REPORT OF DEPARTMENT OF HIGHWAY FINANCE

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We are attempting in this country to build a system of highways, city streets. and all of the various physical improvements that go to make up the transportation facilities and in addition are trying to extend the income from this highway transportation over a very large number It does not seem of other objectives to me that we have as yet brought to the public a full conception of just what we are attempting to do and just what burdens are imposed upon highway transportation when we try to do as much as we are apparently trying to do with the income from this system of transportation In this country, for example, we have the major percentage of motor vehicles in the world, and we have an income annually in excess of a billion We are inclined to think in dollars terms of this over-all figure as an inexhaustible revenue not only for highway purposes but for other purposes and that this income can be extended almost without limitation

We should bring the figures in our thinking to a defined conception We

are attempting to provide a highway system in this country supported for each mile of highway by ten motor vehicles Each one of us who has a motor vehicle would have to pay the annual charges for one-tenth of a mile of highway We have in the last year diverted from our income a very large amount of the taxes raised for keeping up our highways and there is apparently a conviction in some quarters that we can go on diverting and also perhaps decrease our special road user tax rates There are many campaigns sponsored for decreasing taxes It seems to me we ought to do our part in bringing before the public the facts of the financial situation and for that purpose I have endeavored with the assistance of the staff of the Research Board, to develop a statement that may appear dry and perhaps in some respects trite but it does present the very principles we are overlooking and violating in much of the recent legislation and in many of the implications of campaigns that are going on

THE EXPENDITURE OF MOTOR VEHICLE REVENUES¹

SYNOPSIS

Although motor vehicle taxes are levied on the theory that those who use the highways should pay for them, the expenditure of this money is often directed without regard to the financing of those roads and streets from which motorists receive the greatest benefits The attempt to formulate fair highway charges will be unavailing until there is also adopted a plan for fair highway expenditures

With the type of information gathered from highway planning surveys, means are discussed for effecting a wiser use of highway money The demands of four claimants for a share of motor vehicle tax receipts are considered. These are the general fund, the State highway system, local rural roads and city streets

It is stated that the best defence of the benefit theory of taxation for highway financing and the best offense against the use of highway funds for non-highway purposes is a master plan of highway expenditure This expenditure program should be administered centrally

¹ Prepared for the Committee by Wilfred Owen, Research Economist, Highway Research Board

The problem of grants-in-aid to local roads and streets must be solved on scientific and not political grounds From the fiscal standpoint expenditure should be made on the basis of a physical plan, in principle there can be no compromise between expenditure which reflects highway needs, and monetary apportionments to political units which tend to equalize road burdens regardless of traffic requirements It is pointed out that though there are many factors of local policy and local conditions which dictate how much shall be granted for local road and street purposes in any State, the methods of distributing such a sum among counties and cities must follow principles which are applicable universally

Artificial formulae for distributing motor vehicle taxes cannot reflect the best interests of the motorist There must be designated a system of roads and streets eligible for a share in the motor vehicle fund, and the application of this share must be expressed in terms of an improvement program translated into planned annual expenditure

The Problem

Many of the difficulties which hinder a satisfactory distribution of motor vehicle tax revenue in the highway program have arisen from an obvious contradiction in highway financing methods The fact is inescapable that while we justify highway user taxes on the theory of benefits, the expenditure of this revenue is accomplished in many cases with little regard for benefit principles The theory that highway user taxes are charges for a service presupposes that the proceeds of such taxes shall be used to maintain and extend that service Yet today the energies spent upon assuring the use of vehicle taxes for highway purposes are still accompanied by a willingness to distribute highway income on formulae which are often inequitable to those who pay the bill Confusing indices and doubtful equations permit a distribution of the motorist's dollar which has mathematically ignored the logic that the distribution of benefit taxes must be conditioned upon the needs of those who pay them Instead of applying highway money in accordance with highway functions, we divide it on the basis of a governmental set-up which highway transportation has in many instances made obsolete

There has been considerable effort among investigators to compute the annual cost of the highway system and to devise a tax schedule which would assign to each taxpaying group its proper share of the bill based upon use or cost responsibility It should be clear, however, that even were there in effect a scientific tax program which measured how much this or that motorist ought to pay to cover his share of highway costs, it would necessarily fail to create an equitable situation as long as the money so raised were spent without proper regard for the highways which motorists use and need

It is believed that the continuance of haphazard spending must nullify any attempt at an ordered tax schedule, that divided tax administration and the uneconomical use of motor vehicle tax revenue must seriously impair the defense of benefit taxation and weaken the case against diversion, that there is obvious illogic in a fiscal policy which taxes according to benefits and spends according to scientific expression of whimsy

A master plan of highway expenditure financed by the motorists and directed in accordance with his travel requirements is a far-reaching potentiality of the current surveys for highway planning

Tax Opinion '

The complacency with which the motorist watches his tax dollar dissipated and diverted is testimony that public opinion has not yet crystallized in full favor of the principle that taxes paid by motorists should be spent on the roads and streets which motorists use Although this type of indifference is universal towards government enterprise, it is reasonable to suppose that much of the opposition to highway taxes and their proper application is due to the failure of highway interests to recognize the necessity for organized public relations work. Support for the raising and proper use of special highway taxes cannot be expected if the taxpayer is left unaware of the nature of such taxes

Hostility to the gasoline tax was expressed recently in a poll of public opinion ² In reply to the question as to what tax is the most unjust, 127 per cent of those questioned designated the Only the general sales gasoline tax tax and taxes on real estate were subject to greater disfavor It is reasonable to suppose that a large number of those who did not name the gas tax the "most unjust" nevertheless considered it in the general category of unfair charges Regardless of the difficulty in interpreting this poll, it seems safe to recognize in the results an index of the need for highway education

It is a fact that gasoline taxes do constitute an unfair burden when spent in the wrong place or for the wrong purpose, although the voters in the Fortune poll probably did not base their tax opinions on this basis. For by such a policy contributions to government are measured by mileage driven, a factor unrelated to taxable capacity, and spent for general governmental purposes, which are unrelated to direct highway benefits

