Financing County Highways

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Lack of adequate funding to undertake the needed maintenance of local roads and highways is one of the critical issues facing transportation officials throughout the country. This paper examines the problem of revenue shortfall in local highway maintenance and construction, in particular with reference to Indiana counties. A review of the projected needs is made to compare with the expected revenue levels under existing trends. Recommendations are then outlined for possible strategies in addressing the problem of county highway financing and administration.

From a historical perspective, one must conclude that modern technology for the movement of goods and services has all but overwhelmed many local road and street systems. Too many local road and street systems have not been designed and constructed to any specific engineering standard. Instead they have evolved from various stages of surface improvement without much (if any) consideration for base design or drainage. Although rural county roads are often lacking in structural capacity to support traffic loads, city streets are often lacking in traffic-volume capacity and traffic-safety design. In addition, the county road systems include great numbers of weak, narrow, obsolete bridges that are in critical need of replacement or repair.

And yet in the face of all these needs and deficiencies, through the structure and organization of local institutions and economy, we continue to impose great stress and strain on our local roads and bridges. We develop bigger school corporations that require bigger and heavier school buses, bigger and more-productive construction machinery to better serve the needs of industry, and bigger and more-productive farm machinery of all types to better serve the needs of our growing agricultural economy. All these vehicles must negotiate these weak, narrow roads and bridges. In addition, there is the impact of rail abandonment that started some five years ago after financial reorganization and consolidation of many railroad lines. The poor rail service plus the rail abandonment program have forced great quantities of grain and other commodities to be moved to and from grain elevators by truck, and these trucks, too, must negotiate these weak, narrow roads and bridges.

Again, modern technology, which has made commerce and industry more efficient and productive, has been racing along, whereas local road programs have been at a virtual standstill because of inadequate funding to carry on a planned program of roads and bridges built to standards that meet the needs of heavier, wider school buses, grain trucks, farm machinery, etc.

In addition to insufficient funding to meet current needs, however, local road and street programs are all too often plagued with weak and passive administration. Elected county commissioners, city mayors, and town boards have been slow to appreciate the need for technical advice and planning to upgrade management and use of the limited funds available to them. As a result, many local road and street programs have fallen into an "as-needed" maintenance operation that provides temporary relief but no lasting benefit. The extremely high cost of labor, materials, and equipment for maintenance begs for a different direction and dimension to local road administration.

This paper highlights problems in local highway finance related to the condition of county roads under local control. The county road subsystem, although it does not generally account for more than an estimated 6 percent of national highway travel, allows for consumer and producer access to land, farms, shops, and highways of higher classification. Essentially, these county roads are necessary for the economic viability of this country: They provide for the transfer of raw goods to the processing centers or to the market. For example, in Indiana, the county road system is vital to the transportation of grain and other agricultural products. The thrust of today's problem is that local highways are providing lower levels of service year by year, for even if county roads were originally built to meet adequate design standards (and many were not), they are now deteriorating due to inappropriate funding. Inflation and erosion of the highway user-tax base have dramatically fueled highway funding problems at the local level. The trends of these factors that affect county highway finance will be discussed both on the national level and on the county level by using Indiana as a case in point. Sources of funds available for county highway operations are also included in this paper, as are the categorized uses of such funds. A general suggestion for change in the appropriation of funds is made in the conclusion to the discussion of the current problems in the area of county highway finance.

NATIONAL FACTS AND TRENDS

Historically, the majority of roadway funds in this country have been disbursed for capital expenditures for the nation's highways (1). Over the past few years, due to increasing maintenance and operational needs, the proportion of funds used for noncapital expenditures has been increasing, whereas funds used for capital expenditures have undergone a corresponding decrease. This has also been true for county highway spending to a certain extent; capital disbursements fell by nearly 5 percent over the period 1969-1977, and disbursements for maintenance rose by more than 3 percent during the same period (2). Despite these small changes, categorical levels of spending by counties for highways have remained fairly steady during this period, as shown in Table 1 (2).

Examination of Table 1 also reveals that counties have historically spent almost one-half or more of their available funds on maintenance of their highways. Coupled with the fact that maintenance needs are increasing relative to other types of spending, this may be evidence of a vicious cycle in county highway finance: Maintenance of roads never built to meet even low design standards gobbles up higher percentages of the available (albeit inadequate) highway funds, which leaves fewer portions of funds for reconstructing other highways on the county system to provide higher levels of service. This in turn leads to more deterioration of county roads at an accelerated rate because of neglect in their maintenance.

