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Research Study Title: New and Innovative Revenue Sources for Transportation

16. Abstract

A range of actions to address the transportation revenue shortfall is identified in this report. "Refinancing" refers to the fact that while existing dedicated motor fuels tax and vehicle registration fee sources will continue to be the most significant portions of the TxDOT revenue stream, the funding environment and opportunities are changing—there is also a greater emphasis on increasing the flexibility of funding actions.

General concepts recommended for action include opening State Infrastructure Banks for all modes, using toll highway and value pricing concepts for their ability to generate revenue and to act as a match for federal funds, and using practices that are familiar to the private sector but new to the Texas Department of Transportation. A non-revenue action that is an integral part of addressing the funding needs is an education and information campaign oriented toward the public and decision makers. Emphasizing the role of transportation in the economic and social well-being of society will improve the competitive position of transportation in an era of limited governmental and private sector resources.

Funding options for specific modes were similar in that they relied on partnerships between the public agencies, the transportation provider, and the users. Integrating the planning activities and the funding options among these groups for each mode will result in a stronger financial position and better operations for the transportation system.

Products from the study include a short executive summary oriented toward the public, business leaders, and decision makers; a report summarizing the analyses and presenting recommendations; and an appendix with more detailed information.

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REFINANCING TEXAS TRANSPORTATION

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TRANSPORTATION: AS NATURAL AS BREATHING...

...AND ALMOST AS IMPORTANT

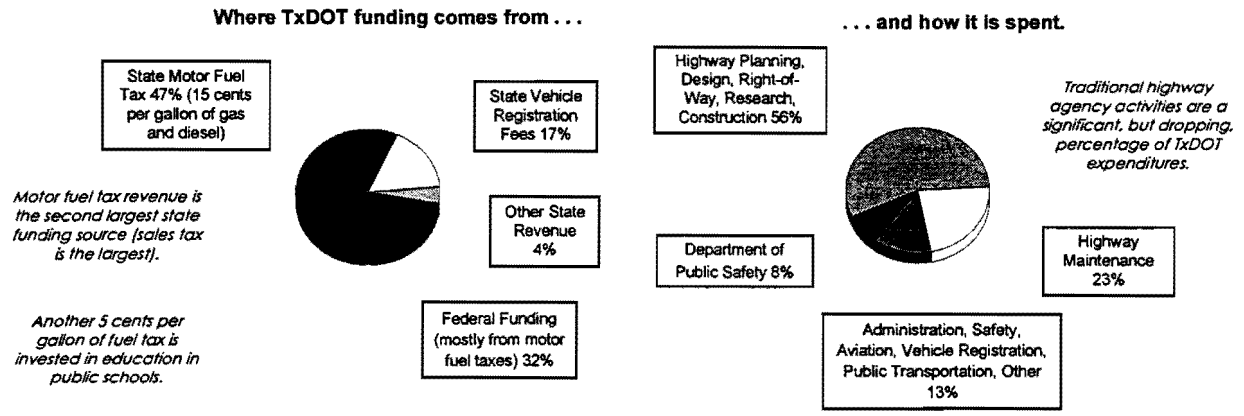
Breathing comes naturally. We don't think about it. We just do it. The same could be said about transportation, particularly when you're talking about Texas. We breathe in, we breathe out. We drive, we ride buses, we fly. Transportation, like breathing, is something we just expect. We expect to be able to:

- get in our cars every day, back out of the driveway onto a good street, and head to the freeway or maybe the farm-to-market road, and go to work.
- buy fresh produce because the transport plane delivered those bananas from Brazil and avocados from California to the airport, where the tractor-trailer rig picked them up and trucked them to the supermarket.
- receive that contract from Seattle that was delivered overnight.
- board that public transit bus and get to work on time.

While we take these goods and services for granted, they aren't free. The Texas Department of Transportation (TxDOT) has responsibility for supporting each part of our transportation system that is represented in the actions above. It faces the challenge of securing the funding—from federal, state, local, and private sources—to keep the transportation system in working order.

