#304

Performance Audit of the Mississippi Department of Transportation's Administration of the 1987 Four-Lane Highway Program

November 3, 1993

The PEER Committee

Mississippi Legislature

The Mississippi Legislature

Joint Committee on Performance Evaluation and Expenditure Review

PEER Committee

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November 3, 1993

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At its meeting of November 3, 1993, the PEER Committee authorized release of the report entitled **Performance Audit of the Mississippi Department of Transportation's Administration of the 1987 Four-Lane Highway Program**.

Cecil McCrory

Representative Cecil McCrory, Chairman

This report does not recommend increased funding or additional staff.

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Performance Audit of the Mississippi Department of Transportation's Administration of the 1987 Four-Lane Highway Program

Introduction

On August 30, 1993, the Department of Transportation (MDOT) announced that 1987 Four-Lane Highway Program costs would exceed revenues by a total of $275 million or more by the year 2001, the projected completion date of the program. As a result of concern expressed by legislators, the PEER Committee reviewed administration of the 1987 Four-Lane Highway Program (hereafter referred to as the Program) by the Mississippi Department of Transportation (formerly the Mississippi State Highway Department).

Authority

The performance audit complies with MISS. CODE ANN. Section 5-3-57 (1972).

Scope and Purpose

The performance audit:

- analyzes Program cost and revenue projections used by the Department of Transportation;
- analyzes actual Program revenues and expenditures through June 30, 1993;
- compares estimated Program expenditures with actual expenditures on completed highways; and,
- reviews MDOT's performance in monitoring and reporting Program activities to the Legislature.

Method

While conducting the performance audit, the PEER Committee:

- reviewed applicable Mississippi statutes;

- interviewed Department of Transportation officials and engineers, legislators and Federal Highway Administration personnel;
- analyzed historical revenue and expenditure data related to the Program;
- analyzed construction estimates and contractual amounts for completed highway projects in the Program;
- analyzed MDOT revenue and expenditure projections presented to the Legislature prior to enactment of the legislation that created the program; and,
- analyzed current MDOT revenue and expenditure projections for the remaining eight years of the Program.

Overview

How much of a funding shortage does MDOT project?

MDOT projects that the Program will face a funding shortage of $305 million if the Program does not receive both an additional year of funding from the Legislature and additional regular construction funding from MDOT.

Why is the Program facing a funding shortage?

MDOT understated its original estimates of total Program costs due to estimation bias and failed to incorporate factors such as urban construction costs, bridges and interchanges, and inflation.

Why has the funding shortage not been disclosed before now?

MDOT has not monitored the Program's revenues and expenditures sufficiently to recognize the funding problems until 1993.

Has MDOT adhered to the construction schedule required by MISS. CODE ANN. Section 65-3-97 (1972)?

No. MDOT had not let all contracts by June 30, 1993, that were necessary to complete Phase I of the Program. MDOT let two contracts on Phase II highway segments between June 30 and October 13, 1993.

Why has MDOT continually reported that the Program was on schedule and in good shape financially?

MDOT did not monitor revenues and expenditures sufficiently to know the Program's funding status until 1993. Thus MDOT impaired its own capacity to report Program activities and subsequently did not report funding and project status on an accurate and timely basis.

Can MDOT complete the Program by August 31, 2001, as originally scheduled?

No. The Transportation Commission voted on October 27, 1993:

> *. . .that the funding schedule and expenditure schedule for the 1987 Highway Program, as proposed and presented by Commissioner Zack Stewart for Fiscal Years 1994* ***through 2003,*** *be and is hereby adopted as the Commission's proposed plan to complete the 1987 Highway Program. . . .* [Emphasis added]

The Commission will request the Legislature to grant a one-year extension on the Program completion deadline. The Commission will also request the Legislature to continue the assessment of dedicated taxes for the program. In PEER's opinion, MDOT will experience similar confusion and imprecision about funding if Program monitoring does not substantially improve.

Background

Legislative History

The legislative process to create the 1987 Four-Lane Program began in June 1986. MDOT officials prepared a four-lane program proposal for presentation to the Senate Finance Committee, and subsequently assisted members of the House of Representatives in developing a four-lane program for presentation to the House. The proposal gained political momentum during the summer and fall of 1986 as support developed from a citizen's lobby group commonly known as AHEAD (Advocating Highways for Economic Advancement) and legislators held public hearings across the state. During the 1987 Regular Session of the Legislature, MDOT officials worked closely with legislative committees developing revenue and cost estimates for use in consideration of four-lane program legislation.

The legislative debate to develop a four-lane program was intense, with many close votes at the committee level and on both chambers' floors. Governor Bill Allain also developed a less extensive six-year, 450-mile four-lane program proposal and lobbied intensely for a four-lane program financed by bonds. The intense legislative debate centered more around proposed funding methods for the Program rather than the estimated cost of the Program. On March 4, 1987, the House of Representatives voted 78 to 39 to concur with a Senate amendment of House Bill 1206 which proposed the 1987 Four-Lane Program.

On March 9, 1987, Governor Bill Allain vetoed the legislation, citing the following reasons:

- The legislation failed to create a Department of Transportation (created in 1992).

- The Program contained "many more miles than we presently need in four-lane roads."

- "Arbitrary" selection of highways would not bring economic development to the state.

- The time limits and priorities for completion were questionable, given the traditional practice of dividing funds into three equal portions to reflect the demands of the three elected highway commissioners.

- The program was underfunded by at least $220 million because no provision had been made for inflation.

- Tax revisions in the bill would harm municipalities and have other adverse effects on state and local government and had not been adequately studied by legislative committees.

On March 11, 1987, the Mississippi House of Representatives voted to override the Governor's veto. On March 12, the Mississippi Senate also voted to override the Governor's veto. House Bill 1206 required the Mississippi Department of Transportation (Mississippi State Highway Department at that time) to convert approximately 1,077 miles (later revised to 1,093 miles) of Mississippi highways into four-lane highways. The legislation also provided additional funding for MDOT, primarily in the form of an increase in the state's fuel taxes. MDOT originally estimated that the Program would cost $1.6 billion over the fourteen-year period.

The Department's Role in Planning the Program

The Highway Commission as a whole never took any official action to authorize its staff to develop a proposed four-lane program for Mississippi. However, at least one Commissioner was quite active.

In June 1986, Sam Waggoner, former Central District Commissioner, directed the Executive Director and several engineers to identify highway segments that warranted consideration for four-laning. Over a weekend, highway executives John Tabb (Executive Director), James Quin (Chief Engineer), Woodrow G. Tullos (Commission Secretary), Lowell Livingston (Transportation and Planning Director) and Kimble C. Sutherland (Public Affairs Director) used traffic volume and highway capacity information to identify highways with the greatest need for four-laning. They used historical construction cost averages to develop per-mile cost estimates that were applied to all proposed highway segments in the Program. In informal sessions, the executives drew proposed routes on a standard road map using colored marking pens and made calculations on an electronic calculator by multiplying cost averages by proposed mileage totals to produce a total Program cost estimate. Commissioner Waggoner presented these estimates to legislative leaders.

Highway officials also provided technical support to the Legislature, stating that they attended virtually all legislative committee meetings and floor debates to provide technical assistance regarding departmental cost estimates and other highway statistics. They prepared multiple cost estimates during the legislative process as legislators considered various Program scenarios. However, the department never deviated from its original per-mile cost estimates during the legislative process.