Benefit Taxes

The distinction between benefit taxes and other payments to government is an important concept in the discussion of highway finance Benefit taxes are levied on the same principle that prices are

² Fortune Magazine, August, 1938

charged for goods and services purchased in private business. General taxes, on the other hand, are levied without regard to the purchase and sale They are applied to the relationship financing of public services in which there is no measurable relation between the use of such services and their cost For example, taxes raised to support the public school system constitute a general levy which must be paid by the taxpayer without regard to the number of children which he may send to school An adequate system of public education is of universal benefit, and its availability cannot with justification be conditioned upon ability to pay the special cost involved

Illustration of the nature of highway charges is afforded by analogy with the turnpike operations of former times When the business of building highways was a private enterprise, financing was accomplished through the toll payments of those who used the roads The mcreasing public significance of highway transportation, however, and its tremendous capital requirements, have logically rendered this industry a public Today the State instead responsibility of the turnpike company collects from those who use the roads a registration fee as a charge for "readiness-to-serve," and a gasoline tax as a measure of actual The fact that we designate these use payments as taxes rather than tolls has not altered their fundamental nature

Revenue Claimants

Each year the collection of motor vehicle revenue from highway users presents a billion-dollar spending puzzle For no sooner is the motorist's bill collected on the theory of supporting a service, than the State is obliged to heed the clamors for aid which are advanced by numberless administrative units That funds are denied to a metropolitan district or granted to submarginal rural counties is symbolic of political agility rather than transportation needs

The impossibility of meeting all demands upon the motor vehicle fund results from the fact that whereas motorists rightly contribute only part of the total highway bill, each unit of government is anxious to obtain as large a share as possible to relieve the burden on local tax sources The compromises and formulae which in many States result from intergovernmental clashes for State-collected revenue are not conducive to a coordinated spending program for motor roads

from 45 to 91 per cent of the State highway bills, 22 to 55 per cent of the outlays on county roads, 0 to 11 per cent of expenditures for township systems, and 0 to 13 per cent of local urban street requirements In spite of these very considerable differences in the financial part played by the motorist on the various systems of the several States, there were six States out of the nine in which the total bill for all systems was met by motor vehicle tax contributions in about the same proportions approximately forty per cent of all direct expenditure Whether or not there exists at the present

TABLE 1

VEHICLE TAX EXPENDITURE FOR ROADS AND STREETS (Per Cent of Total Expenditure* on the Various Systems Financed by Motor Vehicle Taxes)

State	Year	State† System	County Roads	Township and Local Roads	Local Urban Streets	All Roads and Streets
Colorado	1932	64	55	1	0	52
Illinois	1930	89	43	0	132	40
Michigan	1930	91	27	l o í	Õ	43
Minnesota	1932	75	27	l o l	ŏ	42
New Hampshire	1932	853	4	ŏ	ŏ	56
New Mexico	1932	45	27	1	ŏ	42
New York	1932	67	22	7	ğ	26
Wisconsin	1930	71	35	11	Ř	40
Wyoming	1932	45	46	1	õ	42

* Excluding loans and reserves

† Balance of funds from Federal Aid, plus a small percentage of property taxes in all States except Illinois, Michigan and Minnesota

¹ No township roads

² Local wheel tax, Chicago

Includes State Aid System

⁴ No county roads

How much of the road bill the motorist should pay, and how much should be contributed from other sources are problems not considered here It is interesting to note, however, the actual contributions made by motorists and others to the total highway expenditure programs in some States³ Table 1 reveals that of the total spent, excluding loans and reserves, motor vehicle taxes paid

³ Report of Department of Highway Finance, Proceedings, Highway Research Board, Vol 16, pp 21-44, 1936 time a level of contribution publicly accepted as the motorist's share of the total burden is a matter of speculation Planning survey results will determine whether there is any similarity among States in this regard

Whatever the share which the motorist contributes in vehicle taxes, the actual amount of his participation in the highway program depends on how much of his contribution is spent on roads and how much is credited to the general fund The total degree to which motorists benefit from highway expenditures in turn depends upon the amount of such money which is spent where the needs of motor vehicle travel are greatest

For General Purposes

The general fund has lately been an active and in many States a successful contender for the motorist's dollar This success has no doubt been promoted by unfavorable economic conditions, and subsequent search for possible new tax sources It has been upheld by the common notion that because we have paved a large mileage of main roads, the highway task is done This notion neglects important facts

1 That the provision of highway facilities is a continuing operation, not merely a construction job Maintenance and replacements constitute a continuing financial responsibility

2 That in order to meet the increasing demands of motor transportation, expressed in volume, speed and weight of traffic, there is a need for modernizing our main routes, reducing the hazards which contribute to accidents, and relieving the congestion in and about population centers

Inasmuch as the financial needs of the highway system persist regardless of attempts to neglect them, the argument which favors the relief of other taxes by grants of motor vehicle taxes to local roads carrying little traffic is an illusory tax dodge. If expenditure is at a normal level, and motor vehicle funds are used to "take the place of" other contributions, the amount of such tax relief must be made up from other funds Barring an increase in the motor vehicle tax rate, this money will be replaced by other property or general taxes, and the taxpayer will in the end bear the original To expend highway funds for bill other exigencies of government does not mean escape from the costs which highways create Riding on our capital

assets while deferring proper maintenance and replacements merely postpones the ultimate necessary expenditure

Strenuous objection is voiced by many economists against the practice of justifying highway taxes on benefit principles, and of earmarking the receipts therefrom for highway purposes It is argued that the benefit theory cannot be applied to complex governmental services which yield so many varying benefits It is furthermore held that since so many persons pay the tax⁴ it is in reality not a special levy but a general impost