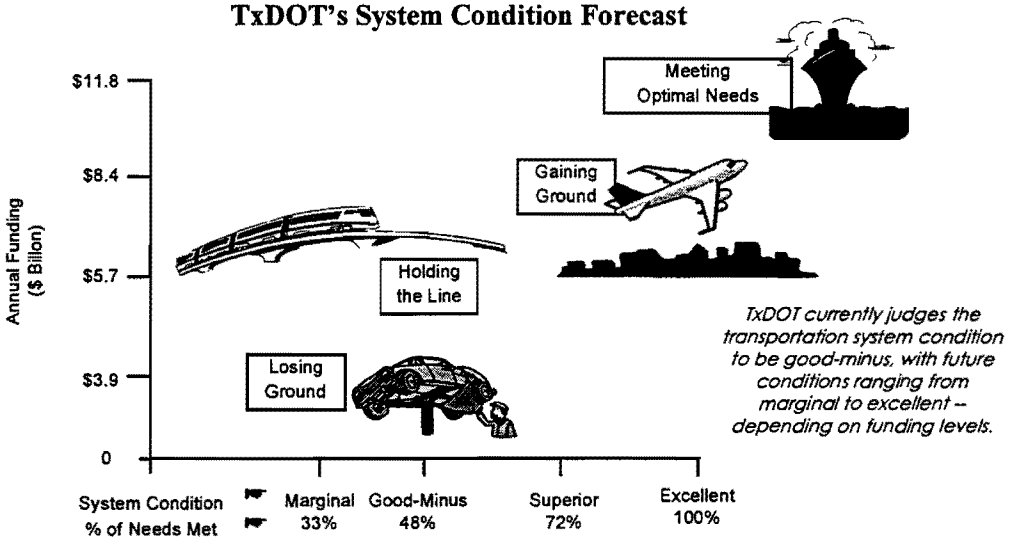
This report examines alternative financing mechanisms to ensure that transportation needs are met for: highway, public transportation, ports and waterways, and general aviation. No single solution is appropriate for all transportation financing challenges. The answer lies in tapping into many resource streams and in using financing alternatives that will be supported by Texas citizens and businesses.

THE CURRENT PICTURE



Transportation needs for all modes (as estimated by TxDOT's Transportation Needs Revenue Assessment) can be described in terms of level-of-service scenarios; they are shown below with their associated costs.

TxDOT's System Condition Forecast



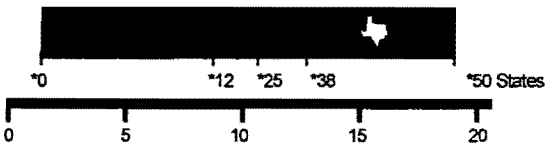
REVENUE-RAISING POTENTIAL

Texas is in the upper quarter of all states in the amount of revenue raised from highway users (including all taxes, fees, and tolls raised, not just those dedicated to highway or transportation users). While some taxing potential remains before Texas becomes the most expensive state for highway use, two factors must be kept in mind:

- raising taxes and toll rates by as little as 25% (compared to the 60% increase in revenue needed to meet the Holding-the-Line scenario) would make Texas the most expensive of all states, and
- Texas can expect some adverse economic and development effects if transportation tax rates are raised significantly above all other states.

Highway User Tax Rate

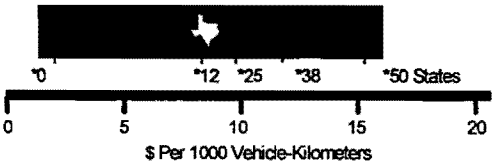
Texas is near the top of all states in highway tax rate. An average of $15.80 is collected for every 1000 kilometers traveled.



*Note: Number represents the number of states with tax rates lower than noted.

Highway Spending Rate

Texas ranks 14th of all states in state and local taxes used for highways. Slightly less than $9 per 1000 kilometers traveled is spent on state and local roads.



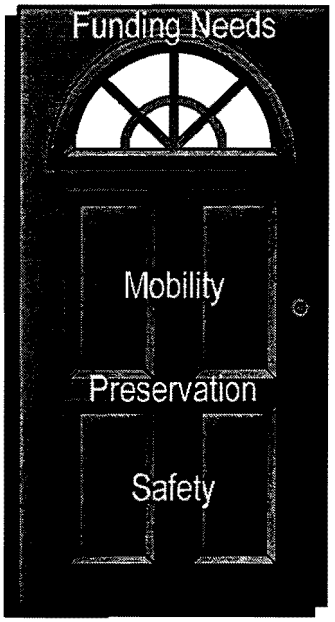
*Note: Number represents the number of states with spending rates lower than noted.

