

HIGHWAY PLANNING SURVEY DATA AS A BASIS FOR HIGHWAY FINANCE POLICY

BY MURRAY D. VAN WAGONER

Governor of Michigan, and Former State Highway Commissioner

SYNOPSIS

The paper takes the position that the formulation of sound highway financial policy should involve two fundamental considerations

First, understanding of existing financial policy and its relationship with other existing public finance policies

Second, understanding of factors other than fiscal which affect highway financial policy.

The fundamental concepts of highway finance which are adopted into the discussion are:

First, That transportation charges and facilities are related

Second, That there is a wide variation in the importance of roads in the transportation system.

The trends of highway policy in the nation and in Michigan are presented and related to the broader trends of general public finance. Also shown is the direction of these trends relative to the basic tenets of sound highway policy.

It is revealed that there is an increasing dispersion of user revenues over roads and streets having slight transportation value despite the fact that user charges are paid for benefits which can only be delivered through the development of an adequate transportation system. This practice results in an unequal distribution of benefits among different classes of user-contributors.

Finally, principles are suggested by which expenditure of user revenues can be directed to road systems in such a way as to result in a balance between the charges paid by each class of user and the benefits they receive through utilization of these systems. Equally important, certain factors are pointed out—the fiscal facts of the situation and the actual needs of the systems—which must be considered as possibly modifying the application of the principles.

The method is not presented as a cure-all nor can desirable results be obtained quickly or without difficulty. It is believed valuable, however, to know that there is a desirable goal for highway policy, what that goal is, and how far short we now are from attaining it.

The steady and rapid increase in the utilization of highway transportation is making ever more mandatory demands that highway facilities be adequate for their job. Military needs are now sharply emphasizing the extent of highway inadequacies and the necessity for correcting them. These demands point to the need for the formulation of a sound highway financial policy. This process involves two fundamental considerations.

First, understanding of existing financial policy and its relationship with other existing public finance policies.

Second, an understanding of factors other than fiscal which affect highway fiscal policy.

The highway planning surveys were intended to supply some of the data necessary to serve as a guide to these basic understandings. It would be a mistake, however, to assume that the mere collection of financial, road and traffic data would be in itself sufficient to solve any problems. It would be equally a mistake to conclude that the raw data outlined in the initial survey year would be applicable to the continuing and changing problems. The formulation of sound highway finance policy rather assumes the careful and continuing assembly of data and its progressive interpretation.

But in order to make a start in perfecting finance policy, it is essential from the

outset to determine what are the fundamental concepts which should guide it. Otherwise, no criteria exist for determining that policies now in effect are right or wrong or that any adjustment in them is required.

There is considerable validity in regarding the use of the motor vehicle as a major form of transportation in this country and that the provision of facilities and proper charges therefor constitute a major governmental transaction. In the acceptance of the motor transportation concept a suitable and justifiable criterion is provided upon which to screen the facts of the survey and to at least make a start in defining the place of highway finance in the more complex problem of total public finance.

The fundamental concepts of highway finance which are adopted in the discussion are.

- 1) That motor transportation charges and facilities are related
- 2) That there is a wide variation in the importance of different roads in the motor transportation system.

So wide is the variation in the transportation service of roads that it is justifiable to permit classification of the total road system into motor vehicle transportation routes which have transport as a primary function, and roads of little or negligible transport significance and which have been referred to variously as land service or access routes, community roads, or residential roads and streets. There is much in the records of public belief and action to justify these concepts. Especially pertinent are the facts that motor revenue originated in the belief that those who use the roads should pay for them, and that local roads have been long regarded as recipients of support from general governmental revenue sources

Having adopted the motor vehicle transportation concept as a criterion of highway finance policy, the purpose of this discussion is to trace the trend of

highway finance in the country, and particularly in the state of Michigan. With reference to Michigan, which necessarily must be used as an example, the survey data are examined to note.

- 1) The change in highway financial policy
- 2) This change as it relates to total public finance in the state.
- 3) The effect of the shift in highway support to the user.
- 4) The factors which should be observed in the establishment of sound highway financial policy.

Trends in Motor Transportation System Support

In the light of the motor transportation concept it might be well worthwhile to study some trends in highway finance. These trends reveal highway finance policies in the making, guided wisely, unwisely, or unguided, as the case may be.

The 1939 report of the Department of Finance of the Highway Research Board¹ indicated, among other facts, a definite tendency in actual practice away from the sound policy of applying highway-user revenues to the motor transportation system of highways. It was evident from the findings of this report that several devices were operative to effectively divorce motor vehicle charges from transportation service. The most significant of these tendencies were.

The persistent growth in use of the revenues for non-highway purposes.

The growth in amounts of motor transportation income transferred to the non-transportation system of highways.

In 1939 the total of these transfers amounted to 41 per cent of the total motor transportation charges which were available for distribution. While trans-

¹ Highway Financial Trends, Thos. H. MacDonald, Chairman, Vol 19, *Proceedings*, Highway Research Board

portation suffers a total loss of the amounts transferred to non-highway service, it should be noted that the loss due to transfers to non-transport highway systems are not total. They do, however, greatly reduce the amount of transportation service which could be provided by more careful application of the revenue to the transport system of highways. It is true that some of the transferred funds find their way to roads of secondary and even primary transportation importance which may be included on the systems of lesser jurisdictions than the state system, but the probability of furnishing actual transportation service by this method is low.

The shunting of funds to the non-highway transportation system is accomplished by transfer of local highway mileage to the state highway department's jurisdiction, and by actual cash transfers by the states to local governmental units. It is also noted that assumption of local road and street debt service by the motor transportation funds is frequently involved in this process.

In spite of these facts it was also evident from the 1939 report that by actual financial practice, the motor transportation concept was greatly strengthened. Revenues available from general state tax source have practically disappeared as means of support of the state-controlled systems which are primarily transportation arteries, leaving them almost wholly dependent on user charges.