The Four-Lane Program as Originally Proposed

House Bill 1206, 1987 Regular Session, required the department to "construct and reconstruct" approximately 1,077 miles (the original mileage estimate which has since been revised to 1,093 miles) of four-lane highway during a fourteen-year period beginning August 1, 1987. The legislation identified specific highway segments that must be four-laned and prioritized the four-laning process by establishing three phases (see Map A, page vii). All contracts necessary for completion of Phase I must be in effect by June 30, 1993, all contracts necessary for the completion of Phase II by June 30, 1998, and all contracts necessary for completion of Phase III by June 30, 1999.

The Legislature prioritized construction of highway segments based on the volume-to-capacity ratio of each highway segment, with a few exceptions. Volume-to-capacity (V/C) ratio analysis is a nationally recognized method of measuring highway needs by considering average daily traffic, lane/shoulder widths, types of terrain, and commercial trucking traffic. A higher ratio reflects a higher level of traffic relative to the capacity of the highway. The Legislature placed all highway segments with V/C ratios in excess of .40 in Phase I, with the exception of 7.2 miles of Highway 49 West from Inverness to Indianola which had a V/C ratio of .25 in 1987. Highway segments placed in Phase II had V/C ratios between .25 and .39, with the exception of 46 miles of Highway 49 West between Yazoo City and Inverness which had V/C ratios ranging from .13 to .21. Highway segments placed in Phase III had V/C ratios less than .25 (see Map A, page vii).

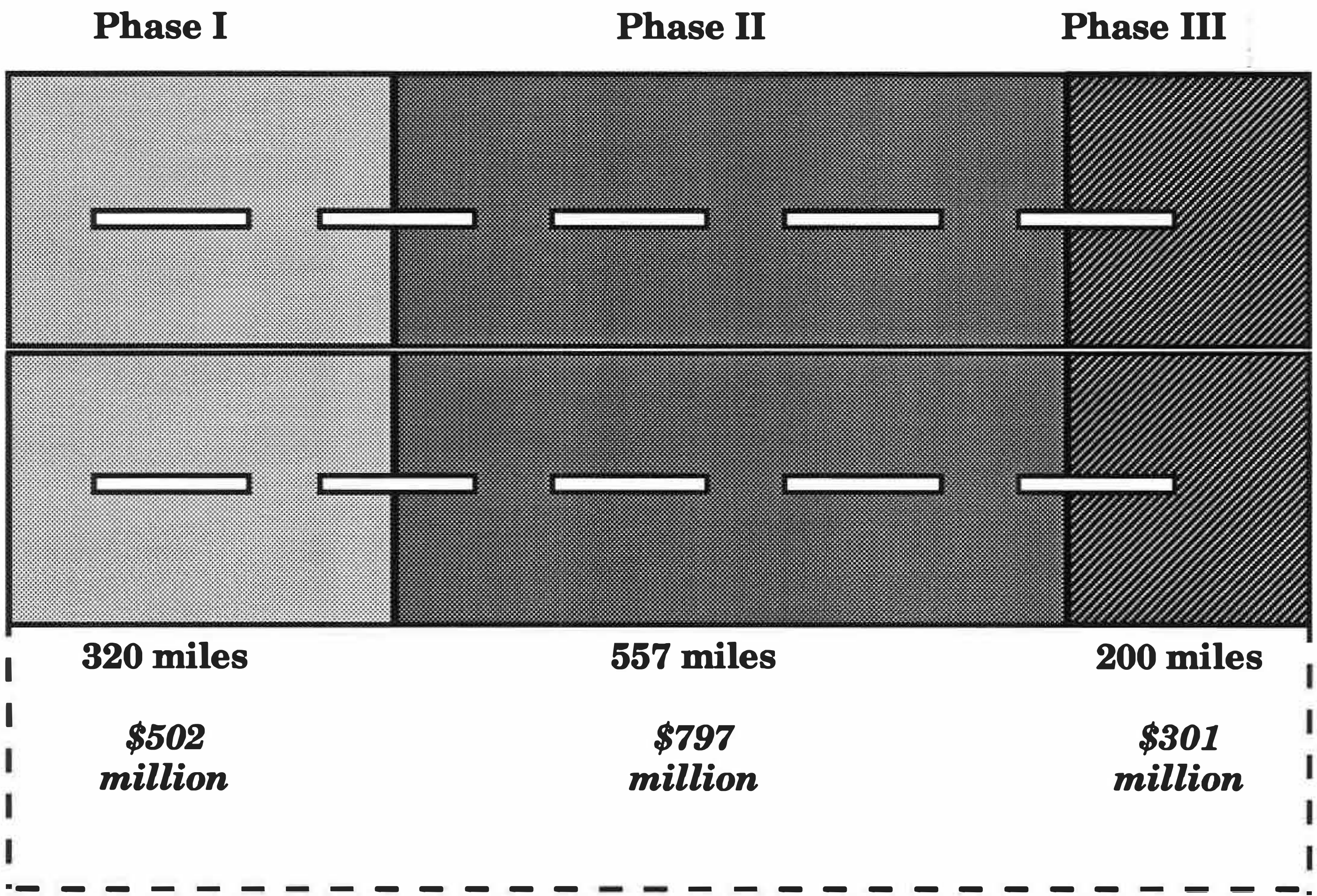
The department initially estimated that Phase I of the Four-Lane Program encompassed 320 miles and would cost $502 million to four-lane. The department originally estimated that Phases II and III encompassed 557 miles and 200 miles, respectively, with projected four-laning costs of $797 million and $301 million (see Exhibit 1, page 7). MDOT recently made significant revisions in its cost estimates and a minor revision in its mileage estimates. Those revisions are addressed later in this report.

Funding the Four-Lane Program

The Legislature enacted several revenue-producing measures in House Bill 1206, 1987 Regular Session, that were designed to provide the necessary funding for the Program. The most significant funding source was an increase in certain state petroleum taxes. The Legislature increased taxes on fuels dedicated to highway use (gasoline by 3.6 cents per gallon, diesel fuel by 3.25 cents per gallon, and compressed gas by 3.6 cents per gallon). The Legislature also provided the following funding sources for the Program:

Exhibit 1

Mileage and Cost of 1987 Four-Lane Program as Originally Proposed



Total Miles - 1,077

Total Cost - $1.6 billion

SOURCE: PEER analysis of MDOT information

- redirected tax revenues on lubricating oils (8 cents per gallon) to the Program;

- dedicated the amount of contractor's tax (three and one-half percent) collected on Program construction;

- applied an annual assessment of five dollars on each motor vehicle tag;

- dedicated fifty percent of selected apportionments to MDOT from the Federal Highway Administration; and,

- dedicated the annual difference between $42 million (MDOT's old debt service requirement) and the current debt service on MDOT's 1985 refunding bonds ("the wedge").

The Legislature provided that the Program's funding sources would remain in effect from July 1, 1987, until August 31, 2001. Exhibit 2, page 9, reflects the proposed funding of the program.

The Legislature also provided MDOT with the authority to borrow up to $50 million through the State Bond Commission if temporary funding shortages occurred. Such borrowed funds must be repaid within five years and were only intended as a mechanism to fill funding gaps during peak construction periods of the Program.