The overall tax rate for individual Texans, however, is very low relative to other states; in fact, it is in the lowest quartile of all states. The relationship between transportation taxes (which are relatively high) and the overall tax rate (which is relatively low) suggests that the broader revenue focus of this research report is appropriate, and a diverse set of financing solutions will be needed.

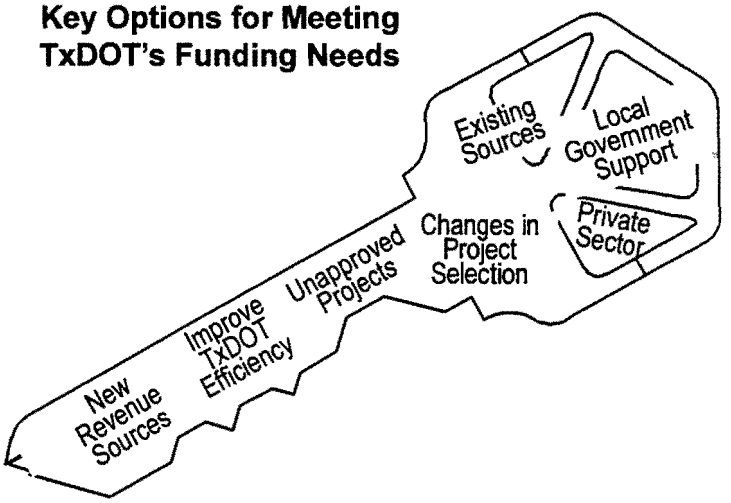
THE KEY TO RAISING REVENUE

Flexibility is the key to unlocking the door to Texas' funding future. Implementing new methods and revising some existing practices will produce the revenue to make transportation needs become transportation reality. Several actions are of a general nature or can be used to fund more than one mode; others present different ways of looking at the funding needs.

- Changes to the Unified Transportation Program procedures—Allow the private sector the opportunity to participate as a funding partner on all projects before public funding is committed.
- Efficiencies within TxDOT—Improve the amount of service or construction delivered per dollar expended. Some federal-level changes will help TxDOT improve the management of its cash flow and projects.
- Support for local governments—Assist other agencies in performing transportation functions and identifying funding so that they may assist TxDOT in meeting Texas' needs.
- Unapproved projects—While not a funding source, it should be noted that some needed projects may not be approved for construction, even if funding were available.
- Existing sources—Motor fuel tax rates and vehicle registration fees should be increased. Both revenue potential and some other desirable effects can be achieved from raising taxes and fees related to "consumption" of transportation services.
- Support from the private sector—TxDOT can learn from private-sector practices, but the public sector also needs businesses to clearly state the importance of transportation.



Key Options for Meeting TxDOT's Funding Needs

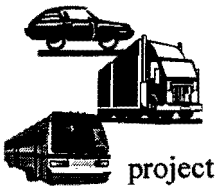


COMMON ELEMENTS AND BROAD THEMES

No single source or action will fund transportation improvements. It's going to take a multitude of solutions, all working together. Many of the ideas in the report cross transportation mode lines and adapt themselves well to several situations. Listed here are some of the best:

- ✓ Improve the type and amount of information to the public. The more the public understands about the value of transportation, the more likely it will be to support new revenue-raising methods.
- ✓ Apply lessons from private-sector practices on managing funds and leveraging revenue sources. Fund-management options include using toll revenue as credit for the state share of federally funded projects and using relatively small amounts of public money to support private development that benefits transportation. Toll roads or facilities that combine transit and office/commercial development can extend transportation funds.
- ✓ Continue using the tried and proven method, "user pays." With new technologies such as electronic toll debit systems, transportation users can be assessed fees that more closely represent their impact on the transportation system. These technologies also give the state more flexibility in addressing equity and fairness issues.
- ✓ Move toward a more flexible and multimodal transportation funding package. In the future, transportation decisions should be based on projects and services that meet passenger and freight transport needs most cost-effectively. There should be a program such as the State Infrastructure Bank for all types of transportation improvements.