Finance policy as actually practiced, then, is guided by conflicting theories—recognition of the transportation concept in financing the most purely transportation system, and at the same time a partial disregard of it in transferring increasing amounts of user revenues to the non-transportation local roads and streets.

There are assembled in Tables 1, 2 and 3 data showing some trends in motor user support of state primary systems and

local road support for the United States and for Michigan. These tables are similar to those presented in the 1939 Finance Department Report, but were revised in order that the parallelism between motor vehicle charges and their application to the two types of highway systems might be followed. The mileage under the

TABLE 1
TRENDS IN TRANSFER OF USER REVENUES
TO LOCAL SYSTEMS IN NATION AND
MICHIGAN, 1925-1939

Year	Nation			Michigan		
	Net User Revenue ¹	To Local System		Net User Revenue	To Local System	
	1,000 Dollars	1,000 Dollars	%	1,000 Dollars	1,000 Dollars	%
1925	393,738	85,992	21.8	22,413	3,494	15.6
1926	459,535	193,999	22.6	25,645	6,646	25.9
1927	544,314	114,355	21.0	31,528	5,998	19.0
1928	611,007	127,481	20.9	37,114	7,285	19.6
1929	760,724	166,415	21.9	43,863	11,860	27.0
1930	829,822	182,058	21.9	43,309	8,987	20.8
1931	858,655	196,180	22.8	41,686	11,337	27.2
1932	817,644	191,668	23.4	38,853	13,134	33.8
1933	788,082	194,174	24.6	36,894	20,650	56.0
1934	854,742	224,012	26.2	35,096	20,963	59.7
1935	908,676	239,403	26.3	38,231	21,639	56.6
1936	1,020,053	267,093	26.1	43,395	24,238	55.9
1937	1,152,603	285,878	24.8	49,454	26,153	52.9
1938	1,131,227	287,735	25.4	46,405	25,427	54.8
1939	1,182,438	306,262	25.9	49,865	26,449	53.0

¹ Less costs of collection.

Sources. Data for Nation furnished by Public Roads Administration. Data for Michigan from Highway Planning Survey Tables 4 & 5.

jurisdiction of the states is subdivided into primary and local mileages. Federal support of the primary systems is tabulated that a more complete picture of the resources of the transportation system might be obtained.

Some of the more important trends which these data show are the following:

- 1) Motor user revenues are being steadily withdrawn from support of

- the transportation system, but constitute its principal support.
- 2) Federal Aid has tended to offset these withdrawals; it is possible that additional support has been given transportation system through Federal emergency relief programs, mostly WPA
 - 3) There has been considerable dilution of the purely transportation

- 5) Demand for transportation service as indicated by number of vehicles registered, traffic, and primary mileage is going up.

FISCAL TRENDS IN MICHIGAN

In Michigan, highway finance has generally followed the national trend though with some important exceptions. The State has been cautious in avoiding in-

TABLE 2
DISPOSITION OF NET RECEIPTS FROM STATE IMPOSTS ON HIGHWAY USERS*

Year	Net Total	State Highway Purposes			Local Roads and Streets			Non-Highway Purposes
		Construction, Maintenance, etc	Debt Service	Total	For Work On Roads and Streets	Debt Service	Total	
	1,000 Dollars	1,000 Dollars	1,000 Dollars	1,000 Dollars	1,000 Dollars	1,000 Dollars	1,000 Dollars	1,000 Dollars
1925	393,738	277,287	23,280	300,567	84,295	1,697	85,992	7,179
1926	459,535	320,831	27,802	348,633	101,288	2,711	103,999	6,903
1927	544,314	374,738	46,428	421,166	112,815	1,540	114,355	8,793
1928	611,007	422,034	49,446	471,480	127,481	—	127,481	12,046
1929	760,724	523,056	56,556	579,612	166,415	—	166,415	14,697
1930	829,822	564,786	62,818	627,604	177,517	4,541	182,058	20,160
1931	858,655	559,593	79,282	638,875	190,399	5,781	196,180	23,600
1932	817,644	463,637	85,592	549,229	187,522	4,146	191,668	76,747
1933	788,082	406,884	95,447	502,331	190,103	4,071	194,174	91,577
1934	854,742	380,668	127,912	508,580	216,388	7,624	224,012	122,150
1935	908,676	388,094	134,036	522,130	231,693	7,710	239,403	147,143
1936	1,020,053	433,519	150,097	583,616	258,058	9,035	267,093	169,344
1937	1,152,603	549,103	156,209	705,312	273,998	11,880	285,878	161,413
1938	1,131,227	511,587	174,389	685,976	282,219	5,516	287,735	157,516
1939	1,182,438	530,432	164,090	694,522	296,705	9,557	306,262	181,654
Total	12,313,260	6,706,249	1,433,384	8,139,633	2,896,896	75,809	2,972,705	1,200,922

* This table was produced by and is used through the courtesy of the Public Roads Administration.

character of the systems under jurisdiction of the state highway departments through absorption by them of rather large mileages of local service roads. This has interfered with the orderly growth of these primary systems.

- 4) Total revenues per mile available for expenditure for maintenance and construction on the state systems are declining.

creasing its responsibilities through additions to its mileage in the face of declining revenues. While outright diversion has not been indulged in, the State probably leads the nation in the transfer of user revenues to local units for expenditure on non-transportation roads and streets. It seems likely that in the nation this policy is destined to outstrip actual diversion to non-highway use as a source of loss to the development of transportation facilities.