Estimated motor vehicle travel figures for the past 10 years show that the amount of local rural travel in the United States, based on total national travel, declined by more than 5 percent from 1970, when the proportion was 11.7 percent, to 6.1 percent in 1978 (2). In actual figures, local rural travel

Table 1. Functional percentages of disbursements by counties for highways.

Year	Percentage of Total Disbursement for		
	Capital Expenditures	Maintenance Expenditures	Other Expenditures
1969	30.0	49.4	20.6
1970	30.2	48.3	21.5
1971	30.0	48.2	21.8
1972	29.9	48.6	21.5
1973	29.9	48.8	21.3
1974	31.1	47.8	21.1
1975	29.8	49.2	21.0
1976	27.8	50.4	21.8
1977	25.3	52.8	21.9

was 130 739 000 vehicle miles of travel (VMT) in 1970 and fell to 94 553 000 VMT in 1978. These figures should be contrasted with those for estimated total VMT in the United States in 1970 and 1978, or 1 120 705 000 and 1 548 213 000, respectively, as total nationwide travel increased by 27.6 percent over the nine-year period. These figures are for all roads in the U.S. highway system, regardless of jurisdiction; hence, the category of local rural roads for which figures were quoted includes travel on rural highways other than those solely under county jurisdiction. However, this classification of local rural travel is sufficient to show the trend in use of county highways because the local rural system includes mostly the county highways.

Mileage counts by jurisdiction are more readily available than are travel data. Nationally, rural mileage under local control includes that of county roads, town and township roads, and other local roads. County road mileage accounts for the largest share, or about 77 percent, of rural highway mileage under local jurisdiction (2). The significant fact is that county road mileage as a proportion of total road and street mileage in this country averages about 46 percent in any given year. This means that, although the proportion of travel on local rural roadways and hence on county highways has declined since 1970 to account for only 6 percent of the nation's total VMT, 46 percent of the nation's highway system is subject to rapid pavement deterioration because highway fund-allocation formulas generally favor high-volume highways.

Two major factors have led to further problems in the area of county highway finance. The first of these relates to one of the sources of revenue for county highways. Total receipts available for all classifications of highway expenditures have risen markedly in the past 20 years. However, the federal and state governments raise 80 percent of their respective highway revenues by direct user charges in the form of motor-fuel taxes and registration fees (1). Because the largest share of county highway revenues comes directly from state funds based on motor-fuel tax revenues, change in this tax base affects the levels of revenue available to counties for their highway needs. Taxes imposed as a fixed amount per gallon lose their impact as gasoline and other prices rise because revenues so generated are not increasing to keep pace with inflation; the proportion of fuel taxes collected decreases as a proportion of the dollar volume of fuel sales. Currently, many states and the federal government levy gasoline taxes as a fixed amount per gallon. Due to high inflation rates, county revenues are suffering from the eroded tax base. In addition, as more fuel-efficient vehicles become part of the nation's vehicle fleet, fuel use per vehicle declines, and since highway revenues are proportional to fuel consumption, they decline in absolute terms as fuel efficiencies improve.

The second factor of significance is that of inflation's effect on the economy and particularly its effect on the prices of highway-related materials and services. As shown in Figure 1 (3,4), the highway bid price indices at both national and state (Indiana) levels have continually outpaced the general inflation rate in the country. In 1978, when highway bid prices shot up dramatically but the consumer price index (CPI) maintained its steady growth rate over the previous year, highway-related prices nationally were 265 percent higher than they were in 1967 (3). Composite consumer prices were up 70 percent less than this level, or 195 percent of the 1967 price level (4). What this means is that highway financing is suffering even more than the general economy from inflation; rising prices of highway construction, maintenance, operation, and administration are rapidly reducing the real purchasing power of roadway dollars in an economy in which the purchasing power of the dollar is losing ground in every category of spending. Governments unwilling or unable to base appropriations for highway expenses on the associated accelerated price index are faced with a widening gap between their highway revenue needs and their sources of such revenue.

