reports from its data system that will assist in monitoring failure rates, waiver rates and repair effectiveness by station.

PennDOT generates statistical reports on overall program performance. Such reports are provided to the EPA, the U.S. District Court for Eastern Pennsylvania, and are used by PennDOT management. However, reports on individual station performance are not routinely prepared, although PennDOT has the capability

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3/EPA also recommended that PennDOT centralize the emission program to improve station enforcement. LB&FC staff did not report on this recommendation because the issue was beyond the scope of our review. A special note, however, is included on centralization of the emission program (see p. 184).

to do so. According to a PennDOT official, few of their reports focus on individul stations because "the summary report data indicates that PennDOT is continuing to meet its program requirements (1988-89 year-end results: 97.2% sticker compliance, 2.4% waiver rate,[4/] 17% overall initial [emission] failure rate)." In addition, PennDOT noted that to design and conduct a study of repair effectiveness in the state and to continually monitor the results would require a major commitment of resources. Table 13 shows PennDOT's sticker compliance rate since 1984-85.

The EPA noted in its 1986 audit report that overall performance data does not alert the Department to "problem" stations. Station-by-station analysis can pinpoint "stations which are improperly repairing vehicles." For example, the EPA examined 36 waiver records during its initial program review. Most of the stations had only issued one to two waivers. One of the stations, however, had issued 17 waivers. Such a discrepancy points to the value of tracking individual station performance as a regular part of PennDOT's enforcement effort.

The Department in its response to the 1986 EPA audit report noted that station-by-station analysis is useful if program goals are not being met. Since PennDOT is meeting its program goals, Department officials believe it is unnecessary to monitor individual station performance on a regular basis.

3. Revise the penalty structure for the I/M program.

The EPA reported on the need for changes in PennDOT's penalty structure. They reviewed 197 enforcement dispositions and found that, in the majority of cases, warnings were issued to stations. They also found that, when multiple suspensions were issued, many of these suspensions were allowed to be served concurrently. The EPA noted that allowing a station to serve a minimum suspension for multiple violations "does little to deter fraudulent and careless practices."

LB&FC staff reviewed the penalties issued by PennDOT to 20 participating I/M stations. Thirteen of these cases involved multiple violations for which separate penalties had been issued. All 13 of these stations were allowed to serve multiple suspensions concurrently. In the remaining cases, warnings or single suspensions were issued.

The EPA also encouraged the Department to impose monetary fines against stations instead of suspensions. The Department

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4/ Waiver rate refers to the total number of waiver certificates issued to vehicle owners divided by the total number of vehicles retested for emissions. The resulting percentage is called the waiver rate. See next page for additional information on a waiver.

has not implemented monetary fines because, according to a Department official, the current penalty schedule is meant to enforce the program without driving participating stations out of the program.

4. Increase waiver repair cost limit to $200 for 1981 and later vehicles.

When a vehicle fails an I/M inspection, the maximum cost the vehicle owner may incur for the repair work is limited in statute (75 Pa.C.S. §4706(c)). The current repair cost limitation is $50 for 1974 and newer model year vehicles and $25 for pre-1974 model year vehicles. If the vehicle repair cost exceeds that limit, a waiver can be issued (i.e., vehicle repairs are required to be made up to the repair cost limitation). (See Table 14 for waiver limits in other states and other characteristics of Emission Inspection programs nationwide.) In short, the waiver allows the vehicle owner to obtain a new sticker even though the vehicle is not within acceptable emission limits. In its 1988 year end report, PennDOT reported a waiver rate of 2.8%. In 1989 the waiver rate was 2.4%.

The EPA expressed concern over Pennsylvania's unusually low waiver rate, noting that I/M programs in other states similar to Pennsylvania's have higher waiver rates. The EPA report notes that such a low waiver rate indicates that "vehicles are not being objectively tested."

According to the EPA, it should be expected that, given the low repair rate limits and the relatively high costs often required to make the necessary repairs, there would be more waivers. The EPA also noted that $50 will not go far in repairing new vehicles and will undermine the overall effectiveness of the I/M program. The EPA recommended that the waiver rate be increased to $200 (for post-1980 model vehicles) so that more car owners would repair their vehicles rather than purchase a waiver. The General Assembly would have to amend the statute, however, for such an increase.

Station owners contacted by LB&FC staff expressed similar concerns. They mentioned that because of the costs associated with vehicle repair work, it is very difficult to repair vehicles for under $50.

PennDOT Position on EPA Recommendations

According to PennDOT officials, the Department's budget does not permit it to implement EPA's recommendations at this time. PennDOT also believes that the current level of station and mechanic enforcement is the most that can be presently accomplished. The Department is currently exploring the possibility of enhancing the program with more technologically advanced emission analyzers. In March 1990, the Department updated proposed

specifications for new analyzers and provided the specifications to the analyzer manufacturers and selected vehicle associations. In November 1989, the Department estimated that the cost for stations to upgrade current analyzers would be approximately $3,000. For stations not currently participating in the program, the initial cost would be $15,000 to purchase an analyzer.

The Department expects that, if implemented, these new analyzer specifications will improve program enforcement. The equipment upgrade would lessen the possibility of manipulating test results, would improve PennDOT's capability of conducting station comparisons, and would eliminate the reliance on manufacturers for tape pick-up. However, no time frame for adopting the new specifications has been set by the Department.

Recommendations

1. *To help ensure the effectiveness of the Commonwealth's vehicle emission program, the EPA's recommendations to improve program enforcement should be implemented. In particular,*

   a) *The Department should begin a limited number of covert audits each year, particularly at stations which have a history of compliance problems. The EPA recommended that at least one covert audit be done at each station every year. Recognizing PennDOT's resource constraints, covert audits could initially be conducted at stations previously identified by the Department as not following the regulations. Stations to be audited could be targeted through the suspension hearing records and from past complaints.*

   b) *The Department should begin examining individual station waiver and repair data and develop a regular report on the costs associated with such repairs. Such information could be used to identify those stations with a history of issuing a large number of waivers or requiring repairs above the $50/$25 repair ceiling established in law.*

   c) *The Department, as part of its revision of regulations pertaining to the emission program, should adopt the penalty schedule recommended by the EPA. In particular, the Department should not permit stations or mechanics to serve concurrent suspensions for multiple violations.*

   d) *The General Assembly should consider amending 75 Pa.C.S. §4706(c) to authorize the Department to establish maximum repair rates in regulation. This would allow the Department to increase the current rate to $200 as recommended by the EPA. It would also allow for the rate to be adjusted as needed in the future.*

Special Note: Discussion of the Benefits of a Centralized Program

The Environmental Protection Agency (EPA) in a 1989 report, recommended that PennDOT consider adopting a centralized I/M program.[1/] The EPA noted, in information provided to LB&FC staff, that vehicle testing reliability cannot be assumed in a decentralized program (e.g., the PennDOT program) because the controls are not sufficient to prevent improper tests associated with the following kinds of problems:

-- Reluctance to fail the vehicles of friends, relatives, or "loyal customers."

-- Reluctance to do necessary repair work on vehicles due to the lack of the proper tools and equipment.

-- The ease of tampering with the emission analyzer to produce the desired test results.

The EPA also noted that program reliability in a decentralized approach requires intensive quality assurance efforts such as the use of covert auditing. Conversely, a centralized approach, being less susceptible to abuses, does not require many covert audits. In a centralized approach, the Department is directly accountable for the enforcement of the program. Thus, quality assurance efforts are minimal because less staff is needed to conduct performance tests and testing equipment is monitored more closely.

A 1988 Department study,[2/] noted that "it would probably be less expensive to monitor the existing (emissions) I/M program in Pennsylvania via a centralized, contractor run system than to continue with our decentralized program." The report also indicated that if the program was expanded statewide, costs could be expected to be higher if such expansion occurred under a centralized format. While no breakdown of such costs were included in the report specifically for a centralized program, such costs for expanding the current decentralized program were prepared by PennDOT. Such costs ranged from $100,000 for limited expansion to $2,100,000 for statewide expansion.

1/In a centralized program the state is responsible for performing the inspections. It may also contract with a private business to set up inspection sites and perform the inspections under the supervision of the state. Table 14 shows which states have a centralized or decentralized program.

2/Project Report for the Bureau of Motor Vehicles: I/M - The Future, November 16, 1988.

TABLE 9

Total Number of Gas and Administrative Audits
(CY 1985 Through CY 1989)

Calendar Year	Gas Audit	Total Gas Audit Failure	Percent Which Failed	Admin. Audits	Total Administrative Audit Failure	Percent Which Failed
1985	a/	a/	a/	3,006	322	11%
1986	1,463	362[b/]	25%	6,091	2,044	34%
1987	3,448	696	20%	5,978	3,289	55%
1988	5,224	896	17%	5,329	2,873	54%
1989	7,558	1,312	17%	7,675	1,647	21%

a/The number of audit and audit failures could not be obtained for 1985.
b/Combination of total leak-check failures and calibration failures for 1986 only.

Source: Table developed by LB&FC staff from statistics provided by PennDOT.

TABLE 10

Suspension Hearings Involving
Stations and Mechanics Participating in
the Emission Inspection and Maintenance Program
(CY 1985 Through CY 1989)

Calendar Year	Stations		Mechanics		Total	
	Hearings/ Suspensions	Percent of Hearings Resulting In Suspension	Hearings/ Suspensions	Percent of Hearing Resulting In Suspension	Hearings/ Suspensions	Percent of Hearings Resulting In Suspension
1985	142/ 63	44.4%	142/ 10	7.0%	284/ 73	25.7%
1986	191/ 72	37.7	172/ 28	16.3	363/100	27.5
1987	195/ 93	47.7	131/ 10	7.6	326/103	31.6
1988	186/ 62	33.3	163/ 13	8.0	349/ 75	21.5
1989	277/163	58.8	277/160	57.8	554/323	58.3
Total	991/453	45.7	885/221	25.0	1,876/674	35.9

Source: Developed by the LB&FC staff from the Department's monthly suspension reports.

TABLE 11

Violation by Stations Participating
in the Emission Inspection/Maintenance Program
(CY 1985 Through CY 1989)

Station Violations	CY 1985	CY 1986	CY 1987	CY 1988	CY 1989
Furnish, lend, give or sell a cert. w/o an inspection .	1	5	3	4	14
Fraudulent record keeping	3	1	1	5	16
Improper record keeping	20	32	21	15	44
Careless record keeping	0	2	7	12	19
Faulty inspection	5	16	3	8	45
Inspection by uncertified mechanic	4	3	0	2	8
Unnecessary repairs for purpose of inspection	0	0	2	0	0
Improper certificate of inspection security	0	1	3	6	3
Required tools or equipment broken or missing	0	0	0	0	0
Failure to notify department of changes	1	2	1	0	0
Failure to produce records upon demand by inspection ..	4	0	3	2	3
Failure to comply with inpection regulations	1	0	0	0	0
Unclean inspection area	0	0	0	0	0
Misstatement of fact	0	0	0	0	0
Inspecting more than twelve vehicles in one hour	0	0	0	1	1
Issue or posses. of altered/forged/conterfeit cert. ...	1	1	0	0	0
Failure to report discontinuance of business	1	7	10	7	11
Improper issuance of certificate	8	0	1	0	0
VIOLATION TOTAL	49	70	55	62	164

Source: Information obtained from the Department's monthly suspension reports.

TABLE 12

Violation by Mechanics Participating
in the Emission Inspection/Maintenance Program
(CY 1985 Through CY 1989)

Mechanic Violations	CY 1985	CY 1986	CY 1987	CY 1988	CY 1989
Furnish, lend, give or sell a cert. w/o inspection	1	3	0	2	7
Fraudulent record keeping	1	1	0	1	9
Improper record keeping	1	12	5	7	67
Careless record keeping	0	0	1	0	12
Faulty inspection	5	11	3	3	64
Inspection by uncertified mechanic	0	0	0	0	1
Unnecessary repairs for purpose of inspection	0	0	0	0	0
Improper certificate of inspection security	0	0	0	0	0
Required tools or equipment broken or missing	0	0	0	0	0
Failure to notify department of changes	0	0	0	0	0
Failure to produce records upon demand by inspection ...	0	0	0	0	0
Failure to comply with inspection regulations	0	0	0	0	0
Unclean inspection area	0	0	0	0	0
Misstatement of fact	0	0	0	0	0
Inspecting more then twelve vehicles in one hour	0	0	0	1	0
Issue or posses. of altered/forged/counterfeit cert. ...	0	0	0	0	0
Failure to report discontinuance of business	0	0	0	0	0
Improper issuance of certificate	1	0	0	0	0
VIOLATION TOTAL	9	27	9	14	160

Source: Information obtained from the Department's monthly suspension reports.

TABLE 13

Number of Passenger Vehicles
Emission Inspected Compared to the Total Number Registered
(1984-85 to 1989-90)

Year[a/]	# of Stickers Issued	# of Vehicles Registered	Sticker Compliance Rate[b/]
1984-85	2,000,645	2,640,378	76%
1985-86	2,932,332	3,316,596	88%
1986-87	2,968,562	3,279,537	91%
1987-88	3,149,633	3,284,042	96%
1988-89	3,131,083	3,222,398	97%
1989-90[c/]	1,580,860	1,664,340	95%

a/ The year, unless otherwise stated, runs from June 1 to May 31.
b/ The sticker compliance rate is obtained by dividing the number of stickers issued by the number of vehicles registered.
c/Figures reported are from March through August 1989.

Source: Developed by LB&FC staff from information provided by PennDOT.

TABLE 14

Characteristics of
Emission Inspection Programs Nationwide
(1989)

State	Type of Program[a/]	Test Frequency	Type of Enforcement[b/]	Equipment Spec. Level[c/]	Test Fee	Waiver Limit[d/]
Alaska	D	Annual	RE	Bar 84	$35-50	$250
Arizona	C	Annual	RE	Bar 90	7.00	50/300
California	D	Biennial	RE	Bar 90	27.00	50
Colorado	D	Annual	RE	Bar 84	8.50	50/200
Connecticut	C	Annual	SE	Bar 74	10.00	40
Delaware	C	Annual	RE	Bar 84	Free	75
Dist. of Columbia	C	Annual	SE	Bar 84	5.00	None
Florida	C	Annual	RE	Bar 90	10.00	100/200
Georgia	D	Annual	RE/SE	Bar 84	5.00	50
Idaho	D	Annual	CM/SE	Bar 74	10.75	15/30
Illinois	C	Annual	CM/SE	Bar 84	Free	L + T
Indiana	C	Biennial	CM	Bar 90	Free	50/100
Kentucky	C/D	Annual	CM	Bar 84	6.00	L + T
Louisiana	D	Annual	SE	*	10.00	None

a/C=Centralized; D=Decentralized.
b/RE = Registration-Enforced; SE = Sticker-Enforced; RS = Registration & Sticker; CM = Computer Matching.
c/Equipment specifications are based upon those issued by the California Bureau of Auto Repair (BAR). The numbers (74, 80, 84, and 90) indicate the year in which updated specifications were issued. The later the year, the more advanced the emission analyzer utilized in that state's emission program. An * signifies the state only inspects for emission system tampering.
d/The monetary amounts represented in this column are the most that can be charged for repair work done to vehicles which failed an emission inspection. Those states with no waiver limits require the vehicle to be repaired regardless of cost. Where two amounts are listed, the lower amount is for older vehicles, higher amount for later model vehicles. L = Limited to stated repairs; T = Cost to replace/repair tampered emission controls.

TABLE 14
(Continued)

Characteristics of
Emission Inspection Programs Nationwide
(1989)

State	Type of Program[a/]	Test Frequency	Type of Enforcement[b/]	Equipment Spec. Level[c/]	Test Fee	Waiver[d/] Limit
Maryland	C	Biennial	RE	Bar 80	8.50	75
Massachusetts	D	Annual	SE	Bar 80	10.00	40
Michigan	D	Annual	RE	Bar 84	10.00	65
Minnesota	C	Annual	RE	Bar 90	10.00	75/200
Missouri	D	Annual	RE	Bar 74	4.50	L
Nevada	D	Annual	RE	Bar 84	15/16	$200
New Hampshire	D	Annual	RE	Bar 84	Open[e/]	50
New Jersey	C/D	Annual	SE	Bar 84	12.00	None
New Mexico	D	Biennial	RE	Bar 84	Open[e/]	L
New York	D	Annual	SE	Bar 84	7.00	L
North Carolina ...	D	Annual	SE	Bar 74	10.00	50
Ohio	D	Annual	RE	Bar 90	7.00	100/200
Oklahoma	D	Annual	SE	*	5.00	None
Oregon	C	Biennial	RE	Bar 84	7.00	None
**PENNSYLVANIA	**D**	**Annual**	**SE**	**Bar 80**	**8.00**	**25/50**
Rhode Island	D	Annual	SE	Bar 80	4.00	None
Tennessee	C	Annual	RE	Bar 84	6.00	None
Texas	D	Annual	SE	Bar 90	6.00	250/200[f/]
Utah	D	Annual	RE	Bar 80	9.00	15/150
Virginia	D	Biennial	RS	Bar 84	12.50	75
Washington	C	Biennial	RE	Bar 90	16.00	50/150
Wisconsin	C	Annual	RE	Bar 84	Free	55

e/Refers to states in which the stations set the fee for emission tests.
f/Texas charges a vehicle owner $250 the first time he or she obtains a waiver. The charge drops to $200 for every future year of failure.

Source: Developed by the LB&FC staff from information provided by the Environmental Protection Agency.

B. Need for Improved Oversight of I/M Analyzer Manufacturers

Pennsylvania's Emission Inspection and Maintenance (I/M) program regulations require the manufacturers of emission analyzers to calibrate the analyzers four times a year and to transcribe for PennDOT the cassette tapes containing the emission test data. However, there have been some 25 known instances of noncompliance with these regulations. According to the Environmental Protection Agency (EPA), several Pennsylvania service station owners complained that manufacturers were not prompt in responding to analyzer problems, particularly calibrating the emission analyzers and picking up the cassette tapes on a quarterly basis. The EPA reported that better oversight of manufacturer compliance with program regulations could be achieved if PennDOT initiated quarterly station inspections. (PennDOT inspections are currently done twice a year).

Discussion

The emission inspection program, implemented in June 1984, is currently operating in the Philadelphia, Pittsburgh and Allentown/Bethlehem/Easton metropolitan areas. I/M inspections are performed by garages and service stations. Vehicle owners registered within specific zipcodes or within certain county boundaries are responsible for bringing their vehicles to one of the 3,521 inspection locations for an annual tailpipe emission test. Failure to do so can result in a $25 fine. In FY 1988-89, a total of 3,131,804 I/M windshield inspection stickers were issued through these tests.

The Department is authorized by the Vehicle Code, 75 Pa.C.S. §4706, to promulgate regulations for the I/M program. The regulations, found at 67 Pa. Code Chapter 177, set forth the requirements for certified I/M stations. One requirement is that stations purchase or lease an emission analyzer from a manufacturer approved by the Department. An emission analyzer tests the amount of carbon monoxide and hydrocarbons emitted by a vehicle. The cost of a new emission analyzer in Pennsylvania is between $4,800 and $9,000, depending on the equipment included on the machine.

Stations are also required to have a tape pickup and analyzer calibration contract with the manufacturer from whom the analyzer was purchased or leased. The regulations require the manufacturer to:

-- Calibrate the station analyzer on a quarterly basis to ensure reliable test measurements.

-- Pick up the cassette tapes on which emission tests results are stored (also on a quarterly basis).

-- Transcribe the emission tests from the cassettes onto magnetic tape for submission to PennDOT. This data is forwarded to the EPA to evaluate PennDOT's performance in the administration and enforcement of the program.

Failure of a station to maintain a calibration tape pick-up contract can result in suspension from the program. The cost to repair an emission analyzer is an additional expense separate from the contract. The manufacturers require that analyzer repairs be done by their service staff.

PennDOT does not determine or set contract fees nor does it regulate emission analyzer repair costs. The contract costs of the four approved manufacturers are:

I/M Manufacturers Contract and Repair Costs[a]

MANUFACTURER	SERVICE CONTRACT (Minimum Cost)	REPAIR COSTS
Manufacturer A	$540 per year	$100 to respond to a service call; a $65 labor charge per hour; $35 for travel.
Manufacturer B	$640 per year	$90 for first hour and $40 for each additional hour.
Manufacturer C	$576 per year	$110 for travel to the station and for the first hour of labor. $55 for each additional hour.
Manufacturer D	$400 per year	$30 travel fee; $84 for first hour and $21 for each additional quarter hour.

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a/As of February 1990.

Under current program guidelines, if a station has a dispute with a manufacturer over repair work and refuses to pay, the manufacturer can cancel the contract, which can result in the station being suspended from the program. PennDOT's Operations Manual, an internal document, provides procedures for station

owners to file complaints regarding the manufacturers.[1/] Additionally, it provides procedures for the manufacturer to notify the Department when a contract has expired, been cancelled, or where the station has failed to pay for services rendered for calibration tape pick-up/replacement under the contract. Nonpayment cases are to be scheduled for Department hearings. These procedures, however, are not included in the program regulations and, therefore, may not be generally known by the service station personnel.