Current Status of the Four-Lane Program

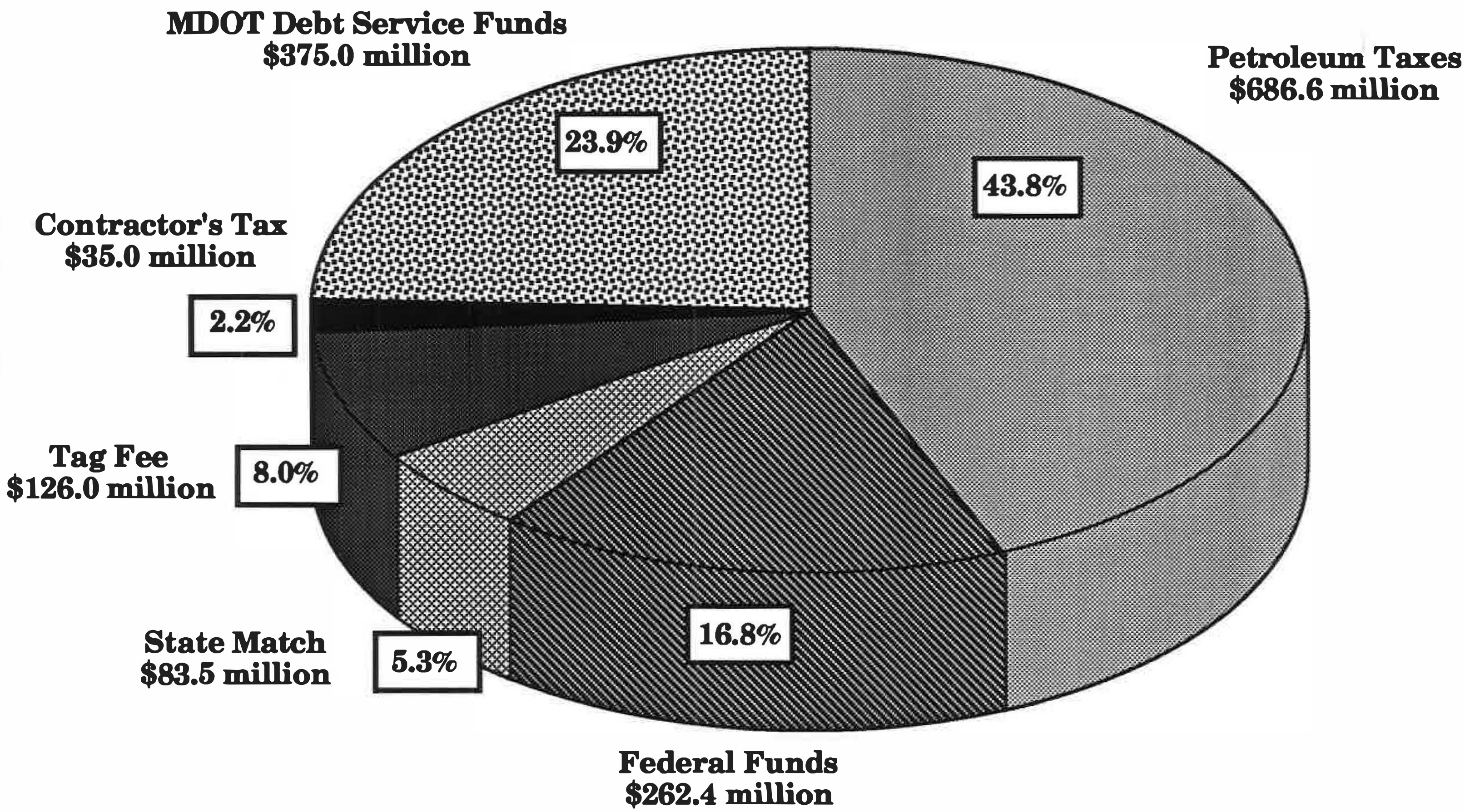
As of June 30, 1993, MDOT had completed and opened to traffic 129.54 miles of four-lane highway, with another 304.7 miles under construction (see Maps B and C, pages ix and xi). MDOT had expended $608.2 million on the Program during the six fiscal years ending June 30, 1993. Program receipts (including transfers from MDOT's regular construction and maintenance funds) for the same period total $699.2 million (see Exhibit 3, page 10).

Program receipts have exceeded MDOT's original revenue projection by $129.6 million (see Exhibit 4, page 11). The excess receipts can be attributed to MDOT's decisions to transfer regular agency revenues (primarily federal revenues) from MDOT's regular operating funds to the Program during this period. In addition, fuel/oil tax revenues have exceeded projections by $27.9 million.

Program expenditures for the first six years of the Program have exceeded the original MDOT cost estimate for the same period by $66.5 million. On August 30, 1993, MDOT revised its revenue and expenditure projections for the Program. MDOT officials announced that Program

Exhibit 2

Funding of 1987 Four-Lane Program as Originally Proposed



Total - $1.57 billion

SOURCE: PEER analysis of MDOT data.

Exhibit 3

1987 Four-Lane Program
Actual Receipts and Disbursements
For the Six Fiscal Years Ended June 30, 1993
(Millions)

Receipts	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	Totals
Fuel taxes	$19.9	$47.6	$55.3	$54.5	$57.3	$57.4	$292.0
Lubricating oil tax	0.9	1.1	1.1	1.0	1.3	1.1	6.5
Federal funds	19.4	35.0	34.0	33.1	30.5	61.3	213.3
State match	9.0	7.3	8.5	6.3	6.3	5.2	42.6
Tag fee	7.3	9.6	9.7	9.5	9.8	10.3	56.2
Contractor's tax	0.4	2.1	2.1	2.7	3.1	2.9	13.3
Debt service funds	3.2	4.2	4.2	9.8	15.0	20.8	57.2
Miscellaneous				0.1	0.1	0.1	0.3
Transfers from MDOT	6.5	0.4	2.4	2.9	2.5	3.1	17.8
Total Receipts	$66.6	$107.3	$117.3	$119.9	$125.9	$162.2	$699.2
Disbursements	$33.5	$80.5	$96.7	$116.1	$133.1	$148.3	$608.2
Excess Receipts Over Disbursements	$33.1	$26.8	$20.6	$3.8	($7.2)	$13.9	$91.0

SOURCE: PEER analysis of MDOT accounting data.

Exhibit 4

1987 Four-Lane Program
Comparison of Projected and Actual Revenues
For the Six Fiscal Years Ended June 30, 1993
(Millions)

	Projected	Actual	Actual Over/(Under) Projection
Petroleum taxes	$270.6	$298.5	$27.9
Federal funds	126.7	213.3	86.6
State match	37.2	42.6	5.4
Tag fee	54.0	56.2	2.2
Contractor's tax	15.0	13.3	(1.7)
Debt service funds	66.1	57.2	(8.9)
Miscellaneous		0.3	0.3
Transfers from MDOT		17.8	17.8
	$569.6	$699.2	$129.6

SOURCE: PEER analysis of MDOT accounting data.

costs are exceeding original MDOT estimates at a rate that will create an estimated $275 million funding shortage for the Program. Subsequently, MDOT has further revised its estimates of Program revenues and expenditures.

On October 27, 1993, the Transportation Commission voted 2-0 (Commissioner Burkes abstained) to request that the Legislature extend the tax assessment and revenue dedication provisions of the Program for an additional year (from August 31, 2001, to August 31, 2002).

As shown in Exhibit 5, page 13, MDOT has revised its total Program cost estimate from $1.6 billion to $2.21 billion, a $613 million increase. MDOT officials have already absorbed some of the increased costs by directing additional federal funding into the Program.

The Transportation Commission proposes a continued increase in the amount of federal highway funding directed to the Program by MDOT and an additional year of funding from petroleum taxes, the contractor's tax, tag fees, and debt service fund transfers.