INDIANA COUNTY HIGHWAY FINANCE

The inflation problem is as apparent in Indiana as it is in the remaining sectors of the United States. Figure 1 shows that the Indiana highway bid price index has nearly paralleled the federal-aid highway bid price index since 1967, which indicates that the problems that Indiana county governments face in the area of highway finance are representative of the national scenario. Alternatively, the issues that have arisen due to rapidly rising highway prices on the national level are issues that should be of concern to state, county, and local governments in Indiana as well. By using 1967 constant dollars, the real value of Indiana county highway gross receipts fell from $85 745 000 in 1969 to $57 188 000 in 1979 [see Table 2 (2)]. Actual receipts rose by more than $49 million over this time span. Figure 2 reveals the opposing trends of local highway receipts in Indiana from 1969 to 1979 in terms of actual and constant dollars (2). The fact that money spent in 1979 bought less than an equal sum did in 1969 is tantamount to other county highway financing concerns.

Due to escalating costs of materials and personnel, maintenance of and improvements to Indiana highways have lagged behind. The 1976 Indiana Highway Needs Study (5) assessed a "real need" of $23 billion over the 20-year period until 1995 for Indiana highways; $7 billion of this amount was needed for projects that have lagged behind scheduled initiation or completion to date. Real need, which is defined in the report as the amount needed "such that at the end of twenty years Indiana will have an adequate system to handle the expected traffic based on nationally recognized practices of capacity analysis and safety considerations," would demand that Indiana spend $1 159 000/year (based on 1975 constant dollars) for highways, roads, and streets. When this figure is compared with the current actual level of spending for roadways in Indiana of approximately $480 million/year, the wide gap between assessed needs and met needs is evident. Even if the minimum-need requirement said to be necessary to maintain Indiana's roadways at their present performance levels without further deterioration were imposed (about $740 million annually), current

Figure 1. Highway bid and consumer price trends.

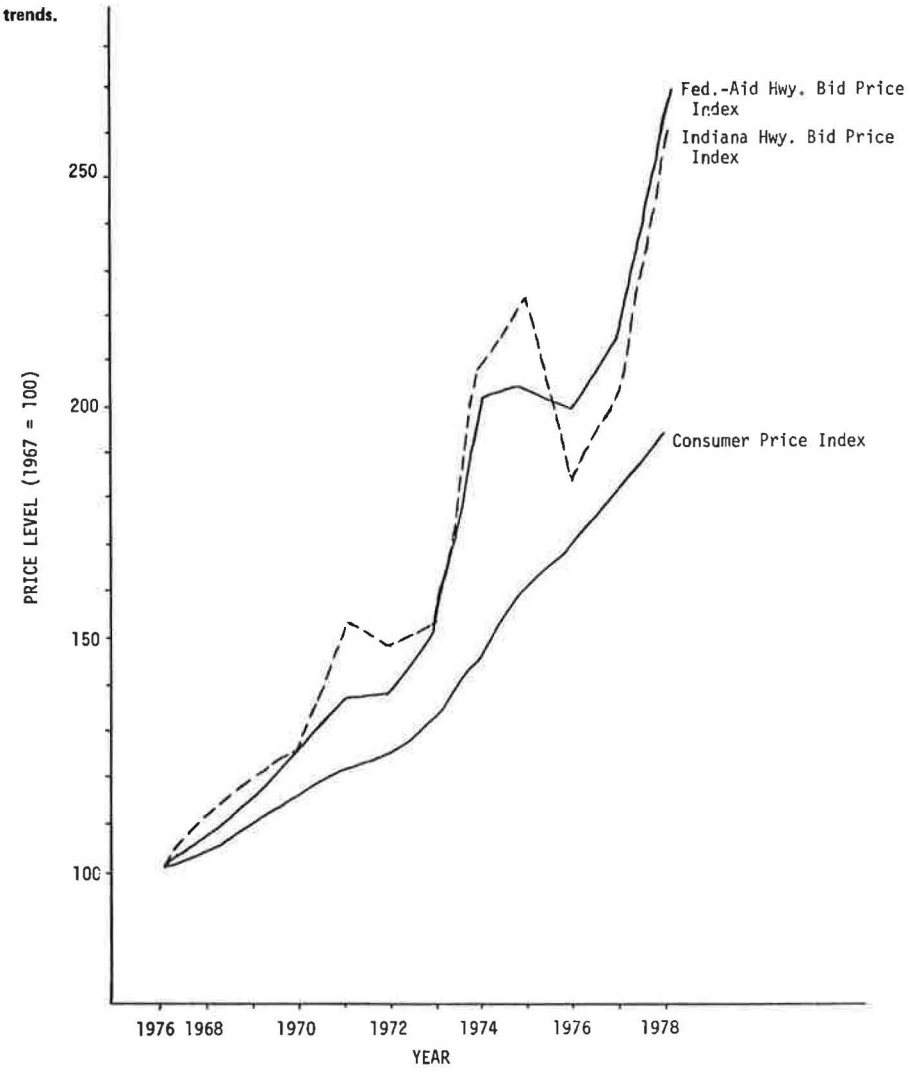


Table 2. Indiana county highway gross receipts.

