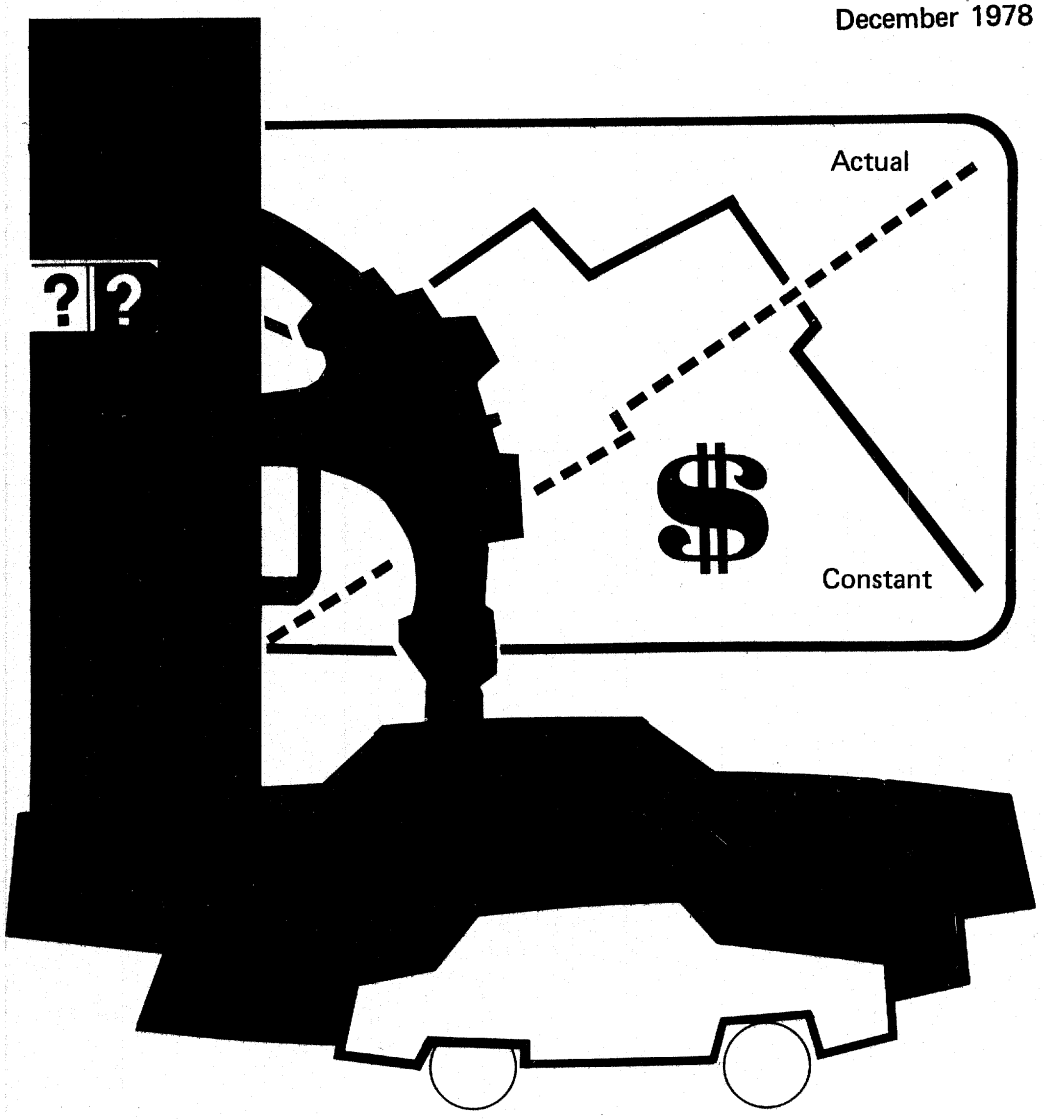
The State Highway Finance Outlook

December 1978



U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration
Office of Program and Policy Planning

THE STATE HIGHWAY FINANCE OUTLOOK

Prepared by

Thomas W. Cooper
Economist

U.S. Department of Transporation
Federal Highway Administration
Office of Program and Policy Planning

July 1978

ACKNOWLEDGEMENTS

Robert C. Matthews is especially recognized for his contribution to this report. Specifically, he is responsible for the discussion and analysis of State Highway Pricing Policies and Practices (Part C of Chapter 1) and the National Energy Conservation Policy.

Also contributing are:

Robert W. Sherrer on Gasoline Pricing and Taxation and

John T. Berg on Energy Roads and Taxation.

Thanks are also due to W. R. McCallum, G. R. Tyndall, W. F. Reulein, and other officials and staffs of the Federal Highway Administration and the Office of the Secretary (DOT) for guidance and assistance; to J. Ritter and L. M. Cooper and others for review and editing; and to V. Moyer for typing assistance.

Table of Contents

List of Figures

List of Tables

Appendix

List of Maps

STATE HIGHWAY FINANCE OUTLOOK

Executive Summary

The State highway financial outlook is clouded. Events of the past few years and the prospects for the future cause concern among State and national policymakers. The purpose of this report is to explain these fiscal developments, review past financial policies and their performance, make appropriate economic tests, and suggest remedial action. In addition, the report describes the specific actions of several States in meeting financial problems.

The uncertainty affecting highway programs is due to inflation, increased noncapital costs, increased vehicle efficiency, increased fuel prices, and deteriorating highway systems. The combined affects of these factors results in fewer real dollars being spent for highway improvement. Although the future is uncertain, highway travel will likely continue to increase, highway costs will likely escalate, and revenue growth will likely level off, or even decline. Reduced real capital investment, in turn, will likely reduce highway performance.

While many States have voiced concern over maintaining highway capital improvement programs, several States have moved forward with some novel fiscal approaches. An appraisal of these strategies is central to the purpose of this report.

Background and Fiscal Performance

Since the early 1900's, the State has been the principal government body providing highways. Complementing this development was the rapid growth in the use of automobiles and trucks by all levels of society. It was soon recognized that the growth in use of motor vehicles could provide the means of support for expanding State highway programs. Road-user taxes, such as the gas tax and motor vehicle fees, were introduced and spread to all States.

The parallel growth of highways, vehicles, travel, and user charges has tended to reinforce the development of highways. For the most part, user taxes have produced sufficient funds for highway expansion, especially for highways serving intercommunity, interstate, and inter-regional travel. A convention has evolved in the United States whereby highway users pay for the provision of highways through a system of selective taxes, fees, and charges. Moreover, based upon accepted tax theory, it is deemed just and equitable that such tax receipts be used exclusively for highway improvement and operation.

Recent events, however, have disturbed the above equilibrium. Inflation has raised the cost of highway construction and maintenance, and tax revenue has not kept pace. Furthermore, due to anticipated energy conservation measures, future prospects of motor-fuel taxes serving as the primary source of revenue for highways are in doubt. The interaction of inflation and the reduction in the portion of State highway budgets available for capital improvement results in a decline in

real capital investment. Compounding the problem is the growth in highway demand. Despite increased motor-fuel costs, vehicle-miles of travel (VMT) continue to grow at a 4 to 5 percent annual rate.

Remedial Action

Highway tax revenue, then, tied to units of consumption, will not likely produce sufficient income to maintain performance of the Nation's highways. Thus, States are responding by taking administrative, institutional, and fiscal actions. Specifically, States are reducing staffs, deferring maintenance, turning roads back to localities, and exploring new revenue sources and mechanisms.

Several States have initiated innovative funding methods for highways. The State of Washington is attempting to sensitize motor-fuel tax rates to price changes. This is a variable gas tax that fluctuates between 9 and 12 cents a gallon, depending upon tax yield and budget levels. Although the device has limitations (it cannot exceed 12 cents per gallon) and price changes apply to fuel costs rather than highway costs, the mechanism has promise.

Departing from a mechanism that adjusts tax rates to price changes is the Texas plan, which indexes the highway budget to specified cost factors. This mechanism taxes nonusers rather than altering road-user tax rates. Any difference between the established budget level and earmarked user taxes comes from the State general fund. Texas, in other words, sets a budget in real dollars.

Other States are also relying upon other revenue sources--some user related, some not. More reliance upon direct user charges in the form of tolls is occurring in States such as Florida, Kentucky, and Oklahoma. In these States, a toll/tax hybrid is formed to build and operate a system of toll roads (and crossings) that relieve the burden on tax revenues. In a similar fashion, Kentucky is looking to energy production to fund road improvements occasioned by the hauling of coal on State highways.

Economic Tests

The relative effort States apply to taxing users is of interest. Since road-user taxes provide the bulk of State-raised revenue for highways, an analysis of tax effort indicates a State's commitment to user taxes relative to other States. Typically, tax effort compares the level of taxation among governments and is usually expressed in a ratio to the national average. Where States appear below this average, the analysis indicates a potential for increasing tax rates.

With exceptions, the tax effort analysis reveals a geographic pattern. States in the east and south tend to have a higher tax effort than the national average. On the other hand, western States are generally below the national average.

Many States borrow against future revenues to finance highway improvements. This practice satisfies certain equity notions. However, over-reliance upon debt financing can become burdensome and restrictive.

Bond interest and retirement costs equaled 14.9 percent of net user revenues for the 43 States servicing debt in the past 4 years. However, five States expended one-third or more of user revenue on debt service and three of these surpassed the 50 percent level at least once from 1973 to 1976. All of these States are in the east.

No judgment is made about any State having passed an undefined danger point, but when one-half of all current revenue is absorbed in debt service, a State's capital program might be considered in jeopardy. Clearly, such practices can restrict State flexibility and responsiveness to sudden shifts in need.

Related Issues

State highway transportation and finance is expected to be affected by certain issues, notably energy. This issue is important for two reasons. First, will sufficient supplies of petroleum be available, and second, how will future State highway revenues be affected by Federal initiatives requiring greater vehicle efficiency and less weight?

Two recent Federal initiatives, the Environmental Policy and Conservation Act of 1976 (EPCA) and the National Energy Plan (NEP), now being considered by the Congress, may compound the financial problems for State highway officials. Both of these address the goal of energy conservation with (1) a strategy of miles-per-gallon (m.p.g.) standards (EPCA), and (2) a reliance on motor-fuel price increases (NEP). When combined, these efforts should impact significantly upon State highway programs inasmuch as revenue is directly linked to fuel consumption. Indeed, some estimates report a State gas tax revenue shortfall of $2 billion to $16 billion for the 1977 through 1985 period.

Conclusion and Recommendations

The growing fiscal plight of the States is clear. Traditional road-user tax mechanisms are falling short of meeting current needs, and the future fiscal outlook is uncertain. Until very recent times, road-user taxes, principally gasoline taxes, have well served highway needs. However, because of unprecedented inflation in highway costs, continuing increases in travel, and the uncertain growth in fuel consumption, user-tax income from eroding real-tax rates will likely prove inadequate in the future.

Based upon the evidence available, States have streamlined operations and set priorities for highway programs. Yet the need for additional revenue is clear, and the most appropriate method is to increase user charges. The user tax concept is just and equitable, in that users are taxed for particular and measurable benefits received. Moreover, failure to assess users would allow receipt of services without particular payments, the cost of which would be borne by the community. Users have displayed a willingness to pay based on the tolls charged for use of major toll roads. These charges are the equivalent of double the present Federal and State gas tax rates. Moreover, the provision of highways represents less than 10 percent of the cost of owning and operating a motor vehicle, and considering the insensitivity of fuel consumption over the last several years to an 85-percent increase in gasoline prices, one readily concludes that motor-fuel tax rates can be raised substantially before consumer resistance is encountered.

In sum, State highway programs are in need of additional revenues, and the best and most equitable alternative is to raise road-user tax rates, or sensitize taxes to inflation. The highway-user tax has performed well over the years but will not likely meet future highway needs, especially at today's tax rates. Because of the impact of the energy crisis and inflation, highway taxation is expected to move to more nearly resemble a pricing system. As costs and benefits increase, so should the tax.

Chapter 1

STATE HIGHWAY FINANCE

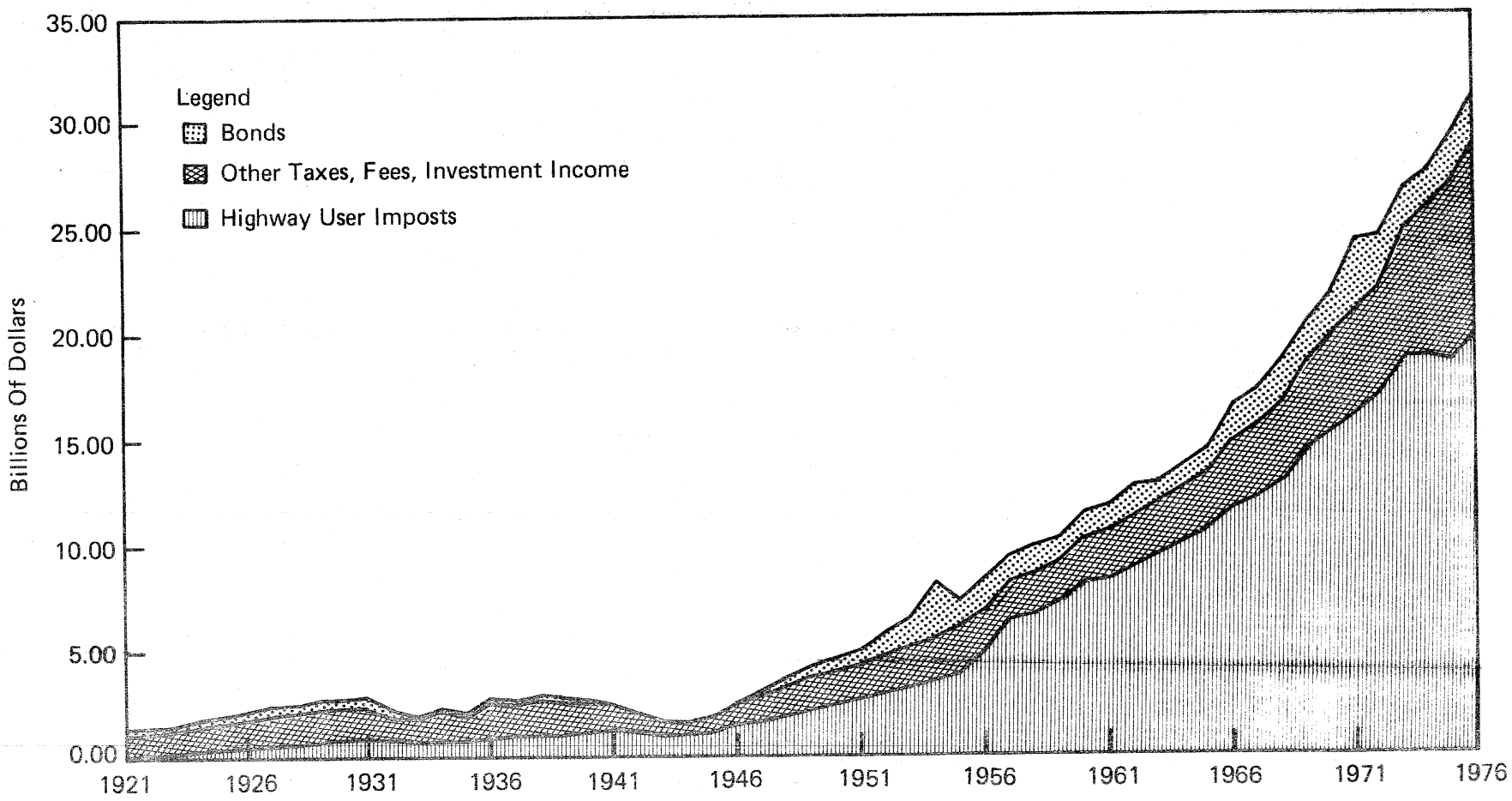
Introduction

The State is the principal provider of highways in the Nation. Among the three levels of government (Federal, State, and local), the State expends nearly $2 out of every $3 spent for highways. Although the Federal Government raises substantial revenue for highways, nearly all funds are paid to other jurisdictions, mostly to States. Without a doubt the Federal contribution to capital improvement is vital, but the States must carry out the Federal-aid highway program, plus provide additional capital for programs both on and off Federal-aid systems. In addition, noncapital cost, especially maintenance, has been consuming both greater amounts and proportions of State highway budgets in recent years. These noncapital costs also include highway patrol, safety, planning, research, administration, and, in many States, debt service.

Revenue for highways at both the State and Federal level is princiaplly derived from user imposts (see Figure 1). These levies may be collected directly, as in toll charges, or indirectly in the form of motor-fuel taxes and motor-vehicle fees and permits. User charges are generally earmarked for highway purposes or are placed in special funds for highways.

Lately, however, road-user charges have not continued the growth pattern experienced during the 1960's. This development is particularly disturbing in light of the pace of inflation and the drain on available revenue caused by related highway costs, such as administration and maintenance. In response, States are taking administrative and

Figure 1
TOTAL RECEIPTS FOR HIGHWAYS, BY SOURCE
1921 - 1976



institutional actions and are reexamining taxation policies and studying alternatives to maintain and, in some cases, to rescue capital programs. Some of these actions are listed below. (See also Appendix A.)

- State administrative actions include employees layoffs, deferred maintenance, delayed or scaled down projects, and elimination of State funded programs.
- State institutional actions include turnback of roads to local governments, require localities provide matching funds, and reduction or elimination of "skim off" appropriations for highway-related functions (e.g., highway patrol).
- State fiscal actions include seeking adjustment in user taxes, in addition to new budget setting mechanisms and taxation strategies, and allocating nonuser revenue for highways. While the States continue to improve program efficiency, cost savings are limited; therefore, future efforts will likely focus on the revenue side of the equation.

This section reviews developments leading to the current funding problem and examines some of the revenue measures either undertaken by States in recent years or currently under study. Part A reviews traditional revenue mechanisms of the States. Included are the principal sources (road-user taxes, borrowing, Federal aid) and their respective shares and trends. This appraisal covers current developments applicable to all highway functions generally, but special attention is directed toward real capital performance.

Part B examines the two principal sources (road-user charges and borrowing) of State highway revenue. The performance of each user tax (motor-fuel tax and motor-vehicle fees) is assessed along with a discussion of certain pitfalls inherent in over-reliance upon a single source. Also addressed is the underlying rationale for imposing and earmarking road-user taxes. Toll charges, also a user cost, occupy an important role in the provision of primary highways in some States. This device and its potential are examined as is State borrowing, for borrowing funds for capital improvements satisfies certain equity notions, but also extracts a high price if overused.

Part C examines and compares taxing and revenue practices of the States. Measures of tax effort, Federal/State shares of capital programs, and debt burden are analyzed. Part C also includes a subjective discussion of tax incidence and burden and tax effort and equity. The aim is to illustrate the relative effort a given State makes to tax its users--whether it is too reliant upon debt financing or whether local flexibility and discretion might be declining. The reader is advised to view this analysis as (1) an indicator of effort, (2) a fiscal crisis early warning system, and (3) an indicator of a diminishing State role in highway capital programs.

Part A. Funding State Highway Programs

State Receipts for Highways (1976)

The 50 States and the District of Columbia raised over $16 billion for highways in 1976. Over $13 billion of this sum was generated from

road-user imposts which included motor-fuel tax, motor-vehicle fees and licenses, and tolls.* The remaining highway receipts, less than $3 billion, came from bond proceeds ($1.5 billion) and other taxes, fees, and miscellaneous income ($1.4 billion). Augmenting State-raised income are intergovernmental transfers. States received $6.4 billion from the Federal Government and $220 million from counties, municipalities, and other local entities. States in turn paid out $3.2 billion of State revenue to localities, thus realizing a net gain of $3.3 billion, which brings the sum of all receipts for State highways to $19.5 billion for 1976. Table 1 summarizes these data and provides comparable data for other selected years. (See also Figure 2.)

State Highway Expenditures (1976)

Nearly 2 out of 3 highway dollars expended by States goes to capital outlay. Capital outlay includes the construction of highways on new locations, e.g., the Interstate System, plus improvements and reconstruction of existing highways. In addition to construction, highway operation and maintenance is becoming an increasingly expensive and burdensome function for State highway agencies. Maintenance costs have increased from less than $2.0 billion in 1970 to $3.2 billion in 1976, an increase of 61 percent. Other related highway costs for 1976 were: administration, planning and research ($1.2 billion); highway and motor-vehicle law

* Excluded is an additional $1.3 billion of road-user charges expended for nonhighway purposes.

