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Abridgment

Private Funds for Highway Improvements

DAVID W. SCHOPPERT AND WILLIAM S. HERALD

Public works finance has become a topic of increasing concern to officials at all levels of government. Fiscal restraint has become a national objective that has severely affected the ability of government to finance improvements from tax revenues. A review of the expenditures for highway projects indicates that increases in construction and maintenance costs have substantially diminished the purchasing power of current funding levels. There is general agreement that current funds from traditional sources are much less than the amount needed to even preserve existing performance levels in the future. One potential source of new or additional funds for highway improvements is the private sector. A number of techniques have been employed, primarily by local governments, to obtain private financial assistance for highway projects. These techniques and their success in securing private funds have varied widely. Several approaches are linked to land use regulation and the approval process for new development. Other mechanisms are based on innovative tax proposals. A brief description is provided of a number of examples of the use of private funds for highway improvements. A preliminary evaluation of techniques to obtain private funds indicates that incentive zoning, special-benefit assessments, and dedicated property taxes may offer the greatest potential for widespread application. Obstacles to the wider use of private funds may include legal restrictions and the financial burden imposed on developers. Several conclusions on the current status of private funding of highway improvements are offered. Although it is clear that a significant volume of private participation already occurs, there is little or no attempt to account for it. Thus, it is difficult to estimate the contribution that private funding can make to highway finance. The strength of the development market is a key factor in the private sector's willingness to pay for public works improvements. More research is needed to identify the opportunities for increased use of private funding sources in the future.

In the past decade, highway finance in the United States was severely buffeted by the twin forces of inflation and the general movement to stabilize or reduce taxes of all kinds. Although revenues for highways increased during the period, their growth rate did not begin to match the rapid increase in construction costs, which substantially outpaced the consumer price index.

As suggested in the following quotation, taken from a recent study of public works needs for the 1980s (1), the response to rising costs and lagging revenues has been to find new ways to finance highway improvements: "The deteriorated condition of basic facilities that underpin the economy will prove a critical bottleneck to national economic renewal during this decade unless we can find new ways to finance public works." For some highway officials, particularly in local government, a new way to finance improvements has been the use of private funds. Working primarily through discretionary powers in local land use regulations, transportation officials in many areas have negotiated for improvements to public highways at the initial expense of real estate developers.

In many cases, the use of these techniques has been successful in significantly reducing the amount of funding required for roadway improvements. Because of this success, there is an emerging interest in expanding the application of the concept.

The increased use of private funds for highway improvements will be accomplished by extending involvement to more local and state governments and more effective use of these mechanisms by communities in which they are already in use. To achieve this extension and increased effectiveness, better information on these mechanisms is required. There is a particular need to document and consolidate existing experience in order to illustrate the full range of techniques available and highlight methods to overcome obstacles to their use.

This paper takes the first steps toward meeting this need. The purpose is to identify some of the innovative mechanisms used to negotiate the commitment of private funds for highway improvements, describe some ways in which they have been applied, and assess their potential for widespread application in the future.

NEED FOR ADDITIONAL FUNDING

There is substantial evidence that the United States is not investing enough money in its streets and highways. For that matter, we are not investing enough in any public facilities. In the introduction to America in Ruins (1), the situation is described in these words:

> America's public facilities are wearing out faster than they are being replaced. Under the exigencies of tight budgets and inflation, the maintenance of public facilities essential to national economic renewal has been deferred. Replacement of obsolescent public works has been postponed. New construction has been cancelled.... The costs of rehabilitation and new construction necessary to maintain existing levels of service on non-urban highways will exceed $700 billion during the 1980's.

Figure 1. Price trends for federal-aid highway construction.