In Michigan the fundamental changes which occurred between 1930 and 1939 were coincident with a modest increase in the total income for all classes of roadway, while in the Nation as a whole there was a comparatively small net loss. But in both Michigan and the Nation, changes during the period have vitally affected

Local financing paid for almost 60 per cent of all roadway operations in 1930, but by 1939 this contribution had sunk to well below 10 per cent. Almost exactly counter-balancing this decline, Federal financed operations in the whole State rose from 2½ per cent in 1930 to 53 per cent in 1939. The contribution of the

TABLE 3

TREND OF AMOUNT AND SOURCES OF FUNDS EXPENDED FOR MAINTENANCE AND CONSTRUCTION PER MILE OF STATE PRIMARY ROUTES IN NATION AND MICHIGAN
1925 = 100 Per Cent

Year	Mileage		Maintenance (See Note)		Construction						Registrations		Trunkline Traffic		
	US	Mich.	US	Mich.	State		Federal		Total		US	Mich.	US	Mich.	
					US	Mich.	US	Mich.	US	Mich.					
1925	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
26	105	102	100	101	89	108	82	89	87	104	110	113	114	114	114
27	107	106	109	98	102	120	81	81	97	112	116	117	123	126	126
28	111	112	120	95	138	171	79	101	124	165	123	126	142	158	158
29	114	113	127	96	141	187	74	56	125	159	133	141	165	187	187
1930	118	116	136	105	177	166	87	91	155	150	133	134	172	192	192
31	120	121	113	94	144	133	198	220	157	151	129	124	179	190	190
32	130	127	110	72	107	125	116	129	109	126	121	115	166	180	180
33	130	129	64	72	66	47	159	171	88	73	119	109	166	172	172
34	124	132	81	66	54	25	310	309	114	85	125	116	178	184	184
1935	128	139	82	72	52	40	187	219	84	77	132	125	189	201	201
36	124	141	96	84	71	87	303	391	126	151	141	139	210	227	227
37	126	140	98	91	82	91	212	125	113	98	149	152	227	259	259
38	126	140	97	105	89	71	163	104	106	78	148	139	228	224	224
39	128	138	86	83	76	64	152	145	94	81	153	146	242	240	240

Note: Maintenance costs included the mileages and amounts expended by state highway departments on non-primary roads administered by the departments. These non-primary mileages were small prior to 1933 when they were increased to 138,781 miles. By 1939 they had grown to about 201,000 miles.

Source: Mileages and costs for the nation were provided by Public Roads Administration.

the support of the highway transportation system. Tracing the effects of the trends in Michigan may serve to throw additional light on the wider problems of highway financial policy.

Sources of Michigan Highway Income

Data provided by the highway planning survey permit an over-all view of the readjustments which have taken place during this critical decade.

State to total roadway operations rose from 38 per cent in 1930 to 55 per cent in 1935, but by 1939 it had receded to approximately the point of beginning.

When operations affected by this process of readjustment are broken down into those on state-administered trunklines and those on locally-administered roads and streets, the real significance of the process is disclosed. Table 4 and Figure 1 show that, after severe intermedi-

ate declines in both jurisdictions, in 1939 expenditures on the State system were 18 per cent less than ten years before and on the local county and urban roadways

ade from about eight per cent to more than 20 per cent of total income. During the same ten years, State financing of local roadway support nearly tripled and

TABLE 4
ESTIMATE OF EXTENT OF FEDERAL, STATE AND LOCAL FINANCING OF HIGHWAY OPERATIONS IN MICHIGAN IN SELECTED YEARS

	1930		1935		1939	
	Dollars	Per Cent	Dollars	Per Cent	Dollars	Per Cent
Local Operations						
Federal Financed*	—		10,475,166	21 94	65,228,682	62 54
State Financed						
General Revenue	—		2,058,658	4 31	170,000	0 16
Motor Vehicle Revenue	8,986,906	11 74	21,639,248	45 31	26,443,910	25 35
Locally Financed	67,576,200	88 26	13,582,226	28 44	12,455,751	11 95
Total	76,563,106	100 00	47,755,298	100 00	104,298,343	100 00
State Operations						
Federal Financed*	2,930,447	7 83	8,441,845	33 70	6,259,769	20 47
State Financed						
General Revenue	162,657	0 43	15,222	0 06	901,005	2 95
Motor Vehicle Revenue	34,322,193	91 74	16,591,811	66 24	23,420,913	76 58
Locally Financed	—		—		—	
Total	37,415,297	100 00	25,048,878	100 00	30,581,687	100 00
State and Local Operations						
Federal Financed*	2,930,447	2 57	18,917,011	25 98	71,488,451	53 00
State Financed						
General Revenue	162,657	0 14	2,073,880	2 85	1,071,005	0 79
Motor Vehicle Revenue	43,309,099	38 00	38,231,059	52 51	49,864,823	36 97
Locally Financed	67,576,200	59 29	13,582,226	18 66	12,455,751	9 24
Total	113,978,403	100 00	72,804,176	100 00	134,880,030	100 00
Recap by Types of Revenue						
General Revenue*	70,669,304	62 00	34,573,117	47 49	85,015,207	63 03
Motor Vehicle Revenue	43,309,099	38 00	38,231,059	52 51	49,864,823	36 97
Total	113,978,403	100 00	72,804,176	100 00	134,880,030	100 00

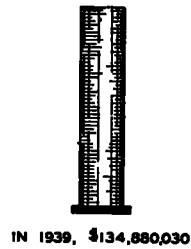
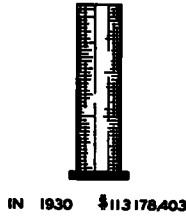
* Includes all cash grants to state and local units and highway activities of WPA which has assumed a large portion of the highway activities formerly financed by local and state governments

expenditures were 36 per cent more. These simple facts show the direction of the trend.