MDOT estimates that the additional federal funds and the additional year of state funding will increase total Program revenue from $1.57 billion to $2.21 billion, averting a potential funding shortage of $305 million.

Exhibit 5

Analysis of MDOT Revenue and Expenditure Projections Original (1986-87) vs. Revised (October 1993) (Millions)

	1986-87 Original Projection	MDOT Commission Funding Proposal	MDOT Proposed Increase
REVENUES			
Petroleum taxes	$686.6	$884.0	$197.4
Federal funds	262.4	604.8	342.4
State match	83.5	102.1	18.6
Tag fee	126.0	154.8	28.8
Contractor's tax	35.0	49.3	14.3
Debt service funds	375.0	419.1	44.1
	$1,568.5	$2,214.1	$645.6
EXPENDITURES	$1,600.9	$2,214.1	$613.2
REVENUES OVER (UNDER) EXPENDITURES	($32.4)	$0.0	$32.4

SOURCE: PEER analysis of MDOT projections.

Findings

Program Costs are Exceeding Budget

Actual Four-Lane Program costs for completed and open highway segments exceed original MDOT estimates by an average of $249,000 per mile, and MDOT now estimates that total Program costs will exceed original projections by $613 million.

As of June 30, 1993, MDOT had completed and opened to traffic 129.54 miles of four-lane highway under the Program at a total cost of $240 million (see Exhibit 6, page 16). MDOT completed a portion of the highways (20.39 miles) shortly after the Program began in 1987 as part of its regular construction program and paid for the construction with regular construction funds, rather than Program funds.

MDOT officials began developing cost estimates for the Program in June 1986 by using historical construction cost information from 1985. MDOT annually develops a weighted average cost per mile for highway construction based on the prior year's experience for a "typical" construction project. The average costs per mile are classified based on the type of construction and the type of terrain (four-lane, two-lane, rural, urban, etc.).

MDOT officials originally estimated average costs for the Program that ranged from $1.0 to $2.2 million per mile, with an average of $1.485 million per mile. The actual average cost per mile on completed highways through June 30, 1993, was $1.734 million per mile. The variance between MDOT's original Program cost estimates and actual costs occurred because MDOT:

- did not incorporate cost factors for bridges, interchanges and urban areas in its original cost estimate that would substantially increase costs above the average used;
- did not consider inflation in its cost estimate; and,
- failed to recognize the potential for estimation bias resulting from its lack of objectivity regarding the potential program.

Failure to Include Costs of Urban Highway Construction

MDOT officials elected to base Program cost estimates for the entire state on averages developed from MDOT's actual cost experience on "Rural Non-Delta" construction projects. Use of the Non-Delta average appeared reasonable based on the fact that the averages for Delta construction and

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Exhibit 6

1987 Four-Lane Program
Highway Segments Completed and Open to Traffic
As of June 30, 1993

Description	Map Ref	Mileage	Original 1987 Estimate Per Mile	Original 1987 Estimate Total	Actual Cost Per Mile	Actual Cost Total
US 98 between Ralston and New Augusta	1	15.30	$1,400,000.00	$21,420,000.00	$1,625,919.19	$24,876,563.67
US 72 between Stricklin and Burnsville	2	7.00	1,000,000.00	7,000,000.00	1,670,248.33	11,691,738.28
US 82 bypass at Winona	3	3.10	1,690,000.00	5,239,000.00	3,993,641.88	12,380,289.82
US 45 from I-59 to SR 19	4	1.30	2,200,000.00	2,860,000.00	5,025,755.74	6,533,482.46
US 49W from Inverness Bypass to Indianola	5	7.20	1,400,000.00	10,080,000.00	1,479,519.64	10,652,541.43
US 82 from SR 12 to Alabama	6	8.40	1,450,000.00	12,180,000.00	3,031,142.72	25,461,598.86
US 98 from the Lucedale Bypass to Alabama	7	6.90	1,000,000.00	6,900,000.00	563,418.20	3,887,585.60
US 98 from Columbia to Lamar County Line	8	7.50	1,000,000.00	7,500,000.00	1,018,771.50	7,640,786.25
US 45 from the Prentiss County Line to Corinth	9	10.25	1,400,000.00	14,350,000.00	2,677,358.29	27,442,922.46
US 45A from US 82 to West Point	10	7.10	1,400,000.00	9,940,000.00	2,431,726.14	17,265,255.62
US 61 at the Homochitto River Bridge	11	2.00	1,400,000.00	2,800,000.00	5,223,743.80	10,447,487.60
US 84 between Jones County Line and Whistler	12	9.60	1,000,000.00	9,600,000.00	651,607.90	6,255,435.83
US 45 between Lauderdale and Porterville	13	11.10	1,000,000.00	11,100,000.00	1,448,863.74	16,082,387.54
US 84 between Auburn Road and I-55	14	5.50	1,000,000.00	5,500,000.00	719,324.77	3,956,286.24
SR 302 from Airways Boulevard to Swinnea Road	15	1.10	1,400,000.00	1,540,000.00	2,986,502.57	3,285,152.83
US 84 between Horse Creek and SR 28	16	1.80	1,400,000.00	2,520,000.00	2,498,858.28	4,497,944.91
US 84 between Whistler and Waynesboro	17	4.00	1,400,000.00	5,600,000.00	1,301,192.07	5,204,768.26
US 78 Fulton Bypass to Alabama	18	13.33			2,825,683.10	37,666,355.69
US 84 between Leesdale and Roxie	19	7.06			774,582.79	5,468,554.50
Total		129.54				$240,697,137.85

SOURCE: PEER analysis of MDOT data

Actual Over (Under) Estimate		
Per Mile	Total	MDOT Explanation
$225,919.19	$3,456,563.67	4 bridges; Wetlands; heavy grading due to hills; extensive slides so regraded site to 88 feet
670,248.33	4,691,738.28	4 bridges; some reconstruction of existing 2-lane due to line change because of railroad
2,303,641.88	7,141,289.82	6 bridges; all new location; half-clover interchange
2,825,755.74	3,673,482.46	Diamond interchange; full control of access; 2 ramps; 12-foot shoulders; 4-laned SR 19
79,519.64	572,541.43	3 bridges; new location for Inverness Bypass; 5-laned into Indianola
1,581,142.72	13,281,598.86	2 interchanges; 13 bridges, including 2 large ones; 5-laned at Highway 50 for turn lanes
(436,581.80)	(3,012,414.40)	2 lanes parallel to existing; no bridges; short hills
18,771.50	140,786.25	3 bridges; rehabilitated existing 2-lane to 3-R standards
1,277,358.29	13,092,922.46	26 new bridges; new location for approximately 2.5 miles off of Corinth Bypass
1,031,726.14	7,325,255.62	4 bridges; regraded some portion in order to meet vertical grade criteria
3,823,743.80	7,647,487.60	2 large bridges; 600' steel center span; all new location; tied into Highway 61
(348,392.10)	(3,344,564.17)	2 bridges; rehabilitated existing 2-lane to 3-R standards; good soil
448,863.74	4,982,387.54	Rehabilitated existing 2-lane to 3-R standards
(280,675.23)	(1,543,713.76)	No bridges; rehabilitated existing 2-lane to 3-R standards
1,586,502.57	1,745,152.83	Urban site (curbing, drainage, widening); Widened 2-lane to 5-lane
1,098,858.28	1,977,944.91	Rehabilitated existing 2-lane to 3-R standards
(98,807.94)	(395,231.74)	No bridges; rehabilitated old 2-lane to 3-R standard; good soil

Non-Delta construction are very similar. However, MDOT did not consider the significantly higher cost of highway construction in urban areas despite the fact that at least ten cities and towns with populations in excess of 5,000 (standard used to define urban area in MDOT cost estimates) are encompassed by the program. MDOT's 1985 weighted average costs for construction of four new lanes in urban areas exceeded the cost in rural areas by $3 million per mile.