According to the EPA, several station owners have complained that the manufacturers are not meeting program regulation requirements to visit each station quarterly. Instances of such violations have also been documented and resolved by PennDOT. In October 1989, the Department, in response to complaints by station owners, sent letters to two manufacturers asking why they had not calibrated some 25 analyzers. Noncompliance by a manufacturer is generally not identified until the Department's investigative staff conducts semi-annual station inspections.

An EPA audit found that out of the eight stations at which overt audits[2/] were conducted, one analyzer was inoperable due to a full tape. The analyzer had not been serviced for seven months; during this time the station was unable to conduct emission inspections. While the stations do not generally view the I/M program as profitable, the availability of the test is important for customer satisfaction as the I/M test is often done in conjunction with other services, including the vehicle safety inspection.

Failure of a manufacturer to provide services to a station as required in regulations could result in that manufacturer being suspended from the program. However, such suspensions have never occurred and would be considered only in those instances where a particular manufacturer's performance had shown a history of noncompliance. PennDOT has no other practical penalties, such as monetary fines, that can be applied against manufacturers when instances of program noncompliance occur.

The EPA, in reports released in 1986 and 1989, recommended that PennDOT begin quarterly inspections of the stations. The

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1/The complaints, according to the manual, are to be directed to the Department, usually the regional referee stations. The Department does not have summary statistics on these complaints and their resolution.

2/An overt audit is the process by which PennDOT staff perform administrative and gas audits (analyzer tests) with the knowledge of the station owner.

semi-annual visits were considered inadequate to ensure program compliance by station owners and manufacturers. Department officials indicated that they requested the EPA to provide data justifying the cost/benefit of quarterly audits, and, as of January 1990, EPA has not provided the data. Department officials also noted that to implement the EPA's recommendation would require additional funds.

Recommendations

1. *PennDOT should amend its Emission Program regulations to include the procedures currently outlined in the internal Operations Manual. The regulations should include procedures for station complaints against manufacturers and the manufacturer notification of the Department when a contract has expired, been cancelled, or when a station has failed to pay for services. Additionally, a special effort should be made to inform all emission inspection stations of the amended regulation to ensure that stations are aware of these provisions.*

2. *PennDOT should amend its Emission Program regulations to provide a specific monetary penalty for the failure of a manufacturer to comply with its regulatory requirements. The penalties currently provided for in the regulations, i.e., revocation or suspension of approval to participate in the program or withholding of the performance bond, appear too extreme to be practicably enforced. Such measures would likely be disruptive for the program since there are only four participating manufacturers.*

3. *The Department should consider conducting a limited number of quarterly station inspections, particularly at stations where manufacturers have had a history of not calibrating the emission analyzers and picking up the cassette tapes on a quarterly basis as required in program regulations.*

C. (Vehicle) Inspection Advisory Board Has Been Disbanded

The Inspection Advisory Board, created by Act 1976-81, as amended, 75 Pa.C.S. §101 et seq., has not met since 1984. The purpose of the Board is to advise the Department and review proposed regulations concerning vehicle safety inspection requirements and operation of official vehicle inspection stations.

Discussion

PennDOT is required by the Vehicle Code, Act 1976-81, 75 Pa. C.S. §4732, to create an Inspection Advisory Board to "advise the Department and review regulations proposed by the Department concerning inspection requirements and operation of official inspection stations."

Act 1976-81 further provides that the Inspection Advisory Board is to include representatives of PennDOT, the Pennsylvania State Police, the automotive industry (i.e., a new car dealer, a service station operator, a used car dealer, a fleet owner, a certified mechanic, a parts and equipment wholesaler, and an independent repair shop operator), and two members of the general public who are licensed drivers.

The Board, however, has not met since 1984. According to a former Board member, no reason was ever given as to why the Board was discontinued. According to a PennDOT official, formal Board meetings were discontinued because the previous administration did not feel the Board served a useful function. Appointed Board positions were not extended or otherwise filled as they expired. A former Board member thought the Board was an excellent way to receive feedback from inspection stations participating in the Vehicle Safety Program.

The Deputy Secretary of Safety Administration informed LB&FC staff that "ad hoc meetings with members of the service station industry and the Pennsylvania Automotive Association are held by PennDOT." However, the ad hoc committee does not include representation from each group specified in the law nor do the meetings provide an opportunity for public participation. Unlike the Inspection Advisory Board, the ad hoc meetings are not subject to the Sunshine Act requirements.

Recommendation

1. ***The Inspection Advisory Board, which is required in law, should be reconstituted or formally abolished. If the Board is reconstituted, new members, representing those specific interests as identified in the law, should be appointed by the Secretary.***

D. LOCAL AND AREA TRANSPORTATION

D-1. ANNUAL CAPITAL BUDGET FOR PUBLIC TRANSIT

A. State Capital Assistance Not Provided in Regular, Predictable Manner

Public transit agencies in Pennsylvania do not receive their state capital funds at regular and predictable intervals that coincide with the federal funding cycle. As a result of delays inherent in the state capital budget process, the Commonwealth's two largest transit systems, SEPTA in the Delaware Valley and PAT in the greater Pittsburgh area, had to wait four years and nearly three years, respectively, to receive their first reimbursement payment for their FY 1986 state match. Such delays have resulted in SEPTA and PAT being forced to turn to their local governments for additional matching funds or borrowing the difference when they initiate their capital projects while awaiting state assistance.

Discussion

Several public transit officials have expressed concerns about funding problems due to delays inherent in the state's current capital budget process and its lack of consistency with the federal process. As a result, LB&FC staff examined the recent capital budgetary experience of the Commonwealth's two largest transit agencies to determine a) the extent of delays confronted by transit agencies and b) the financial and operational impact of the delays on transit agencies.

PennDOT's capital budget for mass transit projects must be enacted by the General Assembly and is subject to constitutionally imposed state debt limitations. These factors limit the Department's ability to achieve a funding source that is both predictable and consistent with the federal process. PennDOT's goal of revitalizing Pennsylvania's transit infrastructure depends, in part, on its objective of developing and introducing an annual transit capital budget. Although the Department has submitted annual capital budget requests in each of the last six years, the capital budget process resulted in only three capital budget project itemization acts--December 1984, July 1986, and October 1988.

PennDOT provides capital funding assistance to eligible municipalities or transportation authorities operating public transit programs. Recipients may use the capital assistance to construct or acquire facilities, vehicles, and equipment. The Pennsylvania Urban Mass Transportation Law (Act 1980-101, as amended, 55 P.S. §600.101 et seq.) limits Commonwealth participation in federally-assisted capital projects to one-sixth of the cost. However, the Commonwealth may provide up to one-half of the cost for projects without federal funding. The Urban Mass Transportation Administration provides 80% of the cost for

capital projects funded through federal formula grants and 75% for capital projects funded with discretionary funds. Local governments contribute the balance of the capital funding.

Transit agencies in urbanized areas receive federal formula grant funds annually and have four years (the year of authorization plus three more years) to use their funds. SEPTA and PAT receive the largest federal formula grants. Their experience with the state match for their FY 1986 federal formula grants, outlined below, illustrate the delays that have resulted from the state's current capital budget process.

Captial Budget Review/Approval Phases

	SEPTA	PAT
Request for state funds submitted to PennDOT	Dec. 1985	Sep. 1986
Request included in capital budget submission	Oct. 1986	Oct. 1986
Project included in capital budget itemization act	Oct. 1988	Oct. 1988
First reimbursement payment received from PennDOT	Dec. 1989	June 1989

As noted above, SEPTA had to wait four years from the time it requested state capital matching funds until it received its first reimbursement payment. Similarly, PAT's delay in reimbursement was nearly three years.

Transit Agency Impacts

Delays in the state capital budget process have caused SEPTA to incur debt while awaiting state matching funds. PAT has had to turn to Allegheny County for additional matching funds when it initiates its capital projects.

SEPTA and PAT have experienced the following problems as a result of delays in the state's capital budget process:

-- SEPTA has had to carry a capital deficit that rises or falls depending on the availability of state matching funds. As of May 1989, SEPTA had accumulated $43.1 million in costs which it anticipates eventually being reimbursed by state matching funds. The total stood at $25.4

million as of December 1989. SEPTA generally must borrow the necessary funds until it receives the state matching payments.

-- Allegheny County provides the local matching funds for the PAT projects and temporarily provides the state share until PAT receives its reimbursement.

-- During the course of the audit, LB&FC staff noted that Capitol Area Transit (CAT) anticipates borrowing approximately $265,000 to cover the state share of a ten-bus purchase in summer 1990. CAT already has the federal funding and the local share of the cost.

The uncertainties of the capital budget process may cause greater problems for transit agencies if federal support continues to decline and transit agencies become more dependent on state capital assistance. PennDOT has noted a 25% reduction in direct federal dollars for transit coupled with a 50% inflationary increase since 1981. According to PennDOT, the Department's Twelve-Year Program can accommodate approximately one-third of the capital needs that SEPTA has projected over the next ten years. The Southwestern Pennsylvania Regional Planning Commission has estimated that the capital needs of PAT and the four other urban systems in the region exceed the available funds through the year 2000 by almost $900 million.

A recent study, conducted by senior elected officials from Philadelphia and its surrounding counties, proposed an alternative method for financing the SEPTA capital program. "Improving Mobility in Southeastern Pennsylvania: A Public Transportation Solution" recommended that the Commonwealth assume responsibility for capital assistance and establish a dedicated local source for operating subsidies. A report on the study recommended that the Commonwealth put an initial amount equivalent to its current operating assistance into a capital trust fund. The Secretary of PennDOT expressed concurrence with the concept but stressed the need for a federal commitment to restore and preserve mass transit systems.

Department Efforts

The Department has met its objective for the FY 1990-91 budget cycle of introducing an annual transit capital budget request. However, the Department's capital budget request is still subject to enactment by the General Assembly and the inherent delays of the state capital budget process.

PennDOT has been increasing the scope of its capital budget requests as a response to the broadening of the federal guidelines. The national transportation policy indicates a movement away from predominantly categorical grants and toward broader,

multi-purpose programs and a reduction in operating assistance. In addition, the Department has attended periodic SEPTA and PAT meetings to keep informed of their capital program priorities.

Recommendation

1. ***The Department should evaluate the feasibility of establishing a capital trust fund as recommended in the report "Improving Mobility in Southeastern Pennsylvania: A Public Transportation Solution." If such a fund appears feasible, the Department should work with the House and Senate Transportation Committees and the Budget Office to develop an appropriate legislative proposal.***

D-2. ROAD TURNBACK PROGRAM

A. Greater Control Needed Over Road Turnback Restoration Costs

Through the Road Turnback Program, PennDOT has returned almost 3,300 miles of functionally local roads to municipalities. A primary objective of the program is to return minor roads that would likely receive greater maintenance attention at the local level. The program does appear to have resulted in better maintenance on turned-back roads, and almost 80% of municipalities with turned-back roads surveyed by LB&FC staff said they would participate in the program again.

The number of miles returned to municipalities each year has dropped steadily since 1984. Unless this trend is reversed, it appears unlikely that PennDOT will be able to achieve its goal of returning 12,000 miles of functionally local roads to local governments. The increasing cost to the Commonwealth of restoring roads to a satisfactory condition prior to turnback appears to be the primary reason fewer roads are being returned. The generally more extensive restoration required for many of the remaining turnback roads, coupled with inaccurate estimates of restoration costs and a lack of standardization of turnback restoration procedures across districts, appear to be at least some of the reasons for these increasing costs. Further, departmental policy which allows municipalities to keep any funds not expended in completion of restoration work may not be authorized by the statutory provision which designates the use of State Highway Transfer Restoration Restricted Account monies.

Program Overview

Pennsylvania has one of the largest highway systems in the nation. Many state roads are functionally local, i.e., roads which are small, have a low traffic volume, and essentially serve only local purposes. Through the Transfer of State Highway legislation (75 Pa.C.S.A. §§9201-9208, referred to hereinafter as the Road Turnback Program), approximately 12,000[1/] miles of functionally local roads were to be removed from the approximately 44,000 mile state highway system and returned to municipalities. No time frame was stipulated for the return of roads in the legislation.

1/The legislation instructed the Department to construct a list of functionally local roads. In this list, the Department identified almost 12,000 miles of roads as turnback candidates.

Act 1981-81 authorized PennDOT to transfer certain roads to local governments but did not provide any dedicated funding for the return of roads. Two years later, Act 1983-32 authorized three mills of the Oil Franchise Tax to a State Highway Transfer Restoration Restricted Account to fund the program. Funding has risen from $8,926,000 in FY 1983-84 to $16,159,000 in FY 1989-90, with a one-time supplemental appropriation of $5 million in FY 1986-87.

Since 1981, PennDOT has returned approximately 3,300 miles of roads to municipalities. PennDOT's Master Policy Statement #604 (effective August 1989) calls for the return of the approximately 9,000 remaining miles of functionally local roads to municipalities.

The turnback funding is to be used for two purposes--maintenance and restoration. First, municipalities which voluntarily take back roads from the state receive a perpetual, annual maintenance payment of $2,500 per mile. (Miles returned to local ownership are not included when determining the Liquid Fuels Tax allocations to municipalities.) The remaining funds are used to restore roads to a satisfactory condition prior to turnback. The annual maintenance payments have first claim on the fund; when the fund is consumed entirely by the annual maintenance payments, no funds will be available for restoration of additional turnback roads. In FY 1988-89 total expenditures were about evenly split between maintenance and restoration.

As mandated by the legislation, before a road is returned the Department and the municipality must agree on the improvements needed to restore the proposed turnback to an acceptable condition. The Department will then estimate the improvement costs and, in most cases, give a cash grant to the municipality. Municipalities may use their own crews or a hired contractor to complete the work. PennDOT restores only a small percentage of the roads either by their crews or by contract. Since 1983 the Department has restored 10% of the roads, while municipalities have restored 90% of the roads.

Discussion

Improved Maintenance

The Road Turnback Program appears to have resulted in improved maintenance on turned-back roads. In an LB&FC survey of 19 municipalities which have participated in the turnback program, 79% of the municipalities thought their turned-back roads received better maintenance under local ownership due to the local government's ability to better respond to local road problems. For example, one municipal official commented: "We used to wait 2 or 3 days for snowplowing [by PennDOT crews]. Now snowplowing is faster."

Local government interest in the Turnback Program remains strong:

-- In FY 1988-89, 165 municipalities requested that 475 miles be returned to their ownership; 242 miles (50.9%) were actually returned.

-- In FY 1989-90, 160 municipalities asked that 460 miles be returned; 216 miles (47.0%) were actually returned.

-- Further, 78.9% of municipalities surveyed by LB&FC staff said they would participate again in the program. (The primary negative comment about the program concerned the $2,500 per-mile annual maintenance payment; about 37% of the municipalities did not believe this amount was sufficient to cover maintenance costs.)

Currently, given maintenance demands on the rest of the state highway and bridge system, the maintenance of functionally local roads may not be receiving as high a priority from PennDOT as it might under local ownership. In a sample of turnback projects, LB&FC staff found that many of the roads had not been resurfaced for 30 to 50 years. In addition, PennDOT's per-mile maintenance expenditures for functionally local roads on the state highway system has decreased from $4,272 in FY 1986-87 to $3,495 in FY 1988-89.

Fewer Miles Returned

Although the Turnback Program is intended to benefit the municipalities and the Department, the high cost of restoring roads prior to turnback is limiting the number of miles that can be returned each year. Between 1983 and 1989, the average municipal restoration cost increased from $11,803 per mile to $38,807 per mile, an increase of 229%. Given current restoration costs and funding, PennDOT would only be able to return an additional 1,200 miles by the year 2000. This would bring the total miles returned to 4,500--a little more than one-third of the 12,000 miles of candidate roads. As noted above, the Department has not been able to meet the municipal interest in the program due to the funding constraints.

PennDOT officials stress that the "easy" and less costly turnback projects were returned early in the program and that the roads which are being returned now require more costly restoration. However, without a better identification of the components of the high cost of restoration, the Department will not be able to meet its own objective of returning all 12,000 miles of roads.

Lack of Standardization

The lack of standardization of the cost estimation process may be one factor contributing to the high cost of restoration work. The initial negotiation for the turnback and the estimation of costs occur at the district level, but only general guidelines are issued to district office personnel. These guidelines do not cover methods to identify the scope of restoration work, the process involved in the negotiation, or prescribe a method to determine the most cost-effective way to complete the work.

A study by the Pennsylvania State Association of Township Supervisors found inconsistent administration of the program in PennDOT district offices. Some townships reported being able to buy construction equipment with the monies they received to complete the restoration work, while others were only allowed to conduct minimum restoration work. In other cases, district office personnel would only negotiate for turnback of specific roads in the municipality and would not allow PennDOT crews, instead of municipal crews, to complete the work. An LB&FC survey of district office personnel found that these unstandardized processes continue to occur. One district office did not allow a municipality to negotiate for the cost of the restoration work, and two did not receive restoration cost estimates from municipalities.

Inefficient Allocation of Turnback Funds

The lack of standardization of the cost-estimation process may also result in an inefficient allocation of turnback restoration dollars. In a sampling of 36 completed turnback projects, LB&FC staff found that 17 projects (47%) came in under budget, 9 (25%) came in on budget, and 10 (28%) came in over budget. (A departmental review of 339 turnback project audit reports yielded generally the same results.)

For those 10 projects which came in over budget, the cost overruns ranged from $496 to $18,832 and averaged 13.9% of the initial estimate. The cost overruns for 9 of the 10 projects totaled $60,683. (The amount of the overrun for one project could not be identified.) All the needed funds were drawn from each municipality's own funds.

For those 17 projects which were finished under budget, the average percentage overestimate of the project cost was 25.6%. The associated excess funding ranged from $593 to $54,742 and totaled $216,032 for the 17 projects. Using FY 1988-89 average restoration costs, these excess funds from the State Highway Transfer Restoration Restricted Account could have financed almost 7 miles of road for additional turnback. (Additional information was provided to LB&FC staff from the Department which

identified 6 projects which were overestimated in excess of 55% of the project cost.) According to several Department officials, project overestimates may be the result of municipalities not always charging the Department for all eligible restoration costs such as supervisory work, stockpiled materials and equipment rentals.

Departmental policy, established in the early 1980s, authorizes municipalities to retain any excess funding not used in the restoration. This includes interest earned on the grant during the restoration. According to that policy, the excess funds must be deposited in the municipality's Liquid Fuels Account and can be used for other local road and bridge repairs (i.e., non-turnback).

However, funds appropriated from the State Highway Transfer Restoration Restricted Account are required to ". . . be used to pay for the costs of restoration of such highways [as provided in the Transfer of State Highway legislation] and annual payments to the municipalities . . . " (75 Pa.C.S.A. §9511(g)). The Department's policy of allowing municipalities to use turnback funds to fund non-turnback projects appears to exceed the uses authorized by the statute. According to Department counsel, a formal opinion has not been rendered regarding the use of turnback funds to fund non-turnback projects.

While the excess funds assist municipalities to maintain their roads (because the funds are deposited into Liquid Fuels Accounts for local road/bridge projects), the policy may exceed the Department's authority to use the funds.

Lack of Program Evaluation

According to a PennDOT official, the Department has not conducted an analysis of the turnback program in recent years to determine its overall cost-effectiveness. District personnel validate whether specific projects are cost-effective by comparing a project's costs to the costs of previous similar local projects. In recent years, numerous projects have exceeded the $35,000 to $40,000 cost-per-mile standard set by the Department. Some of these projects have cost over $100,000 per mile to restore prior to turnback. Although the Department can cite social, economic development and maintenance factors as the rationale for these more expensive turnbacks, at some point the costs of restoration may not be cost-effective.

In the early years of the program, the Department planned on conducting a thorough review of the effectiveness of the program. However, this review was never conducted. To date, program evaluation has generally been limited to anecdotal information. Without a more thorough review, including a cost-effectiveness analysis, the Department may not be using the limited funds available

to full advantage. An analysis of alternatives to the present program design may result in lower overall restoration costs and more miles being returned to municipalities.

For example, in a recent project PennDOT worked with a local government and private industry to turn back a state road which passed through an industrial park. Through this cooperative effort, the Department was able to leverage approximately $250,000 in local and private funding for restoration work.

Recommendations

1. *As a step toward controlling restoration costs, the Department should issue standard guidelines and/or procedures for the negotiation and estimation process to personnel at the district offices. These guidelines should discuss the general steps to be followed in the negotiation process, standards to identify the scope and reasonableness of work to be completed, and methods to evaluate the cost-effectiveness of individual projects. Once issued, the Department should take steps to ensure district adherence to these procedures.*

2. *The Department should review its policy of allowing municipalities to keep excess restoration funding in light of the statutory provision directing the use of funds from the State Highway Transfer Restoration Restricted Account and amend that policy as needed to comply with the statutory authorization. The Department's determination of this matter should be provided to the House and Senate Transportation Committees before the end of the calendar year.*

3. *The Department should undertake an analysis of the cost-effectiveness of the Road Turnback Program. This information should be provided to the General Assembly to assist in considering any future program funding increases. Such an analysis may also be useful to the Department in determining methods to cut average restoration costs by not funding projects in which costs exceed anticipated benefits.*

4. *The Department should consider the feasibility of establishing additional incentives to encourage municipal acceptance of state-owned roads. One possibility could be linking road turnback to other state-local PennDOT programs. Turnbacks could potentially be a negotiated item, for example, in determining the local match for highway and bridge projects. Such a concept would allow the Department to "package" or "leverage" turnbacks in other programs that involve negotiated project costs with local governments and/or private developers.*

D-3. SECTION 203 SHARED-RIDE PROGRAM

A. Additional Compliance Audits Needed of Shared-Ride Providers

In their audits of grantees, the Comptroller's Office at PennDOT has found many instances of noncompliance with the shared-ride regulations. For example, almost half of the grantees audited in FY 1987-88 and FY 1988-89 were not in compliance with age verification requirements, and 45% did not comply with the prior-day's notice requirement. In addition, several providers received reimbursement for trips which were not eligible for shared-ride funding.