MODAL FUNDING HIGHLIGHTS



Private participation in TxDOT's road expansion and construction program can stretch public dollars in some congested urban corridors. "Value" pricing and a mix of public and private funding offer new and expanded funding options, but the project selection methodology must support these new opportunities by looking at all modal funding possibilities.

Significant revenue must be raised, however, and a mixture of increased motor fuel tax rates and vehicle registration fees might be a solution. TxDOT is more likely to win approval for higher fees if citizens are allowed to vote for funds that will be spent on local projects. Rewarding cities for increased transportation funding efforts (adjusted for income levels) will bring local commitment and creativity to the problem.

Establishing a dedicated source of state funding for small city and rural transit systems would greatly enhance the ability of these systems to provide needed services. Transit can also benefit from a Transit State Infrastructure Bank and the use of toll revenue credits. Reestablishing a local matching requirement would provide the federal, state, and local partnership critical to a successful program. Developing a coordinated approach among TxDOT, transit agencies, transit organizations, and other groups will be needed to move these state and local efforts forward.

Educating Texas communities about the benefits of the general aviation industry is an important step toward funding smaller airports. A partnership between the local airports, users of general aviation facilities, local governments, and the state can identify priorities and apply for funding from the Federal Aviation Administration's Innovative Financing Demonstration Program. It will be important for all to contribute funding to the solution.

Additional user fees and a state loan program can provide a mix of "user pays" and state support to meet maintenance needs on the Texas Gulf Intracoastal Waterway and at the state's small ports. User fees on marine fuel and weight-based taxes on shipping can spread the load to shippers with a relatively low increase in costs.

IMPLEMENTATION STATEMENT

The written products from this project—a research report, a project summary, and an appendix—can assist TxDOT in beginning several efforts that are necessary to address transportation funding needs for Texas. The documents are intended for a variety of audiences—legislators, local elected officials, other decision makers, transportation and business associations, business leaders, the public, and the professional staff of governmental agencies.

Information coming from the project may be used by TxDOT staff to promote the following key activities:

- Developing an information campaign on the importance of transportation;
- Forming partnerships, common strategic plans, and information campaigns with a variety of transportation and business groups;
- Evolving the project selection process (as much as possible) toward mode-neutral funding schemes that capitalize on the incentives and flexibility that are open to state departments of transportation;
- Recognizing that there are many other activities that can be pursued which have the effect of decreasing TxDOT's construction or operation responsibilities by providing other governmental or private entities with increased funding; and
- Assisting TxDOT district and division personnel in understanding their key role in identifying and pursuing possible joint funding opportunities or leveraging options with public and private partners.

There are several specific funding initiatives that are identified in the report, some of which require Transportation Commission or legislative changes. TxDOT's successful financial future is dependent upon its success in partnering and leveraging its funds. Not only is it important that senior TxDOT staff promote this approach, but project planners and engineers must also understand the approach and put it into common practice during the project planning and development stages.

DISCLAIMER

The contents of this report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Texas Department of Transportation or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation. In addition, this report is not intended for construction, bidding, or permit purposes.

ACKNOWLEDGMENTS

This research was performed in cooperation with the Texas Department of Transportation and the Federal Highway Administration. The information developed in the project was the product of several TTI researchers. Their contributions are noted below as a way of acknowledging their efforts and providing the reader with access to their expertise.

Highway finance issues—Thomas L. Glenn and David R. Ellis
Public transportation finance issues—Katherine F. Turnbull
Aviation finance issues—Ann C. Horton and George B. Dresser
Port and waterway finance issues—Zane A. Goff
Project coordination and report preparation—Timothy J. Lomax

The project director is Dawn Doyle and program coordinator is Joanne Walsh, Management Services Office of the Texas Department of Transportation, Austin, Texas.

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CHAPTER 1
INTRODUCTION

Since the inception of the Texas Highway Department in 1917, providing for "the safe, effective and efficient movement of people and goods," has increasingly demanded that the state's transportation agency assume a larger and larger role in the transportation arena. In 1991, the 72nd Texas Legislature established the Texas Department of Transportation by merging the State Department of Highways and Public Transportation, the Texas Department of Aviation, and the Texas Motor Vehicle Commission. Texas' funding for highways is constitutionally dedicated, coming mostly from user fees. Programs other than highways do not have dedicated funding and must compete for general revenue funds. Additionally, federal law requires Texas to carry out statewide multimodal planning that is fully integrated with decision making.