It must be pointed out, however, that since this amount of money must be spent regardless of its source, there is considerable gain to be realized in operating efficiency when fairly definite sums of user taxes are assured on an annual basis Anticipation of revenue permits financial planning Assurance that such revenue will be available is particularly desirable in the business of highway transport, since roads are a valuable capital investment which, unlike large-scale private enterprise, have no ready reserves upon which to rely Highway profits are usually turned back into the highway system to pay dividends in better transportation Current earnings, or tax recents, are therefore the only financial support which can be guaranteed for carrying on efficient operation A further argument in favor of using highway taxes for highway purposes lies in the possibility of effecting restrictions on expenditure which may dictate standard practices and counteract a piecemeal highway development which the unrelated spending policies of numerous governmental units would otherwise make inevitable

As a result of the November, 1938

⁴ Motor Vehicle Taxes reach more people directly than any other tax Probably from 15 to 20 million of America's 30 million families pay the tax "Facing the Tax Problem," Twentieth Century Fund, Inc, 1937, p 19

elections, three States have joined the group of four which had already declared themselves constitutionally opposed to the use of highway revenues for nonhighway purposes An amendment which so allocates motor vehicle revenue exclusively to the construction and maintenance of highways has been criticized because it denies the flexibility so necessary in a satisfactory fiscal system These constitutional amendments have nevertheless guaranteed a positive income for highway purposes, and it can be hoped that their passage will be interpreted as a mandate of the people for proper spending of highway taxes To the extent that these safeguards on the motorist's dollar stimulate long-time planning, their benefits will be considerable. It is not to be expected, however, that State amendments of this nature can prevent other abuses of highway money which in many States are of greater magnitude There might be a more salutary effect in declaring unconstitutional the dissipation of revenues to little-used highways and the wastes inherent in administration In the final analysis, the most promising method of assuring proper spending of motor vehicle taxes lies no doubt in the formulation of a generally approved annual highway expenditure plan which by its clarification of highway needs will show cause for and obtain the public support.

For Highway Purposes

Assurance that highway taxes shall be used for highways by no means settles the financial problem For the decision must be made as to where this money shall be spent and how it shall be distributed and administered Justification of the user tax concept dictates that spending should aim toward maintaining and improving the services for which motorists pay Aids to a diverse assortment of highway administrative units. however, often necessitate an apportionment of these revenues which is unrelated to the purposes for which they were raised.

TABLE 2

DISTRIBUTION OF MOTOR VEHICLE FUNDS, 1937 (Per Cent of Net Receipts)¹

·				
State	For State High- way Purposes	For Local Roads and Streets	Non-Highway Purposes	Total
Alabama	58	38	4	100
Arizona	75	25	_	100
Arkansas	93	6	1	100
California	53	33	14	100
Colorado	67	33		100
Connecticut	79	21	—	100
Delaware	91	_		912
Florida	45	24	31	100
Georgia	67	18	15	100
Idaho	70	30	_	100
Illinois	56	31	13	100
Indiana	54	38	8	100
Iowa	74	26	—	100
Kansas	75	25	-	100
Kentucky	86	4	10	100
Louisiana	61	5	34	100
Maine	90	10	—	100
Maryland	62	38	—	100
Massachusetts	43	18	34	95²
Michigan	48	52	—	100
Minnesota	78	21	1	100
Mississippi	45	50	—	95 ²
Missouri	99	-	1	100
Montana	77	23	—	100
Nebraska	44	37	19	100
Nevada	100	_	—	100
New Hampshire	86	14		100
New Jersey	34	29	37	100
New Mexico	85	4	11	100
New York	33	24	37	942
North Carolina	96		4	100
North Dakota	62	36		100
Ohlohanaa	37	46	17	100
Okianoma	57	34	9	100
Dregon Bannardana and	04	10	10	100
Phodo Island			10	100
South Concluse	00	14	00	100
South Dalata	0°± 50	14	<u> </u>	100
Toppossoo	60	19	20 11	100
Temessee	60	43 90	17	100
ICAAS TItob	00	20	11	100
Varmant	90	26	4	100
Virginia	04	30 1	1	100
viigiilia Washington	50	1	1 5	100
West Virginia	100	44	Э	100
Wieconein	100	-	20	100
Wyoming	81	10	04	100
11 J OHILLE	01	19	—	100

¹ After deduction of administration and collection costs

³ Balance of 100 per cent to park and forest roads, etc.

Table 2 shows the amounts and percentages of highway user revenues spent for highways during 1937, and the division of this sum between the State system and local roads and streets Nine States spent more than 90 per cent of all user taxes on the State system, while seven spent less than 50 per cent In seven States less than 5 per cent of motor vehicle funds were allotted to local roads and streets, while 4 States distributed 40 per cent of all motor tax revenue to local units.

That there should be so wide a variation in the relative amounts spent for local roads and streets is due to a number of factors which vary from State to State the mileage of the State highway system, the standard to which it has been improved, the degree to which extensions and modernization are needed, the amount of motor vehicle revenue collected, the volume of trunkline travel, and the set-up of highway administration For example, a State in which most of the user revenue is retained for the primary system might have a large mileage of primary roads, entailing a considerable program of extensions and improvements It might have a heavy traffic system requiring considerable maintenance and replacement, and expensive modernization projects It might favor the concentration of expenditures on the main lines to compensate for late development of the system, or the weight of its debt service structure might be absorbing a a large percentage of current revenues In some cases it might control all the rural roads in the State On the other hand, where generous allocations are made to local road units it is possible that the reverse of these conditions pertains, involving a well developed primary system, low debt service and well organized secondary road units based on State aid

Some of these variables which prevent any generalizations as to how much motor vehicle money should be spent on the several road systems have been tabulated (See Table 3) They reveal that primary mileages vary from httle over 1,000 miles to nearly 21,000, and from 5 per cent to 44 per cent of all rural roads Extremes in debt service payments by the States ranged from 0 to 74 per cent of all motor vehicle revenue dedicated to State highway purposes, while the amount of revenue collected in one State was 50 times greater per mile of surfaced State highway than in another