PennDOT's system of monitoring shared-ride providers does not appear to be effective in reducing noncompliance because the Department lacks an effective penalty for noncompliance, audits of the largest providers are not conducted on a regularly scheduled basis, and field reviews have decreased in recent years. Noncompliance with PennDOT shared-ride regulations can result in over-reimbursements of providers. In recent efforts to detect and curb noncompliance, the Department has begun reviewing CPA financial audit reports from all grantees. In addition, the Department's expansion of the technical assistance program may lead to increased compliance among grantees.

Discussion

The PA Urban Mass Transportation Law (Act 1980-101, as amended, 55 P.S. §600.101 et seq.) authorizes PennDOT to use State Lottery funds to reimburse public and private operators for 90% of shared-ride fares for senior citizens. The Bureau of Public Transit administers the program. Senior citizens pay 10% of the fare or 25 cents, whichever is greater. Shared-ride services operate on a nonfixed-route basis and provide door-to-door service to passengers who "share" the vehicle for their trips. Shared-ride services do not include exclusive ride taxi or call or demand service, charter, special excursion and sightseeing service, or nonpublic transportation.

The Department estimates that the Shared-Ride Program will provide 7.9 million rides to senior citizens at a cost of $48.7 million in FY 1989-90. The following table shows the rapid growth in the program since its inception in FY 1982-83.

Section 203 Shared-Ride Program:
Ridership and State Reimbursement

Fiscal Year	Number of Senior Riders	Total Reimbursement	Reimbursement per Rider
1982-83	1,200,000	$ 4,500,000	$3.75
1983-84	2,900,000	11,300,000	3.90
1984-85	4,800,000	28,000,000	5.83
1985-86	5,900,000	35,800,000	6.07
1986-87	6,600,000	39,600,000	6.00
1987-88	7,500,000	46,600,000	6.21
1988-89	7,328,000	44,133,000	6.02
*1989-90	7,900,000	48,743,000	6.17
Percent Change 1982 to 1990	558%	983%	65%

*/Estimated

The Department may contract directly with a provider for their services or they may contract with a coordinator which then subcontracts for shared-ride service. In FY 1989-90, the Department contracted with 66 grantees--46 providers and 20 coordinators. PennDOT must approve the grantees before reimbursable trips can be provided. The grantees receive reimbursement for service provided based on monthly ridership reports they submit to PennDOT.

The shared-ride regulations, found at 67 Pa. Code Chapter 425, only allow reimbursement for those trips which meet the various regulatory criteria. The regulations state that reimbursement is only available for shared-ride service for persons 65 years of age and over. Grantees are responsible for verifying age of riders before providing services. In addition, all reservations for trips must be made the prior day, at least 24 hours before the time the trip is taken.

Grantee Noncompliance

The shared-ride regulations allow PennDOT to visit grantees on a random, unannounced basis to check program compliance. PennDOT policy requires all grantees to provide a yearly CPA

financial audit. In addition, the PennDOT Comptroller conducts audits to determine compliance with the requirements of the Shared-Ride Program. Only seven (11.3%) of the 62 grantees audited by the Comptroller's Office in FY 1987-88 and FY 1988-89 were in complete compliance with the regulations; 32 grantees (53.2%) had one to three compliance problems, 13 (21.0%) had four to five problems, and nine (14.5%) had six to eight problems.

Many of the grantees demonstrated the same compliance problems. Thirty grantees (48.4%) had deficient age verification procedures (one coordinator did not complete any age verification for its clients). In addition, 28 grantees (45.1%) were found to be in noncompliance with the Department's prior-day's notice regulation. In the case of providers not in compliance with age verification and prior-day's notice requirements, the Department did not have assurance that the associated trips were eligible for reimbursement. For example, the Comptroller's Office questioned the propriety of the entire $320,482 reimbursed to the coordinator which did not complete any age verification.

The Comptroller's Office also found that 31 grantees (50%) had data collection deficiencies. All grantees are required to collect and submit information such as paid driver hours, vehicle miles, passenger miles and the number of ambulatory and non-ambulatory passenger trips. This data allows for comparison of productivity between providers and is used by the Department in their review of requests for fare increases. Because the grantees were found to have provided inaccurate data to the Department, the Bureau may have based their reviews of fare increases on incorrect data.

Several grantees were also found to be receiving large reimbursements for ineligible trips. Two grantees received $551,619 for charter or special excursion trips which are not eligible for Section 203 funding. One of these grantees also provided trips outside of its approved area and received $61,644 for these trips, while a third grantee received $64,055 for similar ineligible trips.

There have been other causes of over-reimbursement. One grantee incorrectly classified 408 trips and was over-reimbursed $2,224. Two other agencies billed PennDOT twice for the same trips; one agency received $7,496 and the other received an extra $2,279. In addition, several agencies did not have the required documentation to support the number of trips claimed; the Comptroller's Office questioned the propriety of $2,100,408 in payment to four grantees because of insufficient ridership documentation.

PennDOT has prohibited several shared-ride providers from participating in the program because of noncompliance and

fraud. Between 1984 and 1988, one New Kensington company charged the Department for rides it had rendered prior to its acceptance into the program. In addition, a Columbia County provider received over $7,800 for "ghost" trips--rides which were never actually provided to senior citizens.

PennDOT has recovered a portion of the over-reimbursements cited above. In some cases the Department fully or partially collected funds based on the Comptroller audits, while in other cases it has conducted follow-up reviews and decided for various reasons not to pursue collection.

PennDOT Responses to Comptroller Audit Findings

The Department's responses to the Comptroller's audit findings may not be fully effective in preventing future noncompliance. If the Comptroller's Office finds ineligible trips, the Department asks that the grantee review its records for the entire period and calculate the total number of ineligible trips. After the grantee reports on this revised number, the Department adjusts future grant amounts accordingly. However, the Department does not subsequently re-examine the grantee's records to determine if the grantee has reported this revised number correctly.

Follow-up to data collection deficiencies also contributes to this problem. In the past, if data collection deficiencies were cited in audits, the Department asked the grantee to resubmit an entire week's data collection which was collected using correct procedures. This new data was then reviewed by the Department for accuracy. According to PennDOT officials, the Department now simply asks the grantee to describe how they will correct the data collection deficiencies. As such, there is no step to verify that the needed changes have occurred. The Department told LB&FC staff that staff resources are not available to review the new data.

Further, one of the strongest measures PennDOT uses to ensure compliance with regulations is applied only to prior-day's notice deficiencies. In their follow-up to prior-day's notice deficiencies, the Department notifies any grantee with deficiencies that if the same problem is found in a second audit the Department will request a refund of the state's 90% share for any undocumented trips. However, this sanction is not applied to other types of noncompliance problems--such as age verification deficiencies.

Resolution of Audit Findings

Improvements in the timeliness of PennDOT's resolution of audit findings also may be warranted. Of the 28 shared-ride audits of Section 203 grantees completed by the Comptroller's

Office in FY 1988-89 and issued before September 1989, the Bureau of Public Transit's follow-up for 5 audits had not been resolved as of March 15, 1990, a period of 6½ months.

The resolution periods exceed PennDOT and Comptroller internal policies for timeliness. The Comptroller's Office asks that PennDOT inform them of its follow-up within 30 days, and Bureau of Public Transit staff usually allow grantees 60 days to correct any problems identified by the audits. Therefore, given PennDOT's response time to the Comptroller's Office and the grantee's response time to PennDOT, follow-up to audit findings should only take approximately three to four months.

Some of the resolution delay is due to response time extensions granted by PennDOT to the grantee. In addition, PennDOT has sometimes delayed review of the resolution of findings until the grantee's application is received at the start of the next fiscal year.

In a recent review, the Comptroller's Office noted that the Department was inconsistent in its responses to grantees with regards to the actions to be imposed if the grantees did not satisfactorily respond to and correct audit deficiencies within given time frames. The review found that Department responses ranged from indications that future grant payments would be withheld, to grantees would be charged financial penalties, to no course of action being specified.

Monitoring

PennDOT's procedures for monitoring providers do not appear adequate to ensure the timely detection of noncompliance with the requirements of the Shared-Ride Program. Although all providers are required to submit financial audits annually, ten providers did not undergo a program compliance audit for at least 2½ years after the shared-ride regulations were published in January 1986. In addition, compliance audits of the largest grantees are not conducted on a regular basis. PAT/ACCESS, which coordinates service in Allegheny County, and Ketron, which coordinates service in Philadelphia County, receive over half of the Section 203 funding (more than $23 million in FY 1988-89 and $24 million in FY 1989-90) but are not audited regularly to ensure they are in compliance with program requirements. Since PAT/ACCESS entered the Section 203 Program in 1983, it has undergone only one compliance audit which occurred in 1989. Ketron became the coordinator for the Philadelphia area in November 1987--its first audit was in spring 1990.

In addition to audits, PennDOT assesses compliance through its review of grantee annual applications. The grantees must describe their methods of operation and administration in their annual application. However, according to PennDOT officials,

although the grantees' applications may describe procedures which are in compliance with the regulations, grantees may not actually adhere to these procedures.

In the past, Bureau of Public Transit staff have visited agencies to assess the grantees' actual operation. However, the number of field reviews has decreased in current years. Only two reviews were completed in 1989, compared to eight in 1986, four in 1987, and three in 1988. The Department requested two new staff positions in FY 1989-90, and planned to increase field reviews to 20 per year. However, the Department's request for funding for these two positions was not met.

These field reviews appear to be an effective way to both discourage and detect compliance problems, abuses and possibly fraud. In addition, the field reviews could be effectively used for PennDOT's follow-up to audit findings.

Department Initiatives

The Department has recently moved toward a more proactive role in detecting noncompliance. The Department will be reviewing all grantee CPA financial audit reports for the previous fiscal year during their review of the annual applications submitted by providers. From these reviews, the Department may be able to identify those providers which, although prohibited from making a profit from the program, do make excess monies. According to the shared-ride regulations, these monies are then to be returned to the Lottery Fund. Thus, these reviews may result in the recovery of overpayments to grantees.

The Department has also taken some positive steps in offering technical assistance to shared-ride grantees. In many of their audits, the Comptroller's Office recommends that the Department offer technical assistance to grantees to help them meet compliance with program regulations. The Department has relied mainly on the Rural Technical Assistance Program (RTAP), a federally funded program, for training. In the past, RTAP was open only to Federal Urban Mass Transportation Act, Section 18 and Section 16(b)(2) recipients, many of which were also Section 203 providers. However, public grantees which were exclusively Section 203 providers could not use this program. Recently, the Department, working with a state transit association, opened up the program to public providers on a space available basis. This step should meet some of the needs of grantees and may help to increase grantee compliance with regulations.

Recommendations

1. ***PennDOT should increase the number of provider field reviews per year to meet its objective of 20 reviews per year. These field reviews, which are primarily to assess compliance with***

program regulations, could also be used to provide informal technical assistance that could also be useful in improving compliance.

2. *PennDOT should consider modifying its current follow-up to audit findings to include stronger sanctions for noncompliance. In particular, the measure PennDOT applies in their follow-up to prior-day's notice deficiencies, i.e., a request for refund of the State's reimbursement for any undocumented trips if the problem is found a second time, should also be considered if age verification problems and other similar deficiencies go unresolved. Further, when a grantee is identified as having provided deficient data, PennDOT staff should take steps to ensure that the deficiencies are resolved on future data reports.*

3. *The Department should work with the Comptroller's Office to schedule compliance audits of the two largest grantees (PAT/ACCESS and Ketron) at a minimum of every two years, as these programs receive over 50% of the Lottery Funding for the Shared-Ride Program.*

4. *To achieve a quicker resolution of audit findings, the Department should consider adopting a uniform policy for the timely resolution of shared-ride audit findings, possibly including a penalty (such as withholding of monthly funds) for agencies which do not respond to PennDOT within 60 days of having been notified of the deficiency.*

B. Duplication of Service Between Shared-Ride and Free Transit Programs

Although the cost of providing transportation service to senior citizens is much less on the Free Transit Program as compared to the Shared-Ride Program, PennDOT does not require shared-ride grantees to establish and apply criteria to determine whether passengers should use free transit rather than shared-ride service. Although many shared-ride providers have developed criteria for making these determinations, six providers (who account for approximately 41% of all shared-rides) have not established such criteria. In a recent study, one coordinator found that up to 44% of its shared-ride service could potentially be provided through the Free Transit Program. The savings associated with reducing duplication could be significant, for example, replacing only 10% of the shared-ride service with free transit rides in Philadelphia and Allegheny Counties could result in a one-year savings of approximately $2.3 million.

Discussion

The Lottery-funded Free Transit Program provides rides free to persons age 65 and older on local fixed-route transit service during nonpeak hours. PennDOT reimburses local agencies for 100% of the fare. The FY 1989-90 reimbursement will be approximately $74 million. Free transit trips cost much less than shared-ride trips, as the latter provides door-to-door service. In FY 1987-88, a free transit trip cost the Commonwealth an average of $1.14 whereas the shared-ride trip cost the Commonwealth an average of $6.23 per trip.

The issue of duplication (i.e., trips being provided through the Shared-Ride Program that could be provided through the Free Transit Program) between the Free Transit and the Shared-Ride Programs is important because of the cost difference of providing the two services. PennDOT has not, however, evaluated the extent of service duplication. The Department's position is that the issue of duplication should be resolved locally. Out of 66 grantees, LB&FC staff identified only one shared-ride provider in the state who studied duplication in its service area. This provider found that up to 44% of its trips could possibly be handled by fixed-route service. (Because local conditions vary, the result of this study cannot be assumed to apply to other areas of the state.)

PennDOT initially attempted to include a quarter-mile rule in the shared-ride regulations, but later withdrew the requirement because of the objection by senior citizen groups and several shared-ride providers. The quarter-mile provision would have

restricted persons living within and traveling to a destination within a quarter-mile of a fixed-route service from using shared-ride services. Although PennDOT does not require grantees to implement a quarter-mile rule, grantees are required to "undertake reasonable efforts to encourage senior citizens to utilize free fixed route transportation when these services are available and represent an appropriate alternative to shared-ride services." Shared-ride grantees, however, have few incentives to encourage the use of free transit since they may lose many of the shorter and more profitable trips.

Most of the 18 shared-ride coordinators with fixed-route transit service available in their areas have established criteria, such as distance from fixed-route service, health status, and weather conditions, to determine whether passengers can use fixed-route service instead of the more expensive shared-ride service.

Only 6 shared-ride coordinators (33%) have not established any criteria. These 6 grantees, however, provided approximately 41% of all shared-rides in Pennsylvania in FY 1988-89. In particular, two grantees receiving the greatest funding, PAT/ACCESS in Allegheny County and Ketron in Philadelphia County, do not have any type of criteria to determine a client's ability to use free transit rather than shared-ride service, although they do have some marketing/promotion of the Free Transit Program.

Statewide during FY 1987-88, the Department saved $5.09 for every senior citizen who chose to use free transit rather than shared-ride. Potential savings are much greater in Philadelphia and Allegheny Counties where shared-rides, on average, cost about seven to eight times more than fixed-route free transit--see table below. If free transit trips had replaced one out of ten shared-ride trips in Allegheny and Philadelphia Counties in FY 1987-88, the Department could have saved approximately $2.3 million in one year.

Average Costs of Free Transit and Shared-Ride Trips in Philadelphia, Allegheny County and Statewide FY 1987-88

	Philadelphia	Allegheny	Statewide
Shared-Ride	$10.84	$6.95	$6.23
Free Transit	- 1.28	-1.00	-1.14
SAVINGS	$ 9.56	$5.95	$5.09

Recommendations

1. *The Department should require that all shared-ride coordinators and providers abide by the regulations to "undertake reasonable efforts" to encourage their riders to use free transit. Currently, it would appear that the largest providers--PAT/ACCESS and Ketron--have not demonstrated reasonable efforts to reduce duplication. Such efforts in the Pittsburgh and Philadelphia areas, however, hold the most potential for controlling duplication.*

   In particular, the Department should ensure that each grantee establish minimum criteria based on local conditions. In establishing such criteria, it should be recognized that legitimate barriers to using free transit exist and therefore the criteria should not be overly stringent. Criteria currently being utilized by grantees (informing riders of the availability of free transit services, requiring free transit use unless mitigating circumstances are present, and reasonable application of distance requirements) should be considered in the development of the Department's minimum criteria.

2. *Once minimum criteria are established, PennDOT should establish a monitoring system to check on the reasonableness of a grantee's efforts to encourage their riders to use free transit. Although Department officials have expressed concern over their inability to check on such efforts, an assessment of established criteria and a sampling of grantees' records for use of these criteria could be included in either Comptroller's Office audits or Bureau of Public Transit field reviews.*

C. Rural Transportation Needs Appear to Be Underserved

Recent surveys of the local Area Agencies on Aging, show unmet transportation needs as the greatest concern for rural senior citizens. An examination of ridership data revealed that, although urban senior citizens receive only slightly more shared-ride trips (on a per capita basis) than rural senior citizens, the urban elderly also have greater accessibility to the Free Transit Program. Thus, the urban elderly have more transit options available to them than the rural elderly. The current reimbursement limit set by PennDOT may be one of the major reasons why transportation services are not more available to senior citizens living in rural areas. In one instance, shared-ride service to two rural senior citizen centers was cancelled because the service could not be provided at a cost below the reimbursement limit.

Discussion

Although unmet transportation needs in rural areas are difficult to measure, it appears that rural shared-ride providers are not meeting the transportation needs of rural senior citizens. A Department of Aging (DOA) survey of 29 rural Area Agencies on Aging (AAAs) in Pennsylvania found that transportation was reported as the greatest need for rural areas. In a recent survey conducted by the Pennsylvania Association of Area Agency on Aging Directors, 50% indicated "either a high level of unmet needs or a critical level of unmet needs for rural trips or specialized medical transportation, or both." Fourteen of the AAAs reported that the need was critical in one or more of these areas.

In FY 1987-88, rural and urban senior citizens received approximately the same shared-ride service per capita.[1/] Rural shared-ride providers provided 4.14 shared-ride trips per capita as compared to 4.39 trips per capita in urban areas. However, urban senior citizens also receive the transportation provided by the Free Transit Program. Free transit, which will provide about 64 million rides at a cost of $74 million in FY 1989-90, primarily meets the needs of senior citizens living in the more urbanized areas of the state. Rural areas without fixed-route service do not benefit from this program.

1/Calculation derived by taking total annual trips over total 65+ years of age population.

In a recent report, the Department of Aging cites the importance of transportation to the rural elderly:

> . . . it should be made clear that accessible rural transportation is also necessary to support productive economic activity and community participation by elders in diverse ways, and is not solely a health [care] access issue. Nonetheless, since many health care appointments require individualized, demand-responsive [e.g., shared-ride] trips, and are often long distances, with a more vulnerable passenger, health-related transportation represents the most prominent concern of community aging services agencies at this time.

The Department of Aging concludes their report by recommending that DOA, aging advocacy groups, and state transportation officials undertake a study to determine whether rural shared-ride providers are meeting the needs of the elderly.

The Section 203 regulations set forth limits to the amount of reimbursement which providers can receive per trip; for most urban and rural providers, with the exception of Philadelphia and Allegheny Counties, the limit is $4.95. Grantees may request either a fare increase to cover higher costs or a waiver if their fare requirements exceed the reimbursement limit set by the Department. The Department reviews all fare increase requests for public grantees and waiver requests from all grantees.

Nineteen of the 23 (83%) fare waiver requests which the Department received since June 1986 were from rural agencies, suggesting that rural agencies may be experiencing relatively higher costs than urban agencies and feel they must raise their fares above the current reimbursement limit to recover these costs. (The Department approved nine rural requests and one urban request.) Rural trips are usually longer on average than urban trips and therefore may cost more on average. In FY 1988-89 urban trips averaged 5.8 miles while rural trips averaged 7.5 miles.

The $4.95 trip reimbursement limit may prohibit rural grantees from providing transportation to the more isolated rural elderly. As such, the 7.5 mile average trip for rural areas may likely be much higher if service were not limited by the reimbursement limit. Rural conditions such as low population density and long trips to medical and service facilities may result in higher costs of service to rural senior citizens.

Recently, service to two senior citizen centers in Crawford County was stopped because the provider believed it was not possible to provide service at a cost below the $4.95 limit and did not receive the Department's approval to increase their

fares above the reimbursement limit. Approximately 53 senior citizens had used the shared-ride service to travel to the centers, but since the service was stopped, some have not attended the centers due to a lack of transportation.