Year	Actual Receipts ($)	Real Value (1967$)
1969	102 894 000	85 745 000
1970	121 624 000	96 527 000
1971	122 817 000	80 272 000
1972	130 050 000	87 872 000
1973	140 120 000	91 582 000
1974	139 011 000	66 512 000
1975	145 056 000	64 757 000
1976	160 846 000	87 416 000
1977	154 036 000	75 880 000
1978	151 416 000	58 462 000
1979	152 119 000	57 188 000

spending levels would still meet only 65 percent of such need.

Projected average annual real and minimum needs and total revenues for Indiana for the years 1976-1995 are shown in Figure 3 (5) disaggregated to state, county, and city levels. Focus on the county-system levels of these amounts reveals significant indications of the seriousness of Indiana's county highway financing problems. Revenues for county roads for the 20-year period on an annual basis rank second, or at nearly one-half of those predicted for state highways, whereas real needs (as previously defined) for county roads exceed by $25 million those needs determined for state highways. The gap between average annual real needs and corresponding revenues for state highways is about $200 million; for city and town streets it is more than $180 million; for county roads this gap approximates $340 million. County road finances also reveal the largest gap between projected average annual minimum needs and average annual revenues at the level of more than $250 million.

Despite the fact that the dollar amounts of needs are based on design and maintenance standards that are generally higher than the current design and maintenance practices and thus may overestimate the extent of needs, the need study clearly reveals the relative degree of needs in various highway systems in Indiana. It is obvious that the projected revenue shortfall for county highways is severe; for the highway system that encompasses more than two-thirds of Indiana's highway miles, this means that county highways in Indiana face grave performance deficits.

Many miles of county highways and roadways are unsurfaced now, and it appears that they will remain unsurfaced indefinitely as counties attempt to maintain surfaced roads by using inflation-reduced highway revenues. Some existing paved county highways may even be degraded to gravel surfaces to diminish needed maintenance expenditures for their upkeep. Because Indiana has large agricultural and manufac-

Figure 2. Highway receipts for counties, cities, and towns in Indiana.