Table 1

STATE RECEIPTS FOR HIGHWAYS FOR SELECTED YEARS

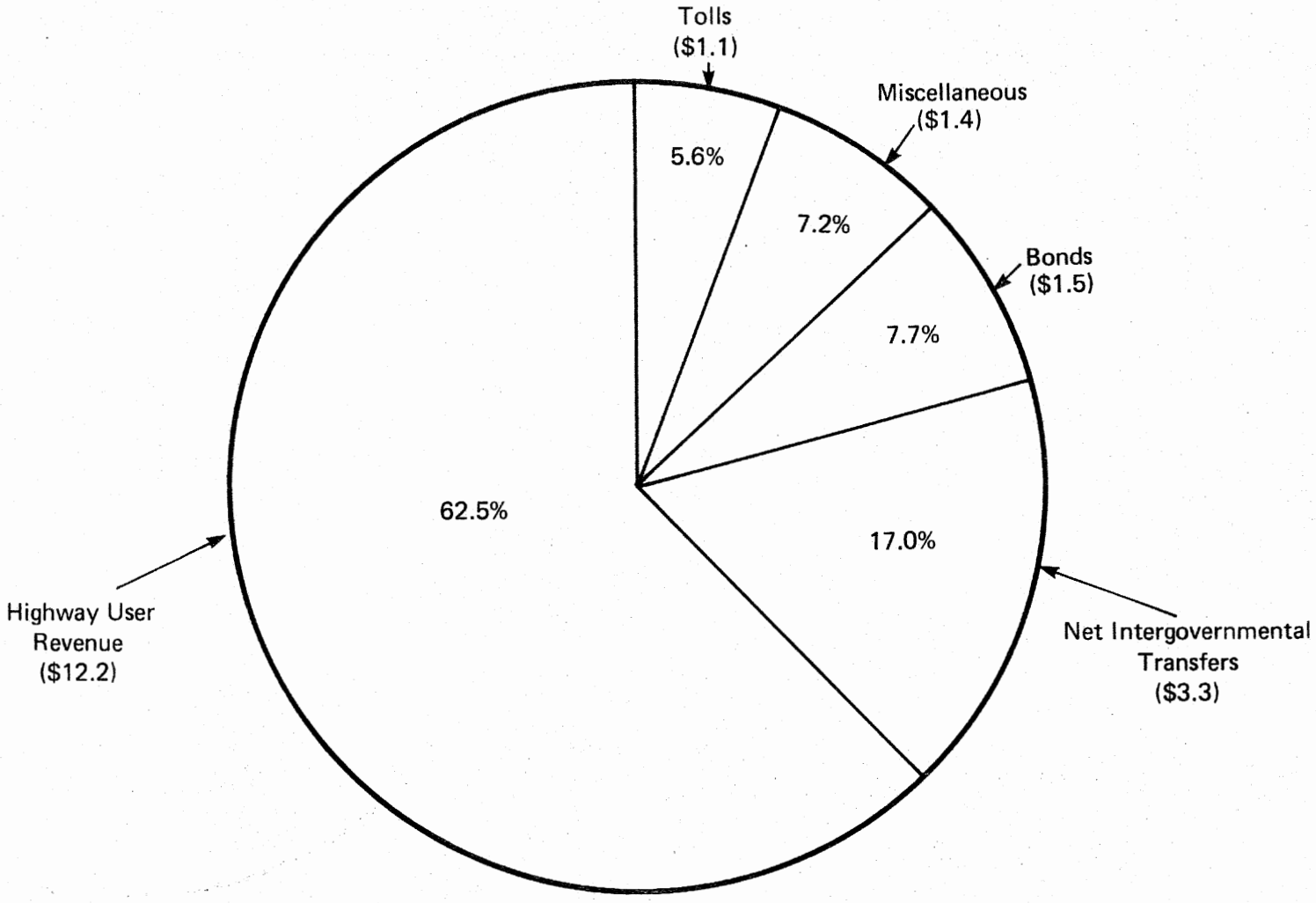
(In millions of dollars)

	1967	1970	1973	1976
Road user imposts: motor fuel and vehicle taxes	6,896	8,853	11,163	12,186
Tolls	652	834	1,022	1,116
Subtotal	7,548	9,687	12,185	13,302
Other taxes and fees[1/]	444	745	886	1,408
Bond proceeds	1,012	1,305	1,216	1,459
Total	9,004	11,737	14,287	16,169
Net intergovernmental payments	2,291	2,348	1,611	3,294
Total receipts	11,295	14,085	15,898	19,463

1/ General Fund appropriations, investment, income, etc.

SOURCE: HF-11 Highway Statistics

Figure 2
STATE RECEIPTS FOR HIGHWAYS – 1976
(in billions of dollars)



enforcement and safety ($1.4 billion); and debt service on bonds issued for highway construction ($1.8 billion). Figure 3 shows these relative shares for 1976.

Noncapital costs have exhibited a faster growth pattern than capital outlay over the last decade, accounting for 32 percent of total direct State expenditures in 1967 compared to 42 percent in 1976. See Table 2 for a summary of expenditures and proportions for 1976 and other years.

State Highway Real Capital Performance

Capital outlay by States amounted to $10.6 billion in 1976, a gain of only $1.3 billion since 1970, or 12 percent. The following tabulation and Figure 4 show State capital investment performance in constant dollars for the 1970-76 period.

State Highway Capital Outlay in Constant Dollars (1967 = 100)

	Year						
	1970	1971	1972	1973	1974	1975	1976
Billions of constant (1967) dollars	7.54	7.50	7.17	6.25	4.99	5.40	5.31

The greatest decline occurred from 1971 to 1974 as real investment slipped by one-third. The last couple of years have seen some improvement due to slightly increased spending and relative stability in unit prices. However, the most recent unit price statistics (1977-78) report a resumption of inflation in construction costs. This means that unless design standards are relaxed and peak-hour travel is reduced, highway system performance will likely decline in the future. According to

Figure 3
STATE DISBURSEMENTS FOR HIGHWAYS – 1976
(in billions of dollars)

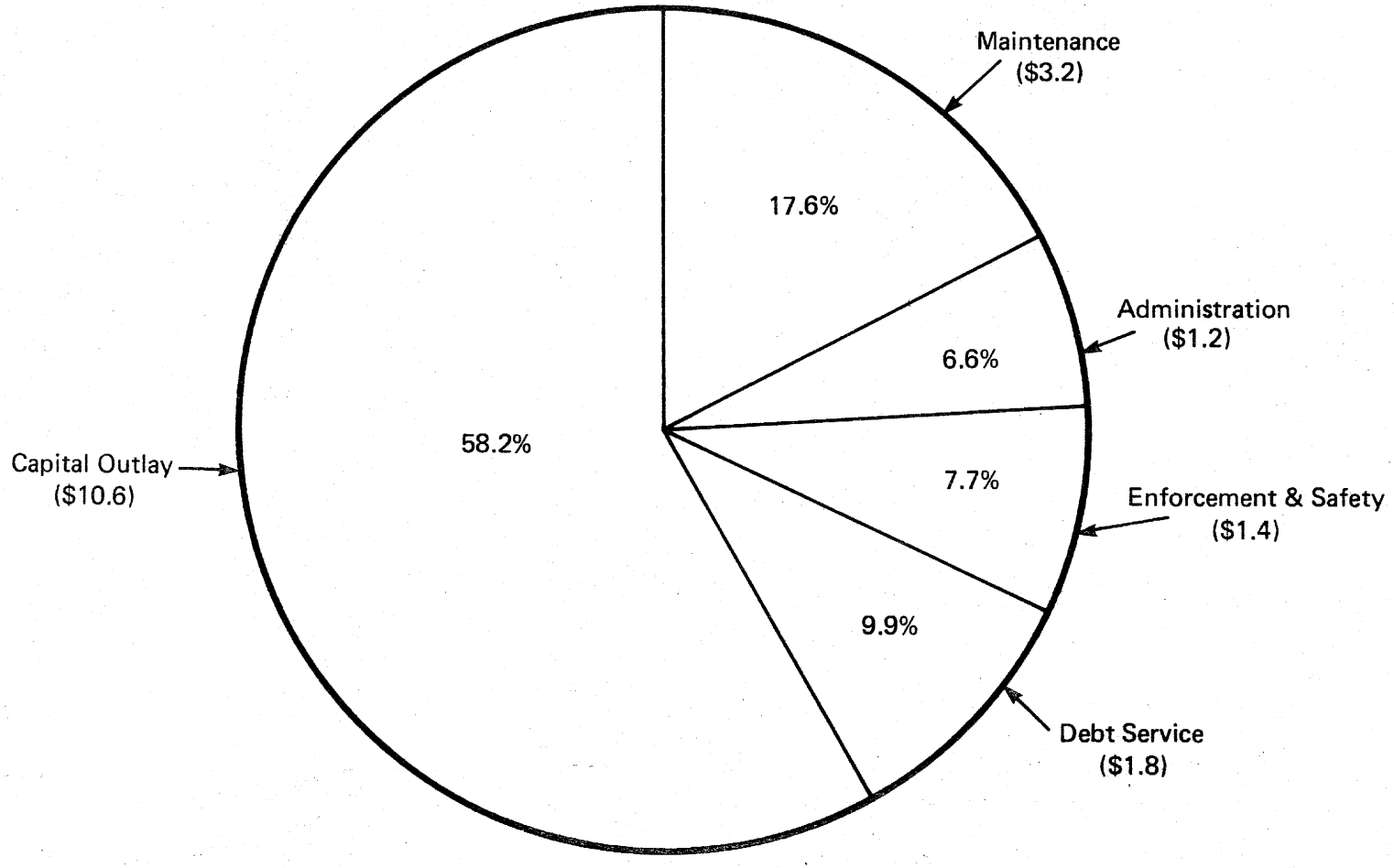


Table 2

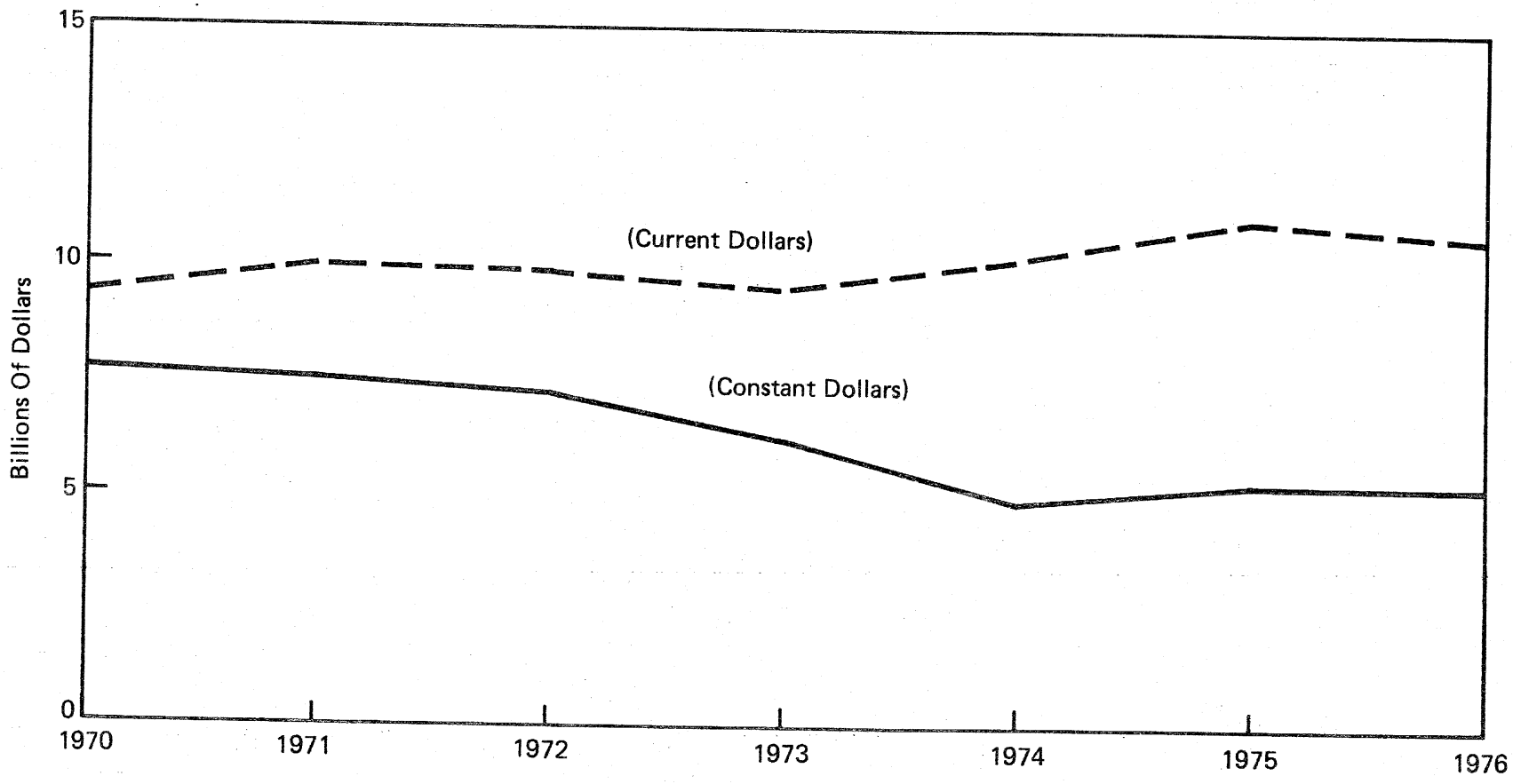
STATE DISBURSEMENTS FOR HIGHWAYS FOR SELECTED YEARS

(In millions of dollars)

	1967		1970		1973		1976		Percent Change 1967-1976
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	
Capital outlay	$ 7,755	68	$ 9,327	66	$ 9,521	60	$10,580	58	36
Maintenance and operation	1,546	14	1,967	14	2,510	16	3,165	18	105
Administration, other	575	5	719	5	973	6	1,237	6	115
Highway law enforcement and safety	496	4	800	6	1,114	7	1,424	8	187
Bond interest	426	4	505	4	774	5	896	5	110
Bond redemption	540	5	782	5	883	6	920	5	70
Total	$11,338	100	$14,100	100	$15,775	100	$18,222	100	61

SOURCE: HF-12 Highway Statistics

Figure 4
STATE HIGHWAY CAPITAL OUTLAY, 1970-1976
IN CURRENT AND CONSTANT DOLLARS



U.S. Department of Transportation report, The Status of the Nation's Highways: Conditions and Performance,[1/] maintenance of highway system performance nationwide, i.e., a composite index of physical, operating, and safety conditions existing in 1975, requires an annual investment of $21.8 billion for arterial and collector highways (in 1975 dollars). Current investment levels, however, are about one-half of this amount.

The combined effects of diminished growth in user revenues and increased allocations to noncapital costs result in State highway capital budgets being increasingly funded from other than direct user charges. (See Figure 5 and Table 3.) In 1976, only 25.7 percent of the capital program was funded from current tax receipts as opposed to 42 percent as recently as 1974. Also, as the Federal funds share increased during this period (1973 to 1976), it was apparent that States were substituting Federal dollars for State dollars inasmuch as programs levels (national) were relatively unchanged.

Road-user taxation, pricing, and earmarking are central to State highway funding. The following section explores these areas more fully.

Part B. Highway Revenue Sources and Performance

Motor-Fuel Taxation

States have relied on fuel taxes for highways ever since Oregon imposed the first gasoline tax of 1 cent in 1919. By 1976, the weighted average State motor-fuel tax (gasoline, diesel, and other fuels used on highways) was 7.71 cents per gallon. Motor-fuel consumption displayed remarkable growth, from 36 billion gallons (net amount taxed) in 1960 to

Figure 5
SOURCE OF STATE HIGHWAY
CAPITAL OUTLAY

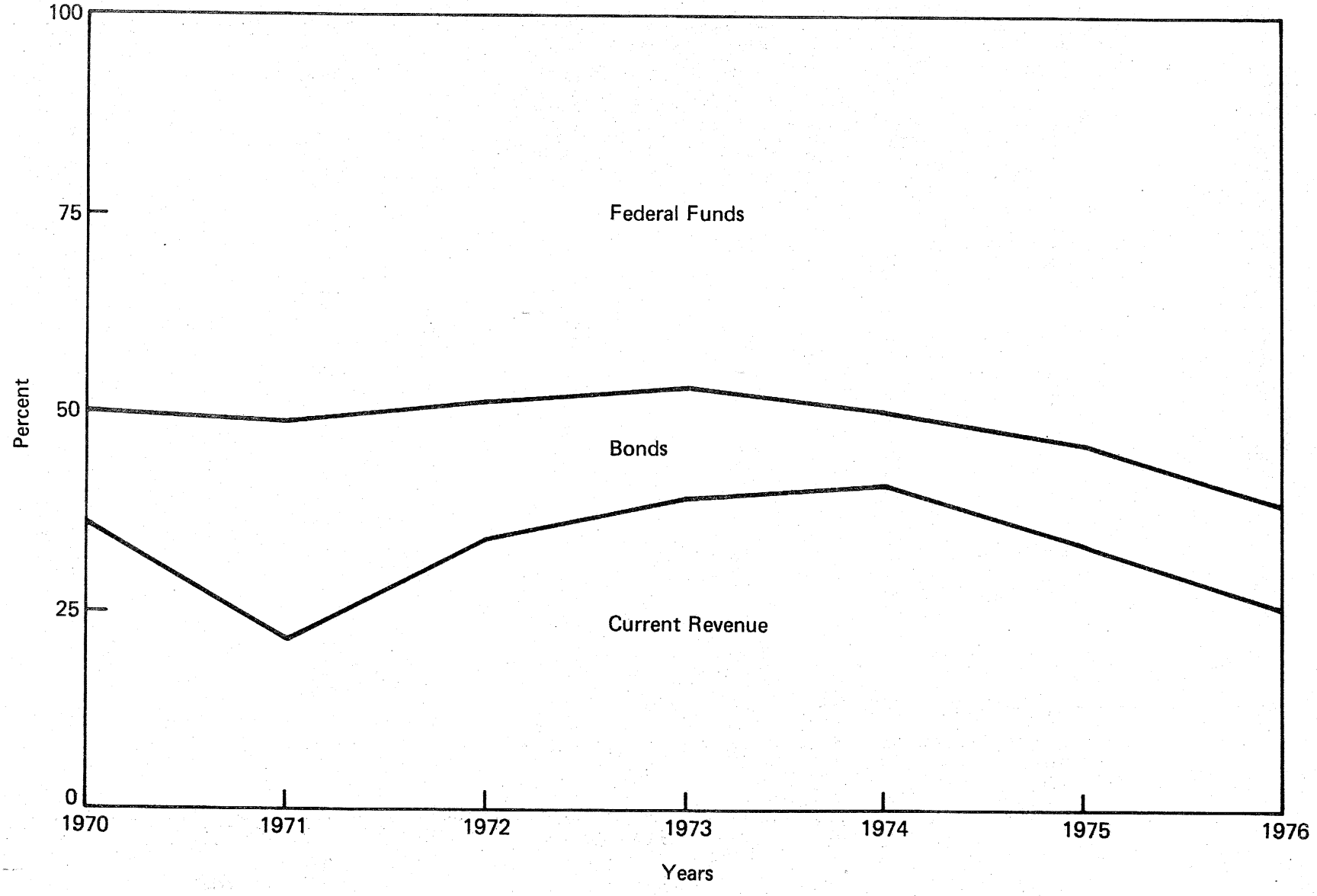


Table 3

SOURCE OF FUNDS FOR STATE HIGHWAY CAPITAL OUTLAY

(In millions of dollars)

	1970	1973	1974	1975	1976	1977 (Est.)
Total capital outlay	9,327	9,521	10,072	11,011	10,580	9,985
Federal funds	4,677	4,505	4,999	5,887	6,404	6,020
Bond proceeds	1,305	1,216	846	1,412	1,459	1,201
Current revenue (residue)	3,345	3,800	4,227	3,712	2,717	2,764
Percent of current revenue of total	35.9	39.9	42.0	33.7	25.7	27.7

111 billion gallons in 1973. However, gallonage declined to 106 billion in 1974 before rebounding to 109 billion for 1975. In 1976, 116 billion gallons were consumed. Revenue from State motor-fuel taxes reached $8 billion in 1973. Revenue declined 2.7 percent in 1974, but recovered in 1975, making receipts equal to that of 1973. In 1976, revenue exceeded 1975 by 6.4 percent, totaling $8.891 billion (see Figure 6).