Failure to Include Costs of Bridges and Interchanges

The weighted average costs developed by MDOT on an annual basis did not include cost factors for bridges and interchanges. As such, MDOT officials did not attempt to identify Program needs in the area of bridges and interchanges during the development of Program cost estimates. MDOT officials stated that they felt that the cost estimates were sufficient to cover any bridge and interchange needs that arose in the program.

Exhibit 6, page 16, reflects that in almost all instances in which actual Program costs have exceeded estimated costs, new bridges and interchanges have been constructed. A notable example of this is U.S. Highway 45 between the Prentiss County line and north to Corinth in Alcorn County. MDOT officials estimated a cost of $1.4 million per mile for this highway segment, yet actual costs were $2.6 million per mile. The primary reason for the excess cost was the construction of twenty-six bridges on this ten-mile highway segment.

MDOT engineers normally perform engineering analyses of potential highway projects prior to MDOT's development of agency estimates on such projects. Such evaluations include detailed analysis (e.g., environmental conditions, condition of current highways and bridges) of the area through which the construction work is planned. These engineering evaluations can take months or even years, depending on the mileage involved. MDOT officials stated that such engineering analysis of the proposed four-lane program in 1986 would have taken more than a year to complete, and MDOT only had six months prior to the 1987 Legislative Session to analyze the proposed program. Thus, MDOT did not perform engineering analyses during the development of Program cost estimates.

PEER concurs that time constraints prohibited the use of formal engineering estimates; however, MDOT could have performed limited analysis of the specific needs of certain highways in the Program. Six district engineers serve the agency throughout the state and are very familiar with the needs in their respective districts. MDOT officials did not seek input from district engineers when developing their cost estimate for the Program in 1986. MDOT officials revised their original cost estimates in August 1993 by performing analysis of the needs of specific highways by seeking input from district engineers. The process took only three weeks.

Failure to Incorporate an Inflation Factor

MDOT officials did not incorporate the potential effects of inflation when developing their cost estimates, despite the projected fourteen-year life of the Program. A conservative inflation estimate of 1.5 percent per year would have added $182 million to the estimated total cost of the Program. MDOT officials stated that they did not incorporate an inflation estimate because they assumed fuel consumption would increase significantly enough during the life of the program to provide additional fuel taxes to offset the costs of inflation.

Failure to Recognize the Potential for Estimation Bias

Highway officials acknowledge that they strongly favored enactment of a four-lane program in 1987. This lack of objectivity regarding the proposed program resulted in estimation bias, a problem that is common to capital budgeting decisions when those responsible for estimating costs are not independent with respect to a proposed project. Highway officials knew that applying a statewide average cost per mile rather than evaluating specific highway segments in the proposed program created only a preliminary and rough estimate. However, officials felt that having a consistent cost per mile factor would make the presentation of the costs of the proposed program less complex and thus increase the chances that the legislation would pass.

Effect of the Department's Understated Estimates

During PEER's review MDOT officials have consistently stated that the original cost estimates were only preliminary and rough estimates that should not be considered for comparison with actual costs. However, the Legislature created and funded the entire Four-Lane Program based on MDOT's original cost estimates. MDOT's original cost estimates effectively created a budget of $1.6 billion for the Program. Actual costs are exceeding the original cost estimates by an average of $249,000 per mile. MDOT now estimates that the average cost per mile will increase to $2.1 million and the total Program cost will exceed original estimates by $613 million. The funding provided in the enabling legislation was projected to provide $1.6 billion over the Program's life. On October 27, 1993, the Transportation Commission voted to ask the Legislature to extend the Program's funding by one year and authorized the transfer of additional MDOT regular construction moneys to the Program to fund the excess costs.

Failure to Monitor and Report Program Activities Adequately

MDOT officials failed to monitor revenues and expenditures of the 1987 Four-Lane Program sufficiently to recognize potential funding problems in a timely manner.

PEER sought to determine why MDOT officials did not address potential funding problems until six years after the Program's inception. MDOT officials acknowledge that they had not monitored the Program sufficiently to know that Program costs were exceeding original cost estimates to such an extent as to create a funding problem. MDOT has no mechanism in place for tracking Program revenues and expenditures for comparison with original Program projections as established in 1987 by MDOT officials.

PEER sought to review the costs of all highway segments completed and open-to-traffic under the Program in order to compare the information with original estimates for such highway segments; however, MDOT's accounting system does not produce information that facilitates such a review. PEER staff, with the assistance of MDOT staff, had to manually match cost information from the accounting system with descriptions of completed highway segments in order to determine the cost of completed highway segments (see Exhibit 6, page 16). MDOT officials had not made any such analyses or comparisons since the inception of the Program. Woodrow G. Tullos, Director of Administration for MDOT, stated that he had monitored Program revenues in comparison to original projections but had never considered performing similar comparisons for expenditures.

MDOT's philosophy for managing the Program is basically the same as for the agency's regular highway construction projects. Agency officials place a significant amount of emphasis on planning and letting contracts for construction; however, they place little or no emphasis on comparing original planning data with actual results to determine whether objectives developed in the initial planning process are being met. Instead the focus turns to planning the next project. While careful planning is essential to project management, the planning process is meaningless unless the results of the planning are measured against the original objectives developed during planning.

MDOT officials have repeatedly downplayed the original cost estimates of the Program as preliminary and rough estimates that had no purpose once the Program was enacted. MDOT officials stated that only official engineering cost estimates should be considered for comparison to actual costs. MDOT officials have felt no need to compare actual costs to the original estimates. However, the Legislature based the entire funding structure of the Program on the original preliminary and rough cost estimates developed by MDOT officials. MDOT's position regarding the original cost estimates ignores the fact that if costs exceed the original estimates, the funding will not be sufficient to offset the increases unless funding increases.

MDOT officials have characterized the Program as "the largest public works program ever conducted in the state," and the Legislature recognized that the Program was not a typical highway project when it established the Program's objectives and funding in House Bill 1206. Thus, the Program should be managed and monitored in a manner different from a typical MDOT highway project. The original cost estimates developed by MDOT and used as a basis for developing funding for the Program effectively established a budget for the Program. Monitoring the actual results of the Program as compared to the original budget is essential to ensuring that problems are identified and addressed in a timely manner before they compound.

MDOT's failure to monitor revenues and expenditures of the Program adequately during the Program's first six years is not the reason the Program faces a funding shortage. However, MDOT's poor Program monitoring and the resulting partial reporting of Program activities have raised questions as to whether MDOT officials have been aware of the potential funding problems since Program's inception (see subsequent finding). These questions have resulted in criticism of MDOT's credibility regarding the planning of the Program in 1986. While it appears MDOT officials have not intentionally attempted to misrepresent the progress of the Program, the department's failure to monitor and report Program activities adequately has created such a perception.

MDOT's annual reporting of the status and activities of the Program has been incomplete and has not been in compliance with the requirements of MISS. CODE ANN. Section 65-3-97 (9).