TxDOT's Scope of Operation

The Texas Department of Transportation constructs, operates, and maintains a state highway system, operates two ferry systems, assists general aviation and public transportation through a variety of services and programs, and serves as the local sponsor for the Gulf Intracoastal Waterway.

To fulfill these varied responsibilities, TxDOT has developed the Texas Transportation Plan, which addresses the complete public and private sector transportation picture in Texas: air, rail, highway, transit, bicycle, pedestrian, water, pipeline, and telecommunications. TxDOT is also striving to improve connections between the different modes of transportation to attain the goal of a smoothly functioning system that meets the needs of travelers and businesses.

The Texas Constitution dedicates revenue in the form of motor fuels taxes and vehicle registration fees, which provide the foundation for TxDOT operations. Various statutes regulate the department's operations and spending authority relating to highway funding options, construction, maintenance and operations; public transportation funding; traffic safety services; aviation funding and services; support for the Gulf Intracoastal Waterway, and other transportation-related services and programs (Figure 1).

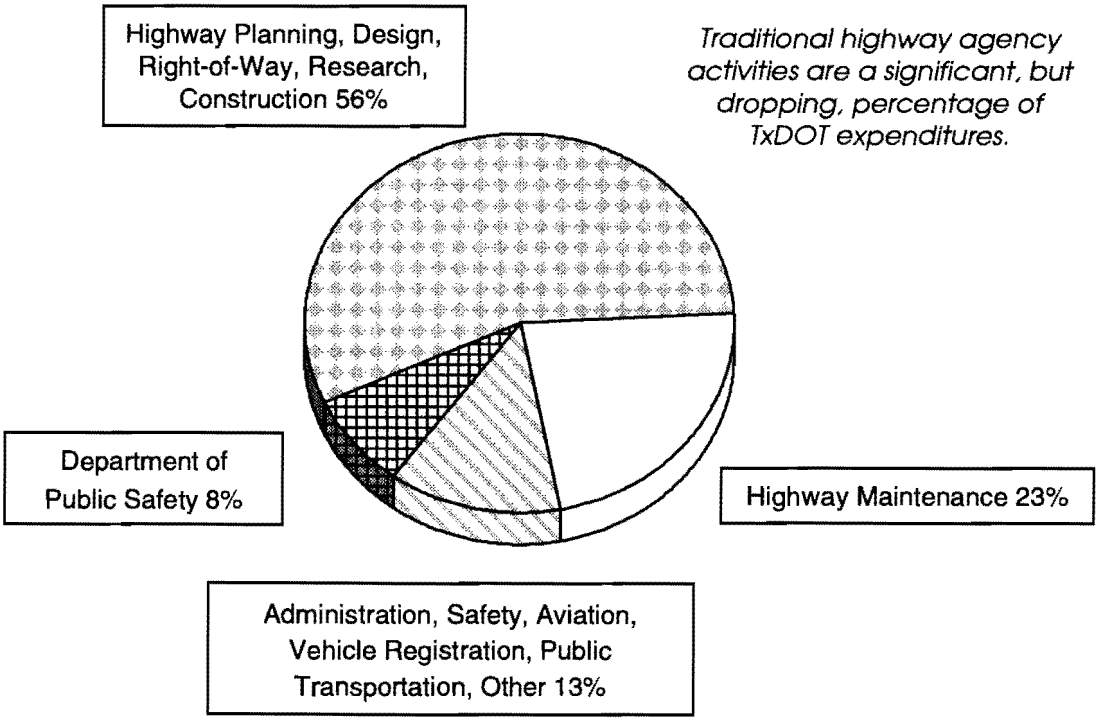


Figure 1. TxDOT Expenditure Categories

TxDOT's Funding Challenge

Transportation funding at the federal and state level has been characterized by reliance on dedicated revenue from motor fuel taxes and other transportation-based fees. Tolls and other directly paid user fees (as opposed to "pay at the pump" fees) are a significant part of the funding in some states, but not in Texas. As the public and businesses have grown concerned about the performance and condition of the nation's transportation infrastructure, toll projects are becoming more numerous.