Use of the Systems

Although these variables do exist, making impossible any similarity of financial procedure for the nation as a whole, there are certain considerations which the highway administrator must take into account regardless of the local situation. That is, granting the necessity for adapting financial policy to specific problems, there must still be a careful analysis of the physical results obtaining from tax distribution procedure, in order that the benefit theory upon which revenue was raised will not expire on roads of little vehicle use For although the amount of motor vehicle funds spent on secondary roads and streets must necessarily vary among the States, the division of that amount among the several local units should be based upon principles which are applicable universally

As a background for discussing the general principles involved in the distribution of motor vehicle tax revenue, preliminary figures of road use in 17 States are presented to indicate the amount of service provided by the various road and street systems. It is estimated that total travel in these 17 States was performed on each system as follows

Main Highways*		Per Cent 56
Secondary* and	Local	Rural
Roads		14
Local City Streets		30
Total		100

TABLE 3					
CONTRASTS	IN	STATE	HIGHWAY	Systems	

State	Primary I	Road Mileage	Vehicle Taxes for State Highways, 1937	Debt Service	Payments, 1937
	1936 Total	Approximate Per Cent of All Rural Roads	(Millions of Dollars)	Total (Millions of Dollars)	Per Cent of Total Vehicle Taxes
Alabama	6 250	8	10.1	2 0	21.6
Arizona	3 450	14	4.0	0.4	31.0
Arkansas	8,900	19	11.0	<u> </u>	72.0
Celifornia	12 550	12	26.9	0.0	10.9
Colorado	2 590	17	30.8	4.0	10.8
Connectiont	3,520	90	0.7	0.7	10.4
Deleware	2,040	20	11.0	2.2	19.1
Elasida	11 020	44	2.9	0.6	20.6
Coordia	11,930	39	12.5	3.3	26.4
Georgia	9,790	8	14.3	2.7	18.8
	4,700	13	4.0		
	10,320		31.4	9.2	29.3
Indiana	9,300	12	19.1		
10wa	8,310	8	17.8	8.1	45.5
Kansas	9,090		10.6	1.3	12.3
Kentucky	8,720	14	15.2	_	
Louisiana	4,440	11	12.4	8.0	64.5
Maine	2,510	12	8.3	2.4	28.9
Maryland.	3,920	26	8.6	2.6	30.2
Massachusetts	1,720	9	10.8	3.2	29.6
Michigan	8,480	10	23.6	3.0	12.7
Minnesota	10,930	7	18.6	4.0	21.5
Mississippi	3,920	7	5.6	2.6	46.4
Missouri	8,160	8	20.8	7.4	35.5
Montana	5,520	8	4.8	0.6	12.5
Nebraska	10,530	11	7.1	_	
Nevada	2,730	11	1.6	0.1	6.2
New Hampshire	1,420	11	4.8	0.8	16.6
New Jersey	1,370	7	13.1	7.6	58.0
New Mexico.	12,110	30	4.7	1.6	34.0
New York.	13,900	16	35.6	10.1	28.4
North Carolina	10,870	19	29.9	9.9	33.1
North Dakota	7,330	7	2.6	0.2	7.7
Ohio	14,590	17	26.7	_	—
Oklahoma	8,230	8	10.6		—
Oregon	4,610	11	11.4	3.8	33.3
Pennsylvania	12,980	14	88.6	6.3	7.1
Rhode Island	1,030	39	3.3	0.3	9.1
South Carolina	6,410	10	10.7	5.1	47.6
South Dakota	5,960	5	3.4	—	—
Tennessee	7,180	10	14.7	8.0	54.4
Texas	20,950	9	37.5	10.2	27.2
Utah	4,660	20	4.1	0.6	14.6
Vermont	1,760	12	3.2	0.6	18.8
Virginia	9,220	20	21.5	0.9	4.1
Washington	3,520	8	10.2	0.2	1.9
West Virginia	4,660	13	14.5	7.6	52.4
Wisconsin	9,880	12	19.5	4.1	21.0
Wyoming	3,560	9	2.6	0.3	11.5

Considering the travel on each system from the viewpoint of its origin, expressed as rural (unincorporated areas) and urban, the following figures designate how travel was divided.

	Origin of Travel Per Cent			
	Unin- corpo_ rated A reas	Urban	Total	
Main Highways* Secondary* and Lo	29	71	100	
cal Rural Roads	58	42	100	
Local City Streets	4	96	100	

Finally, the travel characteristics of urban motorists have been expressed in Table 4 with relation to the various population classes of urban places, in order to illustrate the important variations which distinguish the travel of those living in small towns, from that of residents in metropolitan cities Tabulation A shows how residents of each urban population class distributed their respective total traveling Tabulation B shows the breakdown of total urban travel on

TABLE 4

A TOTAL TRAVEL OF RESIDENTS IN EACH CLASS OF URBAN PLACES BY HIGHWAY SYSTEMS (Per Cent)

	Urban Population Classes Where Travel Originates						
Travel on	1,000 and less	1,001 to 2,500	2,501 to 10,000	10,001, to 25,000	25,001 to 100,000	Over 100,000	All urban travel
Main Highways*	73	73	68	63	56	37	54
Secondary* and Local Rural Roads	22	14	10	8	6	3	7
Local Urban Streets	5	13	22	29	38	60	39
Total	100	100	100	100	100	100	100

B TOTAL URBAN TRAVEL ON EACH HIGHWAY SYSTEM CONTRIBUTED BY RESIDENTS OF VARIOUS CLASSES OF URBAN PLACES

Main Highways*	70	7 4	14 0	107	13 2	18 7	71 0
Secondary* and Local Rural Roads	88	6 2	8 7	57	6 1	6 3	41 8
Local Urban Streets	10	2 4	8 3	91	16 9	57 9	95 6
All Systems	54	57	11 6	96	13 4	28 8	74 5

* Including traffic entering or leaving urban places on streets serving as extensions of the trunkline or secondary systems

Also, looking at the total travel of rural and urban motorists respectively, this is where each of these two classes of people performed their motoring

		Per Cent Rural Motorists	Travel of Urban Motorists
Main Highways*		64	54
Secondary* and	Local		
Rural Roads		31	7
Local City Streets		5	39
Total		100	100

* Including traffic entering or leaving urban places on streets serving as extensions of the trunkline or secondary systems each system into origin by population classes of cities

On the basis of these incomplete data, as well as figures from individual States, it appears that the following observations may be made.