Motor-Vehicle Taxation

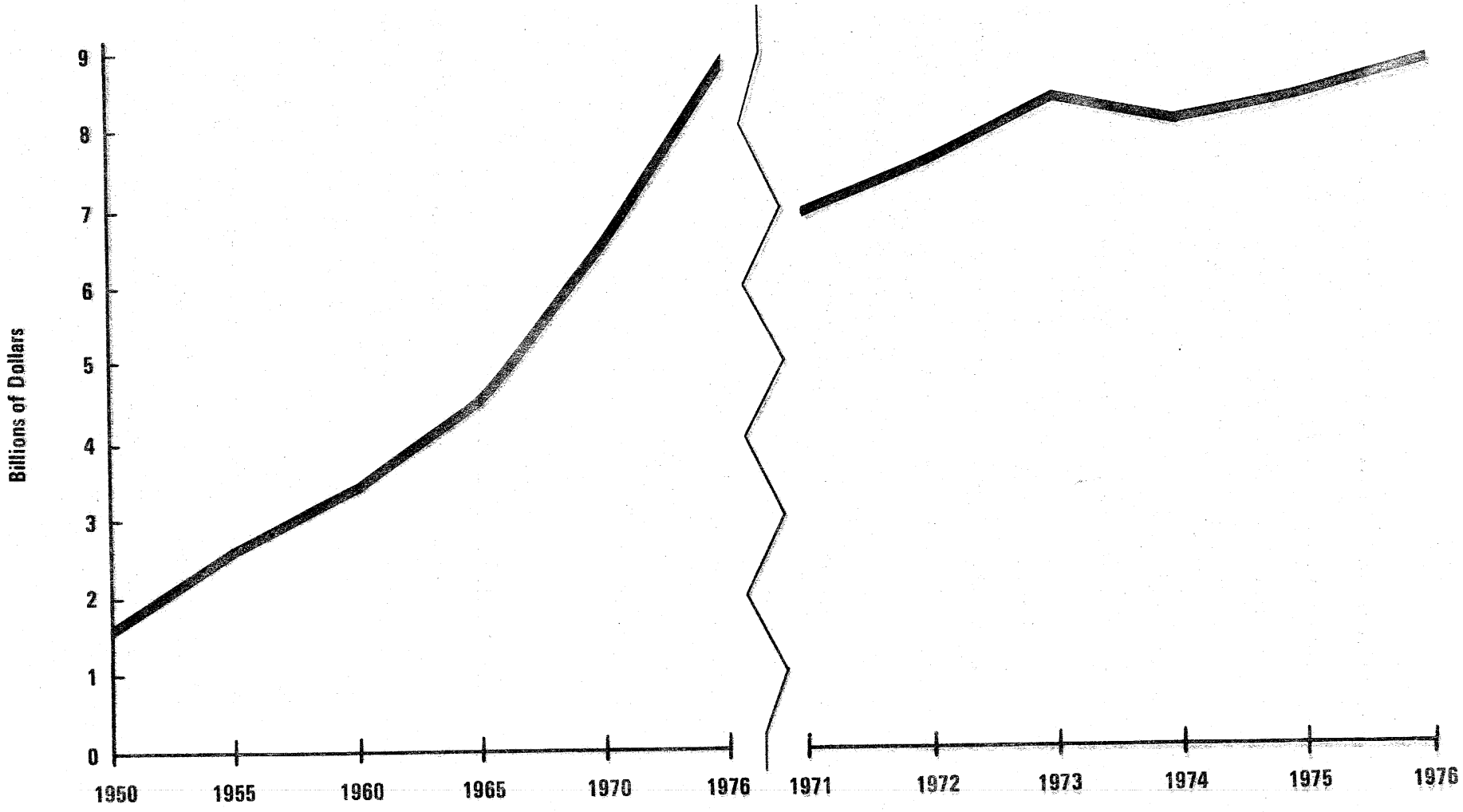
New York, in 1901, was the first State to require all motor vehicles to be registered. By 1970, State motor-vehicle registrations totaled 108 million, and in 1976, 137 million vehicles were registered in the United States. Noteworthy is the fact that registrations were not affected by the fuel shortage of 1974 or the increase in fuel prices. Receipts from State registration and related fees indicate a continuing growth pattern, exceeding $5 billion in 1975. For 1976, motor-vehicle receipts made a substantial increase of 19 percent, totaling $6.104 billion (see Figure 7).

Disposition of State Road-User Tax Revenue

Combined motor-fuel tax and motor-vehicle revenue has exhibited a productive growth pattern over the last half century. Except for certain periods such as the Great Depression (1930's), WW II, and more recently the 1974 fuel shortage, these combined revenues have provided an excellent base for funding highway needs. While road-user tax revenue has increased, the trend in the allocation of these dollars has not favored State highway programs. Total receipts from State road-user taxes for 1976 totaled

Figure 6

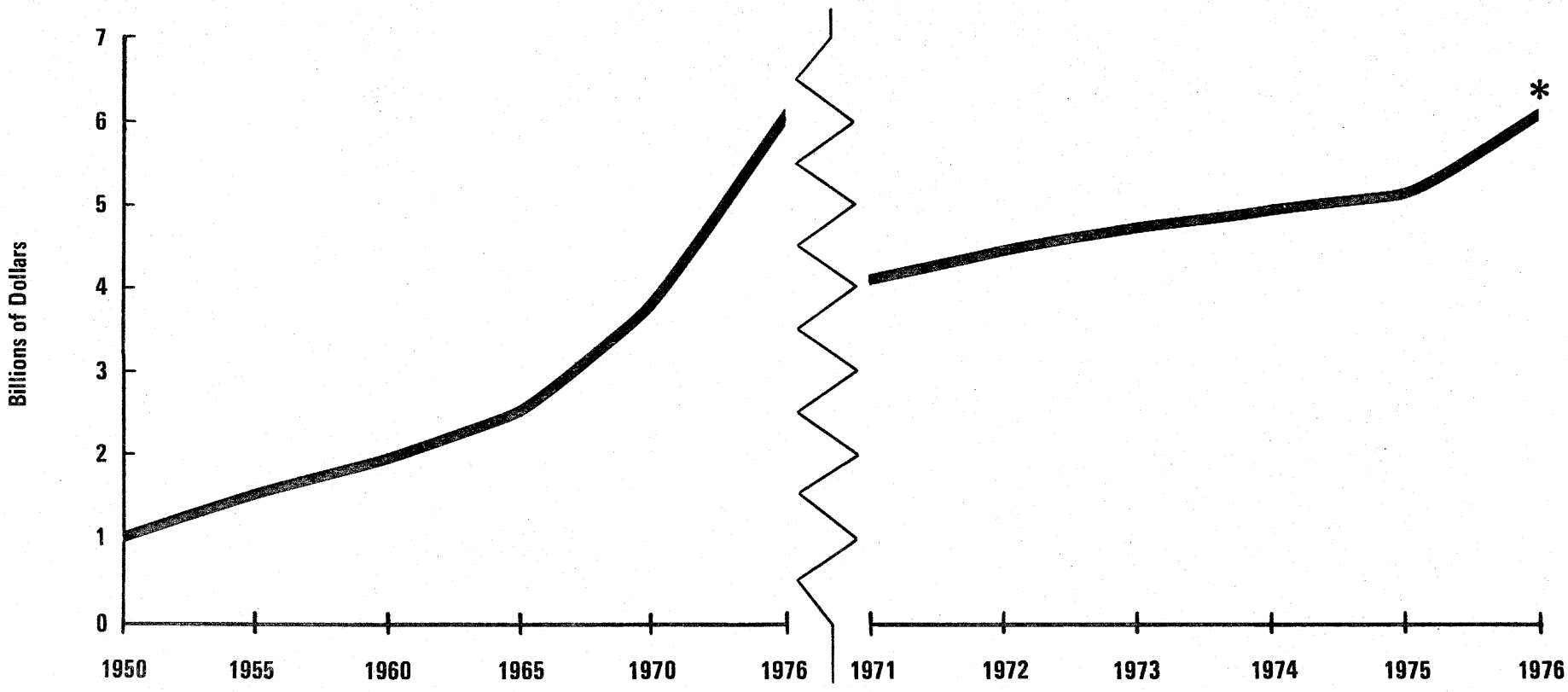
STATE MOTOR FUEL TAX RECEIPTS



Source: Highway Statistics

Figure 7

STATE MOTOR VEHICLE TAXES and FEES



* Abnormal growth due to change in registration cycle in California; 1977 Estimated Revenues less than 1% over 1976.

Source: Highway Statistics

$14.8 billion of which 59 percent, or $8.6 billion, was applied to State highway programs, as shown above.

Disposition of State Road-User Tax Revenue*

	Total		Collection Costs and Nonhighway Use		State Highway Purposes		Local Road Purposes	
	Billions of Dollars	Percent	Billions of Dollars	Percent	Billions of Dollars	Percent	Billions of Dollars	Percent
1976	14.8	100	2.6	18	8.6	59	3.6	24
1970	10.3	100	1.5	15	6.3	61	2.5	24
1965	7.0	100	0.9	13	4.2	60	1.8	27
1960	5.3	100	0.6	11	3.4	64	1.3	25

It is apparent that the net burden of changing shares of State-user taxes has fallen most heavily on State highway programs. The portion of State-user taxes expended on behalf of or transferred to local governments remains constant throughout the period, whereas increases in nonhighway allocations (and collection costs) take place at the expense of State highway programs. In fact, the dollar amount expended for State purposes increased by only 7 percent over the last 4 years (1973-1976).

Earmarked Revenue Rationale

Earmarking may be defined as a restriction imposed on the use of a government revenue. Earmarking of road-user tax revenues is a common practice among the States. The rationale underlying this practice rests on a linkage of benefits received by particular users and the tax burden imposed for receipt of such benefits. Thus, a State will spend tax

* Table DF, Highway Statistics.

dollars for the provision of highways and those expenditures will render particular and measurable benefits to highway users. Taxes, in turn, may reasonably be imposed and limited to highway users; hence, it is judged prudent and equitable to earmark or restrict the use of these revenues to highway purposes.

A criticism of earmarked funds is that they are outside the regular and periodic legislative review process. However, the provision of State highways operates like a market environment. This mechanism efficiently assigns cost to users in proportion to benefits received. Indeed, as the identity of beneficiaries becomes clearer, revenue raising becomes less of a taxing policy and more of a pricing system. Today, therefore, earmarked funding of user taxes is being less faulted in legislative oversight. Rather, its inability to keep pace with inflationary conditions is gaining increasing attention. In this case, earmarking may have delayed recognition of the problems created by the current inflationary trend, and more importantly, it may have complicated their rectification.

Toll Financing

Toll financing serves as an effective adjunct to traditional user taxation for the provision and operation of principal highway facilities. For the most part, tolls are levied to liquidate large capital costs, usually borrowed, for new highways on new locations. Toll financing is often used because the apportionment of State-tax revenue among substate districts can prohibit or impede the assignment of large sums of money for such high cost routes. The toll device is also suited to those States

where free road bonding is prohibited, or where other constitutional or statutory obstacles are deemed too difficult or cumbersome to overcome.

The period from 1956 to the present represents the greatest free roadbuilding era in the Nation's history. The decade of the 1950's also represents the greatest toll road construction era of modern times. By constructing selected high cost segments as toll facilities, States were able to spread existing tax dollars over a greater area. This practice is again finding favor in some States. Thus, States, such as Indiana and Maine, are contemplating continuation of tolls on existing facilities when debt free to reduce the drain on tax revenue.

Numerous States have made extensive use of toll devices for highway transportation. However, some are motivated by factors other than revenue shortages. Kentucky, for instance, uses a toll/tax revenue scheme to open isolated areas to economic development. Under this plan, revenue from toll operation is not required to cover total cost of operation and debt service in order to consider the enterprise a prudent investment. Deficits, when they occur, are met from general road-user tax receipts of the State. See Chapter 3 for more information on this strategy.

There were 394 toll facilities in the Nation as of January 1, 1976, 272 of these were publicly owned and 122 were held by private interests. Toll roads accounted for only 69 of these, the remainder being crossings, i.e., bridges, ferries, and tunnels. Toll road mileage totaled 4,746 miles, 2,410 of which was included in the Interstate System. Revenue from

State-owned toll operations totaled $1,383 million in 1976, $1,178 million from toll charges. Although tolls nationally equal only 7.8 percent of total road-user tax revenues, tolls account for more significant shares in certain States. Tolls equal 30 percent of gross State road-user tax revenue in 4 States, more than 15 percent in 7 States, and more than 10 percent in 14 States.

Twenty-eight States use toll mechanisms to supplement free road activities. A few, such as Illinois, Indiana, Ohio, and Pennsylvania, operate an interconnected toll road network. Others, such as Kentucky and Oklahoma, have constructed intrastate networks of tollways. Unlike Colorado or Texas which removed tolls when toll road indebtedness was liquidated, other States have expanded or combined existing toll facilities with others to the point where tolls are continued long after original costs are recovered and, more importantly, tolls will likely be charged in perpetuity.

The types and forms of State toll facilities and combinations--physically and financially--are diverse. For the most part, however, they are alike in that tolls will likely be continued for the foreseeable future. Indeed, toll removal places a considerable burden on other tax resources which are already strained. Thus, many observers see a compelling need to continue collecting tolls and to combine existing facilities with other urgently needed improvements and strategies.

Debt Financing

A distrinctive feature of capital improvements is that they yield returns that stretch into the future. Such items, it is argued, should

be financed by borrowing. The life of the bond issue and the life of the improvement should coincide. Annual taxes should reflect operating and maintenance costs of the project, plus a pro rata share of capital costs. Under the costs/benefits theory, equity demands that assessment of costs be spread over the life of the project so that late arrivals do not benefit inordinately from an investment amortized prior to their arrival. Hence, a given measure of liability must be assessed to each user--current and forecast.

State highway bond sales in recent years have ranged from $500 million to $2 billion a year. Nontoll State bond issues averaged close to $1 billion annually for the period 1966-1970 and $1.3 billion annually from 1971 through 1975. Sales in 1976 reached $1.5 billion. The highest total sales were attained in 1971 when $1.917 billion was raised from the sale of bonds. Since then, sales have fallen off principally because massive authorizations (New York and Pennsylvania) have been exhausted, and the voters refused to endorse new authority.

Over-reliance upon borrowing for capital improvements can create difficulty for State highway programs. When highway revenue expands proportionately with highway travel, added debt service (interest and redemption) from continued bonding is readily funded. But, when revenue falls behind travel growth, bond interest and retirement command a disproportionate share of current revenue.

Debt service on toll-free State highway debt has increased from $644 million in 1970 to $1,198 million in 1976. Debt service, as a share of net highway-user revenue, has also increased from 7.5 percent to

9.8 percent (1970 to 1976). Total State debt outstanding at the end of 1976 was $11.2 billion, up $4.4 billion since 1970.

Only 11 States do not use bonding to finance State highway improvements. Several, such as Arizona and Iowa, have little debt outstanding, thereby making debt service an insignificant claim on current revenue. However, a number of other States have accumulated sizable debt balances--namely, New York, Pennsylvania (over $2 billion), Kentucky, and New Jersey (over $1 billion). In Part C of this chapter, the implications of over-reliance on bonding will be more fully examined. For now, it is sufficient to state that bonding plays an important role in the majority of States and the debt service burden is adding to the plight of highway administrators. In fact, to some States, capital program continuation is dependent upon issuance of new bonds since current revenue is totally committed to noncapital costs, including debt service.

Part C. Highway Pricing Policies and Practices

This part briefly examines four measurements of the financial status of the 51 State highway programs. The four measurements are:

- Federal aid* as a percent of capital outlay to indicate the degree to which a State depends upon "own-source" revenue to finance capital needs;

* In a few States the sum of Federal-aid reimbursement and borrowing exceeds capital outlay. See Appendix B for an explanation.

- Borrowing* i.e., capital bonds as a percent of capital outlay to indicate the degree to which debt has been incurred to finance capital needs;
- Debt service i.e., the sum of bond interest and bond retirement payments to indicate the degree to which a State is restricted in the use of its funds;
- Tax effort** to indicate each State's ability to increase its user tax revenue relative to other States.

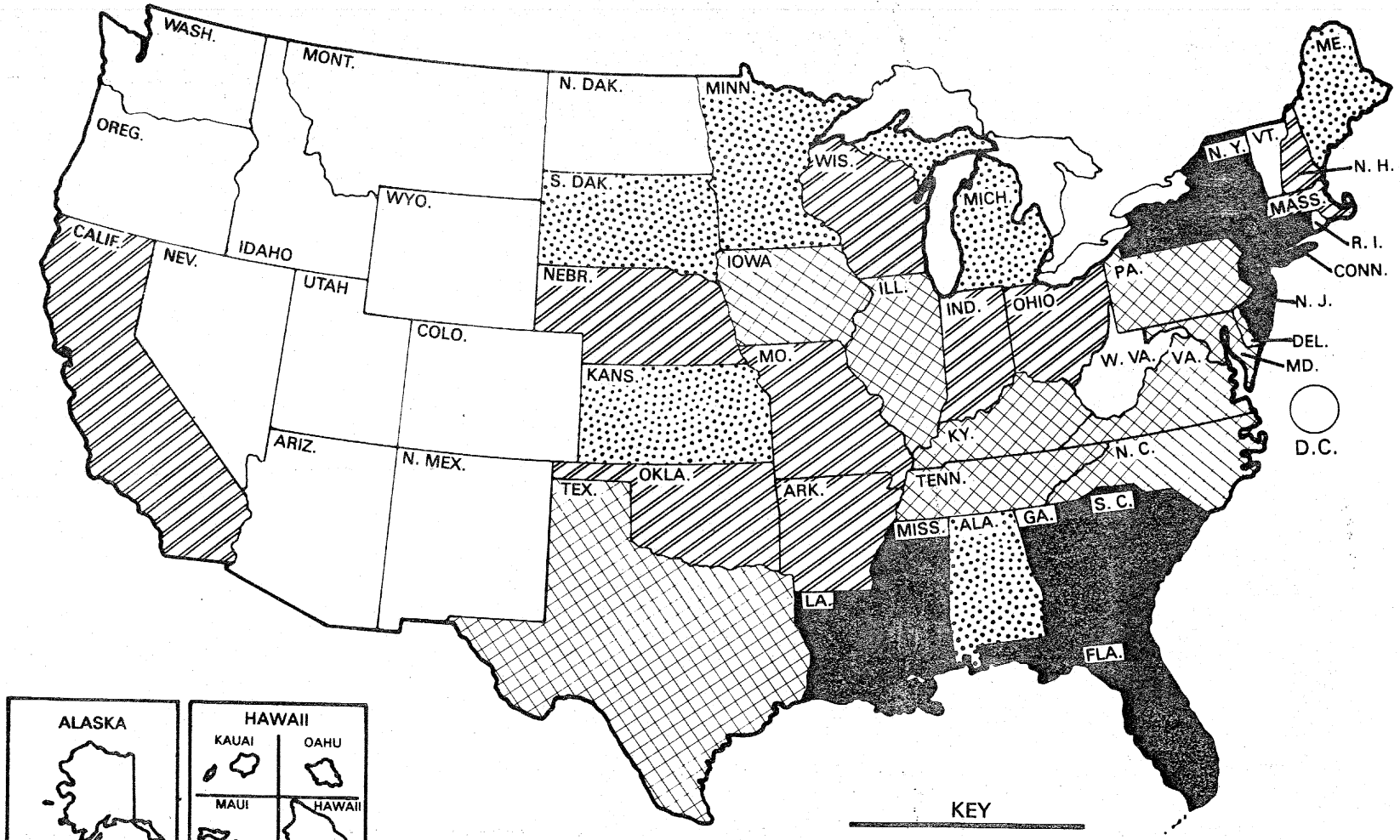
General Observations

With exceptions, some broad patterns appear to exist within these measurements. Generally, as Federal aid increases in importance, a State's need to borrow declines, as does debt burden. Generally, too, the reverse follows: as Federal aid decreases in a capital program, borrowing and debt service increase.