The Intermodal Surface Transportation Efficiency Act (ISTEA), the law that authorized federal spending on transportation from December 1991 until September 1997, gave local governments enhanced roles in planning and spending federal funds for transportation in cities with populations greater than 50,000. Cities with populations of more than 200,000 decide transportation investments for their respective areas in cooperation with TxDOT. ISTEA also broadened the funding procedure options and revenue generating alternatives for state DOTs. This report is only one of several efforts that are virtually rewriting 40 years of transportation funding at all levels of government. The private sector and states that have had active debt

programs will recognize many of the options as established practice, but for many transportation professionals familiar with dedicated, predictable, pay-as-you-go funding, these are challenging times indeed.

Summary of TxDOT's Transportation Needs Revenue Assessment

There are, however, external forces which act to diminish the quality of transportation service provided to Texans, including unfunded federal mandates, inflation, and growth in transportation demand. Unfunded mandates divert resources from direct transportation uses. Highway cost inflation reduces the transportation buying power of tax revenues. Finally, increasing demand for transportation due to increasing population and economic development places further pressure on what the tax dollar can continue to provide in terms of safety, system preservation, and mobility.

TxDOT's Transportation Needs Revenue Assessment (1) identifies the funding required to provide various levels of transportation service to Texas travelers and shippers. The scenarios describe annual revenue needs between 1997 and 2006 (using a 3.66% annual inflation rate) and the associated consequences. Figure 2 illustrates the system condition resulting from the four different levels of investment in the Transportation Needs Revenue Assessment report.

Where the Money Comes From Now

The Texas transportation system is funded by taxes and fees dedicated to the State Highway Fund and general revenue sources. Furthermore, the State Highway Fund (Fund 6), the largest source of transportation funding, contains funds dedicated to highway uses only and non-dedicated monies, but other sources are important and may play a much larger role in the future (Figure 3).