1 That the greatest amount of travel is to be found on the main highways

2. That vehicle use on main highways and city streets forms a major part of all travel, in these 17 States, 86 per cent

3. That secondary and local rural roads, in spite of their vast mileage, are

of relatively minor significance from the standpoint of motor traffic volume

4 That urban people account for a large percentage of the travel performed on main highways, in the case of these 17 States, 71 per cent

5 That the use of secondary and local rural road systems is by no means confined to rural residents, with travel approaching fairly comparable useage by both rural and urban motorists

6 That city street travel is preponderantly by city-owned vehicles

7 That both rural and urban residents, except for urban motorists living in the largest cities, do most of their travel on main highways.

8 That whereas the travel of rural residents is nearly all on main highways and other rural roads, the travel of the urban motorist is for the most part on main highways and local city streets

9 That the travel of urban motorists increases on local city streets as the size of the urban place in which they reside increases, but in spite of the smaller percentage of total travel performed by residents of large cities on main highways, the absolute amount is a large proportion of main highway use because of the large number of such motorists

The foregoing figures may prove to be helpful information in the following discussion on distributing motor vehicle tax revenue

State Grants-in-Aid

In the 1937 Report of the Department of Finance,⁵ among the recommendations and conclusions with respect to the expenditure of motor vehicle taxes was the following

"Allocation of State vehicle taxes to local roads and streets should be made with reference to both volume and intensity of traffic generated, but with con-

⁵ Report of Department of Highway Finance, Proceedings, Highway Research Board, Vol 17, p 15 sideration for the priority of primary road requirements, so that transportation facilities for the integrated system may be adequate and at lowest total cost"

There were four important considerations comprehended in this statement

1 That motor vehicle taxes should not be used to subsidize roads and streets not serving essentially as routes for motor travel, and that for large systems of roads with a considerable aggregate volume of travel, the concentration of that travel is important in deciding eligibility for a share of motor tax revenue.

2 That the physical requirements of motor highways are the proper criteria for basing decisions of motor vehicle tax expenditure

3 That these requirements on the primary system of roads and streets should, because of their greater significance to motorists, be considered first before further application of funds to secondary and less traveled roads

4 That there should be an integrated system of roads and streets eligible for motor tax revenue, and the expenditure on this system should be dictated by the principle that service shall be provided to assure the lowest transport cost for the maximum number of drivers

Current practice with regard to the distribution of motor vehicle tax receipts to local units of government in most cases does not support these principles Grant-in-aid policies which pertain to highway financing are based upon two erroneous concepts

1 The idea that the highway trafficserving functions administered by a local unit of government are synonymous with all road transportation services within the unit, and that local road services furnish equal direct benefit to all residents of the unit

2 The notion that there should be an equalization of the burden of providing highway facilities through motor vehicle revenue distribution which will insure a minimum transport standard regardless of the extent to which motor vehicles are served.

The sections to follow, which consider grant-in-aid demands of rural governmental units and municipalities will point out the fallacy of these concepts and the way in which they defeat a proper application of benefit-tax revenue

Aid to Rural Units

Counties have been the most frequent rural participants in State grants-in-aid from motor vehicle taxes, although the township has been, and in some States still is, an important contender for such The paucity of motor vehicle revenue travel on many township or local rural roads and the predominantly land-access nature of this travel has aroused widespread criticism of the distribution of motor vehicle revenues to townships In the case of counties, however, there are generally considerable mileages of important secondary or feeder roads in the system which are eligible for a share of State-collected motor vehicle revenue Such participation by the counties in any State has been shown to be a matter regulated by local policies and local There are certain factors, conditions however, which have universal application in the case of county road aid, and these are of importance in effecting a fair expenditure of a benefit tax revenue

When driving range was confined to narrow limits by unreliable vehicles and unpaved roads, it could fairly be said that the road program carried on within a county was intended to benefit all those within the county who made use of motor vehicles Today, however, the county may contain a number of street and highway administrative organizations the State may operate trunkline routes which he within the county, and there may be cities and towns administering streets or local rural roads In many counties, therefore, the most important roads as far as the motorist is concerned may be State highways and important streets within cities It is on them that maintenance, replacements and improvements should help to serve the vehicle user But it is very often on secondary rural roads only that the money granted to counties is spent

Some counties spend money within cities and at city limits, for the benefit of urban residents. The State too may participate in the financing of urban extensions of State trunklines, and the rural trunklines within the county receive motor vehicle tax money through the State It need not be criticism. therefore, to point out these obvious facts concerning the functions of county road units, but merely a reminder that the political whole must be distinguished from its functional parts To grant motor vehicle money to a county for highways is a grant to the county-administered roads in part serving "local travel," but only that local travel which actually uses county roads State highways serve greater volumes of local travel, as do also many city streets

The claims that extensive mileages of county roads are in dire need of surfacing. and that such rural routes are important for the transportation of mail and produce are not to be denied That State or federal aid may be necessary or advisable is an acceptable view But to argue that motor vehicle revenue should be granted to counties for general and community purposes cannot be defended as long as we adhere to the theory that such taxes are a charge to finance service for motor vehicles Subsidies for building land service roads or equalizing the burden of furnishing highway facilities are hardly in keeping with the provision of benefits for motorists 6

Although the administration of motor

⁶ See H J Bittermann, "State and Federal Grants-in-Aid," 1938 Chapters 4, 9, 19 4

vehicle tax revenue by local units of government cannot alter the principles involved in the grants themselves, it is of the greatest importance that attention be given to careless management and divided responsibility in the spending of motor vehicle taxes. It is quite generally recognized that the State grant-in-aid, because it comes to the county from another unit of government, is often considered a windfall gratuity. Unless guidance by a sane spending program is accepted policy, the dollars spent for local highways may be carelessly spent as well as spent in the wrong place.