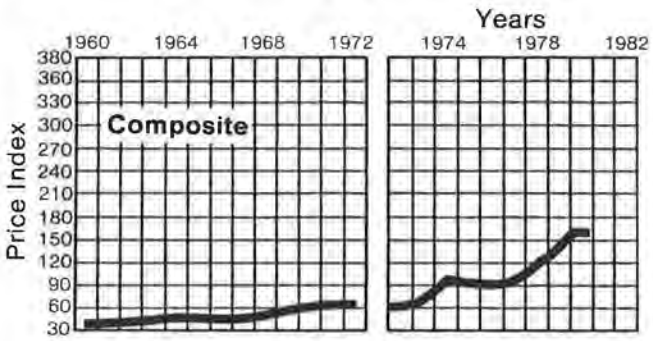
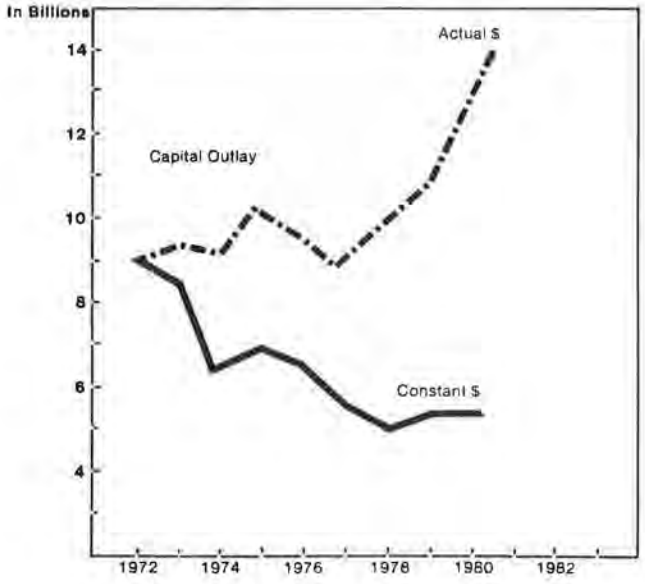


Table 1. Capital outlays for state-administered highways.

Year	Capital Outlay ($)	Construction Cost Index (1977 = 100)	Outlay ($ 1972)
1972	8 981 484	62	8 981 484
1973	9 383 859	70	8 311 174
1974	9 390 755	92	6 328 552
1975	10 168 550	91	6 928 023
1976	9 676 656	91	6 592 885
1977	8 882 863	100	5 507 375
1978	10 015 634	120	5 174 744
1979	11 798 070	138	5 300 582
1980	14 013 201	160	5 430 115
Total	92 311 073		58 554 934
Eight-year total	83 329 589		49 573 450

Figure 2. Disbursements for state-administered highways.



The highway finance problem is in large part the result of two trends of relatively recent origin: increasing costs and declining revenues.

Figure 1 shows the price trend for federal-aid highway construction from 1960 through 1980. Note that prices rose very gradually until about 1973, when they began to rise sharply. Except for a leveling off in 1975 and 1976, prices of federal-aid highway construction have continued to climb; in 1980 prices were roughly 2.6 times those in 1972. Table 1 shows what this has done to the purchasing power of capital outlays in terms of 1972 dollars. Capital outlays have grown very little since 1972; they averaged about $9-$10 billion until 1979 and 1980, when they increased to about $12 billion and then $14 billion. When those outlays are converted to 1972 dollars, it can be seen that they have not bought much. During the eight years since 1972, outlays of $83 billion have purchased only $50 billion worth of construction in 1972 terms. Clearly, increasing costs have had a dramatic impact on the highway system; a shortfall in investment value of about $30 to $35 billion has been created in the past eight years. The relationship between actual outlay and constant-dollar outlay is shown in Figure 2.

Figure 3. Growth of highway construction, consumer prices, and highway revenues, 1970-1979.

The other half of the picture is revenue. States derive most of their funds for highways from motor fuel taxes, although they use several other sources as well. For a variety of reasons (one is that most gasoline taxes are fixed rates per gallon; a second is the reduced rate of growth in vehicle miles of travel; and a third is the replacement of many vehicles with more fuel-efficient vehicles), revenue has not kept pace with costs. The Government Accounting Office (GAO) estimates that construction costs rose 145 percent from 1970 to 1979, whereas revenues rose only 60 percent. At the same time the cost of maintenance, administration, and debt service (for new bonds) also increased. Figure 3 shows cost, price, and revenue trends developed by GAO in their report to Congress on the Federal Highway Program (2).

These data on costs and revenues demonstrate that the funding resources for highways are insufficient to maintain the performance of the nation's highway system even at the level that prevailed in the mid- to late 1970s. Estimates of dollar needs for highways vary widely depending on the analysts' approach and whether the estimate includes all highways or only the federal-aid system. It is enough to realize, however, that funds needed for the highway system of the future (including resurfacing, reconstruction, maintenance, and new construction) far exceed the traditional available sources of revenue.