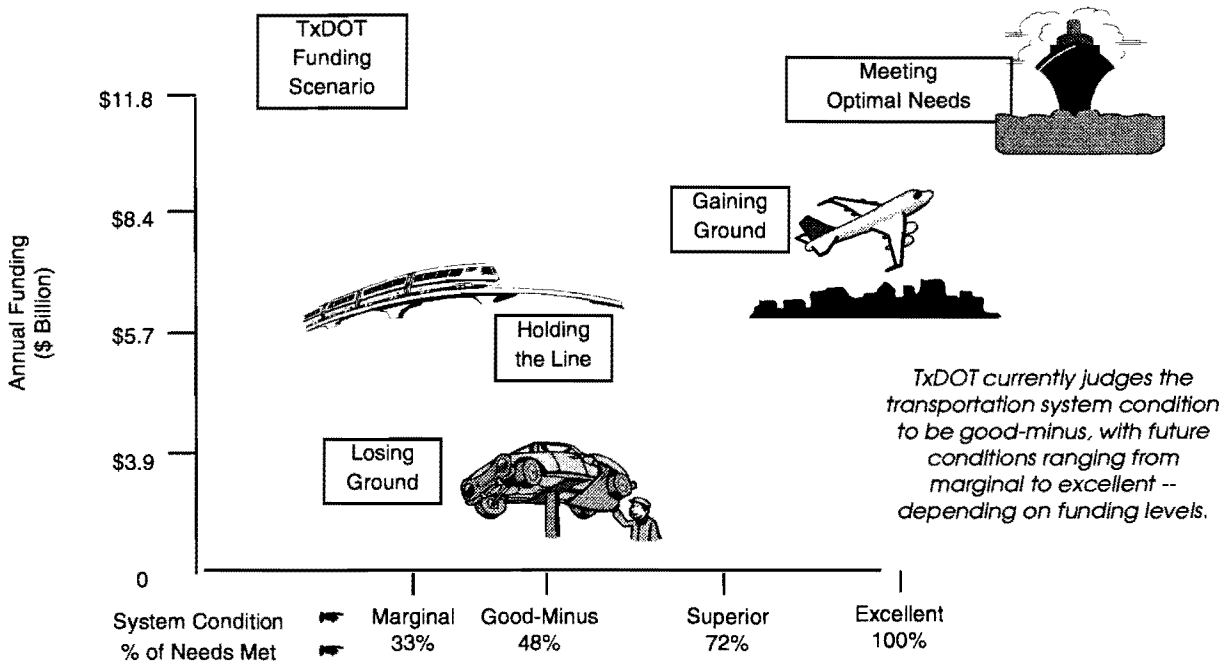


Figure 2. TxDOT's System Condition Forecast

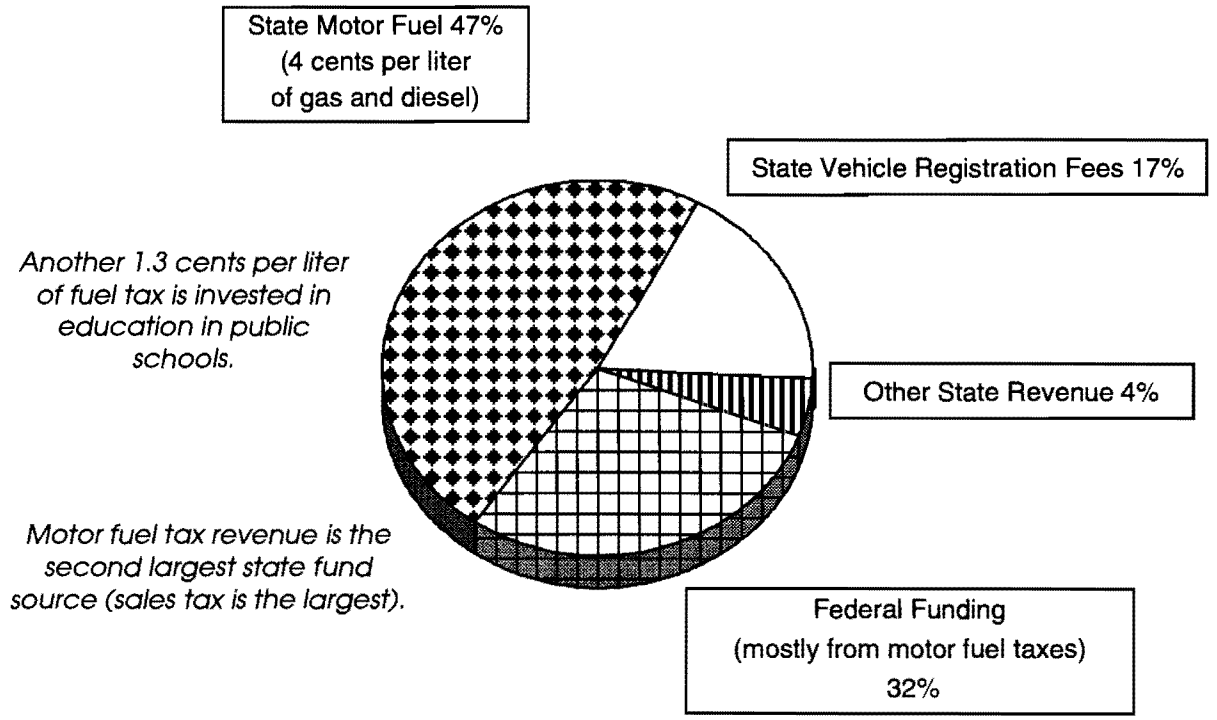


Figure 3. TxDOT Revenue Sources for Fiscal Years 1997 and 1998

State Highway Fund. Seventy-five percent of gasoline and diesel motor fuel taxes collected are deposited into the State Highway Fund and dedicated to highway uses. The other 25% is dedicated to public school education. Federal reimbursements from federal motor fuel taxes collected are placed in the State Highway Fund and dedicated to highway uses also. A number of other taxes and fees are dedicated to the State Highway Fund. These include the motor lubricants sales tax (dedicated to highway uses only) and a portion of the motor vehicle title certificate fee, motor vehicle registration fee, special vehicle registration fee, and sales of machinery and equipment (Table 1). These sources are estimated to provide $3.3 billion in FY97 and $4.2 billion in FY98 (2). (An accounting action to provide $313 million more revenue to the state general fund in FY97 will result in a similar revenue increase for the State Highway Fund in FY98. This is a periodic action that does not alter the amount of revenue received by the Highway Fund, but it could be misinterpreted by readers of the Biennial Revenue Estimate).