Delays in the fare increase and waiver reviews may also adversely affect rural providers. Since the review may, in some instances, take 6 months to a year the provider may have to operate at a deficit before a fare increase or waiver is approved. In comparison, the Public Utility Commission takes only 2 weeks to 2 months to review fare increases for private shared-ride providers. This problem may soon be alleviated. The Department recently dropped a requirement that the grantee be audited by the Comptroller's Office as part of the review process. In the future, in most cases, the Department will simply review a CPA report from the grantee. This should result in a shorter review period.

The Department recently announced that it was requiring shared-ride grantee applicants to contact service user groups to discuss each group's needs and suggestions for improving service. Input from these discussions are then to be forwarded to the local AAA. Such information exchanges should result in improved understanding of user needs and in improved program services.

Recommendations

1. ***PennDOT, in a joint effort with the Pennsylvania Department of Aging, should undertake the study proposed by DOA. This study would examine the "overall structure and operation of the programs at the local level . . . ." The study should assess the adequacy and reasonableness of the rural reimbursement limit in light of the various conditions in rural areas that affect trip costs. The review should include examining comparable service (rural/urban) by looking at various factors of comparable service such as access, hours of service, and prior notice.***

D-4. LOCAL ROAD MEASUREMENT FOR LIQUID FUELS PAYMENTS

A. Allocation of Liquid Fuel Funds to Municipalities Based on Outdated Local Road Mileage Information

Misallocations to municipalities of annual Liquid Fuels Tax payments are likely to occur due to inaccurate local road mileage figures. Prior to 1983, first and second class township road miles had not been surveyed since 1933, and cities and boroughs had not been surveyed since 1945.[1] Since 1983 there has been some remeasurement--491 of the 2,572 municipalities in PA have had their roads resurveyed to update the outdated mileage figures.[2]

Based on the resurvey work done since 1983, 150.5 miles (net) of roads were removed from the local mileage used in allocating the liquid fuels monies. Assuming a similar level of inaccuracy exists for municipalities not yet resurveyed, approximately $832,000 in Liquid Fuels Tax funds may be misallocated to municipalities for over 600 net miles of mileage that may have never existed or for roads which are no longer on the local system. While the dollar effect to any one municipality may not be highly significant in a single year, the cumulative effect over many years of under- or over-allocation could be significant. PennDOT has not established a plan for municipal road remeasurement and, as a result, district offices are not provided guidance as to how to prioritize their resurvey efforts.

Discussion

Act 1956-655, as amended, requires the Department to annually administer the allocation of Liquid Fuels Tax funds to municipalities on the basis of local road mileage and population--the formula gives equal weight to mileage and population. Over $168.8 million was distributed to municipalities for local road and bridge maintenance, repair, construction, and related road activities in the 1990 allocation.

The tax on liquid fuels in Pennsylvania is 12 cents per gallon; 20% of each 11.5 cents per gallon of this tax is distributed to municipalities. In addition, municipalities receive 20% of the original 35 mills collected from the Oil Franchise Tax and $5 million from the Motor License Fund.

1/District 6-0 (Philadelphia) did some limited remeasurements in the 1960s and 1970s.

2/Based upon information from PennDOT's Road Management System (RMS) through October 1989. Although Huntingdon and Fulton counties have been remeasured, the data was not entered into the RMS as of February 6, 1990.

Using a formula based on the total mileage of local roads, the Department calculates an average payment for each mile of locally-owned roadway. Municipalities then receive this average payment for each mile of local roadway; in FY 1988-89 municipalities received approximately $1,255 for each mile of roadway they owned. PennDOT's Bureau of Municipal Services is responsible for updating local mileage based on mileage changes reported by municipalities. Reporting of mileage changes, however, largely depends on whether there has been resurvey activity.

LB&FC staff compared the mileage of 491 municipalities surveyed in the 1930s and 1940s with their mileage as resurveyed since 1983. The review revealed a net reduction of 150.5 miles. For some municipalities the resurvey decreased the reported local mileage, for others it resulted in increased mileage. The most extreme examples include resurveyed municipalities in Berks County which together had a net reduction of 44.1 miles and resurveyed municipalities in Monroe County which had a total net addition of 42.3 miles. For years prior to the resurvey, the municipalities in these counties were annually overfunded and underfunded, respectively, Liquid Fuels Tax funds.

If 1983 to 1989 resurvey findings (19% of all municipalities resurveyed) are representative of the degree of error associated with municipal mileage figures, a total resurvey of all remaining municipalities could result in an approximate net reduction of an additional 663 miles. LB&FC staff estimates that in FY 1988-89 roughly $832,000 (net) in Liquid Fuels Tax funds may be misallocated for mileage that may have never existed or roads which are no longer on the local system. Assuming this sample is reflective of the entire local system, from 1986 to 1989 approximately $3.9 million in Liquid Fuels Tax funds may have been misallocated to municipalities. Inaccurate municipal mileage affects all municipalities because mileage comprises 50% of the allocation formula.

PennDOT has not established a plan for municipal road remeasurements. Districts individually prioritize resurvey efforts at their own initiative. If the Department continues to resurvey at its current rate of 118 municipalities per year, it would take nearly 18 years to resurvey the remaining 2,081 municipalities. The resurvey efforts that have been undertaken by the Department have been uneven across PennDOT districts. There are 16 counties in which no resurvey has taken place subsequent to the original reporting of mileage in the 1930s and 1940s; this translates into 553 municipalities. Resurvey activity across municipal type has also been uneven. Resurveys from 1983 to 1989 included 22% of all second class townships, but only 9% of cities and 10% of first class townships.

The Department is currently drafting a proposal to the Federal Highway Administration requesting funds for a pilot

program to determine the feasibility of conducting a statewide resurvey. The pilot program would, in part, examine ways to automate the current system.

Recommendations

1. *The Department should establish a plan and a timetable for districts to undertake road resurveys. This should be done either in conjunction with the proposed pilot project or as an alternate approach if the pilot project is not funded.*

2. *As an alternative to the Department conducting resurveys, consideration should be given to municipalities conducting their own resurveys. Under this alternative, the Department could provide technical assistance, in the form of equipment loans,[3/] to municipalities and conduct spot audit samplings of select municipal remeasurement efforts. The Department may also wish to further ensure the timeliness of remeasurement information by making the disbursement of Liquid Fuels Tax funds to municipalities contingent upon the receipt of local remeasurement information.*

3. *The Department should develop and provide to municipalities written procedures for notifying the Department of mileage changes on an annual basis.*

3/Equipment consists of a Distance Measurement Instrument (DMI), which costs approximately $500. Most districts have at least one available.

D-5. PUBLIC TRANSIT OVERSIGHT

A. Improved Oversight Needed of Public Transit Agencies

From FY 1984-85 to FY 1988-89 annual state operating subsidies to transit agencies increased by approximately $48 million (29%) to approximately $214 million. Although PennDOT has a statutory responsibility to promote the development of efficient and economical public transportation services in the Commonwealth, the PA Urban Mass Transportation Law limits PennDOT's authority to conduct operational or performance oversight audits of local transit agencies receiving these subsidies. State transportation departments in six of the eight states contacted by LB&FC staff indicated they conducted such operating efficiency audits of public transit agencies on a regular basis. Additionally, in 1988 the Comptroller's Office recommended that the Bureau of Public Transit conduct on-site field reviews of local transit agencies receiving state operating subsidies as part of its review of transit agencies' financial statements.

Discussion

Public Transit Operating Performance

PennDOT's Bureau of Public Transit (BPT) provides operating assistance to 20 transit agencies in urbanized areas and 19 small urban and rural transit agencies. In FY 1988-89, the BPT granted the urbanized systems approximately $214 million in operating assistance, a 29% increase over FY 1984-85. Small urban and rural transit agencies were granted approximately $1.4 million in FY 1988-89.

From FY 1984-85 to FY 1988-89 total operating expenses for transit agencies increased 27% while their operating revenues (i.e., farebox revenue) increased by only 21%. This operating revenue/expense ratio is PennDOT's primary indicator of a transit agency's financial performance. This ratio measures the degree to which a transit agency is able to cover its operating cost by its operating revenue.

The statewide ratio for urbanized systems stood at 55% in FY 1984-85 but dropped to 52% in FY 1988-89, approximating a level it had reached in FY 1980-81. The ratio not only fluctuates from one year to the next but also varies among transit systems. The ratio has declined since FY 1986-87 for the Southeastern Pennsylvania Transportation Authority (SEPTA) and since FY 1985-86 for the Port Authority of Allegheny County (PAT). Eight medium-sized systems (e.g., Erie Metropolitan Transit Authority, Capitol Area Transit, and Luzerne County Transportation Authority) have ratios that ranged from 42% to 73% in FY 1988-89. The average operating revenue/expense ratio for smaller urban systems (e.g., Beaver County Transportation Authority and Washington/

Canonsburg) dropped from 54% in FY 1984-85 to 43% in FY 1988-89. The variation among transit agencies and the overall trend of the operating revenue/expense ratio in recent years demonstrates the importance of meaningful oversight by PennDOT's Bureau of Public Transit.

Bureau of Public Transit Review of Transit Agency Performance

The Department is required by Act 1970-120, as amended, 71 P.S. §512, to develop programs designed to foster efficient and economical public transportation services. The PA Urban Mass Transportation Law, Act 1980-101, as amended, 55 P.S. §600.101 et seq., authorizes PennDOT to perform independent financial audits of the financial statements of the transit agencies; however, the act restricts the Department's authority to conduct operational oversight of local transit agencies by:

-- Limiting PennDOT to review of and recommendations concerning the transit agencies' report regarding performance levels achieved (as measured against standards and measures designated in the law and those adopted by the transit agency).

-- Not providing an enforcement mechanism to require transit grantees to implement recommendations made by the Department in response to transit agency submitted performance data.

-- Exempting transit systems operating 300 or fewer fixed-route transit vehicles during peak periods from grant reductions if operating ratios fall below set standards.

Under the PA Urban Mass Transportation Law, 55 P.S. §600.204(f), transit agencies are required to submit performance data (service standards and performance evaluation measures) to the Department. The Department is authorized to review the submissions and make recommendations regarding the performance standards or goals. The Bureau of Public Transit does not have the authority, however, to require grantees to implement any recommendations it may offer.

In FY 1988-89, the first year the Bureau received service standards and performance data from transit agencies, the Bureau recommended that at least three agencies change one of their standards. According to the Chief of the Urban Transit Division, one agency accepted the recommendation but the others did not change the standards in question.

The Bureau of Public Transit also receives annual CPA audits of each transit agency, which report the financial condition of the agencies but do not address the efficiency or effectiveness of their operations. The Bureau reviews the audits and may

request that the PennDOT Comptroller's Office conduct a field audit of a transit agency if the Bureau identifies a problem. However, the Comptroller's Office audits are financial in nature, and assessments of program performance and operating efficiency are beyond the scope of these reviews. Further, according to a member of the Comptroller's staff, the number of Comptroller field audits has decreased by 50% in recent years, and only two such audits are scheduled for FY 1990-91.

A March 1988 advisory memorandum from the PennDOT Comptroller expressed concern over the Bureau's lack of on-site field reviews. The memorandum cited deficiencies in accounting and billing procedures, CPA reporting, matching fund eligibility, and ridership counting as reasons why on-site reviews are important. The memorandum also noted that "[b]ecause there are no established procedures for field reviews, Bureau Program management have no first-hand observance as to the adequacy of the grantees operation. The program may not be operating efficiently and state funds may be used improperly."

Program Oversight in Other States

Six of eight states responding to an LB&FC questionnaire indicated that they conducted, or caused to be conducted, performance or operational audits of public transit authorities on a regular basis. In two (Virginia and California) of the six states there is a statutory requirement for these evaluations. Audit frequency varies among the states. The Departments of Transportation in Maryland, Virginia, and Michigan conduct annual performance evaluations of all transit agencies. New York has an outside consultant do a risk assessment of each transit system and conducts performance evaluations on the systems identified as being the most at risk. As a result of the risk assessments, New York audits approximately 12% of its transit systems each year. California requires each public transit agency to conduct a performance audit every third year. Regional transportation planning entities receive the audit reports and provide the results to the Department of Transportation. Three of the six states contacted provide technical assistance to assist transit agencies in implementation of performance audit recommendations.

Recommendations

1. ***The General Assembly should consider amending the PA Urban Mass Transportation Law to require PennDOT to conduct, or cause to be conducted, periodic operational/performance evaluations of transit agencies to ensure that they are operating in an efficient and economical manner.***

2. ***PennDOT provide summary information on the number and results of its operational/performance audit activities in its annual mass transit statistical report.***

E. AVIATION AND RAIL

E-1. AIRPORT HAZARD ZONING

A. Low Municipal Compliance With the Airport Zoning Act

The Airport Zoning Act, Act 1984-164, 74 Pa.C.S.A. §§5911-5920, requires that all municipalities affected by airport hazard areas enact airport hazard zoning. Airport hazard zoning regulates land use in affected areas primarily by restricting the height of buildings and objects around airports. Despite PennDOT's efforts to increase municipal compliance, only an estimated 8% of the 721 affected municipalities have enacted the required zoning.

The implementation of zoning, pursuant to the act, is required for municipalities to be in compliance with applicable zoning law, primarily the Pennsylvania Municipal Planning Code, 53 P.S. §10101 et seq. The zoning requirements of the Planning Code, with its associated implementation costs, complexity, and time lags, have hampered many municipalities from enacting airport hazard zoning. While PennDOT has assisted municipalities in complying with the act, the Department has no specific statutory responsibility for the administration or enforcement of the act. These factors have contributed to the act's low compliance rate.

Discussion

Since 1980, all Pennsylvania municipalities which have airport hazard areas have been required to enact airport hazard zoning as required by the Airport Zoning Act, 74 Pa.C.S.A. §§5911-5920. While the act does not specifically charge PennDOT with the administration and enforcement of the requirements of the act, the Department is generally responsible for administering the Aviation Code which includes in its purview the provisions of the Airport Zoning Act.

An airport hazard is any natural or man-made structure or a use of land which obstructs or hampers the airspace required for flight of aircraft during landing or takeoff. An airport hazard area is the land or water surrounding the airport on which a hazard might be established. The Federal Aviation Administration (FAA) sets forth standard airport hazard zoning height restrictions in regulation (14 C.F.R. Part 77).

According to the FAA, some objects which exceed the height limitations in general regulation may have a "substantial adverse effect upon the safe and efficient utilization of such airspace." Although these objects may present hazards to air navigation, the FAA is not able to prevent their construction without local assistance. The Airport Zoning Act provides the basis for local assistance by requiring municipalities to develop zoning requirements to control hazards to air navigation.

Approximately 721 municipalities in Pennsylvania are affected by airport hazard areas, but, according to PennDOT records, only 56 municipalities (approximately 8%) have enacted airport hazard zoning ordinances. Compliance with the Airport Zoning Act is important for the following reasons:

-- To prevent unsafe development near airports that exceeds the standards allowed in general regulation.

-- The absence of airport hazard zoning may also create problems for land developers if they are unaware of the land use restrictions. A Butler County developer, for example, began construction that would have been in violation of the Airport Zoning Act if the municipality were in compliance with the act. PennDOT was forced to intervene and stop the developer from further construction.

Since 1980 the Department has initiated various activities in support of airport hazard zoning, including efforts to increase municipal awareness of the law. In 1988, PennDOT contracted with L. Robert Kimball & Associates for approximately $98,000 for an Airport Hazard Zoning Research Project. The consultant was to a) notify affected municipalities which had not previously been contacted about their responsibilities, b) inform them of their requirements under the Airport Zoning Act, and c) provide model airport hazard zoning ordinances to these municipalities.

The consultant also reviewed existing municipal airport hazard zoning ordinances to determine whether the ordinances were in compliance with the Airport Zoning Act. This review was limited to those ordinances which municipalities voluntarily sent to the consultant. Therefore, the Department has only partial compliance information and does not have a comprehensive assessment of municipal compliance with the act.

Since the initial and partial list of municipal compliants was compiled by the consultant, the Department has not implemented a system to identify compliance with the Airport Zoning Act by all municipalities in the Commonwealth. Without this tracking, the Department may not be able to efficiently direct its future technical assistance efforts. The lack of monitoring also limits PennDOT's ability to assess aviation safety in regard to airport hazard zoning.

Factors Inhibiting Compliance

Despite PennDOT's efforts, few municipalities have enacted airport hazard zoning. The low compliance rate is due to the complexity, time, and costs of enacting zoning; lack of municipal understanding of the act's requirements; and the absence of penalties for noncompliance. Approximately 45% of Pennsylvania

municipalities do not have any type of zoning, and, according to Department of Community Affairs (DCA) officials, many seem reluctant to impose and enforce zoning. Adverse economic development impacts, liability problems and enforcement costs were cited as concerns by several municipalities and municipal associations.

The process for zoning airport hazard areas is complex. The Airport Zoning Act mandates that municipalities must zone for airport hazard areas in compliance with Section 605 of the Municipal Planning Code (MPC). The MPC dictates that, if a municipality enacts zoning, it must zone the entire municipality. As such, airport hazard zoning cannot be done piecemeal but must be part of a zoning ordinance which affects the entire municipality. Kimball & Associates suggest that rural areas without zoning would have difficulty in enacting an airport hazard ordinance due to inadequate funding. Moreover, many rural communities feel they lack the expertise to complete the zoning process. Of the municipalities surveyed by LB&FC staff which were in compliance, 50% required technical assistance to pass their ordinances.

In addition to general reluctance among municipalities to zone, one-third of all municipalities surveyed by LB&FC staff which were not in compliance felt the expense involved in passage of zoning ordinances was prohibitive. According to DCA officials, the cost of enacting zoning for most municipalities without any zoning would be at least $10,000, and the time involved would be two to three years.

Another reason for low compliance is that many municipal officials appear to be unaware of the requirements of the Airport Zoning Act. In the LB&FC survey, 55% of municipalities which were not in compliance said they did not require zoning because they either had no airports located in their municipality or had only a small airport or a small portion of their land in an airport hazard area. These statements suggest a lack of understanding of municipal requirements under the act.

Finally, another factor for the low compliance rate is the lack of penalties for noncompliance. The Airport Zoning Act gives PennDOT few tools to promote or enforce the zoning requirements. Under the Aviation Code, 74 Pa.C.S.A. §5101 et seq., PennDOT is given authority to promulgate and enforce regulations relating to airports and air safety, but the Airport Zoning Act contains no penalty for PennDOT to effectively enforce the law. Without some type of sanction, legal or administrative, to bring against municipalities for noncompliance, the Department has very little real power to enforce the law.

Comparable Legislation: The Flood Plain Management Act

To assess how PennDOT could improve the compliance rate for the Airport Zoning Act, LB&FC staff examined the implementation

of a comparable statute. Similar to the Airport Zoning Act, the Flood Plain Management Act, 32 P.S. §679.101 et seq., mandates that municipalities restrict the use of certain areas of land. In the case of flood plain management, flood prone municipalities must enact regulations to manage these areas.

In contrast to the Airport Zoning Act, the Flood Plain Management Act specifically exempts municipalities from the requirements of the Municipal Planning Code in order to comply with the provisions of the Act and authorizes municipalities to enact regulations as an alternative to zoning to manage flood plain areas. Municipal regulations applied in the Flood Plain Management Act include subdivision regulations, building codes, health regulations, special purpose ordinances, zoning ordinances and other applications of police powers. In comparison to zoning, these regulations can be less expensive, less complex, less time consuming to develop, and can be geographically targeted to height restrictions only in certain areas.

Compliance with the Flood Plain Management Act is high; ninety-five percent of the over 2000 municipalities affected by flood plain areas have some type of flood plain management regulations. The legislation identifies DCA as the primary agency for the enforcement of the act. This is in contrast to the Airport Zoning Act which does not specifically designate any administrative entity with the responsibility for the administration or enforcement of the act.

Among other factors, DCA officials cite the ease and low cost of passage of special purpose ordinances as being reasons for the high compliance rate for the act. Special purpose ordinances cost only $300 to $500 to enact and municipal adoption may take only a few weeks. In addition, the provision of a penalty clause in the Flood Plain Management Act may aid in DCA's enforcement of the law and increase compliance. In contrast to PennDOT, DCA monitors municipal compliance with the Flood Plain Management Act and can determine an overall compliance rate.

Recommendations

1. ***PennDOT should develop proposed legislation to amend the Airport Zoning Act as follows:***

   a) ***The mandatory requirement for municipal zoning of airport hazard areas should be deleted from the Airport Zoning Act. Instead, municipalities should be allowed to enact a broader range of regulations and ordinances, as permitted in the Flood Plains Management Act, to better achieve the purposes of the Airport Zoning Act.***

b) The Department should be specifically designated in the Airport Zoning Act as the agency with administrative responsibilities for implementing the act. Administrative responsibilities should include drafting, publishing and approving model airport hazard ordinances, codes and regulations; identifying and publishing the sites of airport hazard areas; and conducting compliance inspections of airport hazard areas--at least on a limited sample basis. PennDOT officials expressed concern that local enforcement of the regulations would be irregular, but that enforcement could be monitored by Metropolitan Planning Organizations through reports to PennDOT on land-use around airports. (MPOs receive much of their funding from PennDOT.)

c) A civil penalty, similar to that found in the Flood Plain Management Act (32 P.S. §679.502), should be included in the Airport Zoning Act. If civil remedies fail, state funds could be withheld from the municipality for noncompliance, in a similar manner as the withholding of funds in the Flood Plain Management Act (32 P.S. §679.501).