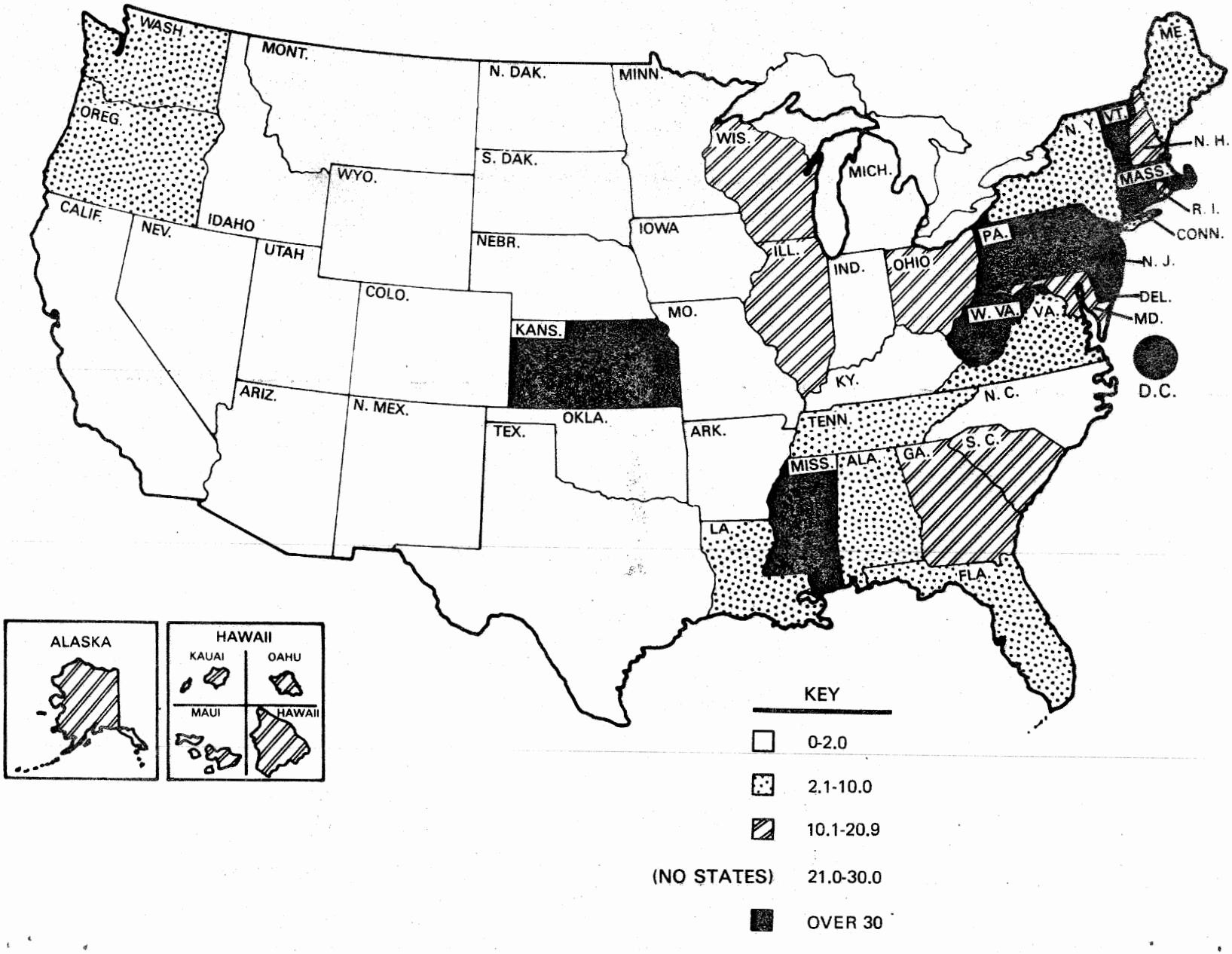
Geographic patterns also emerge. As shown in the following maps, Federal aid tends to constitute a higher share of capital outlay in Western States than in Eastern States. Debt and borrowing tend to be more prevalent in the east than in the west; tax effort tends to be higher in the east and south. However, the regional distribution of tax effort is not as clear as are other measurements.

** Traditionally, tax effort compares the level of taxation among governments, usually expressed in a ratio to the national average. In this paper, tax effort compares State net highway-user tax revenues relative to highway demand, that is, travel, adjusted by the resident population's ability to pay. For more detail and examples, see Appendix B.

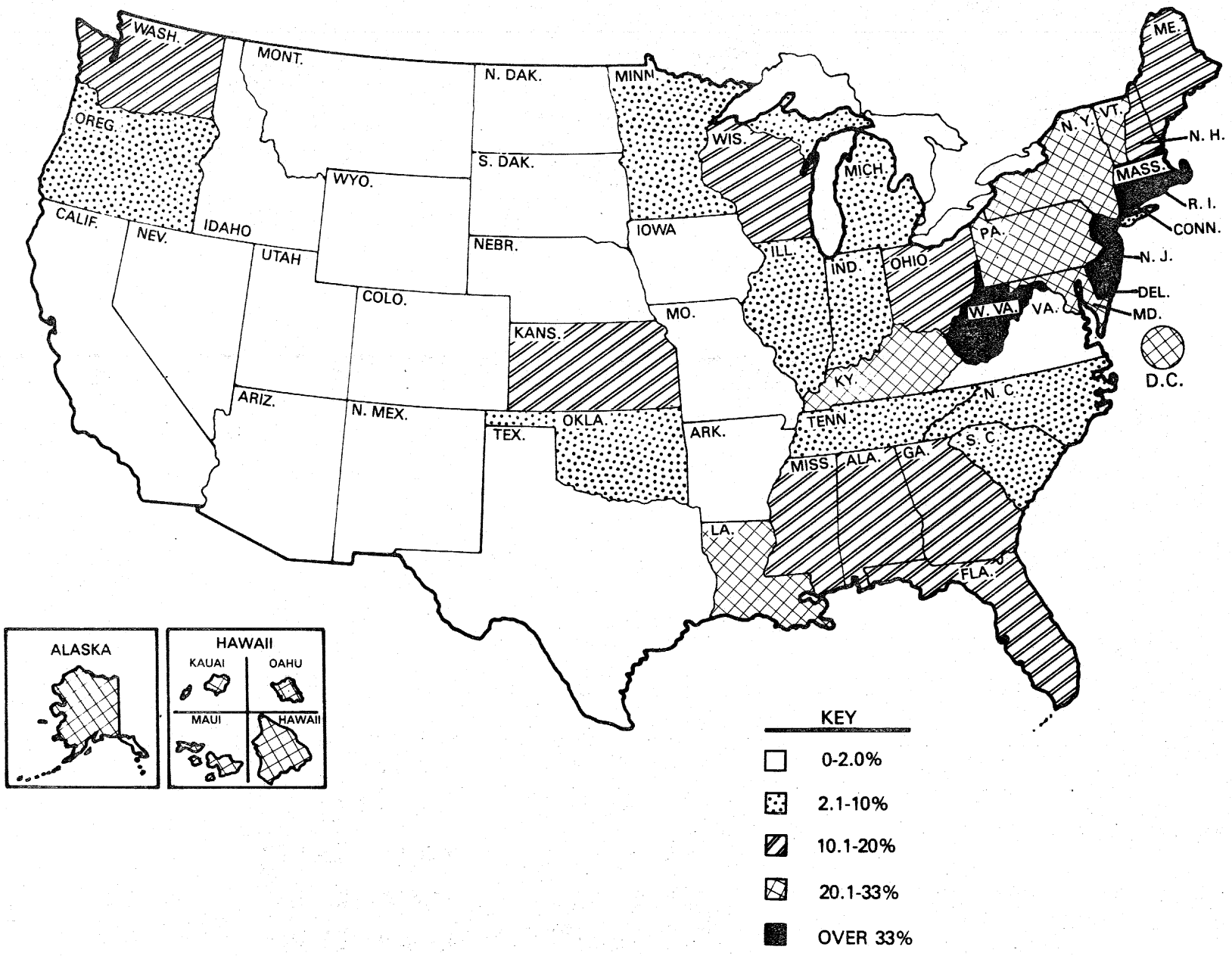
MAP 1
FEDERAL AID AS A PERCENT OF CAPITAL OUTLAY
1973-1976



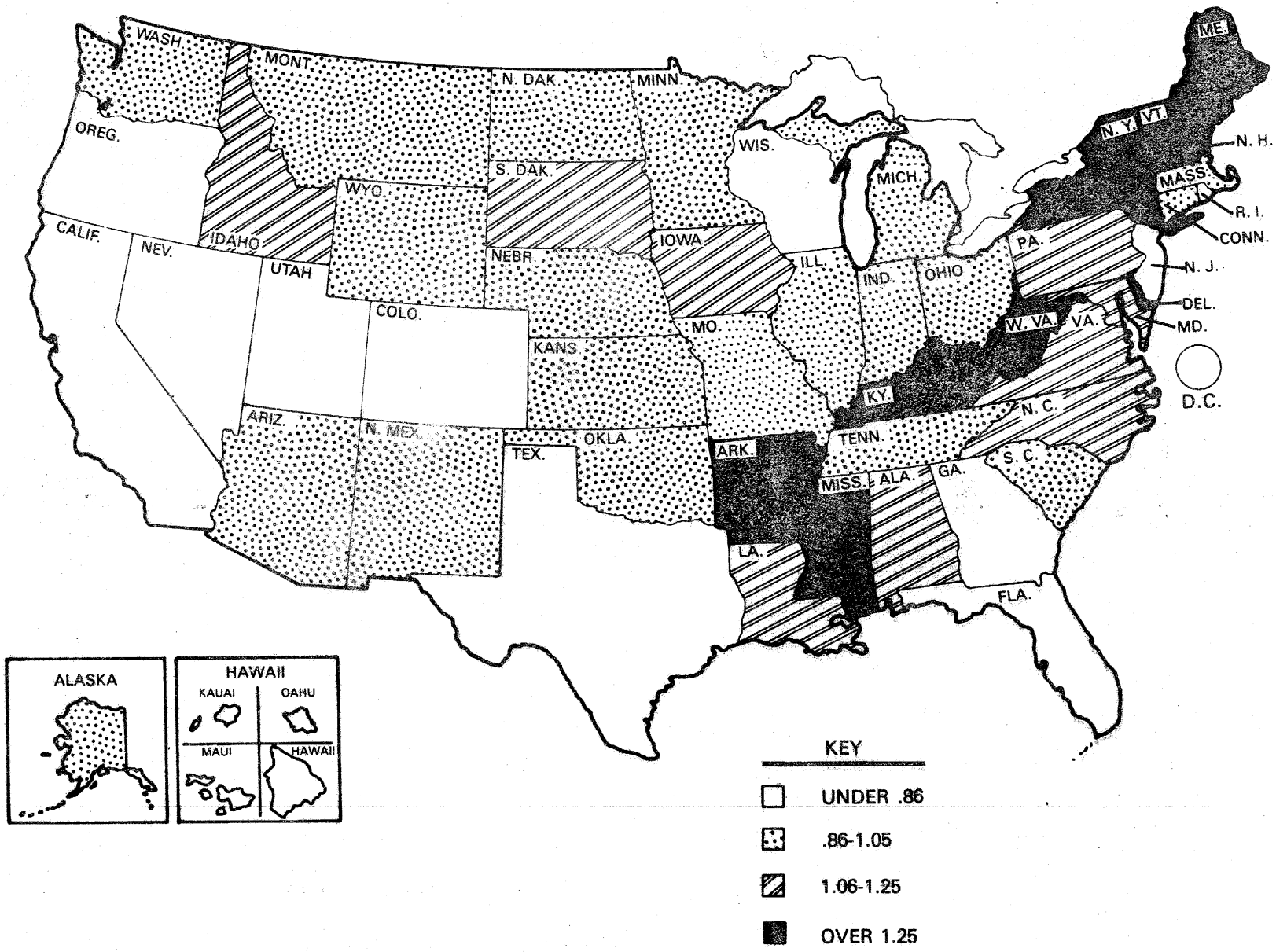
MAP 2
CAPITAL BONDS AS A PERCENT OF CAPITAL OUTLAY
1973-1976



MAP 3
DEBT SERVICE AS A PERCENT OF NET USER REVENUE
1973-1976



MAP 4
HIGHWAY USER TAX EFFORT
1973-1976



State-by-State Analyses

The reader must keep in mind that each State is unique. To adequately examine the status of any individual State's program, that program must be analyzed in more depth than is addressed in this paper. State programs are consolidated into six distinct groups. The States in each group show similar patterns. However, the State of Rhode Island is excluded from these groups because of its possibly confusing data. Table 4 shows how the States are categorized and lists their respective measurements. The following describes the results of the aforementioned fiscal tests.

Rhode Island

Rhode Island's Federal aid equaled 99.7 percent of its 4-year capital outlay. However, in a State such as Rhode Island, the total program is small enough that percentage relationships can be easily misinterpreted. In Rhode Island's case, a large share of the Federal funds received in the past 4 years was for Advanced Construction of the Interstate System (ACI). These funds essentially reimburse Rhode Island for the Federal share of Interstate projects which the State financed in the 1960's through special bond issues. Therefore, Rhode Island's recent Federal-aid contribution appears overstated. In 1973, for example, Rhode Island received its regularly apportioned Federal aid, plus $15 million in ACI funds. With a total capital program of only $28 million, one can readily see how Rhode Island's data seem distorted.

Table 4

FISCAL MEASURES OF STATE HIGHWAY PROGRAMS[1/]

State	Federal-Aid as Percent of Capital	Bonds as Percent of Capital	Debt Service as Percent of User Revenue	Tax Effort
Rhode Island	99.7	15.3	52.2	.59
		Group I		
Nevada	91.9	-	-	.75
Wyoming	84.7	-	-	1.02
Utah	83.8	-	-	.84
Montana	83.7	-	-	1.02
New Mexico	82.8	-	0.6	1.02
Oregon	82.7	5.2	4.4	.84
Idaho	74.7	-	-	1.25
Colorado	74.3	-	-	.72
North Dakota	73.6	-	-	.90
Arizona	70.0	0.2	0.4	.90
South Dakota	66.2	-	-	1.11
		Group II		
Alaska	85.9	12.9	28.8	1.05
Vermont	75.8	33.4	29.2	1.58
Hawaii	72.8	18.0	28.9	.76
Washington	72.8	9.6	16.8	.97
West Virginia	72.6	37.8	40.2	1.87
Dist. of Col.	71.0	31.3	27.8	.79
		Group III		
Minnesota	63.1	-	5.2	.99
Alabama	60.9	5.5	16.6	1.09
Michigan	60.7	-	9.4	.89
Maine	60.1	5.2	16.6	1.46
Nebraska	59.9	-	1.7	1.02
Arkansas	59.4	-	0.7	1.47
California	56.4	2.0	1.3	.74
Missouri	53.4	-	-	.98
Oklahoma	51.6	-	8.7	1.00
Texas	50.3	-	1.2	.74
Tennessee	50.0	7.3	7.6	.99

Table 4

FISCAL MEASURES OF STATE HIGHWAY PROGRAMS[1/]

State	Federal-Aid as Percent of Capital	Bonds as Percent of Capital	Debt Service as Percent of User Revenue	Tax Effort
		Group IV		
Kansas	61.0	34.7	15.3	.97
Ohio	60.0	15.4	17.6	.95
New Hampshire	57.0	16.9	13.1	1.29
Massachusetts	56.0	32.2	33.2	.91
Wisconsin	54.5	17.9	11.5	.79
Maryland	51.0	12.9	20.1	1.11
		Group V		
Indiana	48.3	-	5.5	.93
North Carolina	46.7	-	6.7	1.20
Virginia	45.4	6.7	0.4	1.16
Iowa	45.1	0.6	0.3	1.17
		Group VI		
Delaware	48.1	44.0	47.0	1.59
Illinois	47.7	16.9	6.5	1.00
Kentucky	45.8	-	28.8	1.52
Pennsylvania	44.8	41.7	23.7	1.16
New York	42.9	9.3	25.7	1.31
Georgia	42.6	17.4	13.3	.74
South Carolina	42.3	20.9	5.3	.93
New Jersey	40.9	30.3	41.7	.62
Louisiana	40.1	7.9	21.4	1.23
Connecticut	38.9	47.3	49.9	0.94
Florida	33.6	7.0	14.6	.76
Mississippi	32.7	30.1	18.6	1.53

1/ See Appendix B and Tables A-1 and A-2 for basis of computation.

Group I

Eleven Western States received Federal aid ranging from 66.2 percent to 91.9 percent of their capital outlay. They show little or no borrowing and little or no debt service, and most are sliding scale States. As with all six groups of States, the variable factor is tax effort. Combined, Federal aid equaled 78.2 percent of capital outlay in these 11 States. Their combined borrowing and debt service would, therefore, be expected to be low (0.7 percent and 0.8 percent, respectively) as apparently modest State-only programs are financed. Table 4 lists the States in descending order of Federal aid as a percent of capital outlay.

Group II

The six States in this group constitute the greatest exception to the general patterns identified earlier. Like Group I, these States receive relatively high amounts of Federal aid, ranging from 71 percent to 85.9 percent of their respective capital programs from 1973 through 1976 (75.4 percent, combined). Unlike the 11 States in Group I, borrowing and debt service are quite high. Combined, these six States borrowed 24.5 percent of their 4-year capital outlay, while debt service equaled 26.6 percent of net user revenue. Despite high percentages of Federal aid in their capital programs, three States, the District of Columbia, Vermont, and West Virginia, may soon (if not already) face serious debt problems.

The District of Columbia issued bonds equal to 31.3 percent of its capital outlay in the 4-year study period. In 1976 the District's bonding activity equaled 42.2 percent of capital outlay. If the District encounters difficulty in retiring these debts, it may be hard-pressed to increase its relative tax effort. Though the District's tax effort measures only 0.79 of the national average, the District's income distribution overstates its ability to pay. Though the District's per capita income is the highest among the contiguous States, its median income is 1 percent below the national median. This suggests an inverted bell curve distribution of incomes and lends a per capita measurement that understates tax effort.

Vermont issued bonds equal to 33.4 percent of its capital and serviced debt equal to 29.2 percent of its net user revenue. Bonds equaled 37.8 percent of West Virginia's capital outlay while debt service equaled 40.2 percent of its net user revenue. These two States have the highest and third highest tax efforts among the 51 States; 1.88 for West Virginia and 1.58 for Vermont.

Given that $3 and $4 of every $10 of Vermont's and West Virginia's net user revenues, respectively, must service debt, and their very high tax efforts, neither State would have many options if a sudden increase in capital demand occurred or if either were restricted within the bond market. Such a restriction may result from legislative actions or from market forces, such as a decline in investor confidence which may prevent sales or greatly increase interest costs.

Two more States, Hawaii and Alaska, have similar debt service requirements. Hawaii, however, with a tax effort of only .76, 44th among the 51 States, may have the capacity to address future debt problems. Alaska, always a special case, has unique maintenance needs and unique needs generated by North Slope development. Alaska issued bonds equal to 28.8 percent of its capital outlay. This rather high bond activity is quite different from Alaska's past practices. In Alaska's case, that future revenue will come from severance taxes on North Slope oil. Therefore, Alaska's newly acquired highway debt appears to be only an abberation and should be quite manageable.

Group III

Eleven States in Group III fit the general patterns identified in this paper, but not as neatly as do the States in Group 1. Federal aid as a percent of capital outlay for Group III ranged from 50 percent in Tennessee to 63.1 percent in Minnesota, averaging 55.7 percent. As in Group I, borrowing over the past 4 years has been nonexistent to modest. Combined, these 11 States borrowed to meet 1.5 percent of their capital outlay and serviced debt equal to 4.7 percent of their net user revenues.

Only Maine and Alabama serviced significant debt. Each serviced debt equal to 16.6 percent of its net user revenue. However, each borrowed only around 5 percent of its capital in the past 4 years. Therefore, the debt service, relative to user revenue, should decline in the near future.

Group IV

The six States in Group IV received Federal aid equal to 51 to 61 percent of their capital programs. Although the Federal-aid range is about the same as that of Group III, compared to Group III, borrowing and debt service were substantially higher for these six States. Debt service ranged from a low of 11.5 percent of net user revenue for Wisconsin, to a high of 33.2 percent for Massachusetts. Borrowing remained high enough in all six States to assure the continuation of a significiant debt burden for the near future.