MDOT periodically (at least annually) issues a report to the Legislature entitled *Mississippi Moving Ahead.* According to MDOT officials, this report, along with the agency's regular annual report, represents the agency's annual status report to the Legislature as required by House Bill 1206, 1987 Regular Session (now codified as MISS. CODE ANN. Section 65-3-97). The MDOT Office of Public Affairs prepares the report with assistance from the agency's Planning and Programming Manager. The report format has remained basically the same over the years.

PEER analyzed the most recently issued report (July 1, 1993) for compliance with the statutory requirements of MISS. CODE ANN. Section 65-3-97 (9):

> *The Highway Department shall submit a report to the Legislature by January 10 of each calendar year setting forth the current status of the construction program set forth in this*

section to include, but not be limited to, the following information:

(a) Specific segments on which engineering is being performed or has been completed;

(b) Specific segments for which right-of-way has been acquired or is being acquired;

(c) Specific segments for which construction contracts have been let;

(d) Specific segments on which construction is in progress;

(e) Specific segments on which construction has been completed;

(f) Projections for completion of the next step on each segment; and

(g) Revenue derived for such construction program from each revenue source contained in Chapter 322, Laws, 1987.

The July 1993 MDOT report only provides general information relative to the number and total value of construction contracts that have been let. The report makes no reference to actual costs incurred or the total number of highway miles that are completed and open to traffic relative to the total proposed mileage of the Program. The report provides a map of all highways in the Program but only refers to specific highway segments on which construction work has begun. The status of engineering and right-of-way acquisition work on other highway segments is not presented.

The July 1993 MDOT report also presents incomplete information regarding the funding of the Program. The report presents state revenues for fiscal year 1993 but omits other sources of funds that have been placed into the Program, primarily federal funds. Furthermore, MDOT provides no information regarding Program expenditures for the year or since the inception of the Program in 1987. A reader cannot compare total revenues received with total expenditures for the year or on a cumulative basis for the Program.

MDOT's annual reports also do not reflect revisions of Program mileage and cost estimates. As of June 30, 1993, MDOT officials had revised mileage estimates of Phase I of the Program from 320 miles to 336 miles and had amended the cost estimate to complete Phase I from $502 million to $709 million. However, the July 1993 report continues to reflect Phase I as 320 miles with an estimated cost of $502 million.

By placing specific reporting requirements in law, the Legislature expressed its desire to remain fully informed of the progress of the Program on an annual basis. Any very large capital project, such as the Program, scheduled over a long period is likely to face some changes during the life of the project, whether as the result of changing economic conditions or the determination that original estimates were low. Although MDOT is charged with implementing the Program, the Legislature is ultimately responsible for the priorities and funding of the Program. Thus the Legislature must be informed about significant changes in costs or funding as they occur in order to take corrective action in a timely manner.

MDOT's incomplete reporting of Program activities is not the reason that the Program faces a funding shortage. However, MDOT's failure to disclose such problems in a timely manner has generated questions about the agency's accountability and its ability to manage the Program effectively. Failure to resolve these questions may further impede progress towards completion of the Program in a timely manner.

Failure to Let Contracts as Required by Statute

MDOT has not complied with MISS. CODE ANN. Section 65-3-97 (1972), which requires that the department let all contracts necessary for completion of Phase I of the Program by June 30, 1993.

In House Bill 1206 (codified as MISS. CODE ANN. Section 65-3-97 [1972]), the Legislature established priorities for completion of the Program by placing various highway segments in one of three phases. Highway segments in Phase I have the highest priority, while those in Phases II and III have the second and third highest priorities, respectively. In regard to Phase I, the statute requires:

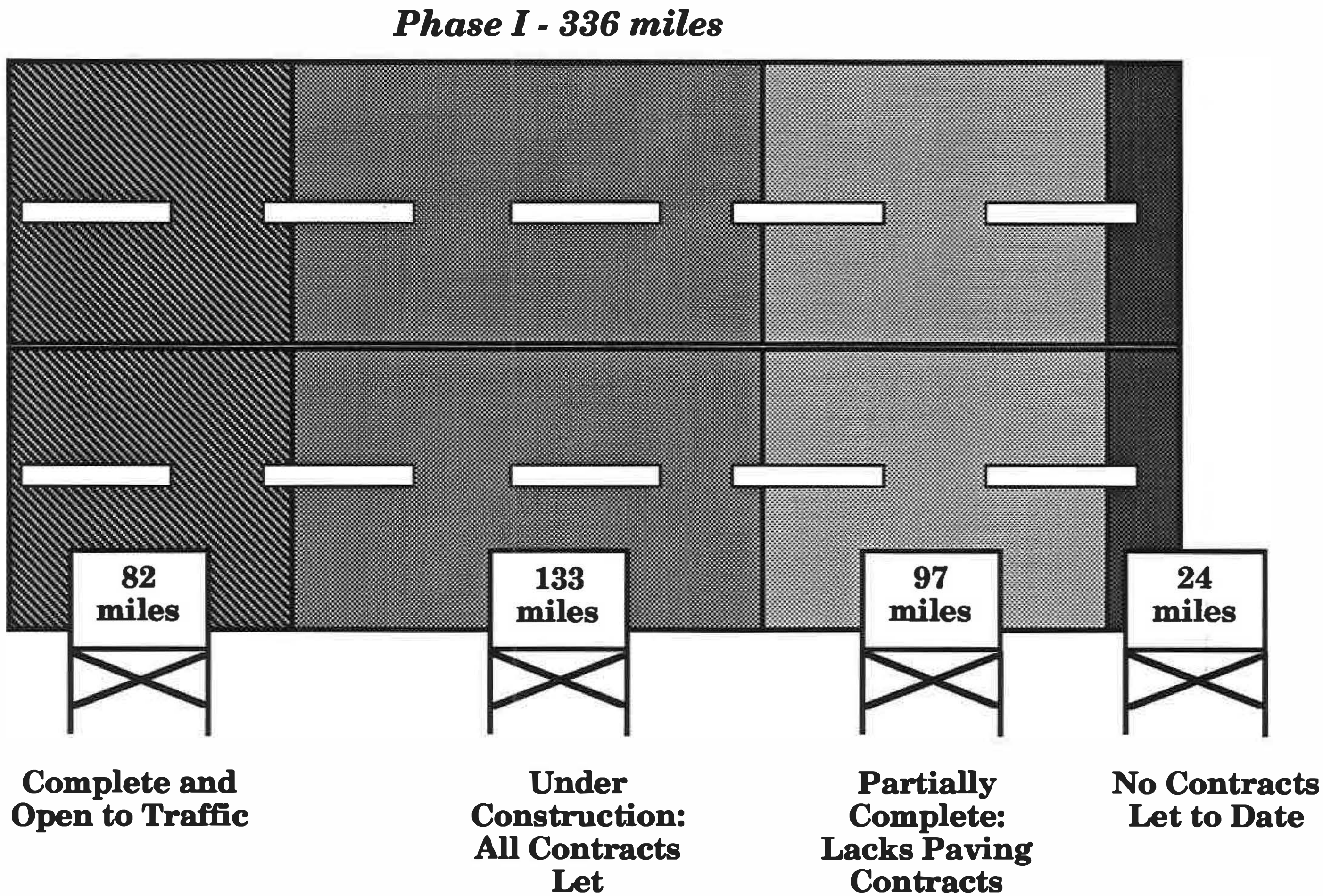
> *Of the following group of highway segments not less than fifteen percent (15%) of all contracts necessary to be let for completion of all segments within the group shall be let by June 30, 1988. . .and* ***one hundred percent (100%) of such contracts shall be let by June 30, 1993.*** [Emphasis added]

The statute permits MDOT to let contracts for lower priority highway segments in Phases II and III as long as MDOT has met all scheduling requirements for letting Phase I contracts.