2. PennDOT should maintain current information on which municipalities have passed zoning ordinances to control airport hazard areas.

3. PennDOT should work with DCA in providing technical assistance to municipalities in their passage of airport hazard regulations. DCA's Peer-to-Peer Program with the Department of Environmental Resources may be one model for this type of technical assistance.

E-2. RAIL FREIGHT ASSISTANCE PRIORITIES

A. Funding Priorities Not Based on Comprehensive Plan or Set of Criteria

PennDOT does not use a comprehensive rail freight plan or a broad-based set of criteria for ranking project applications. A cost-per-job-impacted figure largely determines which applicants will share the limited funds available for accelerated maintenance and rehabilitation. As a result, the funded projects reflect an emphasis on maximizing current employment opportunities instead of preserving or developing essential services to promote long-range economic development goals.

In addition to basing its decisions primarily on a single funding criteria, PennDOT does not independently verify the job information the applicants submit, nor does the Department conduct a post-grant review to determine whether the projected job impacts were actually realized.

Discussion

Rail Freight Assistance

PennDOT provides rail freight assistance through annual programs supported by the General Fund and through a 12-year program supported by the Capital Budget. The annual program assists state-owned lines and other rail freight services with maintenance subsidies and operations subsidies for state-owned lines. The 12-year capital program supports new construction and track relocation and rehabilitation projects.

In FY 1989-90, the annual program received an appropriation of $4.5 million. The state-owned lines received approximately $1 million for maintenance and $300,000 in operating assistance. Another $500,000 went to the Department of Commerce for Economic Development Partnership projects. PennDOT ranks project applications on the basis of their costs-per-job-impacted to determine which projects should share the remaining $2,700,000. PennDOT divides the total cost of each project by the estimated primary and secondary jobs created or preserved to calculate the cost-per-job-impacted. The project with the lowest cost-per-job receives the highest priority for funding.

Project Selection

PennDOT began using the cost-per-job method of ranking applications in FY 1987-88. The ranking represents the second step in a two-tiered process for determining which projects are funded through the rail freight assistance program. Initially, the Center for Program Development and Management (Office of

Planning) calculates a benefit/cost ratio to determine eligibility for the program. States must use a benefit/cost analysis to receive federal assistance for preserving and improving light density rail lines. If a proposed project is expected to produce economic benefits in excess of project cost, the project meets the eligibility requirement.

The benefit/cost analysis entails a more detailed comparison of economic benefits and project costs than the cost-per-job-impacted. Specifically, the benefit/cost ratio takes county-specific factors, such as unemployment compensation, tax rates and public assistance, and alternative transportation options into account.

Although the cost-per-job rankings have tended to favor projects with high benefit/cost ratios, a comparison of the two criteria reveals significant differences in the results. The Program Management Committee approved a two-year program for FY 1989-90 project applications and directed the Bureau of Rail Freight, Ports, and Waterways to fund only one project per location in each fiscal year. Otherwise, the cost-per-job determined whether a project received assistance in FY 1989-90, FY 1990-91, or neither year. Nineteen of 55 eligible projects failed to qualify for funding.

The cost-per-job rankings produced the following partial result:

Cost-Per-Job Ranking

Project	Cost/Job	Rank	Funding Status
A	$ 135.14	4th	Funded 1989-90
B	709.33	22nd	Funded 1990-91
C	2,423.43	41st	Unfunded
D	10,000.00	51st	Unfunded

The benefit/cost (B/C) ratios would have produced the following ranking for these projects:

Benefit/Cost Ranking

Project	B/C Ratio	Rank	Funding Status[a/]
B	41.64	5th	Funded 1989-90
C	13.24	20th	Funded 1989-90
D	9.63	25th	Funded 1990-91
A	1.17	54th	Unfunded

a/Hypothetical funding status if the B/C ratio were used to allocate program funds instead of the cost-per-job.

A further comparison, based on projected total benefits, highlights the differences in the economic impacts of the projects. Projects C and D, which were not funded under the cost-per-job criterion, have projected benefits far in excess of cost, while project A, which was funded, has projected benefits that outweigh costs to a much lesser extent.

Comparison Based on Projected Total Benefits

Project	Total Cumulative Benefits	State Share of Total Cost
B	$3,219,480	$ 61,854
D	1,348,200	70,000
C	1,187,191	71,734
A	789,750	337,500

The cost-per-job ranking also fails to recognize any non-quantifiable or intangible factors in the selection process. For example, the cost-per-job rankings do not reflect the priorities of the rail network study mandated by the Rail Freight Preservation and Improvement Act, 55 P.S. §696.5. A consulting firm submitted the final report on "A Comprehensive Freight Rail Study for Pennsylvania" to PennDOT in January 1987. The $586,000 study received input from the General Assembly, PennDOT, other

state agencies, the railroad industry, and rail shippers through the Rail Freight Policy Committee.

The final report recommended 10 programs or strategies for preserving essential rail services. The study identified three types of lines (core, feeder, and shortline) that seemed likely to remain part of the state rail network through 1991 and would not need special attention (assistance) to preserve essential services. The report also identified lines at risk, classified them into essential and nonessential categories, and recommended creating rail economic development zones to attract industrial traffic to essential lines at risk.

Several recent projects have been funded even though they were not in the essential category as defined by the Rail Freight Study. For example, one "nonessential" shortline will receive $383,406 in state funding for FY 1989-90 and another will receive $389,064 in FY 1990-91. In addition, the report identified Project A (above) as a feeder line that would need no assistance to remain in the state rail network through 1991. In total, slightly over $1 million in state funds will be received by these three lines in FY 1989-90 and FY 1990-91, even though all three lines were identified as self-supportive through 1991 by the rail network study.

Additionally, the cost-per-job rankings do not necessarily direct rail freight assistance to the high unemployment regions of the state. The cost-per-job method treats all regions of the state as if they were virtually equal. In doing so, the method fails to realize the potential for directing state assistance to the regions of the state that have the greatest need for economic development.

Other States

Transportation departments in other states use broader sets of factors, including qualitative criteria, for their rail freight programs. New York has financial assistance guidelines that contain criteria for economic development and for rail system development. The economic considerations include the retention of industry, the creation of jobs, and the expansion of local services. The rail development criteria call for improving the transportation infrastructure, preserving rail system integrity in conjunction with other rail-related initiatives, and maintaining consistency with the Statewide Master Plan for Transportation and other strategies.

Ohio takes job impact into account but analyzes other factors to determine the benefit/cost ratio. The Ohio Department of Transportation will limit its support to technical assistance if a project will not result in cost-effective service. The factors in determining cost effectiveness include the products being

shipped and the availability of other lines in the vicinity. A project will probably fare well in the benefit/cost analysis if it will improve freight service to a critical location or increase the marketability of the line.

New Jersey gives preferential status to projects that affect lines in its core system. A core project receives 70% state support, but a non-core project receives only 50%. In addition, the railroads in the core system have an implicit guarantee that the state will purchase any line that might otherwise drop out of the system. Although the benefit/cost analysis takes job impact into account, the number of jobs does not determine the priority assigned to a project. New Jersey bases its benefit/cost ratio on a minimum number of hauled carloads. The recipient of state funds has a contractual obligation to reimburse the Department of Transportation at a specified rate per carload if the actual number falls below the minimum.

Application Verification, Adjustment, and Follow-up

PennDOT does not have written policies or guidelines for determining whether to accept or adjust the employment information that applicants submit. Reviewers of project applications must base their job-impact decisions on their personal knowledge of industries that use rail freight services. If the reviewer in the Center for Program Management and Development has a question about the potential job impact, the reviewer will discuss it with the applicant and use other information from the application forms to reach a conclusion. PennDOT does not have the legal authority to examine an applicant's personnel files or carload records, according to a PennDOT reviewer interviewed by LB&FC staff.

Staff discretion can determine whether a project applicant receives state funds. The reviewer may adjust the total number of impacted jobs to reflect industry practices or a shipper's inability to take full advantage of the improved service. A decision to reduce the number of impacted jobs increases the cost-per-job proportionately and decreases the prospects for the project to receive state funding.

At the discretion of staff, project proposals that appear to have distinct phases can be split and funded in individual annual phases. Total impacted jobs are assigned to each phase, as are project (phase) costs, but PennDOT has not established guidelines for when to split projects into phases or for how to allocate estimated jobs and costs into the various phases. Splitting a recent proposal into three phases placed one phase in the FY 1990-91 budget and left the other two phases unfunded because of the one-project-per-location-per-year limit imposed by the Department. The three phases would otherwise have qualified for funding as a single project.

The Department does not conduct post-grant reviews of the job impacts of completed projects. According to the Director of the Bureau of Rail Freight, Ports and Waterways, the Bureau does not have the staff resources to evaluate the impacts of completed projects. The absence of such follow-up curtails PennDOT's ability to provide program oversight. It also limits the Department's ability to assess the program in regards to impacted employment.

Rail Freight Advisory Committee

The members of the recently-formed Rail Freight Advisory Committee have expressed an interest in looking into the rail freight assistance program. PennDOT needs to take a more systematic approach to assigning priorities, in the opinion of a Committee officer, who suggested that saving or creating jobs would serve more appropriately as one element in a set of criteria. PennDOT needs to give priority to projects that bring entire shortlines up to standard instead of benefiting only one user, in the opinion of another Committee officer.

The assistance program also needs more flexibility in responding to emergency situations that threaten rail freight services, according to both officers. Currently, applicants for emergency assistance must wait until the next funding cycle if PennDOT does not have uncommitted General Fund appropriations for rail freight or cannot include the project in a capital budget request. Finally, PennDOT needs to devote more attention to identifying lines that might be abandoned or sold off by their operators two or three years later, according to an officer of the Rail Freight Advisory Committee.

Recommendations

1. ***PennDOT staff should work with the Rail Freight Advisory Committee to develop a broader set of criteria for determining rail freight assistance priorities. It is recommended that, in addition to the cost-per-job criterion, the following factors also be considered for inclusion in the Department's funding criteria:***

   a) ***An update of the 1987 comprehensive study to determine the status of the core rail network and the lines at risk.***

   b) ***Rail line preservation needs identified by regional planners.***

   c) ***Statewide transportation initiatives and intermodal strategies.***

   d) ***Cost effectiveness, benefit/cost measures, and criteria (low employment, distressed communities) that other state agencies use to determine economic impact.***

2. *PennDOT should develop written procedures and guidelines for assessing the validity of job impact claims, for adjusting the project applicant's information when the applicant's claims cannot be supported, and for determining when and how projects should be split into multiple phases.*

3. *The Department should conduct post-grant reviews, if only on a sample basis, to determine whether job impacts were realized and to determine whether PennDOT's procedures for estimated jobs are realistic. As necessary, to properly assess economic impact, such reviews or analyses should be done in cooperation with the Department of Commerce.*

F. ADMINISTRATION

F-1. USE OF CONSULTANTS

A. PennDOT's Management of Non-Highway Consultant Contracts

LB&FC staff reviewed six recently completed contracts which the Department held with non-highway consultants to determine if the consultant met contract objectives, submitted all required deliverables to the Department, and delivered all progress reports. This review found that the consultants met most of the contract requirements and that the Department's monitoring of the consultant's work included sound management practices.

Discussion

LB&FC staff reviewed six recently completed (non-highway) consultant contracts to assess departmental contract management procedures.[1/] The six contracts represent various types of consultant services which were administered by five different bureaus within PennDOT. The cost for the six contracts was approximately $2.9 million.

The consultant contracts reviewed covered a variety of services and activities, including: training sessions for Driving Under the Influence (DUI) programs, preparation of zoning ordinances for municipalities affected by airport hazard zones, design of a computer system for automated vehicle registration and titling, development of a computer mapping system, administration of an FHWA demonstration bonding program, and training and technical assistance to disadvantaged and women business enterprises.

According to the Governor's Office of the Budget, Management Directive M215.6 and supplementary manual 215.1, contracts with consultants are to include work statements which define the specific objectives to be achieved, the detailed tasks needed to meet these objectives, the specific deliverables which result from the tasks, and the reports required of the consultant for contract management.

1/Four of the contracts were selected from a Financial Management Information System (FMIS) listing of non-engineering consultant services and unspecified professional services for FY 1987-88 and FY 1988-89. One contract was selected from work done by eight consultants for PennDOT's "Leading Edge" computer system and one contract was selected from an LB&FC staff review of PennDOT programs.

LB&FC staff focused its review on whether the Department's management of consultant contracts resulted in (a) fulfillment of contract objectives, (b) completion of required deliverables, (c) submission of written progress reports, and (d) adherence to cost and time schedules.

Project Managers

All six contracts sampled had assigned project managers. Some of the managers were selected on the basis of their expertise in the consultant contract area, while others were assigned because the contract fell under their program area. For some contracts, a "team" or "committee" of PennDOT staff was formed to monitor the contract. For instance, one contract had a project manager who was responsible for technical review of the consultant's work and an administrative manager who was responsible for fiscal and administrative review of the consultant's work. According to the project managers, the main reason for the use of a consultant for most of these projects was an inadequate number of PennDOT staff.

Contract Objectives

Each of the contracts contained specific objectives. Overall, PennDOT's management of the six contracts resulted in most objectives being met by the consultant. In five of the six contracts, all of the original contracted objectives were met. Only in one instance were the contract's original objectives changed as PennDOT and the consultant reevaluated the scope of the contract. (Some of the original objectives were dropped after this reevaluation and funding was allocated to other objectives).

Deliverables

Four of the contracts contained clearly defined products which were to be delivered to the Department, while two contracts for supportive services listed/emphasized activities in which the consultant was to participate along with several actual products for delivery. The Department's management of contracts resulted in most deliverables being submitted. In five of the six contracts, all deliverables were submitted to PennDOT. One project manager did not receive a final report on the consultant's work because the company entered bankruptcy at the conclusion of the program. This project manager, however, did receive all other deliverables.

In addition to ensuring that the deliverables were submitted to the Department, all project managers assessed the quality of the submitted products or services. These evaluations of the product or service quality included internal PennDOT reviews and PennDOT staff attendance at seminars sponsored by the consultant.

From each of these contracts, the Department appears to have obtained useful products or services; in many cases, the Department continues to use the end products delivered by the consultant.

Monitoring

The project managers' monitoring of the six consultants appeared to apply sound management practices. All of the six contracts required the consultant to report to PennDOT on their progress; five of the six contracts required monthly and/or quarterly written reports and a final report. A single contract required only one final report from the consultant. LB&FC staff found that, except for the one consultant which did not provide a final report due to bankruptcy, the consultants delivered all written reports which were required by project managers for monitoring purposes.

Project managers supplemented their review of these written reports with other monitoring activities, including biweekly or monthly meetings with the consultant's staff, numerous meetings with key consultant personnel, pilot demonstrations of the consultant's products, and reviews of consultant records.

PennDOT's monitoring of consultants' progress appears to be adequate in ensuring adherence to both time and cost schedules. Three of the contracts were completed both on-time and on-budget. For the three other contracts, the consultants' work ran over schedule. The scope of one consultant's contract was expanded with a corresponding increase in budget, a second contract for supportive services was extended for two months at a prorated monthly cost, and a third consultant's contract for supportive services was extended by two months since the consultant had not exhausted all of the contract funding.

F-2. COMPUTER VIRUS

A. Security Measures Taken to Prevent Computer Virus

PennDOT has taken various steps to prevent a computer virus infection of or through its 1,065 personal computers (PCs). Computer virus prevention guidelines have been issued to users, and a Master Policy Manual statement has been developed which addresses, among other things, PC security. Since it is entirely the PC user's responsibility to assure that personal computers are used in accordance with the established guidelines, the Department does not have reasonable assurance that the guidelines and policies are being adhered to.

PennDOT controls PC transmittal of viruses to its mainframe computer through the issuance of a "PC Account." A "PC Account" is only issued to authorized users in order to properly control uploading/downloading between the PCs and the mainframe computer. The "PC Account," however, does not restrict initial access to personal computers. The mainframe contains all of the Department's major data systems, such as driver license, vehicle registration and roadway information. As such, a PC transmitted virus could be disastrous.

The Department has also purchased PC virus detection software that will soon be distributed to all PC users. PennDOT personal computers, however, are not equipped with a computer access control device, (i.e., user identifications/passwords are not used to access PCs). As such, initial access to the PCs is virtually unrestricted. Finally, the Department's Automated Disaster Recovery Plan does not include contingency plans in the event of a computer virus infection.

Discussion

The 1988 LB&FC computer virus study indicated that all computers are susceptible to a "computer virus" attack. "Computer virus" refers to an unwanted program or set of instructions inserted into a computer's memory, operating system, and/or its application programs. The virus can replicate itself and infect other programs or files. This allows the virus to rapidly spread throughout a computer system or to other computers in the same manner a biological virus spreads among people.

While some computer viruses have had relatively harmless effects, others have been quite destructive. Computer viruses can, for example, result in the erasure of data and programming from infected computer systems. Computer viruses can also be constructed to attack the integrity of data, causing inaccuracies and harmful manipulations to occur which are sometimes difficult to detect.

The October 1989 interim report to this audit (Volume II, pp. 82-83) reported on PennDOT's efforts to prevent a computer virus from infecting its mainframe computer. The purpose of this review is to identify PennDOT actions to protect its 1,065 personal computers against the threat of a computer virus.

The Department has established user guidelines that specifically address ways to prevent PC virus infection. The Department has also developed draft PC guidelines pending review and approval by the Office of Administration before distribution to PennDOT staff. Additionally, the Department's Master Policy Manual includes a policy statement on microcomputers (personal computers). The PC guidelines and Master Policy Statement cover PC security but not virus prevention per se.

Computer Virus Guidelines and PC Policies

The 1988 LB&FC study of computer "viruses" listed 21 security controls to prevent and detect computer viruses. These controls are generally applicable to personal computers. PennDOT has implemented most of these security controls. PennDOT computer virus guidelines, for example, direct employees to:

-- Not use pirated or copied software (i.e., any software that does not come in factory sealed containers).

-- Not use software from home computers.

-- Maintain clean backup data in case working data becomes infected and has to be erased.

One of the PC security measures not implemented by PennDOT is the restriction of PC access through user identifications/passwords. User identifications/passwords restrict access to only those employees so authorized to use various PC programs and software. According to a Bureau of Information Systems (BIS) official, PennDOT had considered purchasing a PC access control device, however, other automated technology needs took precedence. Computer security experts indicate passwords and user identifications are one of the keys to preventing a computer virus infection.

Enforcement of Policies and Guidelines

The LB&FC computer virus study emphasized the importance of developing and enforcing security policies to prevent a computer virus. An April 1988 Computer & Security article also notes that one way to reduce viral risks is to "first enforce existing rules and take proper disciplinary action when practices and procedures are knowingly violated."

According to a BIS official, the Department has no assurance that PC users are complying with its computer virus guidelines or PC policy statement. PennDOT's Master Policy Manual statement on microcomputers states that it is the responsibility of the user to protect the microcomputer resources and data from damage and unauthorized or unintended modification. The Bureau of Information Systems officials are not aware of any known violations of their PC policy statement or computer virus guidelines.

Disaster Recovery Plan

The LB&FC computer virus report also indicated that, "a good contingency plan and clean back-up files are essential for recovery from a virus." However, the Department's Automated Disaster Recovery Plan does not address ways to plan for or recover from a PC disaster. PennDOT's current disaster recovery plan only mentions security procedures for data stored on mainframe computers and procedures to respond to a disaster in the data center of the BIS.

"PC Account"

PennDOT implemented an important security measure to restrict the transferring of information between the PCs and the mainframe computer. This was done through the issuance of a "PC Account." To obtain a "PC account," approval is needed from the bureau director(s) responsible for the information to be accessed and the BIS Security Officer. The "PC account" only authorizes the PC user to access that part of the mainframe which stores the data or files that the computer user needs to obtain.

Virus Detection Device

The purchase of a PC virus detection software is another security measure the Department plans to use to reduce the potential of a computer virus infection. According to the software description, the program will only scan for certain characteristics of the limited number of known viruses at the time the program was written. If new viruses appear in the future, it is unlikely that this program will detect them. Back-up copies may also be made for added security. PennDOT plans to have the program available for use on all personal computers by May 1990.

Recommendation

1. ***The Department's PC security could be enhanced by implementing additional measures such as:***

   a) ***Implementation of an access control device which would require user identifications/passwords to access programs and data stored on personal computers.***

b) Developing a means to enforce the current PC policy and computer virus guidelines. The Department's PC environment could be audited by Electronic Data Processing (EDP) auditors or internal auditors (i.e., the Department's Comptrollers) to assure that PC users are adhering to the Department's computer virus guidelines and PC policy statement.

c) Updating the Automated Data Processing disaster recovery plan to include PC information and provide contingency plans in the event of a computer virus infection.

IV. BACKGROUND INFORMATION

EXHIBIT J

PENNDOT LEGAL BACKGROUND[*/]

The Pennsylvania Department of Transportation (PennDOT), an administrative department of state government, is responsible for all modes of the Commonwealth's transportation system. In this role, the Department has the statutory responsibility for constructing, reconstructing, maintaining and repairing all roads included in the state highway system, administering the Aviation Code, the PA Urban Mass Transportation Law, the Vehicle Code, and the Motor License Fund, among others.