It has been observed that additional grants-in-aid to local governments for highways may fail to add to the benefits enjoyed by the motorist, since appropriations out of local general funds are oftentimes reduced accordingly. Fiscal studies in connection with the planning survevs may tell to what extent motor vehicle tax contributions for roads off the State systems may be in excess of a reasonable share The matter raises the question of whether or not, in addition to supervision of spending, there should be a general adoption of local matching of State aid

And to Municipalities

Just as there is often an unwarranted return of highway funds to county and township units of government through the use of equalization and ability-topay concepts in the distribution of benefit taxes, so there has been widespread denial to the larger cities of a reasonable share of aid for direct benefits to urban It has been observed in the motorists preliminary road use statistics from 17 States that cities with populations above 100.000 have travel habits distinct from those of residents in the smaller cities They did about half as much of their travel on State trunklines as did drivers living in town of 2,500 to 10,000 population. They performed 60 per cent of all their travel on local city streets

There are several facts which must be recognized in this discussion First. the travel performed on trunkline highways by urban motorists in the largest cities, though a small percentage of their total driving, was still a very considerable part of total trunkline use It follows too, of course, that the large percentage of local city travel was a large part of all travel in the State Since travel figures closely approximate revenue figures, this means that a considerable amount of total highway user revenue was generated on local city streets, and most of it on the local streets of the larger cities

Two observations must be made in connection with the urban motorist in large metropolitan cities and his fair share of highway benefits first, that much of the rural trunkline improvement is made necessary by the urban motorist's travel, second, that there are, on the other hand, many motorists who rarely or never leave the city limits, but who contribute in considerable amounts to the motor vehicle fund The regulation of expenditures to take into account both these factors is an important consideration, for in many states the problem of large cities in the traffic picture is one of rapidly increasing significance ⁷ In 1930 almost one-half the nation's population resided in the 96 metropolitan districts each having a population of 100,000 or more. These 96 metropolitan areas had 37 million urban inhabitants and 17 million suburbanites

In the decade from 1920 to 1930, population decreased in 40 per cent of all counties in the United States Although the largest losses were registered among farm population, decreases were also taking place in nearly half of all

⁷ There are eight States having 5 or more cities with populations over 100,000, while in fifteen others there are no cities of this size

villages with less than 2,500 persons. In addition to this exodus from the small town, one-fifth of all cities with less than 100,000 persons showed declining populations Increases, on the other hand, were concentrated in relatively few areas, the large cities and their metropolitan areas attracted people not only from farms but also from smaller cities Nearly all rapidly growing small cities were satellites of larger cities, the population of these satellite cities increasing 36 per cent between 1920 and 1930 as compared with an increase of but 19 per cent for non-satellite cities 8

Just as our population is highly concentrated in large cities, so our motor vehicle ownership is concentrated where people live Twenty-seven per cent of all motor vehicles are owned in onetenth of one per cent of the country's area For every mile of paved street in these cities, there are 166 motor vehicles The fact that most vehicle trips are of short-run nature, near their place of origin, emphasizes the traffic congestion which must be reckoned with

In addition to the fact that in large cities more than half of all traffic by residents is on their own streets, the further fact is noted in a study of eleven States⁹ that even the trips which extend beyond city limits are preponderantly short ones In one of the eleven States, trips of less than 5 miles constituted over 40 per cent of total one-way travel extending beyond cities. The lowest percentage of such short trips in any State was 25 These combined factors of heavily concentrated vehicle ownerships, increasing amounts of local travel with increased size of cities, and short radu of travel beyond city, limits, create around cities a sphere of heavy

⁸ National Resources Committee, The Problems of a Changing Population, May, 1938

⁹ H S Fairbank, 24th Annual Highway Conference, University of Michigan traffic movements The growth of satellite cities closely situated causes an overlapping of these traffic spheres and intercommunication on the highways which in recent years has strongly advanced the opinion that special types of express highways must be provided to permit entrance and exit, as well as to by-pass congested areas In view of heavy local travel volumes in large cities it also appears that attention should be given to State aid for arterial routes in cities, regardless of whether they are on designated State systems

The concentration of the problem of moving traffic with safety and dispatch has been aptly expressed by figures of accident occurrence in Michigan¹⁰ Average figures for fatal accidents in 1934, 1935 and 1936, compiled by the Highway Planning Survey, revealed that three cities had 33 per cent of all traffic deaths in the State Fatal accident occurrence on Michigan trunkline highways was related to distance from cities with populations of 5,000 and over The situation was examined within a 15-mile radius of such cities In these zones. containing 38 per cent of rural trunklines, there occurred 63 per cent of all rural trunkline fatal accidents As the distance to the limits of urban places lessened, accident concentration intensi-Finally, within a 3-mile radius of fied cities, where there was but 8 per cent of the rural trunkline mileage, there was 21 per cent of the rural trunkline fatal accident total

Not only was there an increase in the accident rate with proximity to cities, but also with size of cities For example, fatal accidents per mile within three miles of Detroit were four times as numerous as within 3 miles of Michigan's 32 towns having populations of 5 to 10 thousand Within a 15-mile radius the

¹⁰ V B Steinbaugh, "Accidents and Road Design" Highway Research Abstracts, October, 1938 Detroit rate was 8 times higher Benefits for the large metropolitan cities, therefore, may be created not only by expenditure within such cities, but on the rural trunklines close to municipal limits

There are numerous possibilities of alleviating city congestion without a considerable expenditure of funds The provision of off-street parking facilities is one of the most important of these Intelligent traffic engineering can do much to produce better traffic conditions But express roads, widened thoroughfares and grade separations are also needed, and their cost is in many cases It would seem fair to inprohibitive vestigate the possibilities of relieving city congestion with financial aid from the funds which in many States are contributed largely by residents of these metropolitan areas

Arguments which favor the spending of motor vehicle taxes in the large metropolitan cities must not neglect certain facts of significance regarding the use of city streets That there are many beneficiaries who use the city street is an oft repeated truth But the extent to which urban-raised motor vehicle taxes shall be spent on city streets or the main trunkline system is a matter of determining what can be expected to benefit these motorists to the greater degree