MDOT had not let all contracts necessary for completion of 121 of the 336 miles of Phase I four-lane highway as of June 30, 1993 (see Exhibit 7, page 24 and Map D, page xiii). MDOT had not let paving contracts on ninety-seven miles of highway and had not begun initial site preparation on twenty-four miles of highway. MDOT engineers estimate that completion of the 121 miles of Phase I will cost in excess of $115 million. In addition, MDOT officials have let two contracts (with an estimated total cost of $12

Exhibit 7

1987 Four-Lane Program
Status of Phase I Construction
As of June 30, 1993



SOURCE: PEER analysis of MDOT records.

million) on Phase II highway segments during the period between June 30 and October 13, 1993, despite not having let all Phase I contracts.

MDOT officials consider the ninety-seven miles of highway on which site preparation has been completed but paving is lacking as complete within the statutory requirements of MISS. CODE ANN. Section 65-3-97. MDOT considers the program as "on schedule," despite the fact that it has not let necessary contracts to complete more than one third of Phase I highway miles as of June 30, 1993.

Phase II of the Program, with approximately 557 miles of highway is significantly larger than Phase I, which has 336 miles of highway. MDOT's failure to complete Phase I in a timely manner raises a question as to whether MDOT can finish the remainder of Phase I and let all contracts by June 30, 1998, that are necessary to complete Phase II. MDOT's failure to complete highway segments in a timely manner could jeopardize the ability of MDOT to complete future Program highway segments in compliance with the schedule provided by the Legislature in MISS. CODE ANN. Section 65-3-97 (1972).

Failure to Use Program Interest Earnings for Program Costs

MDOT officials have diverted $24.2 million in interest earnings on Program funds into the agency's regular construction fund.

Moneys restricted by law or by MDOT to fund the Program are accounted for separately from other MDOT moneys, but both are maintained in a single treasury fund. MDOT officials do not allocate any of the interest earnings on the treasury fund to the Program. During the six fiscal years ended June 30, 1993, MDOT earned $49.5 million in interest on moneys in its treasury fund. MDOT officials did not allocate any interest earnings on the agency's total cash balances to the Program, despite the fact that Program cash balances represented, on average, 48% of the agency's total cash balance during this six-year period. If MDOT had properly allocated interest earnings, the Program would have realized an additional $24.2 million in revenue during this six-year period.

MDOT officials acknowledge that they have allotted no interest earnings to the Program. Their position is that the law does not require such allocation. Historically, MDOT only allocates interest earnings to restricted funds when required by law. MDOT uses interest earnings to partially fund its regular operating budget, including administrative expenses.

House Bill 1206, 1987 Regular Session, specifically restricted certain MDOT revenues for use in funding the Program (MDOT debt service funds, certain federal funds, tag fees, contractor's tax, and lubricating oil excise tax). In addition, the Legislature increased the gasoline tax by 3.6 cents per gallon and taxes on other fuels as noted on page 8, with the intent that revenues generated by such increases be used to fund the Program. Though not stated specifically in the statutes, it is PEER's opinion that the Legislature intended that the above-mentioned funding sources be used exclusively to fund the Program. The Legislature provides other sources of funding for MDOT's regular operating costs and did not raise taxes in 1987 as a means of providing additional operating revenue for MDOT.

As stated earlier, MDOT officials have estimated that the Program faces a funding shortage of $305 million. The Legislature is ultimately responsible for providing funding for the Program. Legislative intent is that all funds intended for the Program be used exclusively for the Program. If MDOT had followed legislative intent regarding interest earnings, the projected funding shortage would be at least $24.2 million less.

Conclusion

There is no question as to the merits of the Program. According to MDOT, the Program is the largest public works project ever conducted in the state. Due to its size and the extended period that it covers (fourteen years), the exact final cost of the Program cannot yet be determined. As such, estimates are necessary. In 1986, the Legislature called on the department to provide such cost estimates. While MDOT could not have been expected to predict the exact final cost of the Program, agency officials should have relied more on agency expertise when developing the original cost estimates. The use of averages may have been acceptable for preliminary estimates. However, given the six-month period between initial conceptualization of the Program and 1987 legislative consideration, the department should have refined its estimate using formal forecasting methods. PEER suggests that the department may have been reluctant to refine original estimates because of bias and concern that any cost increase could jeopardize legislative success.

The current trend of Program costs exceeding original estimates appears to be more related to poor and imprecise original estimates rather than a problem with current construction costs. MDOT officials have maintained that changes in federal standards for construction have resulted in increased costs. PEER confirmed with the Federal Highway Administration that no federal highway construction standards have changed significantly enough to impact the Program to the extent of the reported funding shortages of the Program ($275 to $305 million).

As presently designed, the Program faces a funding shortage. MDOT should strive to use the expertise of its agency to provide the Legislature with complete and accurate information regarding Program revenues, costs and estimates.

Problems which contributed to the poor estimates made in 1987 may be continuing. The most recent MDOT cost estimate (approved by the Commission on October 27, 1993) was prepared by Commissioner Zack Stewart and approved by the Commission **with no analysis by MDOT's engineering and accounting staff.** PEER suggests that forecasts of this significance should be prepared by MDOT technical staff and not by an elected official whose responsibilities relate to policy making. MDOT should review and refine the agency's latest Program cost estimate prior to the 1994 legislative session to insure that information presented to the Legislature is as accurate and complete as possible.

Recommendations

1. MDOT should develop a formal written document which includes complete and detailed cash flow projection of Program activities from July 1, 1993, forward for presentation to the 1994 Legislature. The document should reflect projected cash flows for each year by source and an estimate of when the Program will encounter a funding shortage due to costs exceeding original projections.

2. The Legislature should amend MISS. CODE ANN. Section 65-3-97 (9) (1972) to require MDOT to include the following information in its annual report to the Legislature on the 1987 Four-Lane Highway Program:

   - an annual cash flow projection as described in Recommendation 1;

   - a schedule of all complete and open-to-traffic highway segments and the related total cost of each segment;

   - a schedule of all highway segments on which all contracts necessary for completion of the segments were not let as of the date required by law;

   - a complete recap of <u>all</u> Program receipts (by source) and disbursements for the prior fiscal year and cumulative totals since the inception of the program as compared to projections; and,

   - a statement from MDOT regarding the status of the funding of the Program based on agency cost experience and projections for the future.

   MDOT should continue to issue the annual report with the above-described information every year throughout the term of the Program, with a final report issued the year following the Program's completion.

3. MDOT should take the following actions to improve its monitoring of the revenues and expenditures of the Program:

   - Develop a process within the agency's accounting system of capturing all costs (preliminary engineering, right-of-way acquisition, construction and overhead) of the discrete highway segments specified in House Bill 1206, 1987 Regular Session.

   - The MDOT Executive Director should delegate responsibility for monitoring Program revenues and expenditures to an agency administrator and require such administrator to make quarterly reports to the Commission. Such administrator should also be responsible for insuring that MDOT's annual report to the Legislature regarding the Program is complete and accurate.

4. MDOT should transfer $24.2 million from its regular agency operating funds to the Program fund as repayment for interest earned by Program moneys but retained in the agency's regular operating funds. MDOT should allocate future interest earnings on Program moneys to the credit of the Program.