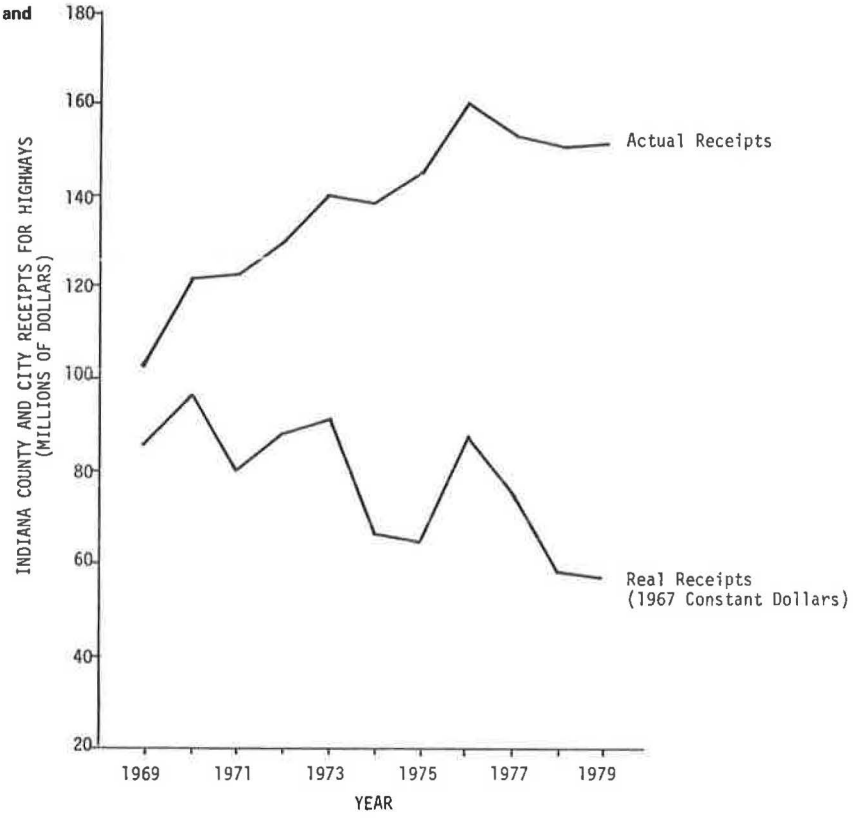
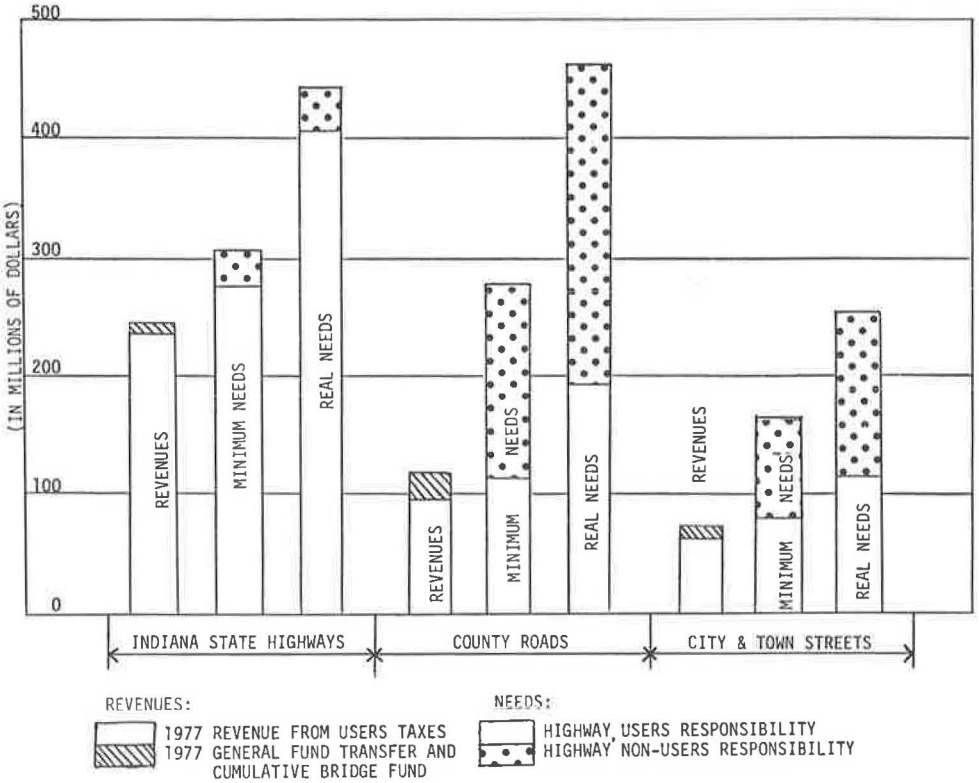


Figure 3. Average annual highway needs and revenues in Indiana (1975 prices).



turing sectors dependent on county roads for movement of goods and equipment, lower-grade roads will introduce some production inefficiencies. Not only will Indiana's economy bear higher prices from such inefficiencies, but also, if it is assumed that other states are similarly affected within their respective counties from poorer roadway conditions, the entire U.S. economy will suffer.

As mentioned previously in this paper, state governments rely heavily on motor-fuel taxes for highway revenues, and Indiana is no exception. The state government has the major responsibility of providing revenues for county highway purposes in Indiana, and most of these revenues are disbursed from the Motor Vehicle Highway Account (MVHA) (6). This account, created in 1937, channels funds from a variety of sources into a single dedicated highway fund. Revenues collected are then apportioned to highway jurisdictions on the basis of the following distribution scheme: 53 percent for state highways, 32 percent for county highways and roads, and 15 percent for city streets. The county share is further divided among 92 Indiana county highway departments: a 5 percent equal share to each county, 30 percent based on county vehicle registration, and 65 percent based on county roadway mileage.

The major source of funds for the MVHA is from taxes collected on motor-fuel sales within the state. Prior to 1969, a fuel tax of $0.06/gal was collected in Indiana. In 1969, the total amount collected per gallon was increased to $0.08 pursuant to legislation passed by the Indiana General Assembly. The Highway, Road, and Street Fund is the recipient of revenues generated by the additional tax on motor-fuel sales within the state of $0.02/gal. The money is further channeled into two accounts within the fund, specifically, the Primary Highway System Special Account and the Local Road and Street Account (LRSA) (6). LRSA is given 45 percent of the Highway, Road, and Street Fund to be used exclusively by cities, towns, and counties for engineering and land acquisition needs and for construction and reconstruction of arterial street and road systems. Counties receive funds from this account via a two-level distribution plan. On the first level, 92 countywide appropriations are made based on the ratio of county passenger car registrations. Second-level appropriations are made to county, city, and town units on the basis of each unit's population and roadway mileage. In 1979, LRSA appropriations amounted to slightly more than 17 percent of total distributions to county highway units within the state.