Maryland bonded for 13 percent of its capital and serviced debt equal to 20.1 percent of net user revenue. With a tax effort of 1.11, Maryland may not be able to significantly increase its relative tax effort to address potential capital problems. Massachusetts' tax effort of 0.91 suggests some capacity for increasing user tax revenues, relative to other States, but this unused tax capacity may be overstated. Massachusetts' other taxes are among the highest in the Nation. In any event, the unused capacity may not be enough to address a sudden increase in capital demand. Massachusetts bonded for 32.3 percent of its capital and serviced debt equal to 33.2 percent of its net user revenue. One out of every 3 net user revenue dollars is consumed by debt service, while substantial new debt continues to be incurred. Kansas (61.0 percent Federal aid) has authorized bond sales only since 1972. Since then, Kansas has bonded for 42.9 percent of its capital. In the past 4 years, Kansas has serviced debt equal to 15.3 percent of its net user revenue.

Because its bonding authority is so recent, Kansas is not servicing long-term debt incurred in the distant past. Yet, by 1976, its debt service equaled 20.3 percent of net user revenue and can be expected to continue to increase in the near future.

The remaining three States in Group IV show similar levels of Federal aid, borrowing, and debt service. Only tax effort varies. Wisconsin's tax effort of 0.79 suggests some yet untaxed capacity, Ohio's tax effort of 0.95 suggests only marginal sources of untaxed capacity, while New Hampshire's tax effort of 1.29 suggests little hope of substantial user tax increases relative to other States.

Group V

Only four States are placed in Group V: Indiana, North Carolina, Virginia, and Iowa. Like the 12 States in Group VI, Federal aid constitutes a relatively small share of capital outlay (46.4 percent average). However, unlike Group VI, substantial State capital programs have been financed with no or with only modest borrowing. Consequently, debt service has been either marginal or nonexistent. To compensate, though, tax efforts are quite high. Only Indiana's tax effort (0.93) suggests potential for relative increases. The other three States have an average 1.18 tax effort.

Group VI

The 12 States in Group VI are the least reliant upon Federal aid (42.6 percent average), thus, each maintains a substantial State-only

program. Tax effort varies widely, from a low of 0.62 to a high of 1.59, but borrowing and/or debt service are consistently high. Borrowing ranged from 0 to 47 percent of capital (18.5 percent average) and debt service ranged from 5.3 to 49.9 percent of net user revenue (21 percent average). Debt has clearly reached a problematic level for some of these 12 States.

Delaware (48.1 percent Federal aid) bonded for 44 percent of its capital and serviced debt equal to 47 percent of its net user revenue. In 1976, 51.3 percent of Delaware's net user revenue serviced debt. More than 1 of every 2 revenue dollars are consumed by debt. Further, Delaware's 1.59 tax effort is the second highest among the 51 States and offers little hope of meaningful increase. Should Delaware be restricted in the bond market or be faced with a sudden increase in capital needs, its program could be seriously threatened.

Pennsylvania (44.8 percent Federal aid) has a tax effort of 1.16 which was exceeded by 13 States during the 1973-76 period. Pennsylvania bonded heavily in the past 4 years for 41.7 percent of its capital and carries an already high debt burden equal to 23.7 percent of its net user revenue (25.4 percent in 1976). Given these figures, the Pennsylvania capital program is in jeopardy since the Legislature has rejected a new bond issue and a user tax increase. In short, a principal source of capital (bonding) has been terminated with the program facing mounting debt problems, but no compensating source of revenue has been established to fill the void.

New York (42.9 percent Federal aid) is in a similar position to Pennsylvania. New York has a high tax effort of 1.31 and serviced debt equal to 25.7 percent of its net user revenues. From 1961 through 1972, New York bonded for 24.5 percent of its capital. However, New York's bonding authority has since been terminated. Only 9.3 percent of its capital came from bonds in the past 4 years, and no new bonding is anticipated in the near future.* New York, like Pennsylvania, must therefore maintain a substantial State-only program from current revenues.

Connecticut (38.9 percent Federal aid) and Mississippi (32.7 percent Federal aid) may be facing difficulties. Mississippi's 1.53 tax effort is fourth highest in the Nation. Mississippi bonded for 30.1 percent of its capital and serviced debt equal to 18.6 percent of net user revenue (up to 23.4 percent in 1976). Bonding has increased in recent years, reaching 33 percent of capital in 1976, assuring that debt service will continue to claim a significant share of current revenue in the future. Connecticut's 0.94 tax effort affords some room for increasing revenue, but its bonding and debt levels would overwhelm any marginally increased effort. Connecticut bonded for 47.3 percent of its capital and serviced debt equal to 49.9 percent of its net user revenue (down from 54 percent in 1974). This is a heavy reliance on bonding and a large debt burden to carry. Connecticut prefers neither to issue new bonds nor to raise

---

* A one-time only Emergency Highway Reconditioning bond issue of $100 million was sold in 1975.

user taxes.* Like Pennsylvania and New York, Connecticut has terminated a major source of income and must service a large debt burden without a tax increase. This leaves very little for capital programing.

Kentucky (45.8 percent Federal aid) had a very high tax effort of 1.52 and serviced debt equal to 28.8 percent of net user revenues. Though Kentucky issued no bonds in the past 4 years, a new $212 million bond issue for coal roads has recently been sold.** Therefore, though no bonds were issued from 1973 through 1976, Kentucky's debt burden can be expected to remain high.

The remaining eight States maintain large State-only programs and, except for Florida, service more debt and bond more heavily than most States. South Carolina serviced debt equal to only 5.3 percent of its net revenue, but has bonded more heavily in the recent past than it had previously, reaching 20.9 percent of capital for the past 4 years. South Carolina's debt burden will increase, but should remain manageable for the near future.

Debt service has taken substantial shares of net user revenue in Louisiana and New Jersey, 21.4 and 41.7 percent, respectively. Though Louisiana bonded for only 7.9 percent of its 4-year capital, a new (1977) $112 million bond issue should keep debt service fairly high. Similarly, New Jersey is assured a high debt service for the near future by borrowing for 30.3 percent of its 4-year capital. Federal aid as a percent of

---

* However, Connecticut has subsequently returned to the bond market for capital.

** Debt service paid from coal severance taxes.

capital outlay is fourth and fifth lowest in the Nation for Louisiana (40.1 percent) and New Jersey (40.9 percent), respectively. Louisiana has compensated with a high 1.23 tax effort, but New Jersey's tax effort of only 0.62 is the second lowest among the 51 States. Presumably, New Jersey has the capacity to address its funding problems.

Conclusions

An attempt has been made to identify some general fiscal indicators reflecting the status of State highway programs. Based on the four measurements used in this paper, many States show no signs of significant problems while other States show signs of imminent problems.

For the 43 States servicing debt in the past 4 years, bond interest and bond retirement equaled 14.9 percent of net user revenues. However, for five States, one-third or more of net user revenue was consumed in debt service. Three of these States surpassed the 50-percent level at least once in the past 4 years. Four more States serviced debt equal to more than one-fourth of their net user revenue, and eight more States surpassed one-sixth. Many of these States have high tax efforts and most support relatively large State-only programs.

A significant number of States, therefore, face a substantial debt burden and little hope of greatly increasing user revenues. Further, energy conservation efforts may leave some States with virtually no chance of increased revenues, even if tax rates are increased.

Therefore, the flexibility of many States will be restricted as they attempt to employ their current revenue to meet future needs. Most will argue that a point exists beyond which no public body can safely dedicate current revenue to debt service. Exactly what point debt service threatens collapse of highway capital programs is subjective. However, it appears clear that debt has become a severe problem in some States with at least two States, Connecticut and Pennsylvania, already taking dramatic steps to address fiscal stress in their highway programs. Throughout the 1970's, the share of capital outlay financed by current State highway revenue (nationwide) has consistently declined. In 1976 it fell to only 25 percent of all capital outlay, while borrowing financed 27.3 percent for the 23 States which issued bonds, and 13.8 percent for all States. Also, Federal funds are replacing State funds in too many cases. This trend can have a detrimental effect on local discretion and direction of State capital programs. In sum, greater State efforts are clearly required to reserve fiscal integrity and autonomy.

Chapter 2

RELATED ISSUES

This chapter consists of a collection of independent discussions on specific issues affecting State highway finance and programs. Topics include energy conservation, tax policy, new tax sources, and an appraisal of State fiscal conditions. The intent is to provide perspective and insight into certain aspects of highway finance facing State officials and policymakers.

Probably the most disturbing element affecting the highway transportation industry today is the question of energy conservation. This issue is important for two reasons. First, will there be sufficient petroleum available to fuel America's cars and trucks? Second, inasmuch as most State and Federal revenue mechanisms are tied to fuel consumption, any change in the availability (or price) of fuel may affect program levels and outcomes. The first section presents an overview of an FHWA publication 2/ covering the highway revenue implications of national energy conservation plans. The second section discusses developments in the relationships between gasoline taxes and gasoline prices. The third section covers an area receiving increasing attention by fiscal managers, the nonuser tax source. Here the prospect of using this untapped revenue source is explored. Finally, a review of State fiscal conditons, as reported by FHWA field personnel, is given.

Energy Conservation

Two Federal initiatives may compound the financial problems for some State highway programs: The Environmental Policy and Conservation Act of 1976 (EPCA) and the National Energy Plan (NEP), now being considered by the Congress. The EPCA and NEP address the development of an energy conservation goal.

Historically, State-user revenues, which depend heavily on gasoline taxes, have increased at essentially the same pace as demand for highway services, i.e., vehicle-miles of travel (VMT). This was a result of an almost constant rate of fuel efficiency. In fact, fuel efficiency (m.p.g.) actually dropped slowly through the late 1960's and early 1970's. State-user revenue generally had the capacity to keep pace with increased demand. However, EPCA and NEP, particularly EPCA, will change this historical relationship between user revenues and demand.

The EPCA pursues energy conservation with a strategy of m.p.g standards which, if met, should increase fleet fuel efficiency by about 50 percent and require compensating increases in gas tax rates. To keep pace with the impacts of EPCA, State gasoline-tax rates would have to increase half again faster than they have historically. However, as already noted, States are having difficulty increasing these rates at all let alone at an increased pace. Even if EPCA substantially reduces the cost per mile to the auto operator, thus encouraging more, not less driving, the additional VMT should offset no more than 5 percent of the revenue loss.

The EPCA will also affect States that rely upon vehicle/weight taxes for a significant share of their user revenue, such as Arkansas. As auto manufacturers attempt to meet EPCA efficiency standards, a key strategy will be reduced vehicle weight. This in turn, will reduce vehicle/weight revenues unless these tax rates are increased accordingly. This too, however, appears politically difficult at the moment.

The NEP will add to the financial effect of EPCA. The NEF fundamentally relies on motor-fuel price increases to encourage energy conservation. The greatest impact of NEP should be to accelerate, or at least to insure, the impact of EPCA. That is, EPCA places a requirement upon the manufacturer to move to more efficient vehicles and NEP, through pricing, will encourage the consumer to conserve fuel.

Several studies have examined the impacts of EPCA or NEP, or both. Their conclusions vary considerably, but at the bottom line they agree that fuel consumption will either experience reduction or only marginal growth.

The stated goal of the NEP is to reduce gasoline consumption by 10 percent between 1977 and 1985. The Office of Technology Assessment (OTA),* in its study, questions whether this goal can be achieved. The study speculates that reductions in auto fuel consumption may approach 10 percent, but this achievement will be offset by increased truck fuel consumption. Nevertheless, OTA projects a straight line or a marginal reduction.

---

* The Congress of the United States.

Another study, the Jack Faucett/Office of the Secretary of Transportation (OST) study, concludes that "with significant incentives," auto fuel consumption will peak in 1979 and then will begin a continuous decline through 1985 (10.6 percent below 1977) but increasing again through 1990 (18 percent below 1977). When trucks are included, reductions are less dramatic. Nevertheless, reduced consumption is forecast.

In contrast to OST's projection, the Congressional Budget Office (CBO) predicts fuel consumption to remain above the 1976 level under the NEP. The CBO expects gasoline consumption to peak in 1979 at 5.4 percent above the 1976 level. Consumption will decline thereafter to 1985 when it is expected to be 0.7 percent above the 1976 level and then begin to increase again through 1990. Still the 1990 projection is only 6.2 percent above 1976. The CBO study also predicts a dollar loss to States. From 1977 to 1985, States will lose $3 billion, and by 1990 the loss will total $8.16 billion.

The National Governors Conference (NGC) has computed a "shortfall" based upon the oil embargo of 1973, EPCA and NEP. Compared to a baseline projection, which assumes a 5-percent annual rate of increase in gasoline-tax revenues, NGC computes the combined effect from 1973 through 1990 to be a shortfall of $33 billion to State highway finance.

The Federal Highway Administration's technical report, "The Expected Impact of the National Energy Plan on the Federal-Aid Highway Program," (January 1978) considers the impact of EPCA, the Crude Oil Equalization Tax (COET), and other NEP taxes. This study assumes limits for a low and a high travel growth in an attempt to define parameters

on anticipated impacts. The FHWA study concludes that, from 1977 through 1985, EPCA will effect a shortfall of $12 to $13.2 billion to the States from gasoline-tax revenues. The NEP would add another $1.8 to $3.1 billion to that shortfall.

If a common theme can be gleaned from the above-mentioned studies, it is that motor-fuel consumption is not likely to increase appreciably in the next decade--if indeed consumption increases at all. This development, in turn, directly affects the expected revenue outlook of the States. Thus, a clouded consumption picture, compounded by increased consumer prices, casts a veil of uncertainty over future State highway programs. Depending upon the assumptions used, State gasoline tax shortfall ranges from $2 billion to $16 billion for the period 1977 through 1985.

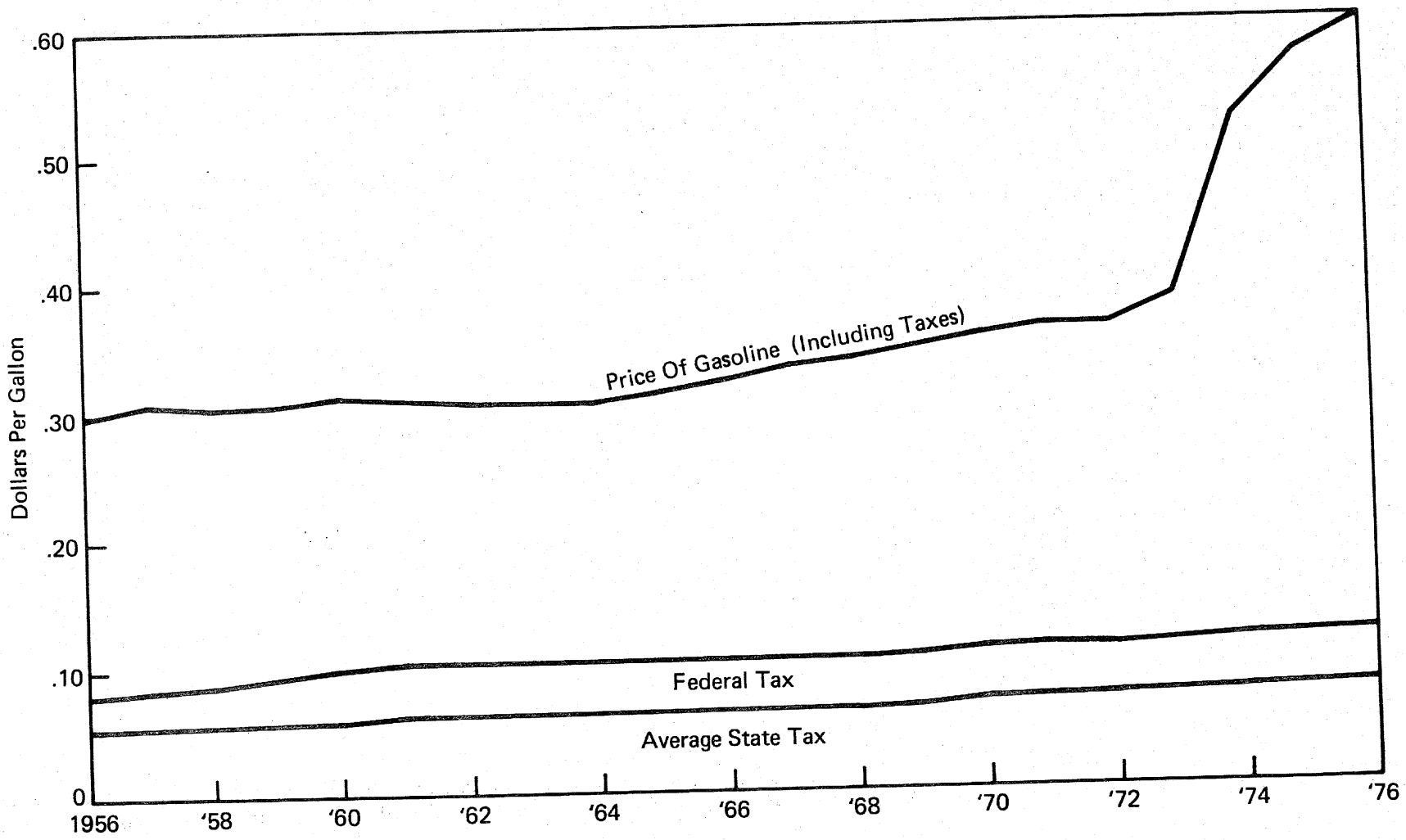
The States, through NGC, contend that whatever this shortfall is, the Federal Government has a responsibility to reimburse the States accordingly. However, the FHWA study points out that <u>if</u> the Congress should determine that the Federal Government has such a responsibility, the Highway Trust Fund will be hard pressed to supply the funds. The FHWA notes that, like State revenues, Federal gasoline tax revenues will also be reduced. The Federal gasoline tax of 4 cents per gallon has not been changed since 1959. Assuming no change in this tax rate, the Highway Trust Fund will experience a shortfall of $0.9 to $1.2 billion from 1977 through 1985.

Gasoline Pricing and Taxation

The gasoline tax has long been the principal source of revenue for highway needs. Individual State gas tax rates have increased sporadically over the years, but in the aggregate they have displayed a gradual growth pattern. The weighted average tax rate for all States has increased incrementally from 5.94 cents in 1960 to 6.41 cents in 1965, to 7.01 cents in 1970, to 7.71 in 1976. As presented in Figure 8, the average State gas tax rate has increased by just slightly over 2 cents a gallon over the past 20 years (1956 to 1976). This computes to an average annual increase of about one-eleventh of a cent. Over the same period, the average price (including tax) of regular gasoline increased from 31 cents to 59.5 cents, an increase of 28.5 cents. Moreover, 23.3 cents of the increase has occurred since 1973.