The clear choice, then, is either to accept the accelerating deterioration of the highway system or to find new ways to obtain needed highway improvements. Among the latter is the use of nongovernment funds.

REVIEW OF CURRENT PRACTICE

Techniques to obtain private funds for highway improvements have been employed most often by local governments. Although there are notable examples of private participation with state government projects, such as the Hackensack Meadowlands development described in the examples below, the major activity in this area has been a function of the power of local government to regulate the use of land.

Land use regulations vary widely across the coun-

try and reflect state-to-state differences in enabling legislation and regulatory approach. In general, however, legal systems for controlling the use of land employ the basic concepts of zoning and subdivision ordinances. These tools, when used in conjunction with the officially adopted local comprehensive plan, form the basis for public control and guidance of the development process.

It is not surprising, then, that the primary legal tools of zoning, subdivision, and site-plan approval have also formed the basis for obtaining private funds for highway improvements. Indeed, it is possible to view the development of the private funding for highway improvements as an extension of the normal application of the subdivision ordinance.

These two elements, the developer's responsibility for infrastructure and the process of bargaining with local officials for approval, have gradually evolved into a variety of systems designed to secure developer provision of off-site highway improvements. These improvements become a de facto condition for approval of the subdivision of formerly rural land for commercial use. It is these major off-site improvements that are of special interest in this study.

In addition to subdivision approval, such strategies for obtaining private involvement now also employ approaches based on an adequate public facilities ordinance and the zoning ordinance. The need for flexibility to respond to the current development market has led to the invention of a number of innovative zoning techniques such as floating zones, impact zoning, performance zoning, and incentive zoning. Although there are important distinctions among these techniques, they all reflect the need for flexibility in application, consider the impacts of a development on the adjacent area, and incorporate some degree of negotiation between developer and government to produce an agreement.

A preliminary survey of municipal transportation planners indicated that one mechanism for obtaining private funds for highway improvements is the project-approval process. This decision power is in the hands of local government when a developer requires a change in zoning, a special permit, or approval of a subdivision. Official approval of that request is made conditional on the developer's provision of necessary improvements and amenities. For example, in Fairfax County, Virginia, any request for rezoning or subdivision approval is to include "proffers" from the developer, which list the amenities and improvements (ranging from highway construction to children's play areas) that will be made if the approval is granted.

In approaching this effort, we must recognize that there are a variety of techniques that can be used to obtain private participation in funding highway improvements. Land use regulation is one category in a spectrum of financing techniques that also includes taxation, special assessments, and the use of public land for sale, lease, or development. A preliminary list of the available techniques would include the following:

1. Land use regulation
    a. Dedications and exactions: developers provide land and/or highway improvements (dedication) or cash (exactions) as a condition for zoning-subdivision or building-permit approvals
    b. Incentive zoning: incentives for increased floor space in exchange for developments that include desired street improvements
    c. Official maps: typically official maps preclude building permits for land within the proposed rights-of-way of major roads and streets
2. Taxes, special assessments, and service charges
    a. Tax-increment financing: all or part of the property tax increased beyond a frozen base in a specified district is reserved for street and highway improvements; other infrastructure investments may be included in addition to streets and highways
    b. Special benefit district: government levies a special charge on property within a specified district; widely used in residential areas by cities since the 1800s
    c. Service charges: a service charge is a special fee for site-plan approval; can be a one-time or continuous charge to recover costs of roads and streets
3. Public land acquisition
    a. Lease or sell air rights: the lease or sale of rights to build above the right-of-way (could also be below elevated freeways)
    b. Lease or sale of excess property: rights-of-way in excess of need are acquired prior to construction and then sold or leased to developers
    c. Joint development: highway agency contributes land and/or air rights or extends loans or loan guarantees to developers in exchange for an equity position in the development

Obviously, these techniques cover a wide range and are directed to more than just private funding sources. Some mechanisms, such as land use regulations, permit in-kind contributions of land or actual improvements rather than cash. Other techniques, such as tax-increment financing, are really using public tax receipts collected in a somewhat innovative fashion. To the extent that these new revenues would not be available without the specific need for highway improvement, however, it is possible to view them as private funds. The lease or sale of air rights or excess property can provide funds from private sources but only in exchange for assets of equal value.