5. The Legislature should amend MISS. CODE ANN. Section 65-1-111 (1972) to require that all interest earned on funds held for construction and reconstruction of highways under the Four-Lane Program (established under MISS. CODE ANN. Section 65-3-97 [1972]) be retained as a source of funding for the Program.

Appendix A

1987 Four-Lane Program Project Descriptions*

Map Ref	Description	Mileage	Phase
1	US 98 between Ralston and New Augusta	15.30	I
2	US 72 between Stricklin and Burnsville	7.00	I
3	US 82 bypass at Winona	3.10	I
4	US 45 from I-59 to SR 19	1.30	I
5	US 49W from Inverness to Indianola	7.20	I
6	US 82 from SR 12 to Alabama	8.40	I
7	US 98 from the Lucedale Bypass to Alabama	6.90	I
8	US 98 from Columbia to Lamar County Line	7.50	I
9	US 45 from the Prentiss County Line to Corinth	10.25	I
10	US 45A from US 82 to West Point	7.10	I
11	US 61 at the Homochitto River Bridge	2.00	II
12	US 84 between Jones County Line and Whistler	9.60	II
13	US 45 between Lauderdale and Porterville	11.10	II
14	US 84 between Auburn Road and I-55	5.50	II
15	SR 302 from Airways Boulevard to Swinnea Road	1.10	II
16	US 84 between Horse Creek and SR 28	1.80	II
17	US 84 between Whistler and Waynesboro	4.00	II
18	US 78 Fulton bypass to Alabama	13.33	I & II
19	US 84 between Leesdale and Roxie	7.06	II
20	US 78 from Hickory Flat to the west end of the New Albany Bypass	9.10	I
21	US 45 from Saltillo to SR 30	14.90	I
22	US 78 from the Holly Springs Bypass to Hickory Flat	14.60	I
23	US 45 from five miles north of the Clarke County Line to SR 19	6.10	I
24	US 84 from I-59 to the Wayne County Line	10.60	I
25	US 45 from SR 370 to SR 4	13.40	I
26	US 98 from two miles west of the Greene/Perry County Line to Little Oktibee Creek	9.20	I
27	US 61 from the Big Black River Bridge to the four lane at Yokena	7.00	I
28	US 98 from Little Oktibee Creek to the Chickasawhay River	5.80	I
29	US 45 from south of the Clarke County Line to the Meridian Bypass	6.00	I
30	US 45 from SR 4 to the Alcorn County Line	6.10	I
31	US 98 from the Chickasawhay River to the Lucedale Bypass	3.60	I
32	US 61 from Port Gibson to the Big Black River	8.00	I
33	US 45 from the south end of the Macon Bypass to Brooksville	12.10	I
34	US 98 Lucedale Bypass	9.70	I
35	US 45A from south of SR 41 to Shannon	8.70	I
36	US 45A from four miles south of Okolona to south of SR 41	5.40	I
37	US 98 from one mile east of SR 29 to two miles west of the Greene County Line	9.70	I
38	US 82 from the Winona Bypass to Kilmichael	11.00	I
39	US 72 from Mount Pleasant eastward to the Benton County Line	12.00	I
40	US 72 from Goose Creek Bottom to Corinth	11.10	I
41	US 72 from the Tippah County Line to Goose Creek Bottom	3.80	I
42	US 72 from Walnut to the Alcorn County Line	5.20	I
43	US 45 from Columbus Air Force Base to McKinley Creek	7.90	I
44	US 45 from McKinley Creek to the interchange at SR 25 and SR 8 near Lackney	6.10	I
45	US 82 from two miles west of Eupora eastward	5.80	I & II
46	US 72 from the Marshall County Line to just east of Wolf River	9.10	I
47	US 45 from US 41 (New Wren) to Shannon	11.50	I
48	US 82 from Station 673 to one-half mile west of SR 15 and US 82	6.05	I
49	US 49W through Yazoo City to the Yazoo River	4.00	I
50	US 61 replace bridge at Buffalo River	0.00	II
51	US 61 from Clarksdale Bypass northward	7.00	II
52	US 45 from Porterville to Scooba	10.10	II
53	US 61 from seven miles north of Clarksdale to US 49 near Lula	6.20	II
54	US 49W from SR 12 to Inverness	15.00	II
55	US 61 from 0.3 mile north of the Natchez Trace to the Jefferson County Line	2.80	II
56	SR 63 from the Jackson County Line to the Lucedale Bypass	7.40	II
57	SR 25 from SR 471 to SR 43	9.70	II
58	US 45 from Scooba to the Noxubee County Line	7.30	II
59	SR 25 from SR 16 to SR 35	7.20	III
60	US 45 from Lackney to Aberdeen	2.70	I
	Total	**458.49**	

* Includes all Phase I highway segments and those segments of Phases II and III on which MDOT has initiated project work.

SOURCE: PEER analysis of MDOT data

Appendix B

Status of Phase I Highway Segments Not Opened to Traffic
As of June 30, 1993

Map Ref	Description	Mileage
Uncompleted Phase I highway segments which have had all contracts necessary for completion let		
20	US 78 from Hickory Flat to the west end of the New Albany Bypass	9.10
21	US 45 from Saltillo to SR 30	14.90
22	US 78 from the Holly Springs Bypass to Hickory Flat	14.60
23	US 45 from five miles north of the Clarke County Line to SR 19	6.10
24	US 84 from I-59 to the Wayne County Line	10.60
25	US 45 from SR 370 to SR 4	13.40
27	US 61 from the Big Black River Bridge to the four lane at Yokena	7.00
28	US 98 from Little Oktibee Creek to the East Relief Bridge over the Chickasawhay River	5.80
29	US 45 from south of the Clarke County Line to the Meridian Bypass	6.00
30	US 45 from SR 4 to the Alcorn County Line	6.10
31	US 98 from the East Relief Bridge over the Chickasawhay River to the Lucedale Bypass	3.60
32	US 61 from Port Gibson to the Big Black River	8.00
34	US 98 Lucedale Bypass	9.70
41	US 72 from the Tippah County Line to Goose Creek Bottom	3.80
43	US 45 from Columbus Air Force Base to McKinley Creek	7.90
44	US 45 from McKinley Creek to the interchange at SR 25 and SR 8 near Lackney	6.10
	Total	**132.70**
Uncompleted Phase I highway segments which have not had paving contracts let		
26	US 98 from two miles west of the Greene/Perry County Line to Little Oktibee Creek	9.20
33	US 45 from the south end of the Macon Bypass to Brooksville	12.10
35	US 45A from south of SR 41 to Shannon	8.70
36	US 45A from four miles south of Okolona to south of SR 41	5.40
37	US 98 from one mile east of SR 29 to two miles west of the Greene County Line	9.70
38	US 82 from the Winona Bypass to Kilmichael	11.00
39	US 72 from Mount Pleasant eastward to the Benton County Line	12.00
40	US 72 from Goose Creek Bottom to Corinth	11.10
42	US 72 from Walnut to the Alcorn County Line	5.20
45	US 82 from two miles west of Eupora eastward	3.50
46	US 72 from the Marshall County Line to just east of Wolf River	9.10
	Total	**97.00**
Uncompleted Phase I highway segments which have not had any contracts let		
47	US 45 from US 41 (New Wren) to Shannon	11.50
48	US 82 from Station 673 to one-half mile west of SR 15 and US 82	6.05
49	US 49W through Yazoo City to the Yazoo River	4.00
60	US 45 from Lackney to Aberdeen	2.70
	Total	**24.25**
	Grand Total	**253.95**

SOURCE: PEER analysis of MDOT data.

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