By weighing the claims of the State trunklines for vehicle tax money, the city problem may be viewed from a different angle. In the earlier days when the construction of rural roads connecting cities was the most urgent roadbuilding 10b. urban residents were agreed that motor vehicle taxes should be used ex-For rural clusively for State highways trunklines provide a transportation service for urban people, and urban use constitutes a considerable part of total traffic. Since the semblance of a main road system has been attained, however, there has been a trend away from the

exclusive use of motor funds on rural highways, and inclusion of trunkline extensions in the State-financed program With data from several road use surveys indicating some 40 per cent of all traffic on city streets, the demand of municipalities for a larger local share in the benefits of motor vehicle tax expenditure has grown more insistent Congested urban conditions have become a vital concern in the planning of adequate transportation service The cry of the rural good roadster to "get us out of the mud" has been silenced by the demand of the urban population to get traffic out of the muddle

The State Highway System

In many States the combined demands of rural and urban road and street units for grants of motor vehicle revenue, together with the practice of using vehicle funds for other purposes, have resulted in a declining percentage of total revenues being dedicated to the main State highway systems During this same period of altering State highway finance, there have been several significant factors increasing the financial requirements of the State highway administration For not only have the speed and volume of rural State highway travel risen perceptibly, but many thousands of miles of secondary and local roads have been added to the responsibility of the State, to be financed by motor vehicle taxes It can hardly be said, therefore, that the State systems require less money now than in the pioneer days of highway Congestion, accidents and construction slow movement on many main roads are evidence of the extent to which modernization is necessary

At the Hearings before the Committee on Roads of the House of Representatives last year,¹¹ testimony offered by the American Association of State Highway

¹¹ H. R 8838, Federal Aid Highway Act, 1938, p 18

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Officials estimated the needs of our "main" highways, constituting 22 per cent of State primary highway mileage, in terms of rebuilding, widening and relocating These figures were as follows

	Miles	Estimated Cost
Should be rebuilt	57,755	\$1,607,609,000
Should be widened	21,424	683,447,000
Should be relocated	19,000	978,812,000
Total	98,181	\$3,269,868,000

In addition, some 19,376 bridges were designated as being in need of widening or rebuilding, at an estimated cost of \$394.428.000 The grand total, then, for immediate needs on but 22 per cent of our main lines, was placed at some \$3,644,296,000 It may further be noted from a recent survey of design trends¹² that even as late as 1932, so-called hightype surfaces were being constructed with an average width of but 185 ft The 22-ft surfacing was in 1936 only "indicated" "future trend" as the Moreover, 4-ft shoulders were the rule in 1932, and few States made a practice of shoulder stabilization It appears, therefore, that we are certain to need considerable modernizations in the future. even on roads built in recent years

Furthermore, the failure to allow for altering travel conditions and to adopt stage construction methods designed with such changes in view has created a situation wherein many highway improvements become impossible without the destruction or abandonment of expensive earlier investments. It appears that repeated reference to "highways of the future" has created a tendency to forget that highways built today, if properly designed, are highways for tomorrow

One of the most urgent physical needs on our main lines today is the acquisition of the necessary right of way to provide

¹² The Design of the Highway Cross-section, W H Simonson, Proceedings, Highway Research Board, Vol 17, p 255 for multi-lane divided roadways and, in the absence of adequate zoning and freeway legislation, to exercise over private development along the highways the degree of control essential to safe transportation

Not only do the physical needs of our primary mileage demand a large part of motor vehicle revenue, but the special significance of the State system as a main network of communication awards to it a prior claim on the State fund Judging from preliminary road use figures, except for the residents of cities of over 100,000 population all classes of motorists do the greatest part of their travel on the State highways On them is carried the largest volume of city to city travel and State-wide or interstate movements

Planning a Remedy

In the final analysis, motor vehicle tax revenue should be expended on the various roads and streets where the need for maintaining motor vehicle service exists, and where the improvement of such service might be expected to create the largest total benefit for present and future traffic, judged in terms of low operating costs, reduced hazards, travel convenience and opportunity for enjoyment

Admittedly it is easier to state this principle than even to approximate it in actual practice, but the purpose in mind is that by aiming the expenditure program in that direction it may cease to be based upon indices which are meaningless in terms of highway transportation It is furthermore admitted that so-called "practical" considerations in most States do not permit an immediate readjustment of highway financing which would replace the division of revenue by political units with a division of revenue for needs However, from the fiscal standpoint a study of highway finance principles must be made independently of these "practical" limitations, which are really not practical but political, and from the standpoint of economics, impractical

Designating a System

The first obstacle to the planning of an expenditure program which would transcend political lines and instead consider engineering needs is the designation of a system of roads and streets which should be eligible for support from motor vehicle The difficulty in determining funds such a system is due to the impossibility of measuring within any reasonable tolerance the extent of various highway bene-For every road and street which is fits used may and usually does create a combination of community, property and motor vehicle benefits For example, the generally adopted principle that primary State highways should be financed entirely from motor vehicle revenues is based partly on administra-To be sure, total tive expediency property values and the welfare of all within the State are enhanced by the provision of such State highways, yet the degree of improvement and modernization of such roads, as well as their most obvious bestowal of benefits, designates the motorist as responsible for the bill Likewise there is a residential class of city streets which is used to considerable extent by motor vehicles, but which is thought of primarily in terms of property access and community services which would persist regardless of the mode of transportation. The financing of these streets has accordingly been charged to property and general levies

Obviously such compromise policies must be adopted, for if an attempt were made to consider eligible for motor vehicle taxes all roads and streets which carry noticeable amounts of motor vehicle travel, there would not be sufficient revenue to accomplish any purpose These considerations are the important "practical" limitations which must be taken into account.