Until the oil embargo in late 1973 and the subsequent large increases in the price of oil by oil exporting countries, the average State gas tax had been running at about 20 percent of the price of regular gasoline. Over the 1973-1976 period, however, the historical relationship between tax rates and the price of gas changed dramatically, with the most pronounced change occurring in 1974. During the 4 years that the gas price increased 23.3 cents, the average State gas tax increased only 0.39 cents and the Federal tax did not change. The combined Federal and State gas-tax share of price dropped from 31 to 20 percent as shown in Figure 9. In real terms, the average tax rate has declined from 7 cents a gallon (1970) to 4.4 cents for 1976. Conversely, if the average State tax

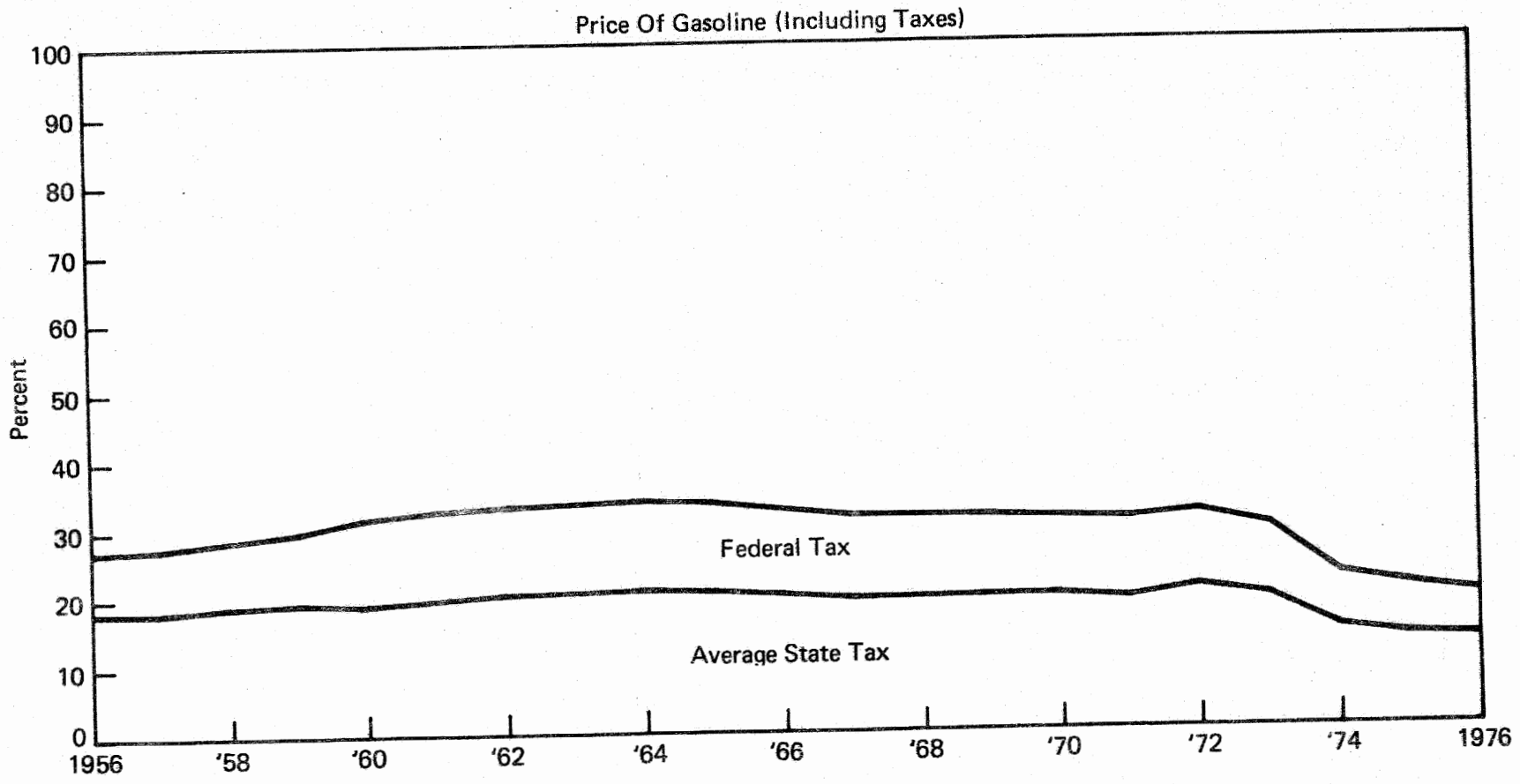
Figure 8
THE PRICE OF GASOLINE AND STATE AND FEDERAL TAX RATES,
1956 - 1976



Source: "Platt's Oil Price Handbook And Oilmanac, 1976", McGraw-Hill. Inc.

Figure 9

STATE AND FEDERAL GASOLINE TAXES AS A PERCENTAGE OF THE PRICE OF GASOLINE 1956 - 1976



Source: "Platt's Oil Price Handbook And Oilmanac, 1976", McGraw-Hill, Inc.

rate has corresponding increased with construction costs, the average State motor-fuel tax would have exceeded 11 cents in 1976.

In sum, while the price of gas has increased dramatically, the average State gas-tax rate has increased only gradually and the Federal tax has not changed. It has been shown that increased highway expenditures must be forthcoming in the years ahead if today's highway conditions and level of service are to be maintained. It would seem reasonable and appropriate to look to increases in the gas tax as a primary means of meeting these needs. 3/

Nonuser Tax Sources

The importance of nonuser revenue in certain States has heightened the interest of other States in their search for new sources of income for highway programs. Some of these account for sizable portions of State highway receipts. For example, Iowa received $50 million from motor-vehicle sales tax in 1976 (15 percent of current income); Mississippi allocated sales tax receipts of $37 million to roads (18 percent of current income); and Louisiana used $20 million of mineral lease receipts for highways. Although these States account for the majority of all nonuser tax proceeds expended on State highways in 1976, the potential for expanding this source is good.

One important source currently receiving increased attention is the severance tax. Due to the Nation's urgent need to expand domestic energy production, there will be increased demand for and transport of coal. For those States directly impacted by the hauling of coal on

State highways, the taxing of coal production to cover highway costs seems appropriate and appealing. For States similarly affected by resource development, these mechanisms provide food for thought. (See Chapter 3 for specific example.)

Other revenue sources in use include specific ownership tax on motor-vehicle purchases, tobacco taxes, gross receipts taxes, game and fish license fees, petroleum inspection fees (nonhighway use), capitation taxes, and others. For more information, see Appendix D.

Appraisal of State Developments

In response to a recent FHWA inquiry regarding the States' capacity to match Federal-aid apportionments and allocations, the States assessed both the immediate and long-term prospects for continuing their respective highway improvement programs.4/ The comments were generally favorable vis-a-vis matching Federal aid for FY 1978 and FY 1979, but near universal apprehension was voiced about the future. A synopsis of the responses is as follows:

> Nearly all States can match all available Federal-aid apportionments. However, several States require drastic measures to accommodate the participation program. These measures involve administrative and operational actions, including maintenance cutbacks; elimination of nonparticipating programs (100-percent State financed); turnback of some mileage to local jurisdictions, requiring local governments to provide matching funds; seeking temporary aid from State

general funds; relinquishing highway-related functions such as highway patrol; salary adjustments and layoffs; and others. Overall, most States foresee a day of reckoning in the immediate years ahead, witness the following facts:

-- Highway dollars are shrinking due to inflation, and States face increased operating costs, while no new revenue is forthcoming.
-- Cost and revenue trendlines are converging, so that increased maintenance and operation costs will soon absorb all current revenue dollars.
-- Localities are drifting toward a capital program posture that merely matches Federal-aid dollars.
-- State priorities and discretion will be reduced to zero in the early 1980's.

Clearly, there are widespread influences affecting State highway finance. It is likely, then, that conditions in Arizona are exemplary of State highway fiscal conditions prevalent throughout the Nation now and anticipated for the years ahead.

"Arizona's overall highway-user revenue growth has declined from an average of 10.9 percent annual rate of the 5-year period preceding the 1973 energy crisis to an expected growth of 5.2 percent for FY 1978 and 4.5 percent for FY 1979. As in the past, motor fuel tax revenue represents the major share of road user revenue, i.e., 60 percent. However, fuel tax revenue is expected to increase by only 3.7 percent.

"Considering the performance of road-user taxes noted above, in light of other factors such as population growth, VMT, construction prices, personal income, it is likely that tax revenue will not keep pace. Increased fuel efficiency and higher fuel prices alone will materially impact available construction funds. In the event of a drop-off in user revenues, it would be necessary to abandon some projects and scaledown others--unless alternative funding solutions are found."

In this regard, the legislature was asked to raise the gas tax in 1977 by 2 cents a gallon. Although the effort failed, it is anticipated that repeated attempts will be made in the future in order to assure adequate funding to maintain an acceptable level of higwhway service.

In the meantime, the highway agency is reducing administrative and operating costs to sustain its construction program. In other words, cost savings are being made in some areas so that minimum capital programing is continued.

Chapter 3

ALTERNATIVE STATE HIGHWAY FUNDING MECHANISMS

The preceding chapter describes the situation facing State highway officials regarding the performance of traditional road-user taxation, that is, revenue growth has failed to keep pace with costs, and future prospects are grim. The conclusions clearly indicate that States should seek increases in tax rates in addition to exploring the possibility of using new mechanisms for generating needed dollars.

The underlying apprehension centers on the perceived motor-fuel consumption outlook and its effect on highway funding. If energy predictions come to pass, fuel consumption alone may not produce sufficient revenue to meet essential programs--that is, at existing tax rates. Consequently, besides seeking rate increases, States are studying new sources of revenue for highways.

The search for new funding mechanisms is the subject of Chapter 3. Some of the more interesting and innovative approaches under study or undertaken by the States are examined. This is by no means an exhaustive inventory, nor are all variations applicable to a given technique covered. Instead, the chapter merely illustrates the lengths to which some States have gone, and the studies they have undertaken in their efforts to raise needed revenue.

The first example explores the possibility of using highway tolls as a supplemental revenue source. Second, the variable gas tax as enacted in Washington State is described. Third is the highway budget indexing plan approved in Texas. Its methodology and rationale are

reviewed. Lastly, this chapter examines the Kentucky approach linking road improvements to energy production and taxation.

Tolls as a Supplemental Resource for Highway Needs

In the past 50 to 60 years, toll financing has enabled the construction or completion of dozens of highway projects that otherwise might have been foregone. Tolls, financing through direct user charges, embrace the benefits-received principle by clearly linking benefits and cost. User awareness is also maximized by the toll mechanism.

Toll revenue, totaling $1.3 billion in 1976, represents a significant source of direct income for highways. Generally, toll financing is used to amortize front-ended capital projects. After liquidation of debt, facilities become toll-free but, more importantly, become a tax burden. Increasingly, State officials are considering retention of tolls for numerous reasons. Some of the contemplated actions include:

1. Continue tolls at reduced rates to cover only maintenance and operating costs.
2. Continue tolls to finance reconstruction and rehabilitation of aging facilities.
3. Combine revenue generating capacity of several toll facilities so that combined tolls cover all costs.
4. Combine toll income with tax funds to meet statewide highway needs.

Some States have already instituted some of these toll applications.

1. Connecticut has continued tolls on both the Merritt and Wilbur Cross Parkways, yet the debt incurred to construct facilities has been retired for many years. Toll revenue, then, supplements State-user taxes for highways. Advocates rationalize continuation of tolls on the ground of the truism that there is no such thing as a free road--there are only tax roads and toll roads. Since road-user taxes are direct benefit taxes and toll charges merely focus the application more narrowly, both are seen as levies for a particular service.
2. A number of toll roads constructed in the 1950's and 1960's are nearing debt-free status. Paralleling this event is the need for major reconstruction. The Pennsylvania Turnpike is typical of this group. Bonds sold to construct the initial east-west sections have been retired for several years, but the need to modernize and upgrade various sections necessitated issuance of new bonds. Hence, a perpetual need/bond/toll cycle seems inevitable.
3. Cooperative arrangements between toll and tax supported networks exist in several States. In Kentucky, an extensive system of tollways is subsidized by State road-user tax revenue. State-tax revenue covers all operating and maintenance costs, plus a substantial share of debt service. Indeed, toll revenue covered only 27 percent of combined operating and debt costs in 1976. Similarly, in Oklahoma toll revenue is supplemented by motor-fuel tax receipts estimated from turnpike travel. In Florida, new toll

projects are financed by bonds issued by the State Department of Transportation and secured by toll revenue plus a portion of the State-gas tax apporionted to counties. In addition, all maintenance and operating costs are paid by the State. States also aid in local government toll operations. In Virginia, The Richmond Expressway (toll) is maintained by the Virginia Department of Highways. In sum, direct and indirect subsidies from tax sources have aided toll facilities for many years.

4. Removal of tolls can prove detrimental to the State highway budgets. By 1981, it is estimated that all debt for the Maine Turnpike will be retired, and the road will be transferred to tax-supported status. Maintenance and operation are estimated to cost $5 million a year, which is equivalent to 1-cent-per-gallon tax on all motor fuel consumed in the State in 1976. Further, reconstruction of the southern end of the turnpike (I-95) is imminent, costing $80 million. If the State can obtain Interstate System funding, it will still require $8 million to match. However, there is considerable uncertainty whether the State can raise this sum. In short, for the State to free the turnpike, it must raise the gas tax or reorder its priorities on other programs.

Several other major toll roads will likely reach toll-free status in the next 10 years. Toll removal will place added hardship upon State budgets to cover reconstruction and maintenance costs. Continuation of tolls, on the other hand, would save funds for other pressing needs. In short, elimination of toll charges will diminish the effectiveness of present tax receipts and will accelerate the need for higher tax

rates. Retention of tolls, in some form, provides supplemental income, combines profitable and unprofitable highway segments into solvent systems, and offers increased flexibility and innovation in highway transportation networks.

The Variable Gas Tax (Washington State)

Probably the most innovative tax mechanism undertaken anywhere is the variable gas tax approved in the State of Washington. For years, tax policymakers have sought a user tax that was sensitive to highway cost. Heretofore, the traditional method of highway finance, based on fuel consumption, reasonably served highway programs as long as increases in fuel consumption and highway unit prices were in balance. As is clearly evident in recent years, events have caused considerable disequilibrium in this relationship. The future looks too uncertain for a State to rely solely upon a tax structure that is tied to units of consumption, as is the motor-fuel tax. To counter the rigidity inherent in past motor-fuel tax mechanisms, Washington selected a variable tax on motor fuel that fluctuates with the price of gasoline and also assures a minimum funding level for its highway program.

The act immediately increased the tax from 9 cents to 11 cents per gallon for the period July 1 to December 31, 1977. Thereafter, the tax rate will fluctuate between 9 cents and 12 cents per gallon, depending upon the price and volume of gasoline sold and the State's highway system needs.

According to the tax provisions, the Department of Motor Vehicles (DMV) semiannually computes the tax rate based on a survey of the average price per gallon of motor fuel sold in the State(prices are net of excise taxes). The initial rate established equals 21.5 percent of the average retail price. The tax rate, however, must be at least 9 cents per gallon but cannot exceed 12 cents.

The rate to be set must also realize the same revenue raised in 1973 from motor-fuel taxes as adjusted by a compound increase of 6 percent per annum. Accordingly, the tax rate is increased in one-half-cent increments until the computed revenue yield is achieved.

The following illustrates the methodology established under this scheme. This plan, in effect, converts a "cents per gallon" tax into an inflation sensitive percentage tax:

Step 1--Tax percent times base price equals cents per gallons.

Step 2--Cents per gallon times gallons sold equals revenue.

Example:

Step 1--21.5 percent x 54 cents = 11.5 cents tax (nearest one-half-cent).

Step 2--11.5 cents per gallon x 4.3 billion gallons sold = $495 million.

The plan also has certain limitations.

1. Revenues from the motor-fuel tax cannot exceed appropriations for highways by more than 5 percent or at a rate of 12 cents per gallon, whichever is less. If revenue from the current tax is too high, the rate must be rolled back.

2. Revenue cannot drop below 1973 level plus 6 percent per year inflation--but no more than equivalent to 12-cents-per-gallon tax, e.g., a 10-percent drop in fuel consumption would automatically raise the rate by 1 cent.
3. Tax rates do not go up or down with highway needs, only the price of motor fuel and the 1973 budget, as adjusted, determine tax rates.
4. Increases in Federal funds could reduce the tax rate.

Highway Budget Indexing (Texas)

The Texas funding crisis is typical of most States. The symptoms are all too familiar, that is--increasing traffic volume, rapidly escalating costs, leveling off of revenue growth resulting in delayed projects, and an increasing backlog of needs. Texas' situation was vividly dramatized in a study made in 1971 that warned that existing tax sources would fail to generate sufficient revenue to match Federal aid by 1985. When the study was updated in 1975, the critical date of insufficiency was advanced to 1979. Thus, Texas was faced with a near-term crisis--not a long-term problem. Subsequently, consultants deemed the forecast conservative and predicted that the day of inadequate funding had, in fact, arrived.

The State immediately took steps to reduce overhead cost by eliminating some 3,000 jobs. The highway department analysts believed that this action plus other related budget constraints could push the day of fiscal insufficiency to match all Federal aid back to 1981. With

the immediate crisis postponed, the State embarked on a thorough review of highway needs, and particulary, various funding mechanisms. Through the efforts of the Governor, the Department of Highways, and the legislature, a compromise was reached that would provide adequate funding for the highway program, while still meeting the needs of an active State program under a limited revenue situation.

The plan has two basic objectives. First, it provides a substantial and immediate increase in funds for highway construction and maintenance. The new base is a statutory rather than constitutional dedication of revenues. Texas, like many other States, constitutionally dedicates certain road-user taxes for highway purposes. This legislative effort determined that the constitutional sources were inadequate, thus, the statutory dedication would most likely place revenue needs above the constitutional estimate. Hence, any difference between the two amounts would be paid out of State general revenues, i.e., the Tax Clearance Fund. In sum, an earmarking of user and nonuser taxes is made for highways.

Second, the plan guarantees protection against the ravages of inflation by automatic dedication of sufficient revenues to the State highway fund that offset unit price increases. Probably the most innovative feature of this scheme, the method used to set revenues, guarantees a base that neutralizes the effect of inflation on highway programs by establishing a highway cost index methodology. Overseeing the process is a committee, consisting of the Governor, Lt. Governor, and Comptroller of Public Accounts, that meets annually to review the Department's highway

cost index. The committee authorizes the program level and sets the amount of State general revenue required to supplement road-user tax revenues. The highway cost index is based upon the weighted annual costs of highway operations, maintenance, and construction. This procedure will be used for the 1979 budget. For the biennium 1978-79, the total amount is set in the statute.

The plan provides a unique funding approach that guarantees funding protection against inflation. Since the existing State sources of financing the system had proved inadequate to meet the dual challenge of continued high levels of inflation and decreasing revenues resulting from better fuel efficiency and lower weights of automobiles, the new financing system was considered the best method of restoring the current program to its former investment performance and to assure continuity of the program in the future.

In sum, Texas has departed from its traditional user-tax source of financing State highway programs. However, that the State has chosen to allocate general revenues for highways is not new. The farm-to-market program, consisting of secondary roads, has regularly received $15 million of general revenues annually for many years. Offsetting this amount is the apportionment of 25 percent of the 5-cent motor-fuel taxes paid each year to the Available Free School Fund.

It will be determined later whether new allocations of general revenues for highways will be sufficient to offset the amount of road-user taxes now expended or apportioned to other than highway purposes. For 1976, total nonhighway expenditures from road-user taxes amounted to $373 million out of a total raised of $1,005 million.

Despite the fact that Texas' highway finances include a cross flow of funds, i.e., road-user taxes being used for State general purposes, while general revenues are being allocated for highways, or whether the net amount favors highways or not, it should not overshadow the importance of this novel mechanism for setting program levels. In the future, revenues for highways will be indexed to relevant cost factors of highway improvement and operation. In other words, funding programs will be established in real dollar terms.

As a final observation, one is puzzled over the apparent reluctance of the State to raise the motor-fuel tax rate. Currently the rate is 5 cents per gallon, the lowest in the Nation. In contrast, the national weighted average for 1976 was 7.7 cents per gallon. Texas has not raised its tax since 1955. In 1955, the national average was 5.3 cents per gallon. If Texas had raised its rate to the national average, that is, a State-tax rate of 7 1/2 cents a gallon, the State would have raised an additional $200 million in 1976.

The bottom line is, therefore, whether or not the $200 million generated from raising the State-tax rate to the national average, plus the $373 million of road-user tax receipts paid to State schools in 1976, would have been enough to offset the effects of inflation without resorting to nonuser revenues to finance highway programs.

Energy Roads and Taxtion

Tax avoidance has become a severe problem in several States that have experienced increased traffic of trucks hauling energy products and

energy-related material. The effect of the increased movements is detrimental to existing road conditions, and, in fact, has accelerated the deterioration of highway systems without correspondingly increasing revenue from users to compensate for road damage. Present taxing mechanisms fail to focus narrowly enough to generate revenue in line with cost. In effect, the incidence of road-user taxation falls more heavily upon general users rather than specific users, i.e., coal haulers. In response, States are considering several methods which target the tax burden on those most responsible for wear on the highways. One of the more important of these mechanisms is discussed below.

State Severance Taxes--The severance tax is a special type of natural resource tax based on the premise that it is possible and justifiable to tax the severance of a resource from its environment. It is argued that when a resource is removed from its natural surroundings, wealth is irretrievably lost by the residents of the States and that this circumstance justifies the recapture of part of the lost values. Like any excise tax, a severance tax can be expressed in ad valorem or in per unit terms, and some States use a combination of both. Most of the following discussion will refer specifically to coal-severance taxes, although many of the same considerations would also apply to the taxation of other natural resources.