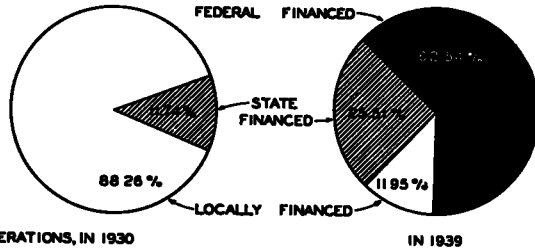
Federal contributions to the State trunkline system have grown in the dec-

Federal contributions grew from zero to \$65,000,000. These gains have more than offset the \$55,000,000 shrinkage in local support which occurred between 1930 and 1939

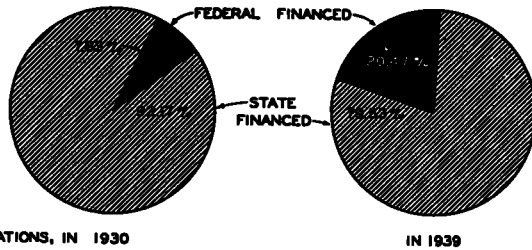
THE SUPPORT OF HIGHWAY OPERATIONS IN MICHIGAN INCREASED 18% FROM 1930 TO 1940 STATE AND LOCAL REACHED TOTALS



THE SUPPORT OF LOCAL HIGHWAY OPERATIONS INCREASED 36% FROM 1930 TO 1940 AS A RESULT OF EXTENSIVE FEDERAL ASSISTANCE AND MARKED INCREASES IN STATE AIDS ON THE OTHER HAND, LOCAL SUPPORT OF THOSE OPERATIONS DROPPED FROM 88% TO 12% SOURCE OF THE SUPPORT FOR LOCAL OPERATIONS, IN 1930



THE SUPPORT OF STATE HIGHWAYS DECREASED 18%, DESPITE INCREASED FEDERAL ASSISTANCE INCREASED STATE SUPPORT OF LOCAL OPERATIONS RESULTED IN A 30% DECLINE IN THE STATE'S SUPPORT OF ITS OWN OPERATIONS, SOURCE OF THE SUPPORT FOR STATE OPERATIONS, IN 1930



A SUMMARY OF STATE AND LOCAL OPERATIONS SHOWS THAT ALTHOUGH THE STATE'S SUPPORT REMAINS ABOUT THE SAME, POSITIONS OF THE LOCAL UNITS AND THE FEDERAL GOVERNMENT HAVE BEEN REVERSED LOCAL SUPPORT DROPPED FROM 59% TO 9% OF THE TOTAL WHILE THE SHARE OF THE FEDERAL GOVERNMENT ROSE FROM 3% TO 53% SOURCE OF THE SUPPORT FOR STATE AND LOCAL OPERATIONS, IN 1930

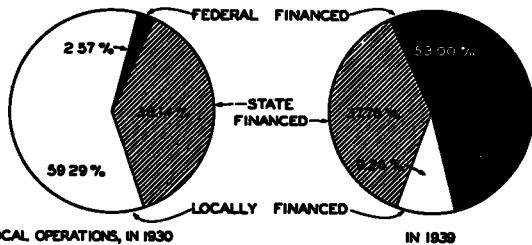


Figure 1. Highway Support in Michigan

Changes in General Finance

These shifts in the sources of highway income were not isolated changes in the structure of governmental finance. Table 5 and Figure 2 indicate that in direction, though not in amount, they are

paralleled by shifts affecting the total fiscal operations of all types of Michigan governmental units. These shifts should be thoroughly studied by the framers of highway and public finance policy. It may be that permanency rather than

emergency character is being assumed in public finance as shown by these patterns, and that highway finance policy may be dictated by the larger public finance policies in the making.

Federal contributions to the cost of state government have risen from 3 to 26 per cent of the total in ten years. And

sibilities of government. The duty of imposing and collecting taxes has long been put to a greater and greater extent on the higher strata of government. At the same time, the responsibility for the expenditure of these revenues has been only partially transferred to the collecting agencies.

TABLE 5
ESTIMATE OF EXTENT OF FEDERAL, STATE AND LOCAL FINANCING OF GOVERNMENT OPERATIONS
IN MICHIGAN FOR SELECTED YEARS

	1930		1935		1939	
	Dollars	Per Cent	Dollars	Per Cent	Dollars	Per Cent
Local Operations						
Federal Financed*	207,315	0 06	61,761,850	18 08	119,459,573	26 83
State Financed**	33,670,865	9 62	70,194,819	20 54	112,564,907	25 27
Locally Financed	316,131,440	90 32	209,723,591	61 38	213,284,663	47 90
Total	350,009,620	100 00	341,680,260	100 00	445,309,143	100 00
State Operations						
Federal Financed*	2,505,569	3 09	12,068,824	18 40	23,510,976	26 29
State Financed	78,655,179	96 91	53,518,559	81 60	65,934,186	73 71
Locally Financed	—		—		—	
Total	81,160,748	100 00	65,587,383	100 00	89,445,152	100 00
State and Local Operations						
Federal Financed*	2,712,884	0 63	73,830,674	18 13	142,970,549	26 74
State Financed	112,326,044	26 05	123,713,378	30 38	178,499,093	33 38
Locally Financed	316,131,440	73 32	209,723,591	51 49	213,284,663	39 88
Total	431,170,368	100 00	407,267,643	100 00	534,754,305	100 00

* Includes all cash grants to state or minor units, and activities of WPA which has assumed a large portion of activities usually financed by local and state governments

** Includes grants-in-aid and assumption of function formerly locally financed

local units which in 1930 financed 90 per cent of their own functional operations, only financed 48 per cent of them in 1939. The balance in the latter year was contributed about equally by the State and Federal Governments in the form of cash aids and direct expenditures.