As of July 1, 1980, Indiana's fuel tax became an 8 percent tax on the pretax price of a gallon of gasoline (7). This action was an attempt by the 1980 state legislature to generate highway revenues that keep pace with inflation. On enactment, this tax was equivalent to an $0.085/gal tax on gasoline sales, based on the statewide average pretax price of $1.15/gal of fuel. Indiana may still be left facing a $67 million shortfall in gasoline tax revenues for fiscal year 1980, however, for two reasons. First, fuel prices in the state stabilized near the time the tax change was enacted, which left prior estimates of revenues based on continually rising gasoline prices in excess of the amount that may actually be collected. Second, the state has experienced a 6 percent decline in gasoline consumption (predictably due to more fuel-efficient vehicles in use and increased conservation efforts), so motor fuel-tax revenues are declining at a higher rate than the new tax is increasing them because of lagging fuel sales.

CONCLUSIONS

The change in format of gasoline taxation in Indiana from a fixed rate per gallon to a percentage sales tax may somewhat increase revenues available to counties for their use in highway financing. As noted, however, even this change will not be adequate to meet projected highway needs. Higher gasoline tax rates, higher vehicle registration fees (particularly for commercial vehicles), and increases in transfers from nonuser revenue funds could circumvent the problem of revenue shortfalls in Indiana. Similar changes in other states' and in the federal government's highway revenue sources may combat the problem nationwide. With the inflation squeeze now felt in every sector of the U.S. economy, however, strong opposition to increased tax rates, if proposed, can well be expected.

Unfortunately, no one solution can alleviate the serious county highway financial concerns. But as more county roads lack maintenance or improvement relief, changes to increase revenues for these purposes must be implemented. Instead of looking only to increasing revenues from various sources, the use of improved allocation schemes may benefit counties without necessarily overburdening taxpayers. Appropriations to governments (state, county, and city) from Indiana's MVHA, for example, could vary in proportion from year to year. A minimum percentage, based on historical need patterns and committed endeavors, could be allocated to each level of government for highway expenditures (say, 50 percent to state, 30 percent to counties, and 10 percent to cities); the remaining portion (i.e., 10 percent) would go to areas that demonstrate the greatest need in any given year. Need for increased revenue appropriations could also be worked into the LRSA appropriation scheme and the distribution of the MVHA at the county level. Conceivably, allocating funds to counties on the basis of actual needs may be desirable. The definition of needs, however, must be examined carefully.

At the same time, Indiana's county highway programs require stronger and more-consistent administration that provides for engineering and technical input so that available (though insufficient) road dollars can produce a more lasting benefit. When inadequate right-of-way, inadequate base, inadequate drainage, and inadequate pavement width are provided, scarce road dollars are soon wasted on the same old potholes. Therefore, in addition to addressing needs for additional highway funding, need for a better framework for administration of county highway programs should not be overlooked. Steps toward workable methods of efficient county highway financing and administration require immediate attention if a large part of the highway system in this country is to be spared from requiring costly replacement.

REFERENCES

1. Status of the Nation's Highways: Conditions and Performance. FHWA, U.S. Department of Transportation, Sept. 1977.
2. Highway Statistics. U.S. Department of Transportation, 1968-1978.
3. Federal-Aid Highway Bid Price Indexes. Engineering News Record, June 19, 1980, p. 82.
4. Statistical Abstract of the United States: 1979. U.S. Bureau of the Census, 1979.
5. 1976-1995 Indiana Highway Needs Study. Clyde E. Williams and Associates, Inc., Columbus, OH, Nov. 1976.
6. J.R. McCarthy. State Highway Finance and User Taxation in Indiana. School of Civil Engineering, Purdue Univ., West Lafayette, IN, Joint Highway Research Project JHRP-76-26, M.S. thesis, Oct. 5, 1976.
7. New Gas Tax Turns into Puny Bite for Streets, Highways. Lafayette Journal and Courier, Vol. 61, No. 183, July 1, 1980, p. A-3.

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