PennDOT was originally established as the State Highway Department under the Act of 1911, May 31, P.L. 468. The name was changed to the Department of Highways by the Act of 1923, June 7, P.L. 498, and to the Department of Transportation by Act 1970-120, as amended, 71 P.S. §511 et seq.

Duties and responsibilities given PennDOT under Act 1970-120 include developing programs to ensure that adequate, safe and efficient transportation facilities and services are provided at reasonable cost to the citizens of the Commonwealth with planning and development of such facilities and services to be coordinated through the creation of the Department. PennDOT has the overall responsibility for a balanced transportation policy, research, planning and development. Specifically, PennDOT has, among others, the power and duty to:

- Develop and maintain a continuing, comprehensive and coordinated transportation planning process.

- Coordinate the transportation activities of the Department with those of other public agencies and authorities, both state and federal.

- Develop the 12-year transportation plan.

- Purchase and maintain all materials, machinery, supplies and equipment necessary for the construction and repair of highways and state-owned airports, including selling, purchasing or leasing right-of-ways.

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*/This background is intended to provide an overview of the powers and duties of PennDOT by highlighting its responsibilities in several statutory areas; however, the information provided is not intended to represent a detailed and comprehensive discussion of the Department's statutory responsibilities in these or other areas.

- Provide advice and information to county, city, borough, township or incorporated town officers regarding the design, construction, repairing, alteration and maintenance of highways and bridges.

Highways

The State Highway Law, the Act of 1945, June 1, P.L. 1242, as amended, 36 P.S. §670-101 et seq., gives PennDOT specific duties and responsibilities in the construction, reconstruction, repair and maintenance of state-designated highways.

The Road Turnback Program, established by Act 1983-32, 75 Pa.C.S.A. §9201 et seq., allows the Department to transfer state-designated highways to municipalities in which the highway is located. Upon transfer, the municipality assumes responsibility for the maintenance and repair of the highway.

Motor Vehicles

PennDOT is responsible for the administration of the Vehicle Code, Act 1976-81, as amended, 75 Pa.C.S. §101 et seq., which gives the Department responsibility for issuing certificates of title and registration, driver licensing, financial responsibility, inspection and operation of vehicles, vehicle characteristics, and general administration and enforcement provisions.

Act 1985-20, 75 Pa.C.S.A. §4704, implements the Motor Carrier Safety Assistance Program, 49 U.S.C.A. app. §2501 et seq., in Pennsylvania and gives any police officer or Commonwealth employee engaged in weighing vehicles or a systematic vehicle inspection program the authorization to inspect a vehicle's equipment, driver, documents, or load to determine whether they meet the standards established by department regulations.

Act 1976-81, 75 Pa.C.S. §4901 et seq., provides for the size, weight, and load limitations for motor carriers and establishes fines for violations of these provisions.

Funding

The Motor License Fund was established by the Act of May 1, 1929, P.L. 1046 which was later repealed by Act 1970-120. Use of monies from the Motor License Fund are restricted by the limitations established by the Pennsylvania Constitution and the Administrative Code. The funds are comprised of fines, fees, taxes, etc., collected by the Department. PennDOT uses these

funds for the payment of salaries and wages of PennDOT employees, to purchase supplies, equipment, fuel, motor vehicles, etc., and for constructing, improving, maintaining, and repairing state-aid highways.

The Liquid Fuels Tax Act, the Act of 1931, May 21, P.L. 149, as amended, 72 P.S. §2611a et seq., imposes a tax on all liquid fuels used or sold and delivered by distributors within the Commonwealth. The taxes collected are allocated to municipalities for construction, reconstruction, maintenance and repair of roads, highways and bridges.

Mass Transportation

The Pennsylvania Urban Mass Transportation Law, Act 1980-101, as amended, 55 P.S. §600.101 et seq., directs PennDOT to undertake and provide financial support for research concerning urban common carrier mass transportation. PennDOT makes grants to municipalities, counties, or agencies of the Commonwealth for the purpose of conducting studies, analysis, planning and development of programs, and additionally makes grants from the State Lottery Fund to transportation agencies to enable them to provide free service to persons who are sixty-five or older.

The Rail Freight Preservation and Improvement Act, Act 1984-119, as amended, 55 P.S. §696.1 et seq., empowers PennDOT to preserve and improve rail freight service in the Commonwealth by making grants, loans, and other assistance available to qualified applicants.

Aviation

The Aviation Code, Act 1984-164, 74 Pa.C.S.A. §5101 et seq., authorizes PennDOT to provide for the examination, rating and licensing of airports and commercial operators and assist in the establishment and construction of airports.

Federal Laws

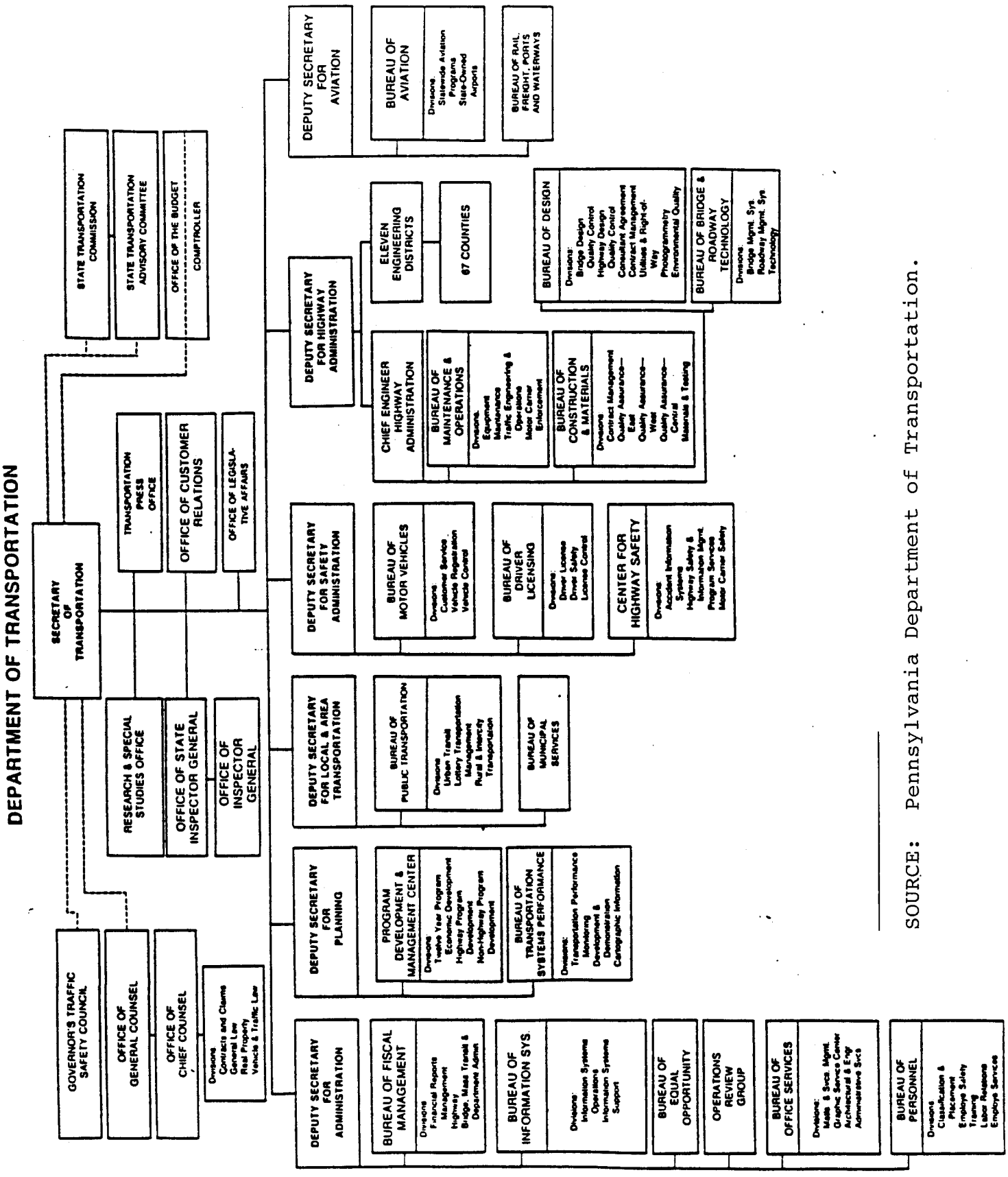
In addition to the various state laws described above, there are various federal laws impacting upon the activities of the Department. The most notable include:

- The Federal-Aid Highway Act, Pub.L. 85-767, as amended, 23 U.S.C.A. §101 et seq., provides funding to states for the construction and maintenance of roads. The Department may receive 75% to 100% funding for projects under this Act, depending upon the type of project and type of funding.

- The Commercial Motor Vehicle Safety Act of 1986, Pub.L. 99-570, 49 U.S.C.A. app. §2701 et seq., provides for the testing and licensing of commercial motor vehicle drivers.

- The Motor Carrier Safety Act of 1984, Pub.L. 98-554, as amended, 49 U.S.C.A. app. §2501 et seq., promotes the safe operation of commercial motor vehicles, minimizes danger to the health of commercial motor vehicle operators, and assures increased compliance with traffic laws and with the commercial motor vehicle safety and health rules, regulations, and standards established pursuant to this Act.

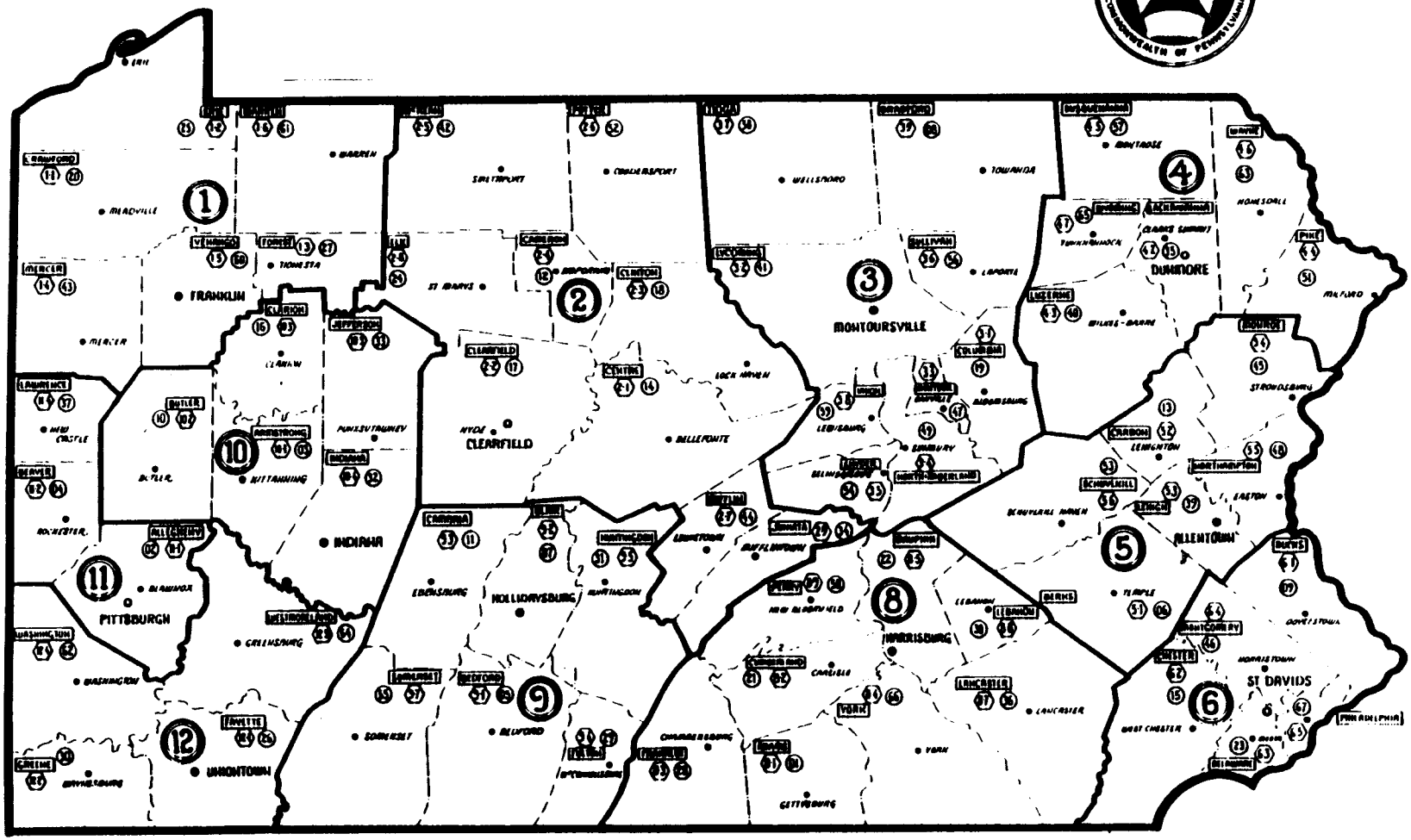
- The Clean Air Act, 42 U.S.C.A. §7401 et seq., sets emission standards for motor vehicles or motor vehicle engines. States may receive grants in an amount up to two-thirds of the cost of developing and maintaining effective vehicle emission devices and systems inspection and emission testing and control programs.



SOURCE: Pennsylvania Department of Transportation.

EXHIBIT L

DISTRICT/COUNTY MAINTENANCE ORGANIZATIONS



SOURCE: Pennsylvania Department of Transportation.

EXHIBIT M

PENNDOT PROGRAM FUNDING SUMMARY
(Dollar Amounts in Thousands)

	1986-87 Actual	1987-88 Actual	1988-89 Actual	1989-90 Available	1986-87 to 1989-90 % Change
Transportation Support Services[a]					
General Funds	$ 1,339	$ 1,442	$ 1,335	$ 1,537	14.79%
Special Funds	22,626	23,511	24,408	26,069	15.22%
Federal Funds	5,531	4,642	3,879	4,099	-25.89%
Other Funds	914	529	322	0	-100.00%
Total	$ 30,410	$30,124	$29,944	$31,705	4.26%
State Highway and Bridge Construction/Reconstruction					
General Funds	$ 100	$ 0	$ 0	$ 50	-50.00%
Special Funds	175,000	188,540	205,730	302,869	73.07%
Federal Funds	495,827	506,451	655,075	692,700	39.71%
Other Funds	200,660	167,132	114,557	99,178	-50.57%
Total	$871,587	$862,123	$ 975,362	$1,094,797	25.61%
State Highway and Bridge Maintenance					
General Funds	$ 0	$ 711	$ 914	$ 986	38.68%[b]
Special Funds	632,447	638,356	692,032	687,814	8.75%
Federal Funds	161,128	162,123	133,098	190,200	18.04%
Other Funds	9,269	12,380	30,117	1,200	-87.05%
Total	$802,844	$813,570	$856,161	$880,200	9.64%
Local Highway and Bridge Assistance					
General Funds	$ 0	$ 0	$ 0	$ 0	0.00%
Special Funds	158,476	157,719	163,191	233,426	47.29%
Federal Funds	304	346	431	3,000	886.84%
Other Funds	97,589	94,346	94,419	43,000	-55.94%
Total	$256,369	$252,411	$258,041	$279,426	8.99%
Urban Mass Transportation					
General Funds	$179,586	$210,271	$213,682	$229,366	27.72%
Special Funds	0	0	0	0	0.00%
Federal Funds	0	0	0	0	0.00%
Other Funds	0	0	0	0	0.00%
Total	$179,586	$210,271	$213,682	$229,366	27.72%

a/This program provides for the administrative and overhead services which support the operations of programs necessary for the achievement of Commonwealth and Department objectives.

b/The percent change was calculated using the 1987-88 data instead of the 1986-87 data as in the other calculations.

EXHIBIT M
(Continued)

	1986-87 Actual	1987-88 Actual	1988-89 Actual	1989-90 Available	1986-87 to 1989-90 % Change
Lottery Funded Transit Programs					
General Funds	$ 0	$ 0	$ 0	$ 0	0.00%
Special Funds	115,721	119,935	124,031	127,818	10.45%
Federal Funds	0	0	0	0	0.00%
Other Funds	0	0	0	0	0.00%
Total	$115,721	$119,935	$124,031	$127,818	10.45%
Rural and Intercity Rail and Bus Transportation					
General Funds	$ 8,456	$ 7,556	$ 8,481	$ 9,267	9.59%
Special Funds	0	0	0	0	0.00%
Federal Funds	7,034	6,871	6,238	11,035	56.88%
Other Funds	2,168	464	1,053	5,000	130.63%
Total	$17,658	$14,891	$15,772	$25,302	43.29%
Air Transportation					
General Funds	$ 325	$ 375	$ 400	$ 400	23.08%
Special Funds	0	0	0	19,406	9.27%[c/]
Federal Funds	950	1,027	4,927	5,424	470.95%
Other Funds	11,879	13,642	17,760	1,000	-91.58%
Total	$13,154	$15,044	$23,087	$26,230	99.41%
Safety Administration and Licensing					
General Funds	$ 1,505	$ 1,550	$ 1,612	$ 1,676	11.36%
Special Funds	48,416	44,477	48,541	58,254	20.32%
Federal Funds	1,735	1,781	1,268	2,177	25.48%
Other Funds	12,471	13,276	17,386	9,000	-27.83%
Total	$64,127	$61,084	$68,807	$71,107	10.88%
Total PennDOT Programs					
General Funds	$ 191,311	221,905	226,424	243,282	27.16%
Special Funds	1,152,686	$1,172,538	1,257,933	1,455,656	26.28%
Federal Funds	672,509	683,241	804,916	908,635	35.11%
Other Funds	334,950	301,769	275,614	158,378	-52.72%
Total	$2,351,456	$2,379,453	$2,564,887	$2,765,951	17.63%

c/The percent change was calculated using the 1988-89 data instead of the 1986-87 data as in other calculations.
Source: 1988-89, 1989-90 and 1990-91 Governor's Executive Budget.

EXHIBIT N-1

PennDOT's Operating and Administrative Expenditures
(FY 1985-86 to FY 1988-89)

	FY 1985-86	FY 1986-87	FY 1987-88	FY 1988-89	% Change FY 1985-86 FY 1988-89
Total Operating Expenditures	$2,208,194,958	$2,313,750,094	$2,496,249,632	$2,593,450,815	17.45%
General Government Operations (GGO)[a/]	$ 21,068,223	$ 22,101,004	$ 21,404,362	$ 22,694,225	7.72%
Total (non GGO) Administrative Expenditures[b/]	$ 95,085,013	$ 96,387,637	$ 128,211,375	$ 121,511,999	27.79%
Total Department Expenditures	$2,324,348,194	$2,432,238,735	$2,645,865,369	$2,737,657,039	17.78%
Operating Expenditures as a Percent of Total Expenditures	95.00%	95.13%	94.35%	94.73%	
GGO as a Percent of Total Department Expenditures	.91%	.91%	.81%	.83%	
Administrative Expenditures as a Percent of Total Department Expenditures	4.09%	3.96%	4.85%	4.44%	

a/The GGO appropriation includes major areas of support, such as legal, budgetary, accounting, personnel, procurement, information services and public relations matters.
b/Some expenditure categories are classified as "administrative" in the Department's Financial Management Information System since the Federal Highway Administration will not reimburse these expenditures as direct project costs.

Source: Department of Transportation, Financial Management Information System (FMIS) reports.

EXHIBIT N-2

Summary of Administrative and
Operating Expenditures by Appropriation

	FY 1985-86	FY 1988-89	% Change FY 85-86 FY 88-89
General Fund			
Administrative ..	$ 1,323,738	$ 2,116,406	59.88%[a/]
Operations	338,654,769	450,656,870	33.07%
Approp. 181 (Aviation)			
Administration ..	$ 1,053,722	$ 1,655,999	57.16%
Operations	10,695,251	18,001,990	68.32%
Approp. 183 (Safety & Licensing)			
Administration ..	$ 736,785	$ 1,603,453	117.63%[b/]
Operations	80,082,692	86,719,155	8.29%
Approp. 185 (Highway & Safety Improvement)			
Administration ..	$ 32,477,749	$ 40,810,949	25.66%[c/]
Operations	885,539,331	1,148,442,149	29.69%
Approp. 187 (Highway Maintenance)			
Administration ..	$ 59,493,019	$ 75,325,192	26.61%[c/]
Operations	893,222,916	889,630,651	-0.40%
Appropriation 191 (General Government Operations)			
General Government Operations	$ 21,068,223	$ 22,694,225	7.72%
Total Department Expenditures	$2,324,348,195	$2,737,657,039	17.78%

a/Department attributes increase to two new programs: Operation of Welcome Centers and Goods Movement Operations.
b/Department attributes increase to salaries and benefits as a result of reorganization in the Deputy Secretary's Office.
c/Department attributes increase to salaries, wages, benefits, and payments of maintenance contracts.

Source: Pennsylvania Department of Transportation, Financial Management Information System (FMIS) reports.