These percentages, which mark and measure the readjustments of the last ten years, reveal revolutionary changes in the fiscal processes and the functional respon-

Methods of Readjustment

Two methods are used to bring the revenues collected by the State and Federal governments to bear on the performance of the functions of the counties and cities. Funds are transferred to the minor units to be expended by them; this is the more usual procedure. But with increasing frequency, operations and functions for which these units were

formerly responsible are being performed by the state or federal governments or their agencies.

thought, many are thoroughly sound. It is probably true, for instance, that as taxing agencies the State and Federal Gov-

THE SUPPORT OF GOVERNMENTAL OPERATIONS IN MICHIGAN INCREASED 24% FROM 1930 TO 1940. STATE AND LOCAL REACHED TOTALS,



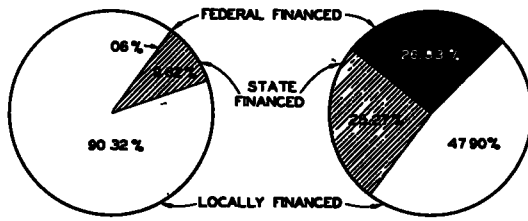
IN 1930 \$431,170,368



IN 1939 \$534,754,305

FINANCIAL RESPONSIBILITY OF LOCAL UNITS FOR LOCAL OPERATIONS HAS DECLINED, DESPITE SUBSTANTIAL INCREASES IN EXPENDITURE FOR LOCAL BENEFITS. FEDERAL ASSISTANCE, INSIGNIFICANT IN 1930, HAS REACHED 26.63% IN 1939. STATE ASSISTANCE IS UP TO 25.27% BY 1939.

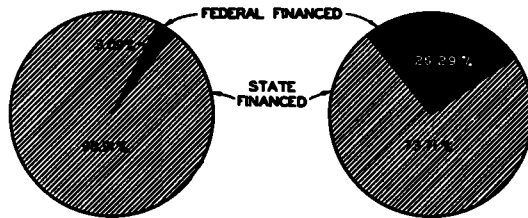
SOURCE OF THE SUPPORT FOR LOCAL OPERATIONS, IN 1930



IN 1939

THE FEDERAL GOVERNMENT IS INCREASINGLY IMPORTANT IN ASSISTANCE TO OPERATIONS OF THE STATE GOVERNMENT.

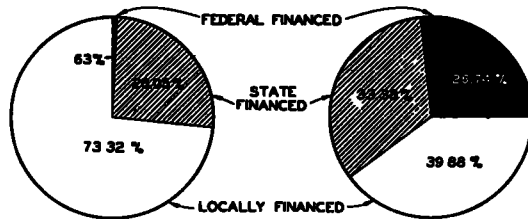
SOURCE OF THE SUPPORT FOR STATE OPERATIONS, IN 1930



IN 1939

A SUMMARY OF STATE AND LOCAL OPERATIONS SHOWS THAT THE FEDERAL GOVERNMENT HAS ASSUMED ONE FOURTH OF THE TAX LOAD, AND THE STATE HAS INCREASED ITS SHARE UP TO A THIRD OF THE TOTAL. CORRESPONDINGLY, FINANCIAL RESPONSIBILITY OF LOCAL GOVERNMENTS HAS BEEN REDUCED ONE HALF.

SOURCE OF THE SUPPORT FOR STATE AND LOCAL OPERATIONS, IN 1930



IN 1939

Figure 2. Government Support in Michigan

Although many of the present arguments in support of these changes are rationalizations of measures which were taken without such elaborate fore-

ernments are stronger and more efficient than are local units. It is likely, too, that in certain fields of governmental activity larger units function more effec-

tively and economically than smaller units.

But actually the principal object sought by the proposers of fiscal readjustment was local tax relief. The divorce of desire for services from direct responsibility to pay for them which followed, has had unforeseen and sometimes unfortunate results. This has been particularly true in the highway field.

It is permissible to interject here that tax relief on such a broad front is not easy to accomplish. In Michigan, after all the changes of the intervening ten years, general taxpayers contributed almost exactly the same proportion of total roadway support in 1939 as they had in 1930.

Shifting Highway Responsibility

Shifting responsibility for local roads and streets to other shoulders was something more than just a phase of the effort to bring local tax relief in Michigan. It was the principal and, in some respects, the most effective means to lessen demands for local tax revenues. Examination of the trends in the highway and general fiscal operations of the units make it clear that general funds formerly required for local roadway support were actually freed for use in providing other governmental services.

Highway user tax revenues, originally levied for the development and support of primary and secondary highways and long devoted to that purpose, were used to bolster the general fiscal structure. In the depression period when the structure required bolstering, the yield of user taxes was less affected than that of other kinds of levies and it was large in amount. In one instance by outright diversion, but normally by the substitution method these revenues were used to meet emergencies in other phases of governmental function.

As has been pointed out, various devices have been adopted in different parts of the country to shift the responsibility

for local roads and streets from the local taxpayer to the highway user. In general, these take two forms. The first is the transfer of state-collected highway user tax revenues to the minor units for expenditure on their roads and streets. The second is the transfer of local roads and streets to higher governmental agencies whose operations are financed by highway user tax revenues.

In Michigan both devices were resorted to. Local rural roads, which up to 1931 were under the jurisdiction of township road commissions and supported by local property taxes, were merged into the county road systems. At the same time, user revenues were allotted in increased amounts to these county agencies for the support of their enlarged systems with provision for distribution of certain residues to the contained municipalities. Coincident with these measures, a fifteen mill tax limitation law was passed which severely crippled local units ability to levy on local property for highway purposes.

In 1930, Michigan had distributed about 21 per cent of its motor vehicle revenues to the minor units. This was just about the national average for that and a number of preceding years. But, while the amount allotted to lesser roads in the nation as a whole increased very gradually to 25 per cent in 1939, the trend of increase in Michigan was much steeper. By 1932 allotments to counties amounted to 34 per cent of net collection and two years later reached a peak of 59.7 per cent. Since that time, due to increased yield of the gasoline tax there has resulted a recession to 53 per cent in 1939. It must be remembered, however, that the National and Michigan condition is probably more closely parallel than those figures indicate, due to the expenditure in many states, of user revenues on non-transport roads which have been merged into the state systems.

Effects of Readjustment on Transportation System

The withdrawal of local property taxes and the much wider distribution of user tax revenues have created thin spots in Michigan's highway support. These thin spots have been reinforced by federal grants of cash and by federal work relief operations which have increased in volume from year to year.