Severance taxes were used by 31 States in 1975, yielding revenue of about $2 billion. In 1975, 11 States had revenues from severance taxes on coal, while others taxed oil, gas, and timber. Six of the States with

coal-severance taxes dedicate a portion of severance tax revenues for highway improvements at either the State or local level (Arkansas, Kentucky, Maryland, Montana, Tennessee, and Wyoming). In only three States (Alabama, Colorado, and Ohio) are all coal-severance tax revenues dedicated for nonhighway purposes. The other eight States have at least a portion of their severance tax revenues available for State or local general purposes which could include highway improvements.

Severance taxes constitute a potential reserve of funds that can supplement road-user taxes. Currently severance taxes vary among the States. Eight States base their tax on the number of tons extracted (from 7 cents to 54 cents per ton). Four other States impose an ad valorem tax ranging from 1.25 percent to 30.5 percent of the price of coal. Nationally, the Department of Energy forecasts predict upwards of $5 billion will be generated from coal-severance taxes for the period 1975-1985. Kentucky and Montana will account for about 80 percent of this sum. By 1985, Kentucky should be receiving about $221 million annually from coal taxes and Montana's collection will be about $276 million.

Energy production, tax policy, and transportation are covered in the publication "The Expected Impact of the National Energy Plan on the Federal-Aid Highway Program," which is excerpted in Appendix C. As noted above, Kentucky is a primary recipient of severance tax revenues, as well as being severely impacted by coal haulage. Accordingly, Kentucky has moved to link these elements into a comprehensive funding and improvement program.

Kentucky Coal-Road Improvement Program

In Kentucky, the movement of coal is accomplished by rail and truck. Since 1973, the increase in coal production has moved almost exclusively by truck. Trucks hauling coal have increased from 2,890 in 1973 to 5,860 in 1975. While Kentucky coal production was approximately 16.7 million tons greater in 1975 than in 1973, nearly 3.4 million fewer tons were moved by rail. Both east and west regions show increases in the use of trucks hauling coal, however, it is the eastern region that is particularly affected by coal hauling (77 percent of movement is by trucks). This is due to relatively small mines, and their short-term operations.

Based upon the increases in truck registrations, frequency of coal-hauling trips, and average loads, plus the observed impact of such usage on State roads, the Kentucky Department of Transportation recommended a program to upgrade coal-hauling roads. The program involved highway reconstruction coupled with adequate maintenance of service levels. The first project identified in the program is located in eastern Kentucky, that is, a four-lane divided highway, 42 miles in length, funded from the proceeds of a $212 million bond issue.

The road is designed for the transportation of coal from mines in eastern Kentucky to the markets in central Kentucky, and for connection with other transportation modes. The road is also intended for general highway use. The agency used to market the bonds and to administer debt service is the Turnpike Authority of Kentucky--a quasi-State instrument

originally established to finance toll roads. The toll authority will sell revenue bonds to finance coal roads and will secure a lease-rental from the State Department of Transportation in amounts required to pay bond interest and redemption. Kentucky Department of Transportation, in return, will receive revenue from the coal-severance tax, the first deposit of which is earmarked for the State Transportation Fund. Any deficit in severance tax revenues is paid from general road-user taxes. (An interesting adjunct to the lease-rental agreement probably explains why the toll authority serves as the State fiscal agent for these toll-free roads. Security provisions embodied in the bond indenture state that if lease payments are terminated, tolls shall be charged for road use.)

To recapitulate, the State instituted a program of upgrading limited portions of the State's coal-hauling highway mileage which are expected to be severely impacted by the Nation's need for energy resources. Program funds will come from State severance taxes on coal production. Collections from the severance tax neared $100 million in 1975 and are expected to reach $134 million in 1978. The first road planned under this program was funded by a revenue bond issue marketed through the State's turnpike authority. Construction was carried out by the Kentucky Department of Transportation, which is also obligated to make payments to the turnpike authority to cover debt service on the revenue bonds. Completing the cycle, severance taxes on coal production are paid into the State Transportation Fund to cover debt service payments.

Summary

Future revenue raising for highways will likely differ from present patterns because of certain fundamental changes in the ways energy is used and produced. Foremost among these changes is a reduction in the anticipated level of fuel consumption. Tax performance tied to consumption has proven inadequate in recent years, and the prognosis for the future is uncertain at best. While most States are considering increases in user-tax rates and charges, recent events, such as inflation and highway noncapital costs, have given increased importance to establishing a given budget level to meet highway needs. To achieve that funding level, some States are considering indexing revenues with costs by either adjusting the tax rates (Washington) or supplementing user taxes with nonuser funds (Texas). Still, other States might focus taxation directly on the cause of recent increases in highway needs, witness energy taxation and road improvement plans in Kentucky. These examples will likely encourage other novel approaches in the near future as other States begin to encounter increasing difficulty in raising funds for highways.

Chapter 4

CONCLUSIONS

States, as the chief provider of highways, have been experiencing a converging of fiscal trendlines. On the other hand, noncapital costs and inflation have drastically reduce real capital investment. Revenue to cover these costs, on the other hand, is leveling off and the future outlook is clouded. States, having relied on road-user taxes to fund highway prorams, are faced with pending energy conservation and pricing measures that will likely curb consumption, and in turn, dampen growth in revenue. In sum, the State highway funding problem can be succinctly described as follows:

Causes--

- o increasing traffic volume
- o rapidly escalating costs
- o leveling off of revenue growth

Consequences--

- o delaying of capital improvement projects
- o increasing reliance on Federal aid
- o an increasing backlog of needs

The fiscal plight of the States is clear. Based on data available, States have acted to economize operations and maximize investment dollars. Still the need for new revenue is urgent. Traditional road-user taxation is out of step with recent cost trends and because of increased fuel

efficiency of motor vehicles which results in lower receipts from this source, increased road-user tax rates are clearly required to produce needed future highway revenue.

The innovative revenue mechanisms discussed in this paper are designed to offset the effects of inflation and energy restraints on highway revenue. To achieve desired funding levels, the Washington State system indexed gasoline-tax rates with budget needs and motor-fuel prices. Texas, departing from the user-tax concept, sets the highway budget in real dollars by allocating supplemental general revenues to the highway fund. Another scheme, used in Kentucky, focuses the tax burden on those precipitating specific highway needs, i.e., coal producers and users. Although these examples will likely encourage other novel approaches to highway funding, the most appropriate and just method of funding highways is still the road-user charge.

The traditional road-user tax concept is just and equitable in that users are taxed for particular and measurable benefits they receive for government expenditures for highways. Failure to assess users allows receipt of services without particular payments, the cost of which is borne by the community. Because of its fundamental fairness, the road-user tax device enjoys wide public acceptance. Moreover, users have displayed a willingness to pay, witness the following:

- Toll charges on major toll roads convert to a per-mile rate twice the combined State and Federal gas-tax rate.
- The provision of highways represents less than 10 percent of the cost of owning and operating a motor vehicle.

- Motor-fuel consumption continues to grow despite an increase of 85 percent in the price of gasoline.
- According to a recent survey, the public would support user-tax increases if it were adequately appraised of the need.

In sum, highway-user taxes, particularly motor-fuel taxes, are out of step with highway costs. Future motor-fuel consumption alone will not likely generate highway revenue on a scale commensurate with needs. Adjustments, then, should be made in the tax rate. Indeed, if State motor-fuel tax rates (collectively) had been indexed to construction unit prices, the 1976 national average would have been 13 cents a gallon instead of 7.7 cents. The real tax rate has been eroded by inflation, and to restore balance between costs and benefits, highway taxation should evolve to more nearly resemble a pricing system so that as costs and benefits increase, so should the tax.

APPENDIX A

STATE ECONOMIC AND FISCAL ACTIONS

The following measures were taken by States in the last few years to stretch highway funds and to generate new revenue.

I. Administrative Actions

-- Employee Actions

State maintenance forces have been reduced in nearly all States. For example, common labor is down 14 percent (nationally) and skilled labor is down 27 percent from 1972 to 1977, according to "Transportation Research Circular."1/ Another survey (FHWA) reports 29 States reducing employees in 1975/76 fiscal year. Specific examples cite Pennsylvania firing 1,200 highway employees. Texas personnel dropping from 19,500 to 14,000, and Minnesota reducing its labor force by 2 percent. As for wages, Maine reduced State employee pay raises. Probably most States have taken similar action to stretch budgets.

-- Deferred Maintenance

All States are setting priorities in maintenance budgets. Lowest priority functions are being cut back first--they include roadside maintenance, such as mowing, motorist services, rest areas, and stripping. State expenditures of this nature have declined from 12 percent of total maintenance in 1973 to 8 percent in 1976. Minnesota, for example, foresees a reduction in highway services and performance which will necessitate the study of alternative strategies.

-- Increase Reliance on Federal Aid

Nationally, 100-percent State funded programs have declined in current and real dollars. In 1971, totally funded State projects accounted for 25 percent of capital outlay; for 1976, it was 19 percent. In 1967 dollars, the national total for 1976 was less than $1 billion--about half of the 1971 level.

-- Scaledown or Delay Projects

The average size (dollars) of contracts has declined. In 1974, the average Federal-aid contract was $1 millipn; by 1977, the average had shrunk to less than $600,000. Also, in 1970, 17 percent of all Federal-aid contracts were under $1 million; by 1976, 26 percent of all contracts were under $1 million, suggesting more safety, reconstruction, rehabilitation, and restoration (3R), and TOPICS work. Other examples, Alabama has postponed construction awards; Pennsylvania canceled $300 million in new construction and $90 million of 3R; Texas placed a moratorium on right-of-way purchases (1975), canceled contract lettings in 1977, and also reported building fewer lanes on certain freeways.

II. Institutional Actions

-- Transfer Jurisdiction of Roads to Local Governments

At least two States, Iowa and Pennsylvania, are considering turnbacks. Iowa specified 431 miles for county control.

-- Reduce "Skim-Off" Appropriations for Highway-Related Functions

For example, Pennsylvania wants greater State police and driver

education paid from general revenue rather than from highway funds. Texas limited the allocation of highway funds to highway patrol, saving $60-$65 million. Six other States have shifted funding to general revenues (California, Maryland, Minnesota, Oregon, South Dakota, and Wyoming).

-- Require Localities to Provide Matching Funds

States now routinely expect local governments to provide a portion of the matching funds for FAU and off-system apportionments.2/ Also, transfer of FAU funds ($9 million) to transit is proposed in Pennsylvania to avoid lapse (by end of FY 78) due to shortage of matching funds.

-- Greater Use of Toll Financing

Colorado and Pennsylvania propose converting free roads to toll roads. Retaining tolls after debt free is being studied in many States--notably Indiana and Maine.

III. Fiscal Actions

-- Continued Adjustments in User Taxes

Nearly all States attempt to raise user taxes annually, however, few succeed. From 1966 to 1976, motor-fuel tax rate increases were achieved in a total of 31 States. For example, changes in tax rates from 1972 to 1976 were as follows:

	Tax Change	Weighted Average Tax Rate (cents per gallon)
1972	10 States	7.32
1973	4 States	7.53
1974	2 States	7.57
1975	7 States	7.65
1976	3 States	7.71

In 1977, States changing rates were Delaware, Montana, Nebraska, New Hampshire, North Dakota, South Carolina, and Washington. Hawaii made permanent a 3.5-cent temporary tax. So far in 1978, Idaho, Iowa, Utah, and West Virginia are among the States that have raised motor-fuel tax rates and at least five other States are considering increases (Indiana, Oregon, Pennsylvania, Rhode Island, and South Carolina).

-- Transfer from General Funds

In 1976, 22 States received general funds for highway functions. Five other States have joined in allocating general revenue for highways (Kentucky, Oklahoma, Pennsylvania, Texas, and Virginia).

-- Recapture Diverted Road-User Taxes

Florida is using $64 million of motor-vehicle fees, formally allocated to the State general fund, to provide matching funds for the Federal-aid program. Delaware created a Road Improvement Fund, earmarking 2 cents of the State motor-fuel tax for 3R work (previously gas-tax revenue was not dedicated for highways). Similarly, New York now pledges gas-tax revenue for debt service on recently issued free-road bonds.

-- Use Federal General Revenue-Sharing Funds for Highways

Counties and cities estimated that over $600 million was used for highways in 1977. Arkansas used $20 million of State allocated GRS funds for highways.

-- Continued Borrowing for Highways

Bonding for highway capital improvements has been widespread,

however, authorizations committed to referendum have failed in certain States (New York and Pennsylvania). Bond authority was approved for toll facilities in California, Delaware, Florida, and Pennsylvania, and for nontoll facilities in North Carolina and Rhode Island. Michigan approved bonds for all forms of transportation, and Arkansas and Utah considered bonding as an alternative to raising motor-fuel taxes.

-- Other Actions

Among the innovative fiscal measures recently approved are the variable gas tax in the State of Washington and the budget indexing in Texas. These are extensively covered in the report. Also discussed is the spreading use of energy production taxation for road improvements (Kentucky, Montana, New Mexico, Tennessee, Utah, and Wyoming).

1/ "Transportation Research Circular," December 1972, 1974, and 1977.

2/ "Urban Systems Study," U.S. Department of Transportation, December 1976.

APPENDIX B

TAX EFFORT METHODOLOGY

Traditionally, tax effort compares the level of taxation among States. Generally, the tax effort analysis uses one of two methods described in the following:

1. A ratio of total tax collections to total personal income is determined for each State. Each State's ratio is then indexed to the United States median, with the median equaling 1.00.
2. A "representative" tax index is computed similar to that above. However, the denominator is based upon a calculated total tax capacity.

The Advisory Commission on Intergovernmental Relations (ACIR), in its publication "Measuring the Fiscal 'Blood Pressure' of the States--1964-1975," points out that the latter method has one distinct advantage.

> "Resident personal income tends to <u>understate</u> the fiscal capacity of those States that are in a position to export a substantial portion of their tax, i.e., mineral-rich and tourist States, and <u>overstates</u> the fiscal capacity of those States not in such a fortunate position." (page 2)

However, the latter method has the problem of satisfactorily computing total taxable sources. Further, each method suffers from two other basic criticisms. Tax effort measures a specific point in time, failing to reveal trends. Secondly, tax effort fails to incorporate a State's

appetite for, or consumption of, services which require public funds. However, each method attempts to balance taxes collected with ability to pay.

Regardless of the tax effort's shortcomings by either method, that tax effort is accepted as a valid measure is clear. The Congress has incorporated the personal income method of measuring tax effort in both apportionment formulas used in General Revenue-Sharing.

Given that the Congress has accepted tax effort in so sensitive a matter as an apportionment formula, it is deemed appropriate to employ tax effort as a measure of tax policy. Further, because user charges are employed as a measurement, most of the shortcomings of tax effort can be averted. First, a 4-year period (1973-1976) rather than the traditional 1-year period is used. This still may not reveal a "trend," but a 4-year analysis should withstand scrutiny better than a single-year measurement. Second, a relation to demand for services is easily established in the case of highways by employing vehicle-miles of travel (VMT). Third, given that the Congress has accepted personal income as a valid denominator, per capita income is used as a measure of ability to pay in this analysis.

In this paper, tax effort compares net highway-user charges and is computed as follows, with the computation of Alabama's tax effort used as an example.

1. Net user revenue per 1,000 VMT is determined for each State ($8.453 for Alabama) and for all States combined ($9.372).
2. From step 1 above, each State's net user revenue per VMT is expressed as a ratio to the national average (.9019 for Alabama).

3. Each State's 1974 per capita income, the latest year for which data is complete ($3,624 for Alabama), is expressed as a ratio of the national per capita income of $4,572 (Albama's income ratio is .7927).
4. To consider ability-to-pay, each State's user-revenue ratio from step 2 (.9019) is divided by the per capita income reatio from step 3 (.7927), yielding an income-weighted index of net user revenue (1.1378 for Alabama).
5. Finally, each State's index from step 4 (1.1378) is divided by the median State's index (Oklahoma's 1.0459), yielding tax effort (1.09 for Alabama).

Tax effort is used to indicate the degree to which a given State can realistically hope to increase the yield of its user taxes. This measure increases in importance as indications of potential future problems increase in a State. It must be stressed that these tax effort measures are not intended to be definitive. They are intended to serve only as general and unrefined indicators of a State's ability to increase its user taxes. Further, when tax effort is discussed in this paper, the very real political problems faced by States attempting to raise user-tax rates are not considered. Rather, this tax effort attempts only to indicate a State's untapped user-tax source relative to other States.

Federal Aid and Borrowing

The sum of Federal aid and borrowing may exceed capital outlay in a very few States for two reasons. First, capital raised from a bond

issue is not necessarily expended in the same year in which bonds are issued. Borrowed funds may stay on hand for some time, awaiting later stages of a given project for which bonds were issued.

Second, the computation of Federal aid as a percent of capital excludes "other Federal funds," i.e., not administered by FHWA, which are passed trhough State governments of which go directly to local governments. However, "other Federal funds" that are retained by a State and that are used for highway purposes are included in the computation. These funds are modest in most States, but in some States they are substantial, e.g., Srkansas' statutory dedication of $20 million* annually to the State highway department. These other funds may not be restricted to capital outlay. Therefore, not all Federal funds received by a State were necessarily used in the State's capital program. However, for all but a few States, only fractions of a percent are not used for capital.

Whatever the case, the use of Federal aid as a test of financial status remains valid because even those funds not used for capital essentially make available other State funds for capital. Further, the intent of this test is not to offer a detailed examination of how a given State finances its capital program, but, rather, simply to indicate the States that depend heavily upon Federal aid relative to other States, and, therefore, depend relatively less upon own-source revenue.

---

* General Revenue-Sharing Funds.