Toll-financing, a prominent form of the use of private funds for highway improvements through the sale of revenue bonds, is not included in this list of techniques. This mechanism is already familiar to highway planners and constitutes a special case substantially different from the negotiated agreements for private funding that are of principal interest in this paper.

EXAMPLES OF DEVELOPER PARTICIPATION

To illustrate the diversity of the possible approaches, we have described several examples drawn from our experience with developer participation in financing highway improvements, which comes from serving both private and public clients throughout the United States and in several foreign countries. The following examples of a range of recent projects illustrate both the advantages and some disadvantages of this approach.

Transportation Improvement District--Denver, Colorado

Near Denver, Colorado, local governments and private business interests are working with examples of two techniques to generate continuing funding for transportation improvements in a very active development market. The Denver Technological Center (DTC) now has 1.8 million ft² of floor space and about 7000 employees. The local government, Greenwood Village, levies a head tax of $1.00 per employee per month on the employers located in the center. The funds generated by the tax are used by the village to provide various infrastructure improvements, which include highway facilities.

The area immediately surrounding the center has about 2.0 million ft² of commercial floor space that lies outside Greenwood Village. The developers who are active in DTC and its surroundings were instrumental in getting Arapahoe County to create a transportation improvement district for the entire area. The district prepared a transportation improvement program, which is keyed directly to the pace of proposed development. Improvements are financed by special assessments on the property within the district. Current projects include construction of an overpass on Yosemite Road over Interstate 25, construction of the Dry Creek Road interchange, and widening Belleview Avenue. The Colorado Highway Department has designed and is supervising construction of the improvements, for which the total cost is estimated to be $17.8 million.

It is significant that the improvement district was initiated by the developers as a mechanism to assure an orderly program for equitably allocating the costs. Especially noteworthy is the fact that the approach secures private funds but eliminates the continuing need for negotiation between developers and government. Therefore, a coordinated system of improvements can be implemented on a timely basis without the risk of delays or disagreements over each developer's financial responsibility. The employee head tax provides a stable and continuing source of funds that can be applied to problems with the highest priority for resolution.

State Control of New Development--Hackensack, New Jersey

For decades, the 21 000 acres of the Hackensack Meadowlands was viewed as a major opportunity for development in the New York metropolitan area. In order to assure that this valuable resource was used wisely, the State of New Jersey created the Hackensack Meadowlands Development Commission, which assumed all control of land use in the area, formerly administered by 14 different municipalities. The commission has actively pursued a policy of requiring developers to provide all types of transportation infrastructure. For example, Hartz Industrial Park was required to build and maintain a six-lane divided arterial with an actuated signal system at every intersection. Also required was a commuter rail station, privately funded bus service, an intermodal transportation center, an automated people-mover, and a complete access-road network. Many of these facilities were constructed, operated, and maintained at private expense.

Local Transportation Trust Fund--Roseville, California

To pay for needed highway improvements, the City of Roseville has a policy of exacting 2 percent of the construction cost of new developments. It is not known whether this policy has been tested in the courts, but it accords with proposals for growth management that have been put forward in California and other high-growth areas.

Public Corporation and Private Funds--New York City

The Lower Manhattan Plan called for development on fill between the bulkhead and pierhead lines in the Hudson River. As part of the development, the old West Side Highway was to be demolished and replaced with a partly depressed highway connecting to Battery Park Tunnel. This development was undertaken by the Urban Development Corporation (UDC), which is a public corporation financed by the sale of revenue bonds. UDC participated in financing the roadway improvements as well as the placement of the landfill and the construction of the development. Although UDC is not, strictly speaking, a private developer, it does develop housing and commercial property to achieve a public purpose and frequently finances infrastructure improvements to its sites.

OBSTACLES TO INCREASED PRIVATE FINANCING

One need is to examine the legal and practical obstacles to the the use of private funds for highway improvements. At this point, it is useful to take note of what these obstacles are in order to clearly focus our research priorities on the assessment of their impact and on methods to overcome them.

A preliminary list of problems in the use of private funds would include these concerns:

1. Administrative and institutional constraints,
2. Financial feasibility,
3. Context variables,
4. Transportation system development,
5. Cost allocation, and
6. Accounting and documentation.

As noted in the examples described above, the use of private funds for highway improvements requires extensive administrative effort and institutional coordination. Although there are legal limits on the extent that developers can be encouraged to finance or provide highway facilities, these limits have not been clearly defined and are not widely known.