Due to this large-scale federal participation there has been a slight increase in over-all highway expenditures in Michigan over the ten-year period. But, not only is this increase much less than the growth of traffic volume and of the demand for highway service; it is entirely confined to the local roadway systems. The redistribution of revenues has penalized the transportation system on which increases of utilization are the most critical because they involve much greater traffic volume.

How adversely the primary transportation system of Michigan has been affected, is revealed when the State Highway Department's direct expenditures are compared with indices of its growing responsibilities. Taking 1925 as a base, it is found that by 1939 motor vehicle registrations had increased 46 per cent, trunkline traffic 140 per cent, and trunkline mileage 38 per cent.

Contrasting with these rising indices of service demand, expenditures to meet this demand fell off. Seventeen per cent less was spent per mile for maintenance in 1939 than in 1925. Although federal-aid allotments per mile had increased 45 per cent, the total amount of State and Federal funds expended per mile for construction declined 19 per cent in these fifteen years. Trend percentages for both the Nation and Michigan are shown in Table 3.

These figures—46 per cent more vehicles, 140 per cent more travel, and 19 per cent less capital investment—indicate one

of two conditions, a system which has reached ideal "completion," or a system which is being allowed to drift into progressive obsolescence and inadequacy. It is generally acknowledged that the Michigan state highway system is far from completed.

TESTS OF HIGHWAY FINANCE POLICY

It has been pointed out that the main objective of highway financial policy should be the development and maintenance of the highway transportation system. The commercial concept of support of this system also presumes that there shall be a balance between the charges collected from transportation sys-

TABLE 6

System	Total	Distribution	
		Urban	Rural
Expenditures			
	<i>Per Cent</i>	<i>Per Cent</i>	<i>Per Cent</i>
State Trunklines	34 1	7 5	26 6
County Systems	57 1	9 1	47 9
Urban Streets	8 9	8 9	—
All Expenditures	100 0	25 5	74 5
Travel			
State Trunklines	61 04	26 93	34.11
County Systems	17 05	3 62	13 43
Urban Streets	21 91	21 91	—
All Travel	100 00	52 46	47.54

tem users and the benefits those users enjoy. In spite of the huge contributions of federal funds to the highways, the fulfillment of this objective and this concept depends on the proper and skillful use of motor vehicle revenues.


Motor vehicle revenues are collected from highway users for the support of the highways. In Michigan the Constitution of the State now enforces this relationship.


Motor vehicle revenues are also collected from highway users in approxi-

mately direct proportion to the use they make of the highways. There is, however, neither constitutional nor statutory provision requiring that expenditure of these revenues shall be directed to the

agencies in the survey year, shows where these revenues paid for transportation benefits are actually expended. Traffic survey and road use data show both the relative utilization of the several road

EXPENDITURES
ARE MADE IN
THESE PROPORTIONS

THIS  AREA
REPRESENTS AMOUNT
EXPENDED ON THE
URBAN PORTIONS OF
THE THREE SYSTEMS

THIS  AREA
REPRESENTS AMOUNT
EXPENDED ON THE
RURAL PORTIONS OF
THE THREE SYSTEMS

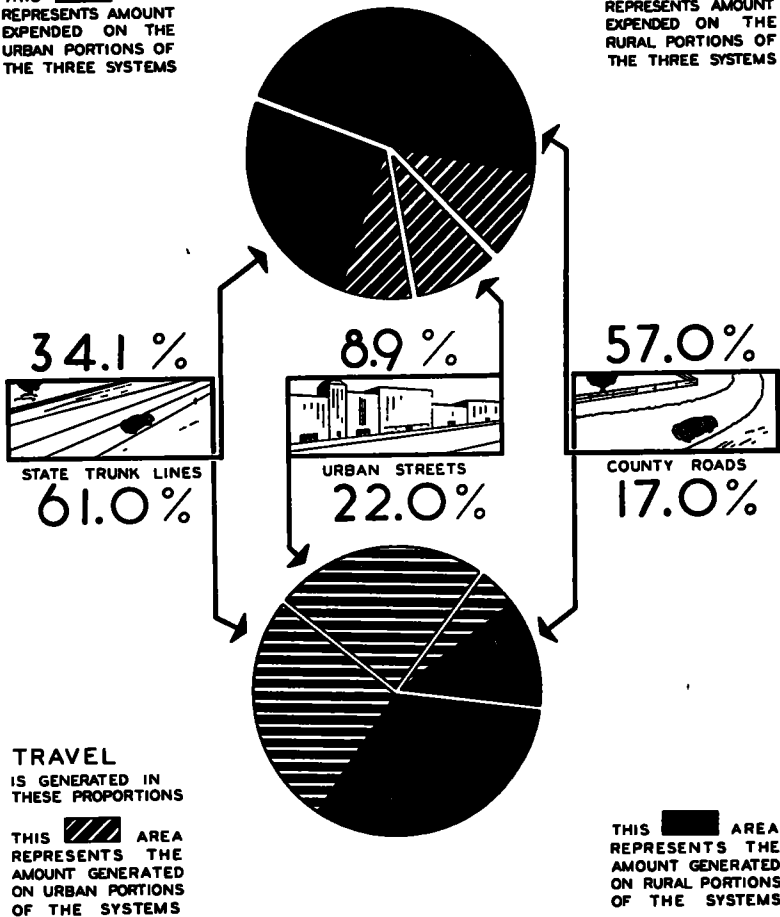


Figure 3. Expenditure of User Revenue and Travel on Michigan Systems

development of the transportation system or even to those parts of the total roadway mileage where users mostly travel.

An examination of the operations of the State, county and municipal highway

systems and the proportions in which benefits are enjoyed by two major classes of taxpayers, the rural and urban users.