TABLE A-1--STATE HIGHWAY INCOME, DEBT SERVICE, AND CAPITAL OUTLAY: 1973-1976

State	Fuel Taxes 1/	Vehicle Taxes 1/	Tolls 2/	Total User Revenue	Capital Bonds 2/	Federal Aid 3/	Debt Service 4/	Capital Outlay 2/
Alabama	630,557	178,206	-	808,763	45,023	484,983	134,408	812,137
Alaska	58,465	32,105	42,762	133,332	62,275	389,854	38,414	453,924
Arizona	387,671	177,224	-	564,895	1,007	337,523	2,097	483,182
Arkansas	423,432	168,644	273	592,349	-	283,487	4,388	477,016
California	2,921,176	1,246,244	138,725	4,306,145	38,373	1,424,323	58,063	2,525,149
Colorado	332,767	166,631	-	499,398	-	365,449	5,285	491,569
Connecticut	475,601	176,386	140,313	792,300	239,767	197,054	395,119	506,509
Delaware	95,963	58,953	82,114	237,030	79,771	89,566	111,296	186,161
Dist. of Col.	70,036	47,360	-	117,396	39,856	90,359	32,652	127,227
Florida	1,407,064	304,683	245,283	1,957,030	118,986	609,930	286,083	1,813,632
Georgia	835,319	145,937	-	981,256	205,501	504,111	130,566	1,183,666
Hawaii	73,981	59,392	-	133,373	47,418	192,138	38,567	264,057
Idaho	165,645	91,731	-	257,376	-	172,686	-	231,124
Illinois	1,472,273	934,529	209,110	2,696,912	400,020	1,128,273	176,396	2,367,760
Indiana	983,523	298,432	86,472	1,369,427	-	376,484	74,743	780,063
Iowa	474,240	432,522	5,871	912,633	5,000	356,643	3,376	790,613
Kansas	393,837	151,520	63,955	609,312	160,000	277,752	93,010	462,078
Kentucky	692,964	431,117	76,980	1,201,061	-	486,775	345,365	1,069,875
Louisiana	626,961	120,930	3,140	751,031	106,500	541,168	160,645	1,349,066
Maine	200,197	72,613	51,764	324,574	10,314	119,273	53,973	198,396
Maryland	614,467	486,909	173,555	1,274,931	127,668	508,790	256,663	995,163
Massachusetts	729,468	166,407	194,380	1,090,255	208,350	362,664	361,594	647,949
Michigan	1,541,675	573,358	25,547	2,140,580	-	757,187	202,009	1,246,874
Minnesota	637,648	379,366	-	1,017,014	-	467,732	53,276	741,337
Mississippi	471,648	109,525	-	581,173	230,911	255,632	108,129	781,694
Missouri	765,017	340,369	-	1,105,386	-	508,723	-	953,494
Montana	147,943	74,565	-	222,508	-	269,922	-	322,631
Nebraska	314,268	129,043	-	443,311	-	223,038	7,715	372,112
Nevada	104,999	42,784	-	147,783	-	153,657	-	167,163
New Hampshire	148,314	74,650	29,238	252,202	31,000	104,842	33,004	184,002
New Jersey	508,287	241,076	595,852	1,345,215	272,111	408,726	561,297	998,478
New Mexico	205,674	103,453	-	309,127	-	231,360	1,990	281,656
New York	1,847,933	972,536	842,878	3,663,347	202,500	938,526	942,496	2,189,457
North Carolina	1,074,525	378,168	1,507	1,454,200	-	485,700	97,729	1,040,722
North Dakota	99,487	78,181	-	177,668	-	162,630	-	221,062
Ohio	1,491,701	764,538	155,478	2,411,717	200,508	784,778	423,272	1,308,954
Oklahoma	449,227	236,641	84,304	770,172	-	275,275	66,799	533,095
Oregon	304,202	235,499	3,984	543,685	25,000	393,652	23,889	476,217
Pennsylvania	1,778,144	785,678	404,423	2,968,245	1,055,929	1,141,260	703,999	2,547,007
Rhode Island	84,305	32,774	12,038	129,117	18,750	122,205	67,412	122,617
South Carolina	518,350	83,286	-	601.636	115,138	233,508	31,740	551,751
South Dakota	126,302	79,654	-	205,956	-	163,022	-	246,182
Tennessee	735,110	304,687	-	1,039,797	73,200	503,356	78,985	1,006,719
Texas	1,188,788	999,430	50,839	2,239,057	-	1,038,738	26,957	2,063,395
Utah	186,271	39,741	-	226,012	-	261,493	-	312,040
Vermont	86,387	86,201	-	172,588	48,000	108,970	50,396	143,668
Virginia	970,950	463,298	202,849	1,637,097	103,000	692,483	134,082	1,526,281
Washington	643,139	218,555	106,524	968,218	65,000	496,026	162,826	681,526
West Virginia	294,482	269,623	45,166	609,271	410,000	790,343	244,800	1,088,169
Wisconsin	625,270	255,241	-	880,511	108,217	331,117	101,558	607,146
Wyoming	96,161	52,960	-	149,121	-	212,898	-	251,323
Total	31,511,813	14,353,355	4,156,324	50,021,492	4,855,093	21,816,084	6,887,118	41,183,088

1/ Highway Statistics, Table SF-1
2/ Ibid., Table SF-21
3/ Ibid., Table SF-21 (Columns 5 and 6), minus Table LF-1.
4/ Ibid., Table SF-21 (Sum of Bond Interest and Retirement).

Table A-2- Basis for State Highway Tax Efforts: Data 1973-1976

State	Net User Revenue ($ 1000)	VMT 1/ (millions)	User Revenue: Per 1,000 VMT	User Revenue: Ratio to National Average	Income: Per Capita 2/	Income: Ratio to National Average	Income-Weighted User Revenue	Tax Effort
Alabama	808,763	95,675	8.453	.9019	3,624	.7927	1.1378	1.09
Alaska	133,332	9,350	14.260	1.5216	6,315	1.3812	1.1017	1.05
Arizona	564,895	64,783	8.720	.9304	4,530	.9908	.9390	.90
Arkansas	592,349	55,549	10.664	1.1379	3,378	.7388	1.5402	1.47
California	4,306,145	529,749	8.129	.8674	5,114	1.1185	.7755	.74
Colorado	499,398	66,600	7.498	.8	4,884	1.0682	.7489	.72
Connecticut	792,300	73,540	10.774	1.1496	5,348	1.1697	.9828	.94
Delaware	237,030	14,491	16.357	1.7453	4,809	1.0518	1.6593	1.59
Dist. of Col.	117,396	12,218	9.608	1.0252	5,659	1.2378	.8282	.79
Florida	1,957,030	247,493	7.907	.8437	4,815	1.0531	.8012	.76
Georgia	981,256	151,605	6.472	.6906	4,091	.8948	.7718	.74
Hawaii	133,373	16,438	8.114	.8658	4,963	1.0855	.7976	.76
Idaho	257,376	23,380	11.008	1.1746	4,119	.9009	1.3038	1.25
Illinois	2,696,912	245,334	10.993	1.1730	5,107	1.1170	1.0501	1.00
Indiana	1,368,427	152,965	8.946	.9545	4,458	.9751	.9789	.93
Iowa	912,633	78,920	11.564	1.2339	4,628	1.0122	1.2190	1.17
Kansas	609,312	62,591	9.735	1.0387	4,669	1.0212	1.0171	.97
Kentucky	1,201,061	99,134	12.116	1.2928	3,712	.8119	1.5923	1.52
Louisiana	751,031	80,501	9.329	.9954	3,545	.7754	1.2837	1.23
Maine	324,574	28,059	11.568	1.2343	3,694	.8080	1.5276	1.46
Maryland	1,274,931	100,819	12.646	1.3493	5,299	1.1590	1.1642	1.11
Massachusetts	1,090,255	116,601	9.350	.9977	4,755	1.0400	.9593	.91
Michigan	2,140,580	234,217	9.139	.9751	4,751	1.0392	.9383	.89
Minnesota	1,017,014	102,328	9.939	1.0605	4,675	1.0225	1.0372	.99
Mississippi	581,173	57,133	10.172	1.0854	3,098	.6776	1.6018	1.53
Missouri	1,105,386	123,634	8.941	.9540	4,254	.9304	1.0254	.98
Montana	222,508	23,363	9.524	1.0162	4,347	.9508	1.0688	1.02
Nebraska	443,311	44,787	9.898	1.0561	4,508	.9860	1.0711	1.02
Nevada	147,783	17,805	8.300	.8856	5,149	1.1262	.7864	.75
New Hampshire	252,202	21,279	11.852	1.2646	4,281	.9364	1.3505	1.29
New Jersey	1,345,215	193,934	6.936	.7401	5,237	1.1455	.6461	.62
New Mexico	309,127	39,351	7.856	.8382	3,601	.7876	1.0642	1.02
New York	3,663,347	265,934	13.775	1.4698	4,903	1.0724	1.3706	1.31
North Carolina	1,454,200	145,798	9.974	1.0642	3,875	.8476	1.2555	1.20
North Dakota	177,668	17,956	9.895	1.0558	5,087	1.1126	.9489	.90
Ohio	2,411,717	259,408	9.297	.992	4,561	.9976	.9944	.95
Oklahoma	770,172	90,186	8.540	.9112	3,983	.8712	1.0459	1.00
Oregon	543,685	64,229	8.465	.9032	4,660	1.0192	.8862	.84
Pennsylvania	2,968,245	267,586	11.093	1.1836	4,449	.9731	1.2163	1.16
Rhode Island	129,117	22,438	5.754	.6140	4,558	.9969	.6159	.59
South Carolina	601,636	83,004	7.248	.7734	3,635	.7951	.9727	.93
South Dakota	205,956	20,796	9.904	1.0568	4,167	.9114	1.1595	1.11
Tennessee	1,039,797	128,182	8.112	.8656	3,821	.8357	1.0358	.99
Texas	2,239,057	335,852	6.667	.7114	4,188	.9160	.7766	.74
Utah	226,012	31,093	7.269	.7756	4,022	.8797	.8817	.84
Vermont	172,588	13,045	13.230	1.4117	3,907	.8545	1.6521	1.58
Virginia	1,637,097	139,649	11.723	1.2509	4,701	1.0282	1.2166	1.16
Washington	968,218	95,997	10.086	1.0762	4,864	1.0639	1.0116	.97
West Virginia	609,271	41,966	14.518	1.5491	3,617	.7911	1.9582	1.87
Wisconsin	880,511	115,469	7.626	.8137	4,468	.9773	.8326	.79
Wyoming	149,121	14,870	10.028	1.0700	4,566	.9987	1.0714	1.02
Total	50,021,492	5,337,444	9.372	1.0000	4,572	1.0000	1.0000	1.00

1/ Highway Statistics, Table VM-2.
2/ Bureau of the Census, Series P-25.

Appendix C

OTHER ENERGY-RELATED TAX MECHANISMS

Producer Taxes

A broad range of tax alternatives for use in financing public expenditures on energy-impacted roads is found in the producer tax area. Producer taxes generally fall into two categories, the first yielding fixed revenues, the second, variable revenues.

Fixed revenue taxes are derived from lump sum taxes, such as license or franchise fees and taxes on truck weights, the number of axles per truck, the type of commodities hauled, or other items. These taxes are fixed in that they are unrelated to such variables as the value of the commodities transported or the number of ton-miles traveled.

Revenues collected from truck franchise or license taxes, etc., can be used with justification to rehabilitate, upgrade, or build roads. Whether or not sufficient amounts of revenues can be raised to do all three depends largely on the tax rate, the density of truck traffic, and on the price elasticity of demand of the commodities that are produced with the resource hauled.

Variable revenue taxes are levied on a variable base, such as ton-miles produced per truck or per firm in a given period, tons hauled or miles traveled. They might also be graduated on the basis of weights carried. Variable taxes fluctuate with the rate of service.

The strongest case can be made for a variable tax on the grounds of benefits received. Only when the energy resource is actually transported over public roads do the consumers of final commodities receive

a benefit. Hence, forward-shifted costs in the form of tax-induced higher prices would come to rest on beneficiaries.

Other forms of user accountability include:

Performance Bonds. The posting of performance bonds in advance of road use by coal trucks can be required in order to assure compliance with acceptable road degradation standards. Since surface mine operators are typically required, for environmental purposes, to file their coal transport plans at the time they obtain their licenses, the licensing agency is in a position to know the prospective traffic flows and the carriers beforehand. The degree of road degradation allowed can be varied by varying the load limits that are allowed under the trucker's permit. Bonding is typically used to repay the costs of repairing roads used by overweight trucks, rather than to prevent road damage.

Revenue Bonds. Revenue bonds are financial instruments sold in capital markets by public authorities. Energy-related highway improvements can be financed from newly issued revenue bonds, while repayment of interest and principal can be made from truck taxes or other revenues of beneficiaries of the energy-related road improvement program. Again, the costs of servicing and repaying the principal amount of the bonds can be passed on to consumers of the products hauled over the roads or to those who otherwise benefit from the road improvements.

PROVISIONS GOVERNING THE ALLOCATION FOR HIGHWAY PURPOSES OF CERTAIN STATE TAXES, FEES, AND APPROPRIATIONS

(OTHER THAN HIGHWAY-USER REVENUES)

TABLE S-106
SHEET 1 OF 2
STATUS AS OF JANUARY 1, 1973

STATE AND SOURCE OF FUNDS	NAME OF FUND OR AGENCY	AMOUNT OR PROPORTION	OBJECTS OF EXPENDITURE	REMARKS
Arkansas				
Severance tax on natural resources	County Highway Fund	12.5 percent of 97 percent of gross receipts	Construction, maintenance, and administration of county roads.	Collected by Commission of Revenue and returned to county of origin. (Except on timber to State Forestry Department, and tax credits allowed petroleum producers for approved salt water disposal.)
Colorado				
Specific ownership tax on motor vehicles Class A & C - For Hire Vehicles	County Fund	All	Construction, maintenance and administration of the county highway system.	Collected by Department of Revenue and apportioned to counties in proportion to the distance traveled across each county as compared to the total distance of the route within the State. This tax is also levied on not-for-hire vehicles (class B & D) and is collected by county clerks and distributed in the same manner as ad valorem tax proceeds. (Not required to be used for highway purposes.) Allocations to cities and towns on same basis as ad valorem tax proceeds if county does make a distribution.
Hawaii				
Diesel and LPG - 1¢ per gallon	State Highway Fund	All	For expenditure, see distribution on MF-106.	Collected by Department of Taxation.
Iowa				
3 percent tax on purchase price of motor vehicles	Road Use Tax Fund	All		Collected by County Treasurers.
	State Primary Road Fund, State Highway Commission	47 percent	State Highway construction, maintenance, and administration.	
	Secondary Road Fund	29 percent	County road construction and maintenance.	Distributed 60 percent on need and 40 percent on area.
	Farm-to-Market Road Fund, State Highway Commission	9 percent	Construction of Farm-to-Market roads. Distributed by the Highway Commission to the counties.	
	Street Construction Funds of incorporated cities and towns.	15 percent	For construction, reconstruction or repair and maintenance of roads and streets in cities and towns.	Distributed in proportion that the population of the municipality bears to the total municipal population.
Kentucky				
3 percent sales and use tax on motor vehicles	State Road Fund	All	For expenditure, see distribution shown on table MF-106.	Collected by Department of Revenue.
Louisiana				
General Fund	Parishes	$1,920,000	Construction and maintenance of parish roads.	Distributed equally among the parishes, including the city of New Orleans, (Orleans parish).
Mineral leases on State owned lands	Parish Road Fund	10 percent	Construction of roads and operation and maintenance of automobile ferries.	Collected by Register of State Land Office. Credited to parish where production occured and subject to expenditure by the State highway department.
Lubrication oil tax 8 cents per gallon	Department of Revenue	Amount required	Collections and administration expenses.	Not to exceed $50,000 annually.
	Long Range Highway Fund	Remainder	Construction and maintenance of State highways and bridges.	
Mississippi				
General sales tax	Division of State-Aid Road Construction	6.6 percent plus amount equivalent to 1/2 cent of motor fuel tax receipts	For expenditure as follows:	Amount "equivalent to 1/2 cent of motor fuel tax receipts" is derived entirely from sales tax proceeds.
		Amount required	Administrative expenses of the division.	Not to exceed $300,000 per year
		Remainder	Construction and reconstruction of State-aid road system.	Allocated for expenditure by divisions in each county on the following basis: $833.33 monthly to each county and remainder on a statutory percentage basis. Title 40, chapter 3 Section 10127 of the Mississippi Code.
Lubrication oil tax 8 cents per gallon	Motor Vehicle Comptroller	Amount required	Collection and administration expenses, refunds.	
	Division of State-aid Construction	Remainder	Construction and reconstruction of State-aid road system.	Same as above for sales tax revenues.

PROVISIONS GOVERNING THE ALLOCATION FOR HIGHWAY PURPOSES OF CERTAIN STATE TAXES, FEES, AND APPROPRIATIONS

(OTHER THAN HIGHWAY-USER REVENUES)

TABLE S-1C6
SHEET 2 OF 2
STATUS AS OF JANUARY 1, 1973

STATE AND SOURCE OF FUNDS	NAME OF FUND OR AGENCY	AMOUNT OR PROPORTION	OBJECTS OF EXPENDITURE	REMARKS
Mississippi (Continued)				
Other oil tax	State Highway Department Fund County Road Fund	)All)	For expenditure, see distribution on table MF-106.	Collected by Motor Vehicle Comptroller.
Tobacco Tax	State Highway Fund	15 percent	Construction and maintenance of State highway system.	Collected by State Tax Commission, Amount transferred annually to the State highway department not to exceed $5,000,000.
Missouri				
3 percent use tax on purchase price of motor vehicles	State Highway Department Fund	All	Administration of State Highway System.	Collected by Department of Revenue.
	State Road Fund	The Residue	Construction, reconstruction and maintenance of State Highway System.	Transfer by Comptroller to State Road Fund from State Highway Department Fund.
Nebraska				
Use tax	Tax Refund Fund	Amount required	For payment of refunds.	Collected by State Tax Commissioner.
	Highway Allocation Fund	Remainder	Construction and maintenance of State highways.	
North Dakota				
2 percent excise (sales) tax on special fuels	County Road Funds	All	Construction and maintenance of county roads and bridges on county FAS system.	Collected by Gas Tax Division. Distribution to counties gives equal weight - each county - to land areas, population and mileage of rural roads exclusive of State highways. (Tax applies to retail sales of agricultural, railroad, industrial, and heating fuel.)
5 percent severance tax	County Road and Bridge Fund	40 percent of county share	Construction and maintenance of county roads and bridges and water resources surveys conducive to control, distribution and utilization of water supplies.	Collected by State Tax Commission. County share of proceeds is distributed to county of origin.
Oklahoma				
Severance tax on natural resources	County Highway Construction and Maintenance Fund	10 percent	Construction and maintenance of county roads.	Collected by State Tax Commission. County share is distributed to county of origin.
Pennsylvania				
Gross receipts tax	Motor License Fund	All	For expenditure, see distribution on table MF-106.	Collected by Department of Revenue on gross receipts of vehicle operating over routes when only part of the route is in the State.
South Dakota				
Game and Fish Licenses	Special Highway Fund (Township)	10 percent	Construction and maintenance of Township highways.	Distributed to county of origin.
2 percent sales tax on purchase price of motor vehicles	State Highway Fund	All	Construction and maintenance of State highways.	Collected by county treasurers at time of registration.
Tennessee				
Petroleum Inspection Fees (Nonhighway use)	General Highway Fund	One-third of total	For expenditure, see distribution shown on table MF-106.	
Texas				
2 percent excise (sales) tax on lube oil used in motor vehicles	State Highway Fund	All	For expenditure, see distribution shown on table MF-106.	Collected by State Comptroller on that portion of motor oils and lubricating oils consumed on public highways.
West Virginia				
Capitation tax $1.00 per male inhabitant age 22 or over	State Road Fund	All	Maintenance of State Secondary roads.	Collected by county assessor and deposited in State Road Fund. Expended in county which tax is raised.
District of Columbia				
Parking meter fees	Motor Vehicle Parking Agency Highway Fund	Amount required Remainder	Operating expenses of the Agency. Maintenance of D. C. highways, including snow removal.	

Source: Highway Statistics, 1973

FOOTNOTES

1. Federal Highway Administration, The Status of the Nation's Highways: Conditions and Performance, U.S. Department of Transportation report for the Congress, Washington, D.C., September 1977.

2. Federal Highway Administration, The Expected Impact of the National Energy Plan on the Federal-Aid Highway Program, U.S. Department of Transportation, Washington, D.C., January 1978.

3. Op. cit., The Status of the Nation's Highways.

4. Memorandum of September 22, 1977, from L. P. Lamm to Regional Federal Highway Administrators.

BIBLIOGRAPHY

Juster, F. Thomas, "A Note on Energy Policy and Automobile Demand," Economic Outlook USA, Volume 4, No. 3, University of Michigan, Ann Arbor, Michigan, Summer 1977.

AASHTO Newsletter, August 8, 1977.

Better Roads, The New Magazine for Governmental Road and Street Officials, Engineers and Contractors, Chicago, Illinois, September and October 1977.

Nehring, Richard, et. al., Coal Development and Government Regulations, Santa Monica, California, 1976.

Liston, L. L., and Aiken, C. A., Cost of Owning and Operating an Automobile--1976, Office of Highway Planning, FHWA, Washington, D.C.

Gruver, William, "Economy League Proposes New Highway Financing Program," Highway Builder, October 1977.

Engineering News-Record, McGraw-Hill, Inc., New York, September 15, 1977.

The Expected Impact of the National Energy Plan on the Federal-Aid Highway Program, U.S. DOT, Washington, D.C., September 1977.

Maxwell, James A., and Aronson, J. Richard, Financing State and Local Governments, Third Edition, The Brookings Institution, 1977.

Highway Statistics, FHWA, Washington, D.C.

Kentucky's Toll Road System, Summary Information, Kentucky DOT, June 30, 1976.

New York State Thruway Authority, 25th Annual Report for 1974

Platts Oil Price Handbook and Oilmanac, McGraw-Hill, Inc., 1976, page 93.

Harvey, C. E., Public Measures Designed to Provide Adequate Energy Imported Roads, U.S. DOT, Washington, D.C.

Statement of National Transportation Policy, by the Secretary of Transportation, U.S. DOT, Washington, D.C., September 17, 1975.

Status of the Nation's Highways: Conditions and Performance, U.S. DOT for the Congress, Committee Print (95-29), Washington, D.C., 1977.

Status of Toll Facilities in the United States, FHWA Bulletin, Washington, D.C., June 28, 1976.

The Turnpike Authority of Kentucky, Resource Recovery Road Revenue Bond, 1977, Series A, Official Statement.

Toll Financing, A Supplemental Resource for Transportation Needs, prepared for IBTTA by Wilbur Smith and Associates, Washington, D.C., April 1977.