It has been noted how the demands of the State highway systems, county roads and city streets for motor vehicle taxes would exceed such revenue collections were they all to be granted The reason for such an unbalance is natural where numerous competitive governmental units bid for funds without the benefit of a coordinated and compromise policy based on the greatest good

It is proposed, therefore, that a designated master system of highways and streets to be financed by motor vehicle taxes should be selected by the State Highway Department This system should not necessarily follow present primary and secondary road classifications, and should ignore present highway administrative set-ups Roughly speaking it would comprise a mileage of the most important rural State arteries, both from the point of type and volume of present and estimated future traffic as well as the functional significance of such It should also include for partial travel financing by motorists the extensions of primary highways within urban communities, and those secondary rural roads and secondary city streets in metropolitan cities which serve as alternate routes and as feeders to the primary rural and The extent of this system urban system beyond the main network and the extent to which such secondary roads and streets should be financed by motor vehicle taxes, if at all, is a matter which must be adjusted in the light of an estimated annual expenditure plan and the amount of vehicle revenue available The type of system should aim at presenting an integrated network of roads and streets which as closely as possible would be the system used most by motorists of all rural and urban communities

A Physical Plan

The proposal is made that through a series of adjustments and corrections, there should be determined a planned program of highway expenditure over a period of years for this designated system of roads and streets Such annual expenditure would be conditioned by estimated future revenues, by the rate of improvement publicly desired, and by the estimated highway "needs" for motor vehicle travel

The term highway needs is hardly less nebulous than highway benefits, unless it be understood that the only needs referred to here are those which can be paid for, and paid with motor vehicle revenue It is a careful consideration of what these needs really are that must constitute the foundation of a spending policy.

The inventory and traffic data resulting from the surveys for highway planning make available for the first time the hope that highway financial policy may be guided by orderly and profitable pro-Data will produce a complete cedure inventory of the road and street investment mileages of each surface type, their condition, width, number of lanes, obstructions to adequate sight distance, excessive grades, and the number and condition of bridges These physical facts will be related to volume range and type of traffic and to studies of highway capacity, vehicle behavior, and the special characteristics and requirements of heavy vehicles. Significant data will be available concerning railroad grade crossing features, and important highway intersections will be classified according to traffic densities

In addition to such information on the present physical condition and use of our highway plant, estimates of future travel and future revenue will aid in extending present needs to take into account and accommodate these trends, as well as provide for their financial support Estimated probable service lives, depreciation rates, salvage values and maintenance costs for various types of surfaces and structures will furnish a guide in determining the extent and type of necessary improvements in the future replacement program.

These planning survey data will yield no mathematical formulae for better roads Their extensive and thorough nature, however, are providing the means of outlining a procedure for highway operations based upon considered judgment They will indicate the most urgent needs of the motorist which should be translated into an immediate priority schedule of improvements and a complete long-term physical plan

A Financial Plan

Physical programs must be translated into financial requirements, and their success must ultimately depend upon a guaranteed income. Expressing the physical improvement program in dollars and cents will be necessary as a guide to the physical program itself to adjust it to anticipated revenue, and as an indication of the mileage of roads and streets to be considered, as well as the period of years over which the program shall be extended Adjustment of the planned annual expenditure to the estimated annual tax fund must take into account not only the yearly debt service payable by the State highway department, and the annual capital outlay for improvements and extensions, but also the present and future maintenance and replacement program based on changing traffic conditions

These principles of planning, from the fiscal standpoint, are not new But they would introduce much that is new in highway administration They would put an end to outright distribution of cash to local governments for roadbuilding purposes and require that on those roads and streets to be partially financed with vehicle funds, other locally raised revenue would be matched to assure minimum standards. State financial participation would be conditioned upon the attainment of such standards This coordinated plan might also bring about greater cooperation among small road units, and in some cases a movement toward consolidation

Summary and Conclusion

The foregoing discussion relative to expenditure of motor vehicle funds has emphasized several points which it is believed are essential both to the equity and economy of highway operations The following statements summarize what has been written and present conclusions which the facts appear to support

1 Tax revenue raised on the benefit theory should logically be spent to maintain and improve the service through which benefits are created

2 When motor vehicle benefit taxes are distributed among local government units according to unsound formulae, a considerable part of highway expenditure may be contrary to the best interests of the motorists

3 Adoption of a scientific tax schedule for motor vehicles cannot effect an equitable situation while spending policies remain subject to political considerations

4 The use of motor vehicle taxes for other than highway purposes is economically no more inequitable than the use of such funds for non-motor highways

5 Local factors are significant in determining the total amount of State motor vehicle aid to be granted lesser jurisdictions, but the distribution of this amount among the several jurisdictions should be based upon principles applicable universally

6 The universal principle which applies in motor vehicle tax expenditure is that spending should be in accordance with the needs of motor vehicle highways

7 The earmarking of motor vehicle revenue for highway purposes may be criticized because it renders the fiscal system inflexible, but it is of substantial benefit in guaranteeing a fixed revenue

for highway operation, which is dependent for support upon current earnings

8 Because of the several types of benefits derived from highways, it is considered necessary from an administrative as well as an economic standpoint to concentrate the expenditure of motor vehicle tax revenue on a limited system of roads and streets which individually are of prior service to the motorist, and which collectively serve the greatest number of motorists to the greatest extent

9 Inventory, traffic and road life studies which are parts of the surveys for planning highways may be used to determine the needs of this designated system of motor roads in terms of present road conditions and estimated future traffic

10 Physical needs must be translated into financial needs, and these must be expressed on an annual basis and adjusted with such factors as future estimated revenues, State obligations for debt service, maintenance and replacements, the size of the designated system and the desired rate of improvement

11 The final conception of this annual planned expenditure may include roads and streets of secondary importance financed by joint State and local participation, State motor vehicle funds being matched with local general or property revenues, and being conditioned on the adherence of the local unit to the master plan

12 In the financing of the master plan for motor highways there would be no actual awards of cash to local jurisdictions, and strict supervision of all expenditure would be vested in the State highway department

13 Only such a planned annual expenditure, which substitutes needs for geographical considerations, can effect a spending policy to permit unconditional justification of highway user taxes and public support against diversion