Thirty-four per cent of motor vehicle revenues were expended on the 9,000 miles of the state trunkline system, rural

and urban; 57 per cent on the 80,000 miles of former county and former township roads; and 9 per cent on the 13,500 miles of local urban streets. The distribution of expenditures of user revenues and travel on rural and urban sections of the highway systems in Michigan is given in Table 6 and Figure 3.

But the preferences and necessities of car owners do not necessarily distribute highway travel among the systems in the same proportions that revenues are distributed. Sixty-one per cent of Michigan's total motor vehicle traffic is produced on urban and rural State trunklines, 17 per cent on the county systems, and 22 per cent on local city streets. Transportation service accounts for practically all the travel on the State trunkline system and for a considerable proportion of the travel on the principal county system roads and on certain urban arteries. It is an insignificant factor in the use of practically all other roads and streets.

In view of the manifest divergence between the distribution of user revenue to the systems and the latter's service to transportation, it is worth while to see what the balance of payments and benefits is in the case of urban and rural users.

It is clear that benefits are not benefits except as they are utilized. Therefore the sum total of benefits created by the expenditure of revenues on a road system is the amount used by and shared between rural and urban motorists as measured by their travel on that system. The contributions to traffic on systems, by urban and rural users, are as in Table 7.

Thus, for example, because rural owners perform 13 per cent of the total vehicle miles of annual travel on the state trunkline rural and urban system, they receive 13 per cent of the benefits created there by the expenditure of 34 per cent of the motor vehicle revenues. The balance, or 87 per cent, of the benefits created were enjoyed by the urban owners who per-

formed that percentage of the system's total travel.

In like manner, the rural motorists got 39 per cent from the county system roads and 67 per cent from the local rural roads of the benefits built into those systems by

TABLE 7

System	Per Cent of Total for each User Class		
	Urban User	Rural User	Total
State Trunklines	87 1	12 9	100 0
Former County Roads	61 1	38 9	100 0
Former Township Roads	33 0	67 0	100 0
Total Urban Streets	98 7	1.3	100 0
All Driving	84 0	16 0	100 0

TABLE 8

System	Expenditures \$1,000,000	User Class			
		Rural		Urban	
		Use	Benefits \$1,000,000	Use	Benefits \$1,000,000
State Trunklines	13 47	12 9	1 74	87 1	11 73
Former County Roads	13 64	38 9	5 31	61 1	8 33
Former Township Roads	8 82	67 0	5 91	33 0	2 91
Local Urban Streets	3 52	1 3	0 46	98 7	3 06
Totals	39 45		13 42		26 03
Percentages of Benefits	100 00		34 40		65 60

the expenditure on them, respectively, of 35 per cent and 22 per cent of the motor vehicle revenues. The balance of the benefits, of course, goes to urban motorists in each case. When it comes to the local urban streets, the urban motorists enjoy a preponderant 99 per cent of the

benefits from the expenditure of 9 per cent of user revenues there, because they almost completely monopolize travel on those streets. The dollar value of benefits accruing to each user class by virtue of the expenditures and corresponding use on each component of the highway system is computed in Table 8.

Footing up the allotment of benefits which occurs under the present distribution of user charges, the following peculiarly unbalanced relationship between travel, contributions and benefits is disclosed.

The Rural User:

Produces 16 per cent of all travel
 Contributes 15 per cent of user revenues
 Receives 34.4 per cent of user revenue benefits

The Urban User:

Produces 84 per cent of all travel
 Contributes 85 per cent of user revenues
 Receives 65.6 per cent of user revenue benefits

BASIS FOR FINANCIAL POLICY

The inequality in the distribution of benefits in relation to revenue contributions is a fore-warning of impairment in financial support just as faulty expenditure of revenues is a sign of impairment of transportation service.

Sound fiscal policy on the basis of the commercial concept requires recognition of traffic utilization as the guiding principle of revenue distribution. In other words, the expenditure of user revenues in direct ratio to the distribution of travel will develop and support the transportation system and at the same time will secure an equitable balance between contributions and benefits for important classes of users.

The fact that the investment of user revenues in ratio to user travel habit will direct a larger proportion of the expenditure to the primary and high priority secondary routes need arouse no fears that the interests of either class of user will be penalized. Preference by both

rural and urban user for these essential transportation routes is indicated by the following table showing travel interest on the rural systems by urban and rural motorists:

System	Per Cent of Total Driving By Each User Class	
	Rural User	Urban User
State Trunklines	41.2	80.7
Former County Roads	34.6	15.0
Former Township Roads	24.2	4.3
Total Rural Travel	100.0	100.0

But the requirements of sound financial policy are not all met by allotment of revenue to systems on the basis of their traffic. A further responsibility rests on the agencies administering these systems that they shall spend the funds received on those portions of their system mileage which are of major transportation significance. This involves a careful classification of all roadways in each system, a process which is fundamental to most phases of highway administration.

Modifying Factors

The commercial concept of user charges as well as its application to highway policy are strongly and logically based. But a word of warning is needed against the danger of permitting policies derived from this concept to freeze into hide-bound formulas. Two considerations forbid that such a policy as has been suggested should be more than a very broad rule of basic priorities.

In the first place is the consideration that its application would further intensify fiscal difficulties in the local jurisdictions which are now being met through federal programs initiated as emergency relief measures. The extent of the dependence on these programs is illustrated by the fact that in 1939, nearly 75 per cent of municipal street work and nearly

half the work on county rural roads was represented by WPA projects.

There may be a tendency to over-emphasize the emergency and temporary character of this Federal assistance. Perhaps it may only prove that when ordinary and accustomed support is withdrawn, underlying necessities force contributions from other sources. It certainly is a fact that this type of federal contribution is continuing after seven years.

But, in lieu of increased Federal assistance, reinstatement of the commercial concept in relation to support of the transportation system entails the always serious problem of finding additional revenues. This problem is doubly serious in a period when the trend is toward lower local property tax contributions, away from borrowing, and against higher user taxes.