EXHIBIT O

PENNDOT PERSONNEL SUMMARY
(As of April 30, 1990)

	Authorized Positions	Filled Positions	Percent Filled/ Authorized
CENTRAL OFFICE[a/]			
Secretary's Office			
Executive Office	7	7	
Chief Counsel	84	79	
Press Office	4	4	
Research and Studies	10	10	
Secretary to the Transportation Commission/Advisory Committee	1	1	
Legislative Affairs	4	4	
Customer Relations	32	30	
Total - Secretary's Office	142	135	95.1
Deputy Secretary for Administration			
Deputy Office	2	2	
Personnel	56	53	
PA Management Interns	2	2	
Information Systems	177	172	
Fiscal Management	17	16	
Office Services	102	97	
Equal Opportunity	16	17	
ORG	17	13	
Total - Administration	389	372	95.6

a/In certain instances, Filled Positions are larger than Authorized Positions. This occurs when the turnover rate is high in a scarce skill area and the Department allows the Authorized Positions to be overfilled. This is done with the knowledge that the complement level will quickly fall back within authorized levels because of continuing turnover.

EXHIBIT O (Continued)

	Authorized Positions	Filled Positions	Percent Filled/ Authorized
Deputy Secretary for Highway Administration			
Deputy Office	6	6	
Construction and Materials	163	160	
Design	183	178	
Bridge and Roadway Technology	51	51	
Maintenance and Operations	139	134	
Motor Carrier Enforcement	72	70	
Total - Highway Administration	614	599	97.6
Deputy Secretary for Planning			
Deputy Office	16	16	
Transportation Systems Performance	50	49	
Program Development and Management	43	40	
Total - Planning	109	105	96.3
Deputy for Local and Area Transportation			
Deputy Office	2	2	
Public Transportation	27	24	
Municipal Services	18	17	
Total - Local and Area Trans.	47	43	91.5
Deputy Secretary for Safety Administration			
Deputy Office	11	11	
Motor Vehicles	712	704	
Driver License	247	244	
Center-Highway Safety	73	71	
Total - Safety Administration	1,043	1,030	98.8
Deputy Secretary for Aviation			
Deputy Office	2	2	
Aviation	105	101	
Rail, Freight, Port	10	10	
Total - Aviation	117	113	96.6

EXHIBIT O (Continued)

DISTRICTS/COUNTIES[b/]	Authorized Positions	Filled Positions	Percent Filled/ Authorized
1-0 Franklin Engineering District			
Engineering District Office	246	238	
Crawford	139	136	
Erie	156	156	
Forest/Warren	132	130	
Mercer	144	141	
Venango	93	90	
Total - District 1-0 Office	910	891	97.9
2-0 Clearfield Engineering District			
Engineering District Office	248	255	
Cameron Reg. Repair Facility ...	13	13	
Centre	115	114	
Clearfield	135	133	
Clinton	75	74	
Cameron/Potter	97	96	
McKean/Elk	120	116	
Mifflin/Juniata	99	94	
Total - District 2-0 Office	902	895	99.2
3-0 Mountoursville Engineering District			
Engineering District Office	264	258	
Columbia/Montour	138	136	
Lycoming/Sullivan	181	176	
Northumberland	103	98	
Snyder/Union	102	98	
Tioga	113	105	
Bradford	137	134	
Total - District 3-0 Office	1,038	1,005	96.8

b/The engineering districts and county offices are allowed to temporarily exceed complement levels each year so that new engineers and technicians can be hired. Attrition in other job classes brings them back to authorized levels.

EXHIBIT O (Continued)

	Authorized Positions	Filled Positions	Percent Filled/ Authorized
4-0 Dunmore Engineering District			
Engineering District Office	264	258	
Lackawanna	119	116	
Luzerne	138	134	
Pike	56	55	
Susquehanna/Wyoming	171	166	
Wayne	100	100	
Total - District 4-0 Office	848	829	97.8
5-0 Allentown Engineering District			
Engineering District Office	263	255	
Berks	119	115	
Pocono Maint. Org.	157	154	
Lehigh	101	97	
Northampton	96	93	
Schuylkill	120	118	
Total - District 5-0 Office	856	832	97.2
6-0 St. Davids Engineering District			
Engineering District Office	443	438	
Bucks	141	129	
Chester	152	141	
Delaware	79	76	
Montgomery	145	131	
Philadelphia	78	73	
Total - District 6-0 Office	1,038	988	95.2
8-0 Harrisburg Engineering District			
Engineering District Office	311	315	
Adams	79	80	
Cumberland/Perry	173	167	
Franklin	95	94	
York	171	164	
Dauphin/Lebanon	174	170	
Lancaster	174	164	
Total - District 8-0 Office	1,177	1,154	98.1

EXHIBIT O (Continued)

	Authorized Positions	Filled Positions	Percent Filled/ Authorized
9-0 Hollidaysburg Engineering District			
Engineering District Office	269	268	
Bedford/Fulton	182	180	
Blair	87	86	
Cambria	129	126	
Huntingdon	98	93	
Somerset	155	147	
Total - District 9-0 Office	920	900	97.8
10-0 Indiana Engineering District			
Engineering District Office	245	242	
Armstrong	119	117	
Butler	137	136	
Clarion	99	96	
Indiana	142	135	
Jefferson	100	94	
Total - District 10-0 Office ...	842	820	97.4
11-0 Pittsburgh Engineering District			
Engineering District Office	357	348	
Allegheny	243	238	
Beaver/Lawrence	178	177	
Tunnels	74	69	
Total - District 11-0 Office ...	852	832	97.7
12-0 Uniontown Engineering District			
Engineering District Office	238	242	
Fayette	120	120	
Greene	92	84	
Washington	180	170	
Westmoreland	198	191	
Total - District 12-9 Office ...	828	807	97.5
Totals	12,672	12,350	97.5

Source: PennDOT's Bureau of Personnel, Personnel Strength and Activity Report as of April 30, 1990.

CHAPTER 97
DEPARTMENT OF TRANSPORTATION PRODUCTIVITY

Sec.
9701. Legislative oversight.

§ 9701. Legislative oversight.

(a) Findings.—The General Assembly hereby finds that imposition of a tax on oil company revenues should provide the Department of Transportation with an annual growth in revenues which offsets the growth in highway maintenance and construction costs more effectively than the annual changes in revenues produced by the flat-rate tax on the retail price of gasoline and by the various other taxes and fees levied on behalf of the department. As a result of such a tax on oil company revenues, the Department of Transportation should have sufficient revenues to carry out necessary maintenance and construction activities with less frequent increases in highway taxes and fees than the General Assembly has enacted in recent years. One effect of less frequent requests for highway tax and fee increases could be a significant decrease in the ability of the General Assembly to oversee the activities of the Department of Transportation. Accordingly, the General Assembly finds that responsible legislative oversight requires ongoing monitoring of the department's activities and periodic indepth evaluations of its performance.

(b) Annual reports.—No later than 30 days after the effective date of this section, the department shall, upon request, provide to any member of the House of Representatives and to any member of the Senate a brief outline of the maintenance and construction program planned for that member's district during the 1981-1982 fiscal year. No later than 30 days before the beginning of the 1982-1983 fiscal year and each subsequent fiscal year, the department shall, upon request, provide to any member of the House of Representatives and to any member of the Senate a brief outline of the maintenance and construction program planned for that member's district during the upcoming fiscal year. No later than 30 days after the end of the 1981-1982 fiscal year and each subsequent fiscal year, the department shall, upon request, provide to any member of the House of Representatives and to any member of the Senate a brief outline of the reasons for any major deviations from the maintenance and construction program which had been planned for that member's district during that fiscal year.

(c) Performance audits.—During the 1983-1984 fiscal year, the Legislative Budget and Finance Committee shall conduct, or cause to be conducted, a performance audit of the department carried out in accord-

ance with the standards for performance and financial compliance auditing developed by the United States General Accounting Office. The performance audit shall determine whether the department is conducting authorized activities or programs in a manner consistent with accomplishing the objectives intended by the General Assembly and is conducting programs or activities and expending available funds in a faithful, efficient, economical and effective manner. The Legislative Budget and Finance Committee shall make a written report of the findings of the performance audit and shall submit a copy of that report to each member of the House of Representatives and each member of the Senate prior to enactment of a maintenance and construction budget for the department for the 1984-1985 fiscal year. During the 1989-1990 fiscal year and every six years thereafter, the Legislative Budget and Finance Committee shall conduct, or cause to be conducted, a performance audit of the department similar to the performance audit required by this subsection to be conducted during the 1983-1984 fiscal year.

Section 4. Section 3 of this act shall take effect immediately and shall be applicable to petroleum revenue received on and after the first day of the first full calendar month subsequent to enactment. The remainder of the act shall take effect in 60 days.

APPROVED—The 23rd day of June, A. D. 1981.

DICK THORNBURGH

EXHIBIT Q

Highway Users Federation
FOR SAFETY AND MOBILITY
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036

STATE MOTOR FUEL TAX RATES

(cents per gallon)

STATE	GASOLINE	DIESEL	GASOHOL	ADDED TAX (%)	LOCAL OPTION
ALABAMA	13	14	13		L
ALASKA	8	8	0		
ARIZONA	17	17	17		
ARKANSAS	13.5	12.5	13.5		
CALIFORNIA	9	9	9	6.25	L
COLORADO	20	18	20		
CONNECTICUT	20	20	19	3	
DELAWARE	16	16	16		
D.C.	18	18	18		
* FLORIDA	9.7	9.7	9.7		L
GEORGIA	7.5	7.5	7.5	4	
HAWAII	11	11	11	4	L
IDAHO	18	18	14		
ILLINOIS	19	21.5	18	6	L
INDIANA	15	16	15	5	
IOWA	20	22.5	19		
KANSAS	15	17	15		
* KENTUCKY	15	12	15		
LOUISIANA	20	20	20		
MAINE	17	20	17		
MARYLAND	18.5	18.5	18.5		
* MASSACHUSETTS	11	11	11		
* MICHIGAN	15	15	15	4	
MINNESOTA	20	20	18		
MISSISSIPPI	18	18	18		L
MISSOURI	11	11	11		
MONTANA	20	20	20		
/* NEBRASKA	22.8	22.8	19.8		
NEVADA	18	22	18		L
NEW HAMPSHIRE	14	14	14		
NEW JERSEY	10.5	13.5	4.5		
NEW MEXICO	16.2	16.2	13.2		L
NEW YORK	8	10	8	6.75	L
* NORTH CAROLINA	21.95	21.95	21.95		
NORTH DAKOTA	17	17	17		
* OHIO	18	18	18		
OKLAHOMA	16	13	16		
OREGON	18	18	18		L
PENNSYLVANIA	12	12	12	6	
* RHODE ISLAND	20	20	20		
SOUTH CAROLINA	16	16	10		
SOUTH DAKOTA	18	18	18		L
TENNESSEE	21	17	21		L
TEXAS	15	15	15		
UTAH	19	19	19		
VERMONT	18	17	18		
VIRGINIA	17.7	16.2	17.7		L
/ WASHINGTON	22	22	22		
* WEST VIRGINIA	20.35	20.35	20.35		
/* WISCONSIN	21.5	21.5	21.5		
WYOMING	9	9	5		

* Variable tax expressed in cents per gallon

/ Recent rate change
Highway Users Federation
April 20, 1990

See notes on reverse side for additional information

NOTES

Alabama - Includes 2 cent per gallon "inspection fee".

Connecticut - 2 cents/gal to be added July 1, 1990.

Florida - Variable: 4 cents + 5% retail average (5.7 cent floor on sales tax portion).

Georgia - 3% Second Motor Fuels tax plus 1% sales tax. Applied to the wholesale price of motor fuel and the federal motor fuel tax.

Hawaii - Diesel tax includes 1 cent/gal. tax for highway use; gasohol is exempt from sales tax.

Illinois - 4% sales tax on gasohol.

Indiana - 8 cent special fuels surcharge on commercial vehicles paid quarterly.

Kentucky - Variable: 9% wholesale average + increase of 1 cent for each 2 cent decrease in wholesale price; surtax on trucks (60,000 lbs. +) 5.2 cents/gal, paid via report.

Massachusetts - Variable: 10% wholesale average.

Michigan - Variable: Federal Operations & Maintenance Cost (FOMC) + consumption (2 cent max. per year).

Mississippi - September 1, 2001 and thereafter, taxes revert to: Gasoline - 14.4 cents/gal, Diesel - 14.75 cents/gal.

Nebraska - Variable: 12.5 cent base plus excise tax.

New York - 4% sales tax; 2.75% gross earnings tax on oil co.

North Carolina - Includes 0.25 cent inspection fee. Variable: Effective 8/1/89 base 17 cents, plus whsle component of 3.9 cents/gal. based on 7% of the average wholesale price of motor fuel.

Ohio - Variable: Effective 7/1/87 to be adjusted July 1 each year 1988 thru 1993. Increase is limited to 1 cent/gal. and can only be adjusted in 1 cent increments.

Oklahoma - Includes 0.08 cent inspection fee.

Oregon - Diesel taxed through ton-mile structure. January 1990, increase MFT 2 cents/gal.

Pennsylvania - 6% is wholesale franchise tax; varies between 5.4 cents & 7.5 cents.

Rhode Island - Variable: 11% wholesale average + excise tax equal to 2% of wholesale price. (18 cents + 2 cent excise tax both minimums).

South Dakota - Dealers blending ethanol w/ gas receive 1 cent/gal. credit.

Tennessee - Includes 1 cent special petroleum tax for gas and diesel.

West Virginia - Variable: 15.5 cents + 5% wholesale average.

Wisconsin - Variable: Federal Operations & Maintenance Cost plus consumption.

V. APPENDICES

APPENDIX A

Audit Methodology

The following are methodology descriptions for each audit review area:

Highway Administration

A-1 Road and Bridge Conditions - Data provided by the Bureau of Bridge and Roadway Technology on key highway and bridge conditions and on ride quality indicators formed the basis of this analysis. LB&FC staff also examined PennDOT initiatives designed to improve bridge safety, and reviewed the circumstances related to closing the Vanport Bridge (Beaver County) as a case study highlighting the importance of inspecting for corrosive buildups and the cleaning and flushing of steel bridges. PennDOT officials, outside experts and LB&FC staff met to discuss issues concerning the effects of roadway deterioration and bridge structural integrity. LB&FC staff also attended meetings of PennDOT's district bridge engineers and industry representatives.

A-2 Highway Maintenance - LB&FC staff conducted interviews with maintenance managers at selected engineering districts and county maintenance offices regarding management systems for reporting the extent of maintenance need and procedures for planning, controlling and prioritizing work loads. LB&FC staff held discussions with key Central Office staff and obtained various reports and data pertaining to highway maintenance cycles, four-year district plans and surface improvements. A review of Department maintenance manuals, policy letters and reports assessed the extent to which the Department analyzes and uses information concerning roadway conditions and levels of maintenance. LB&FC staff used Federal Transportation Research Board studies to define accepted highway maintenance management principles. Department data was analyzed to identify trends relative to performance factors used by either PennDOT or other states.

A-3 Productivity - The basis for the audit review was the General Accounting Office (GAO) model of an effective productivity management effort. Using this model as a guide, LB&FC staff reviewed the Department's Master Policy Statements, policy letters, meeting notes, and briefing outlines. Program data were obtained from the PennDOT Operations Review Group. Interviews of members from various productivity management groups were conducted to understand the evolution of the Department's productivity management efforts from the late 1970s until the present. LB&FC staff interviewed four district engineers to gain an understanding of different approaches in implementing employee

involvement programs and attended select employee involvement meetings. Analysts used a review of Department measurement techniques and reports to compute the extent to which the Department measures productivity. To assess the proposed highway maintenance productivity measurement system, a review of the Department's consultant's reports on a productivity measurement system for highway maintenance was undertaken. An analysis of Quality Circle and Quality Breakthrough Team projects for the past three years determined tangible and intangible savings. Finally, a productivity management questionnaire, administered to 188 PennDOT managers, provided information on the perceptions of productivity management efforts.

The Director of the Operations Review Group and the Chief of the Productivity Center provided extensive feedback through numerous meetings and memoranda. The Deputy Secretary for Administration was also interviewed concerning his views on the Department's Employee Involvement programs.

A-4 Certification Acceptance Reviews: Federal-Aid Local Projects - LB&FC staff contacted individuals involved with the CA process to assess Department performance in administering the certification acceptance (CA) reviews of local projects. Interviews were conducted with Central Office staff, liaison and contract management engineers in selected engineering districts, and municipal representatives/consultant engineers who had recent involvement with a CA local project. Also contacted for comparative purposes were the states of Virginia, Maryland, Illinois, and Georgia. In addition, LB&FC staff analyzed samples of CA local projects let between July-December 1988 and July-December 1989.

A-5 Work Zone Traffic Control - LB&FC staff reviewed PennDOT's work zone quality assurance procedures and reports, minutes of the Work Zone Traffic Control Task Force and subcommittee, and policy letters. LB&FC staff met with District 6-0, (Philadelphia) and District 11-0, (Pittsburgh) staff to review district office procedures concerning lane closures and temporary speed restrictions public information dissemination, especially for the purpose of notifying the public about work zones. Central Office and Office of Chief Counsel staff were interviewed about controls on policy and regulatory development and dissemination.

A-6 Litter - LB&FC staff examined statutes to determine whether the Department was required by law to control litter. Department policy, procedures, activities, and programs concerning litter control were reviewed and analyzed. A review of program statistics determined the number of Department and volunteer hours expended for litter clean-up. LB&FC staff analyzed the effectiveness of PennDOT's anti-litter signing efforts, noting the number of signs, sign message content and location.

A review of PennDOT's "1990 Highway Beautification Initiatives" publication was made to identify the Department's planned litter cleanup programs and activities. Contact with key Department program personnel and the Pennsylvania State Police added perspective to the litter problem. Other state transportation departments and national and state associations of concerned interest groups were queried concerning litter control.

A-7 Truck Permit Program - LB&FC staff met with PennDOT Central Office program managers, district permit office personnel and association representatives to determine the current status, procedures, and policies of the truck permitting/special hauling programs. A review of applicable statutory and regulatory documents determined the authority for the program. Visits to two districts provided an understanding of day-to-day program operations. Department user manuals--Chapter 15 of the Maintenance Manual and Publication 31--were reviewed to determine stated procedures and responsibilities. The industry's opinion of the permit program was obtained by interviewing the Executive Director of the PA Motor Truck Association.

LB&FC staff reviewed and summarized the quality assurance reports maintained at the Central Office. State Police Reports of Investigation for citations involving permitted overweight/oversize vehicles were categorized by type of citation. Master Policy Statements and strike-off letters determined program performance standards. The Program Services and Permit Sections of the Bureau of Maintenance & Operations provided numerous computer printouts of performance data which were used to identify compliance with Department standards for issuing permits. Discrepancies in program data obtained from the Bureau of Maintenance and Operations and the Office of the Comptroller were reconciled by representatives of these offices.

Representatives of the Office of the Comptroller, Office of Chief Counsel, and Office of the Inspector General provided input concerning their participation and responsibilities with respect to the truck permit program.

A-8 Contract Quality Assurance - LB&FC staff made several visits to District 6-0, (Philadelphia), to view construction activities on I-476, the "Blue Route," and to interview officials regarding procedures for inspection monitoring and other project management matters. Staff met with and interviewed officials of the Bureau of Construction and Materials; especially the Materials Testing Division (MTD) to gain information on procedures for assessing penalties against contractors when tests reveal material deficiencies. Also, follow-up work to findings from a review conducted by the Comptroller in 1987 prompted a sampling of data at the MTD for selected laboratory tests.

A-9 Cost Overruns - LB&FC staff met with Central Office, district and association representatives to determine the current policies and procedures relative to cost overruns and to audit their effect in the field. At the Central Office the following persons provided input: the Directors of the Bureaus of Construction and Materials and Design, the Counsel-in-Charge of the Claims Section, the Chiefs of the East and West Quality Divisions, the Chief of the Contract Management Division, the Work Order Engineer and the Chief of the Estimates Section. LB&FC staff visited five engineering districts chosen to provide a cross section of rural and urban, size of complement, and type and volume of workload characteristics. The principal personnel interviewed at the district level were assistant district engineers for construction, and representative assistant construction engineers, project engineers, and finals unit personnel. Finally, the staff met with representatives of the PA Highway Information Association and Consulting Engineers Council of PA.

LB&FC staff reviewed key agency documents, files, reports and manuals of the FHWA, and other state transportation departments, and GAO standards to establish the status of the Department's written policies and procedures with respect to work orders and construction claims. Agency documents included Master Policy Manual statements, Contract Management System manuals, interim report of the Construction Claims Task Force, Publication 408, relevant portions of the Project Office and District Construction Engineers Manuals, and design consultant liability procedures. Agency files included the Central Office's repository of open contracts and claims in process and the districts' files for work orders and claims.

Computer generated data were obtained from the Department's Management Information System, primarily the Contract Management System (CMS) to evaluate the magnitude of cost overruns. The LB&FC staff verified selected portions of this data. In addition, counsel from the Office of Chief Counsel's Claims Section provided a compilation of claims data.

A-10 Contracting Procedures - LB&FC staff reviewed the cost implications of PennDOT's decision not to implement a recommendation of a 1985 LB&FC Low Bid Rejection Report. That report recommended that the Department lower (to 30%) its requirement that prime contractors accomplish 50% of contract work without subcontracting (30% is also the FHWA requirement). For low bids rejected from July 1, 1985, through December 31, 1989, LB&FC staff reviewed those rejections which failed to meet the 50% requirement but would have met the 30% requirement. The contractor's rejected low bid price was compared with the award price to determine the potential net savings had the 30% acceptance policy been in effect.