Financial feasibility may pose a major practical obstacle to the use of private funds for highway improvements. The private sector will provide such financing only to the extent that it is advantageous to do so. If development revenues are not sufficient to provide the improvements sought by government, then there will be no addition to the municipal tax base and no improvements to local roadways.

Many developers already bear large financial burdens for the provision of infrastructure. In a typical single-family housing development, site-preparation costs range from $7000 to $12 000 per lot. Site preparation for townhouse lots ranges from $4000 to $7000. These costs include lot grading, clearing, sewer, water, and utility provision, but streets are an important consideration. For a single-family lot in a new subdivision, street costs will range from $3000 to $5000 per lot. In addition, residential and commercial developers often contribute substantial amounts of right-of-way and construction to arterial roads and streets. Such contributions have an impact on the cost of housing or office space for the consumer. These markets are currently in recession in many parts of the country and so it can be questioned whether they can support an additional burden.

Most of the techniques in current use are applied in urban areas, especially fast-growing suburban jurisdictions. Rural areas may require special

adaptation of these mechanisms before they can be applied. Similarly, the success of these techniques is closely related to the overall development market. Cities and states in growth areas like the South and West may have more success in obtaining private funds than stable or declining cities where the real estate development market is weaker. Local attitudes may also be significant; they may reflect a basic pro-growth or anti-government-regulation point of view that would influence local or state policy.

Another problem in the use of private funds for highway improvement is its impact on the orderly development of the transportation system. Reliance on developers to provide highway facilities may result in a jumbled pattern of piecemeal improvements. Frequently, private investment in highway improvements is poorly utilized because only short sections are improved or current traffic volumes do not warrant facilities required to serve an ultimate future development density.

PRELIMINARY EVALUATION OF TECHNIQUES

Recent research into innovative financing mechanisms for public transit may be transferable in part to highway improvements. Because of the lack of a stable funding source such as the Highway Trust Fund, public transit planners have been very active in exploring the potential for new, nongovernmental sources of funds for capital and operating expenditures. Although there are important differences between the development of highway and transit improvements, they share some common elements. Figure 4 presents a summary evaluation matrix of the techniques listed earlier, adapted from a study of transit financing (3).

The evaluation indicates that some types of mechanisms have considerably more promise than others, although none was ranked higher than moderate for overall potential. The dedicated property tax and the special assessment, similar to the Denver example described earlier, show relatively high value in terms of financing potential, institutional feasibility, and transferability. Other highly rated techniques include incentive zoning and the sale or lease of air rights. Techniques that show promise despite problems with institutional feasibility include tax-increment financing and service charges.

CONCLUSIONS

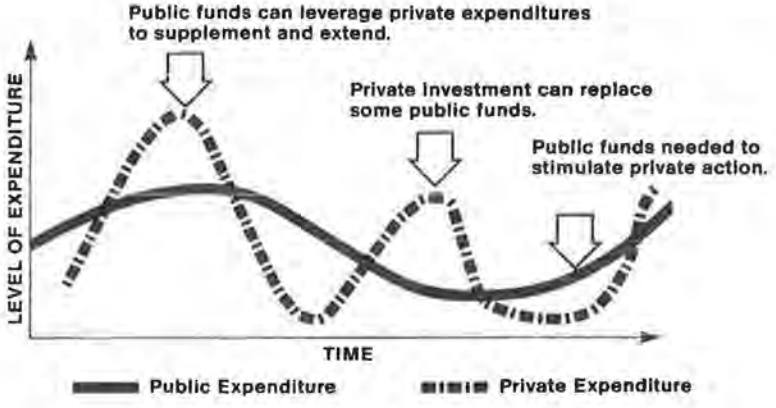
Available data on highway finance demonstrate that current levels of public funding are not adequate. Current expenditures are not sufficient to maintain even recent levels of highway performance on the

Figure 4. Preliminary evaluation of private funding techniques.