The second consideration which should shape and guide the application of a policy for the expenditure of user tax revenues, is that of actual physical requirements of the several systems.

The planning engineer's insistence on channeling motor vehicle revenues to the most important routes does not mean that expenditures should be indefinitely on the high-volume routes. That would be almost as bad as the present policy of spreading expenditures evenly. The one policy is building systems of roads, but not a transportation system; the other would eventually produce an over-developed primary system which would be ineffectual because it would lack an adequate subsidiary network to make its facilities fully accessible and usable.

Factor of Physical Needs

If a financial program is to pass the test of practical efficiency as well as that of balanced equity, what is essential is that it shall provide the means for meeting the physical needs of the transportation system. Needs, in this case, are not

all the improvements and conveniences that may be desired by each and any class of user. They are the actual basic requirements of the system as interpreted and determined by the amount and character of its service. They consist of a route practical for safe travel and of an adequate number of lanes.

Survey inventory and traffic information is being used in many states, Michigan among them, to identify and list the needs on the trunkline system as a basis for programming its improvement. The data have also permitted more general studies of acceptable standards of improvement on other rural roads. Determination of urban street requirements depends largely on special surveys dealing with specific situations.

Data consist of information regarding the location, type, dimensions, design, and condition of facilities, and the volumes character, occurrence, and future trends of traffic. In considering these data, Michigan planning engineers have acted on the twin presumptions that no pavement less than 20 ft. wide and no gravel surface is adequate to carry trunkline traffic.

As a matter of practical procedure, the highways are being classified as to whether or not they have an adequate number of lanes. Next they are classified relative to other criteria. Finally, priorities are determined on the basis of the seriousness of the inadequacies and the importance of the traffic affected.

On certain heavily traveled primary routes, capacity studies reveal that the estimated future traffic trend goes up so steeply as to call for excessively frequent additions of facilities of ordinary design. That result is probably the surest indication we have of the existence of a need for highly specialized types of road such as the limited access expressway.

The determination of actual needs on non-trunkline rural roads presents many difficulties. In the first place, the very

large mileages involved and the widely varying services different segments of these systems perform complicate the problem. However, a long step has unquestionably been taken in the selection of the routes for the Federal-aid Secondary system. While this work has not gone into the details of inadequacies and requirements, it has accomplished the essential job of segregating the routes having real transportation value and where inadequacies are important.

The determination of actual needs on the local rural roads is particularly vital to good financial practice. For it is on this class of roadways that there is danger of over-development at the expense of the highways having much greater transportation significance. In view of the complete separation which has occurred between the desire for highway benefits and the responsibility of paying for them, it is not strange that demand for improvement has gone considerably beyond what is justified by their service to traffic.

Studies of improvement in relation to traffic before the divorce of demand and responsibility, lead to the belief that the real requirements of local road usage were more accurately met when the bill was paid directly as a local charge for local use. Regardless of the very widely varying conditions which exist between Michigan industrial and northern counties, it is found that there was a quite consistent and rather modest relationship between the type of surface and the volume of travel.

In the great majority of instances, a road served 200 or more vehicles daily before it was given a bituminous surface. With 100 to 200 vehicles, a dustless surface was considered adequate. One- or two-course gravel appeared to meet the peak demands on roads carrying up to 100 vehicles a day. Unsurfaced earth roads generally had a traffic of 25 vehicles or less a day with a minority carrying as high as 50 vehicles.

In Michigan, these figures indicate the very slight transportation interest of the 34,000 miles of unsurfaced local rural roads, each mile of which annually receives its share of motor vehicle revenues. It seems evident, that sound financial policy will decree that the purely land-access function of most of these roads must be supported from some other source than the charges paid by users for transportation service. The prudent management of the past found that the cost of this support was not necessarily high.

Conditions of life in the modern metropolis and the volumes and surges of traffic which they generate make the revamping of urban arterial facilities a prime requisite of highway policy. The need for remedial action is rapidly growing more critical and continued failure to take it, more destructive. Since 1936, the urban problem in Michigan has been accentuated by a 40 per cent traffic increase, with an accelerated increase to be expected as the defense program gets under way.

The development of the primary and secondary links in the urban areas in proper relation to the state's motor transportation system as an integral whole is a legitimate objective of user revenue expenditure. Road use figures in Michigan show that 54 per cent of all the state's travel is generated on urban streets. The fact that the bulk of the traffic problem in cities is confined to urban extensions of the rural primary and secondary routes and other intra-city arteries, should furnish a logical guide to a sound financial program on this portion of our transportation system.

CONCLUSION

This discussion of highway finance in the light of data made available by the highway planning surveys has not pretended either to cover completely the subject of highway finance or to exhaust

the pertinent information which the surveys have gathered. It has, however, attempted to present a picture of the trends of highway fiscal policy in a somewhat typical state as they are related to the broader trends of general public finance. It has also shown what direction has been taken in relation to what may be considered the basic tenets of sound highway policy.

There has been revealed an increasing dispersion of user revenues over roads and streets having slight transportation value. This, despite the fact that user charges are paid for benefits which can only be delivered through the development of an adequate transportation system. The unequal distribution of benefits resulting from this practice has been shown.

Finally, a method was suggested by which expenditure of user revenues could

be directed to road systems in such a way as to result in a balance between the charges paid by all classes of users and the benefits they receive through utilization of these systems. Equally important, certain factors were pointed out—the fiscal facts of the situation and the actual needs of the systems—which must be considered as possibly modifying the application of the method.

This method is not presented as a prescription or a cure-all. It merely suggests the direction in which a desirable result is to be found. Nor is it presented with any illusions regarding the difficulties or the delays which beset the path toward adoption of a sound policy for highway finance. It is believed, however, that it is of value to know that there is a desirable goal for highway policy, to know what the goal is, and to know how far short we are from attaining it.