LB&FC legal staff conducted a compliance check of sole source service procurement contracts (SPCs) to determine whether they contained the required sole source justification. A random sample of 15% of all sole source SPCs in effect for the period July 1, 1989, through December 31, 1989, was selected and these contracts were examined for compliance.

A-11 New Consultant Selection Process - The Bureau of Design, Consultant Agreement Division, provided LB&FC staff with information gathered for their own internal process assessment. Firms ranked from January 1989 through July 1989 (old procedure) were compared with firms ranked from August 1989 through March 1990 (new procedure). Four large consulting firms were selected at random from lists provided by the Department. The four firms and the Federal Highway Administration (FHWA) provided their perspectives on the new procedure.

A-12 Small Firms - LB&FC staff reviewed the Department's consultant selection policies and procedures and interviewed key Central Office personnel involved in this process to evaluate the degree of difficulty small engineering firms experience in obtaining contracts by PennDOT. Industry representatives were also contacted to learn their opinion of PennDOT's consultant selection process. A review of Department records (maintained in the Consultant Selection Division) focused on two major phases of the consultant selection process: (1) from letter of interest to shortlisting and (2) from shortlisting to consultant selection. Data were analyzed with two distinct time periods in mind--before and after the Brooks Act. To establish a working definition of a small firm, LB&FC staff researched a number of sources and adopted the Federal Small Business Administration's definition, i.e., engineering firms with gross annual receipts of $2.5 million or less, and combined this with an industry standard that the average employee's contribution to annual gross receipts is approximately $50,000. Firms were classified as being small (1 to 50 employees), medium (51 to 100 employees), or large (101 or more employees). Each firm's size classification was determined from the number of employees listed on its Standard 254 form. LB&FC staff contacted a sampling of other state departments of transportation. LB&FC staff also interviewed representatives of the PA Department of Commerce, attended meetings of the Consultant Selection Committee, and conducted a literature search to determine the impact of small firms on the economy.

A-13 Coordination With Local Governments - The Department's performance in coordinating efforts with municipalities was assessed through a questionnaire survey of selected municipalities. Sixty municipalities were randomly chosen from each of PennDOT's eleven engineering districts for a total of 660 municipalities receiving questionnaires, and a return rate of 61% was achieved. The 660 municipalities represent 16% of the 2,572 municipalities within the Commonwealth.

Department personnel (central and district level), other state and state-affiliated agencies, and local government associations were consulted.

Planning

B-1 Twelve Year Program (TYP) - LB&FC staff reviewed related state and federal legislation to determine PennDOT's statutory responsibilities and obligations for project selection and prioritization. Policy statements, procedures, selection criteria, interview information, and memoranda were analyzed to assess whether the Department's TYP processes are consistent and conform to applicable legislation. The extent to which the TYP is a viable planning document for transportation projects was analyzed using the above information.

The status of the progress of highway and bridge projects included in the TYP was used to analyze the TYP's degree of predictability as a planning vehicle for the Commonwealth's transportation projects. Expected progress towards construction within a 12 year time period was measured by examining the status of Bridge Bill I and II, interstate highway, and non-interstate highway projects.

B-2 Intermodal Planning - A review was conducted of the enabling statutes for PennDOT to determine what powers and duties the Department and its advisory groups had regarding planning for the various transportation modes. LB&FC staff examined the steps in the planning and programming process including public hearings, regional planning input, and preparation of the Twelve Year Transportation Program to assess the intermodal orientation. Staff members attended meetings of the advisory groups.

Metropolitan Planning Organizations provided information on intermodal coordination at the regional level. LB&FC staff reviewed policy statements, planning documents, and project descriptions from national organizations and other states to identify intermodal transportation trends. The staff assessed the development and current status of intermodal issues and initiatives undertaken with the support of PennDOT.

Safety Administration

C-1 Motor Carrier Safety Assistance Program - Meetings were held with Department officials in the Center for Highway Safety and in the Motor Carrier Enforcement Division. The Department's Commercial Driver & Vehicle Safety Inspection Training Manual was reviewed, as were laws and regulations that relate to the requirements of motor carrier companies to participate in the MCSAP program. Statistical data was obtained and

reviewed as to the number of accidents in which motor carriers were involved. Finally, documentation was obtained from the Department in order to verify that progress was achieved in implementing the previous LB&FC recommendations.

C-2 Transportation of Hazardous Materials - LB&FC staff met with officials of the Center for Highway Safety, reviewed the Department's five year hazardous materials plan, and policies and procedures established to monitor the program. In addition, laws and regulations pertaining to the transportation of hazardous materials were also reviewed and a compliance check of PennDOT's implementation of such laws and regulations was conducted. Finally, statistical data was requested and reviewed as to the number of accidents involving trucks transporting hazardous materials. Pennsylvania's Emergency Operations Plan was also reviewed in order to get an understanding of PennDOT's responsibilities during a hazardous material emergency.

C-3 Safety Programming - LB&FC staff met with Department officials in the Highway Safety & Information Management Division, the Center for Program Development and Management, and in two engineering districts. Additionally, LB&FC staff reviewed performance data and management controls in the Highway Safety Improvement Program process. Funding mechanisms and special initiatives for safety programs were also reviewed. Finally, LB&FC staff met with Maryland Department of Transportation officials to review their High Accident Location Program and to compare their program to PennDOT's Safety Improvement Program.

C-4 Tort Liability and Risk Management - LB&FC staff met with the Risk Management Engineer, reviewed a paper prepared for the Transportation Research Board, and reviewed the interim and final 1988-89 Tort Liability and Risk Management Status Reports that were prepared by the Risk Management Engineer. LB&FC staff coordinated their audit efforts with the External Audit Division of the Comptroller's Office in accordance with the appropriate Government Auditing Standards. The LB&FC staff reviewed the audit program, the working papers, and the draft report of the Comptroller.

C-5 Motor Vehicle Financial Responsibility - The LB&FC staff met with officials of the Bureau of Driver Licensing, reviewed the financial responsibility manual, laws and regulations pertaining to automobile insurance requirements and obtained statistical data on the number of accidents involving uninsured drivers. Officials of the Insurance Department were contacted to determine their responsibility in enforcing automobile insurance requirements. In addition, the Department's process for identifying uninsured vehicles was also reviewed.

C-6 Titling, Registration and Licensing - LB&FC staff met with officials in the Bureau of Driver Licensing (BDL) and the Bureau of Motor Vehicles (BMV) to obtain an understanding of the processes involved in issuing driver and vehicle documents and preventing the issuance of fraudulent documents. Additionally, LB&FC staff observed and reviewed the BMV and the BDL computer system controls and functions, identified customer complaints through the Telephone Information Center, and contacted AAA officials regarding citizens concerns over driver documents.

LB&FC staff also reviewed the Commonwealth Automated Registration and Titling System (CARATS) computer system to determine whether its design objectives have been met and reviewed the objectives of the Driver License and Control System (DL&C) planned to be implemented in November 1990. Turn-around-times and error rates were analyzed for both bureaus. Finally, LB&FC staff reviewed the recommendations of a 1984 feasibility study on decentralization of services and determined the Department's position concerning that issue.

C-7 Emission and Vehicle Safety Inspection Programs - LB&FC staff met with officials of PennDOT's Vehicle Control Division, and reviewed policies, records of 100 stations participating in the program, regulations, hearing records and statistical data established for the programs. Meetings were also held with officials of the PA State Police to obtain an understanding of the enforcement aspect of these programs.

In addition, LB&FC staff met with the Environmental Protection Agency and obtained two performance audits of Pennsylvania's emissions program and material on other state programs. LB&FC staff met with station owners who currently participate in these programs and conducted a telephone survey of other station owners in order to ascertain how the program is operating in the community.

Local and Area Transportation

D-1 Annual Capital Budget for Public Transit - A review of capital budget project itemization acts and fiscal-year capital budget acts was conducted to determine the frequency and regularity of their enactment since FY 1984-85. LB&FC staff obtained the last five capital project requests from the Bureau of Public Transit to compare with the itemization acts. Three of the largest urban transit agencies in Pennsylvania provided information on the problems that the capital budget process had created for them. The Director of the Bureau of Fiscal Management, two division chiefs in the Bureau of Public Transportation, and the Non-Highway Programs Coordinator in the Center for Program Development and Management provided input about the capital budget process and how it affected the capital assistance programs.

D-2 Road Turnback Program - LB&FC staff met with Bureau of Municipal Services staff, reviewed legislation and departmental policy, and interviewed district office personnel. LB&FC staff analyzed data on project costs and sampled project files to determine costs of restoration and the types of roads being returned. LB&FC staff also surveyed 19 municipalities to obtain their views on the program.

D-3 Section 203 Shared-Ride Program - LB&FC staff interviewed personnel at the Comptroller's Office External Audit Division at PennDOT, reviewed audit reports and follow-up documentation, and met with staff at the Bureau of Public Transit to identify over reimbursement in the Shared-Ride Program and the resolution of findings in audits. In the examination of duplication of service, LB&FC staff met with several shared-ride providers, obtained and reviewed a study on duplication, analyzed costs for the Shared-Ride and Free Transit Programs, and reviewed coordinators' annual applications to determine criteria for establishing eligibility to use Free Transit. LB&FC staff met with several rural providers, the Pennsylvania Association of Area Agencies on Aging, and Department of Aging officials, analyzed ridership for urban and rural areas, and reviewed requests for fare increases and waivers.

D-4 Local Road Measurement for Liquid Fuels Payments - LB&FC staff focused its activities on a review and examination of data supplied by the Bureau of Municipal Services. The 1982 allocations to municipalities, completed mileage surveys by district, and municipal road log information were analyzed in this regard. An error rate was determined by comparing 1982 mileage to the 1983-1989 resurvey miles and dividing the difference by the 1982 mileage. The error rate was then applied to the remaining miles to resurvey.

LB&FC staff contacted key Department personnel, related municipal associations, and other related Commonwealth and private agencies.

D-5 Public Transit Oversight - LB&FC staff reviewed pertinent legislation to determine the Bureau of Public Transit's (BPT) legal mandates in the area of oversight. BPT staff were interviewed to determine what bureau actions were undertaken to meet the various legal mandates. A review of Bureau statistical reports was conducted to gain an understanding of long-term trends in mass transit system performance.

A questionnaire was sent to ten states departments of transportation which were identified as being similar to Pennsylvania (those which have at least one large city and several rural areas) to assess their level of performance oversight.

Aviation and Rail

E-1 Airport Hazard Zoning - LB&FC staff interviewed Bureau of Aviation (BOA) officials at PennDOT, L. Robert Kimball and Associates staff, and Federal Aviation Administration officials. LB&FC staff analyzed data obtained from PennDOT, the Southwestern Pennsylvania Regional Planning Commission, and the Delaware Valley Regional Planning Commission to determine a compliance rate for the Airport Zoning Act. LB&FC staff surveyed municipalities and municipal associations, interviewed local airport managers, and met with BOA staff to determine the factors responsible for the low compliance rate. In assessing the effects of airport hazard zoning, LB&FC staff contacted aviation officials in other states and reviewed Pennsylvania aviation accident data from the National Transportation Safety Board. LB&FC staff interviewed Department of Community Affairs officials to review their Flood Plain Management Program.

E-2 Rail Freight Assistance Priorities - A review of the benefit/cost files in the Bureau of Rail Freight, Ports, and Waterways was conducted to determine how much the Bureau relied on information that the applicants submitted. The Bureau Director and a Transportation Planning Specialist answered questions about the process and the specific steps in the calculations. An LB&FC attorney reviewed federal and state laws and the State Rail Plan to determine whether it required or prohibited cost-per-job rankings. Rail freight officials from six other states provided information about their assistance programs.

LB&FC staff tested the statistical significance of the correlation between the benefit/cost ratios and the cost-per-job factors. LB&FC staff compared the priorities from "A Comprehensive Freight Rail Study for Pennsylvania" with the funding priorities of PennDOT. Members of the Rail Freight Advisory Committee expressed their opinions on the rail freight assistance program.

Administration

F-1 Use of Consultants - LB&FC staff met with personnel from the Transportation Comptroller's Office and obtained a listing of recently completed contracts. LB&FC staff developed criteria for examination of PennDOT's contract management through a review of relevant state and Departmental policy. LB&FC staff reviewed individual contracts to determine the requirements placed on consultants, and interviewed project managers for each contract and reviewed all consultant reports to determine if these requirements were met.

F-2 Computer Virus - LB&FC staff reviewed the Department's PC policies and guidelines on computer virus and PC security. Additionally, literature on computer virus was reviewed and analyzed to determine the various security measures an organization could implement to prevent a computer virus infection. The literature analysis was to show whether PennDOT had implemented any of the various security measures. Meetings were also held with PennDOT officials.

VI. RESPONSES TO THE AUDIT

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
HARRISBURG, PENNSYLVANIA 17120

OFFICE OF
SECRETARY OF TRANSPORTATION

(717) 787-5574

June 15, 1990

Mr. Philip R. Durgin
Executive Director
Legislative Budget and Finance Committee
Room 400 Finance Building
Harrisburg, PA 17120

Dear Mr. ~~Durgin~~ Phil:

We have had an opportunity to review the draft final report of the performance audit you and your staff have done on the Pennsylvania Department of Transportation for the Legislative Budget and Finance Committee.

Congratulations on the quality work done by you and your 20-person audit team under the able leadership of Keith Chase during this year-long review. This is the kind of balanced, honest and impartial report that we will use to help improve the Department's operations, performance and management as we have done in the past.

I am encouraged that in this second major review of the Department's performance that your staff found so many positive actions that reflect credit on PennDOT and its 12,500 employes.

The report reaffirms that Pennsylvania's roads are getting better under our systematic program of maintenance and construction, our bridge rebuilding effort is well targeted, and new initiatives have been undertaken that improve truck safety and are saving lives and reducing injuries.

With the cooperation of the Pennsylvania General Assembly, the Commonwealth has become "number two" among the states in providing annual financial support for mass transit, our programs are resulting in expanded airport development and the retention of viable rail freight lines, and we have initiated strategies to integrate all transportation modes for concerted improvements and better management of user demand.

Furthermore, I take considerable pride that PennDOT is meeting its legislative mandates under the law and that no improprieties were found.

Working cooperatively with your staff, we have already embarked on some suggested actions, we agree with many of the recommendations, and we will review all of them as we work together to improve the delivery of cost-effective, quality products and services in all transportation modes.

In the attachment, we have briefly highlighted some of the key items in the audit and included some additional information to be noted in parentheses. We welcome the performance audit as a meaningful tool in our common objective, performing well on behalf of our citizen-customers throughout the Commonwealth of Pennsylvania.

Sincerely

Howard

Howard Yerusalim, P.E.
Secretary of Transportation

Legislative Budget and Finance Committee
Pennsylvania Department of Transportation

PENNDOT AUDIT HIGHLIGHTS-COMMENTS

HIGHWAY ADMINISTRATION

The Department's planned, systematic program of maintenance and construction on the Commonwealth's roads and bridges is producing positive results.

Among the audit findings:

-- A massive investment in Interstate highway reconstruction over five years has reduced the total Interstate needs.

-- "Pavement smoothness" or "rideability" has generally been maintained or improved on the major road systems, including the Interstates and the Priority Commercial Network.

-- "Deficient" bridges have been identified and prioritized for reconstruction or replacement.

(In U.S. Transportation Secretary Samuel K. Skinner's 1989 report to the U.S. Congress, he noted: "The fact that a bridge is 'deficient,' either structurally or functionally, does not imply that it is likely to collapse or that it is unsafe. With proper load posting and enforcement, most structurally deficit bridges can continue to serve traffic when restricted to the posted maximum loads. Some functionally obsolete bridges have geometric deficiencies [for example, they may be narrower than modern standards require] that can be mitigated, but not eliminated, by the use of roadway striping, signs, signals, and crash cushions." PennDOT weight-restricts and posts its bridges through its safety program to ensure they can safely carry traffic.)

(In addition, bridge cleaning has doubled over the past five years in an effort to prevent deterioration.)

-- Management of construction cost overruns have been contained for the past four years.

-- Maintenance cycles have been established and most are being met, including surface improvement goals that have been exceeded, averaging 6,700 miles per year. (Major resurfacing has actually increased as part of the surface improvement program.)

-- Coordination among municipalities has resulted in a high degree of satisfaction among local officials.

-- Employe involvement to improve productivity, including Quality Circles and Quality Breakthrough Teams, has been recognized as one of the most extensive public sector programs in the nation.

-- Litter pick-up initiatives have resulted in a doubling of maintenance manhours in the past five years, and growth in the major volunteer effort, Keep Pennsylvania Beautiful, has climbed from 225,000 to 500,000 participants. (A new initiative, Adopt-A-Highway, recently got off to a successful start.)

PLANNING

The Department's planning process continues to facilitate the engineering, design and construction of improvements throughout the Commonwealth in all transportation modes.

Among the audit findings:

-- Planning through the 12-year transportation program has resulted in predictable advancement of projects to construction.

-- Aggressive pursuit of federal discretionary funding has resulted in successful Interstate restoration.

-- Intermodal strategies have been initiated to ensure an integrated process for addressing all transportation assets, for coordinated improvements, for better management of user demand, and improved utilization of total transportation networks.

SAFETY ADMINISTRATION

The Department has placed a greater emphasis on highway safety programs as well as working to improve customer service for drivers and vehicle owners.

Among the audit findings:

-- A new Safety Corridor Initiative, targeting high-accident sites for physical improvements as well as increased enforcement and emergency response, has received national recognition and been recommended as a model for other states.

-- Key accident indicators show the highway safety record has improved. (Fatalities in traffic accidents statewide declined for the second straight year in 1989.)

-- "On-the-road" truck safety inspections have been fully implemented, including most earlier recommendation changes, in cooperation with the Pennsylvania State Police and the Public Utility Commission.

(Recent legislation endorsed by the Governor will increase truck safety by increasing penalties for critical defects, provide for forfeiture of defective motor carrier vehicles involved in serious accidents, and force out-of-state trucks to met federal inspection standards.)

-- Although substantially in compliance with statute and regulations, a five-year plan has been initiated to improve the oversight responsibilities for trucks transporting hazardous materials; (the only state in the nation that has done so).

(The Department's risk management program has been recognized by the Transportation Research Board and the Institute of Traffic Engineers as among the best in the nation.)

-- New computerized information systems are being established for titling and vehicle registration (completed) and for driver licensing (under development) to improve the processing of transactions.

LOCAL AND AREA TRANSPORTATION

Pennsylvania is "number two" among the states in providing annual financial support for the operation of urban mass transit and public transportation.

Among the audit findings:

-- Annual state operating subsidies to urban mass transit were increased by 29 percent in five years through 1988-89.

-- On lottery-funded passenger service for elderly citizens, most county coordinators now have established criteria to direct riders to free transit, where available and feasible, rather than the more expensive "shared ride" program.

-- Interest remains strong in the "turnback" program, which has restored and returned about 3,300 miles of roads with low traffic volumes to municipalities for maintenance.

AVIATION AND RAIL

The Department has expanded its annual programs for airport development and rail freight assistance; in addition, state capital investments continue to assist in major capital investments, such as track rehabilitation for the Delaware & Hudson and Pittsburgh & Lake Erie railroads, which recently helped keep those railroads operational. Funding for airport development has increased from $1 million in 1981-82 to $7 million in 1989-90.

Among the audit findings:

-- The Department has actively supported airport hazard zoning, including efforts to increase awareness of municipalities of their responsibility to enact the zoning ordinance.

(The report acknowledges that while the Department has no specific statutory responsibility for administration and enforcement of the Airport Zone Act, much progress has been made in providing information and technical assistance to the responsible parties.)

-- The rail freight assistance program places an emphasis on maximizing employment opportunities.

(The rail freight assistance program was revised in 1988 to maximize the use of state funds to have a positive impact on jobs, a key initiative of the Governor's. The $4.5 million program favorably impacted on 24,000 jobs in 1988-89 at a cost of $190 per job and on 20,000 jobs in 1989-90 at a a cost of $225 per job. In terms of cost per jobs impacted, this program may be the most cost-effective in the Commonwealth.)

ADMINISTRATION

The Department continues to emphasize the quality support its centralized administrative functions provide to programs and people throughout the state.

Among the audit findings:

-- Sound management practices were exercised to ensure non-highway consultants provided useful products and services.

-- Most of the computer security controls recommended in 1988 by the LB&FC have been implemented.

* * *

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF AGING
Harrisburg, Pa. 17101-1195

June 18, 1990

Mr. Philip R. Durgin
Executive Director
Legislative Budget and Finance Committee
Room 400
Finance Building
Harrisburg, PA 17105-8737

Dear Mr. Durgin:

Secretary Rhodes has asked me to respond to the draft report on the performance audit of the Department of Transportation. The information which we received pertained to the Shared-Ride Program.

The Department has no recommended changes concerning the report content. The draft information shows a thorough effort on the part of you and your staff. This Department is pleased to have been involved in its preparation. We look forward to assisting the Department of Transportation in implementing the recommendation concerning the study of local service structures and operations.

On behalf of the Secretary, I thank you and your staff for their open communication with our Department and for keeping us informed on this important area.

Sincerely,

R. Dan Ainscough
Director
Bureau of Program and Field Operations

RDA/JJD/bs