	Financing Potential	Institutional Feasibility	Scope for Use in U.S. Cities	Overall Promise for Highway Finance
Incentive Zoning	◑	◑	◑	◑
Special District Zoning	◑	○	○	○
Dedications and Exactions	○	◑	○	○
Official Map	○	◑	○	○
Dedicated Property Tax	●	●	◑	◑
Tax Increment Financing	●	○	◑	◑
Special Benefit Assessment	◑	◑	◑	◑
Service Charges	◑	○	◑	◑
Lease or Sell Air Rights	◑	◑	◑	◑
Lease or Sell Supplemental Property	◑	○	○	○
Develop Air Rights/Supplemental Property	◑	○	○	○
Participate in Property Development	◑	○	○	○

Legend: ● High ◑ Moderate ○ Low

Figure 5. Relation of funding potential to development market.



existing road system. This shortfall and future needs for new construction mandate consideration of new approaches in financing highway improvements. Involvement of the private sector in funding highway improvements has been successful in some cases and has significant potential for increasing the funds available.

The potential for obtaining private funds is closely related to the strength of the real estate development sector of the economy. Experience and common sense tell us that in an adverse market, the funds available for highway improvements are diminished. Figure 5 presents a simplified graphic representation of the economic context for the use of private funds for highway improvements. This graph shows that real government expenditures for this type of infrastructure tend to rise and fall in relatively gradual cycles. The real estate development market, however, is more volatile and can experience sharp increases and declines. Although the two areas are related, their peaks and valleys do not necessarily coincide. The result is a variation in the potential for private funding.

When the expenditures of government and the private sector are both at high levels, the potential for obtaining private funds is greatest. When government spending is reduced but the development market is strong (as is currently true in some areas of the country), there is potential for private funds to replace some portion of public spending. When the development market is depressed (as is currently the case in many other parts of the country), increased public expenditure may be needed to stimulate private investment.

Review of analyses of innovative financing mechanisms for other types of transportation improvement suggests that there are some techniques that hold considerable promise. These include incentive zoning regulations that offer a developer density increases in exchange for public improvements and dedicated property taxes or special benefit assessments that set aside all or a portion of a levy on a specified group to pay for needed improvements. The lease or sale of air rights may also provide a source of private funds.

The review of current practice and examples of the use of private funds indicates that there is substantial experience and current activity in this field. Preliminary investigations suggest that there may be no way to estimate how much activity of this type exists. Moreover, experience with techniques to obtain private funds is extremely varied. Further study and analysis are needed to document past experience and extend the knowledge of useful techniques to highway planners throughout the country.

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State Highway User Taxes: Comparative Tax Structures and Current Trends

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An attempt is made to interrelate and analyze the important state highway user taxes within their historical context. First are the registration fees for automobiles and light trucks. These are sometimes referred to as first-structure taxes. Second are the motor fuel, or second-structure, taxes. Third are the heavy-truck registration, weight, and mileage taxes, or third-structure taxes. Eighteen states increased and five states decreased their automobile registration fees in 1981. Some states have changed from flat fees to fees based on weight or horsepower to encourage the energy-saving potential of lighter vehicles. Five states base their fees on weight and age or value. This is one method of trading off the conflicting values of energy conservation and not unduly penalizing low-income households that own older, heavier vehicles. A motor fuel tax is relatively inexpensive to administer and is most closely related to use, so the taxes to cover costs of providing highway service can be related to the benefits received. As a result, 26 states increased their motor fuel taxes in 1981. In order to keep up with inflation, eight states have completely converted their motor fuel tax from a cents-per-gallon to an ad valorem tax (percentage of price). Ten states have changed to a combined cents-per-gallon and ad valorem tax. User taxes for heavy trucks include graduated registration fees and weight, mileage, and gross-receipts taxes. Generally, states attempt to relate taxes to benefits obtained from highway service and the costs occasioned to the system and seek to minimize administrative costs of collecting the taxes.

Beginning in the last quarter of the 18th century and extending to the railroad era in the middle of the 19th century, tolls were levied to support turnpikes in America. Aside from these early tolls, which were very grudgingly paid, the first user tax was a registration fee. The first registration fee was enacted by New York in 1901 as a regulatory mechanism; the practice soon spread and by 1921 every state required registration fees.

The next type of user tax was the fuel tax, first adopted by Oregon in 1919. This tax spread quickly throughout the country, and by 1929, all states had levied fuel taxes. One reason for the popularity of the fuel tax was that it was related to road use to some degree. Since heavier vehicles consumed more fuel than lighter ones, the fuel tax compensated for some of the additional wear by the heavy vehicles. Another reason for the popularity of the fuel tax was its low collection and administration costs. Typically, less than 1 percent of receipts was used for those purposes.

Although registration fees and fuel taxes were