Table 1. State Highway Fund Revenue Sources

Revenue Source	*FY 1997 ($ million)*	*FY 1998 ($ million)*
Federal Receipts-Matched	$1,126	$1,314
Motor Lubricants Sales Tax	24	25
Motor Vehicle Title Certificate Fees	17	17
Motor Vehicle Registration Fees	623	630
Special Vehicle Registration Fees	10	10
Sale of Machinery and Equipment	10	10
Supplies/Equipment/Services - Federal (Other)	60	60
Interest on State Deposits	25	23
Motor Fuel Tax Allocation	1,434	2,077
Other Revenue	25	25
Total Estimated Fund Revenue	$3,353	$4,191

Numbers may not add to total due to rounding.

Source: (2)

State Revenue. One of the major sources of state income is the sales and use tax. The Comptroller estimates that $23.7 billion will be collected from the sales and use tax in the 1998-99 biennium, an increase of 8.2% over the previous biennium. The second largest

source of state revenue, however, is motor vehicle taxes, a class separate from motor fuel taxes (2). These sources are not dedicated for transportation purposes but include the motor vehicle sales tax, motor vehicle rental tax and manufactured housing sales and use tax. These sources are estimated to contribute $4.2 billion to state revenue during the 1998-99 biennium. This is an increase of 8.4% from the previous biennium and is a greater amount than the portion of motor fuel taxes that go to the State Highway Fund. There are several other transportation-related revenue sources noted in Table 2 that are deposited in the General Revenue Fund (2).

Table 2. Transportation-Related Revenue Deposited in the Texas General Fund

Revenue Source	*FY 1997 ($ million)*	*FY 1998 ($ million)*
Motor Vehicle Sales and Use Tax	$1,837	$1,915
Motor Vehicle Rental Tax	128	137
Gasoline and Diesel Fuel Tax[1]	937	346
Motor Vehicle Title Certificate	7	7
Motor Vehicle Sales Tax-Seller Financed	34	35
Waste Tire Recycling Fee	29	13
Motor Vehicle Inspection Fees	54	55
Battery Sales Tax	16	16
Driver License Fees	72	73
Driver Record Information Fees	43	43
Manufactured Housing Sales and Use Tax	30	34
Total Estimated Revenue	$3,187	$2,674

[1]Represents the amount not deposited in the State Highway Fund.

Source: (2)

Conclusions

There are several transportation-related fees and taxes which are deposited in the state general revenue fund. These represent a range of impacts and effects on the need for transportation infrastructure and services. They range from direct impacts, such as the motor fuel taxes, to less direct impacts, such as motor vehicle sales and driver's license fees. They also include relatively indirect charges such as driver record information fees. These are important in a discussion of innovative finance treatments not just for the revenue potential for transportation

projects, but also for the possibilities to use these revenue streams to secure bonds and for the fact that they represent significant contributions by the transportation sector to state government funding. This report identifies several actions that could increase the funding options open to TxDOT by focusing on the direct impact end of the funding option range.

CHAPTER 2
EVALUATING TRANSPORTATION REVENUE IN TEXAS

Transportation is an integral and significant part of the world's economy and, as such, it is affected by technological, social, political, environmental, and other trends. These trends impact transportation cost, transportation use, or land use, and, directly or indirectly, they also affect TxDOT.

Revenue Raising Potential

Taxes and fees from transportation-related activities are a significant part of the public sector revenue stream in most states. The amount of money raised from transportation sources might be thought of as the "transportation tax," as viewed by the general public and businesses. That this money does not all go to funding transportation needs is only partially relevant to the discussion. The taxes and fees mean that a significant portion of these revenues are expended for planning, constructing, and operating roadways. The public discussion about increasing these revenues for TxDOT's use may include a comparison of Texas' transportation tax level relative to other states.

The individual tax rate for Texans is very low compared to other states. Figure 4 illustrates that Texas' overall tax rate per capita is in the lowest quarter of all states. Texans paid 5.0% of their income in all state taxes in 1996, making them 4th in the country for lowest state tax rate. This compares to a rate of 5.8% for the 10th lowest state rate and 6.9% for the 25th lowest state. The highest state tax rates are just above 10%.

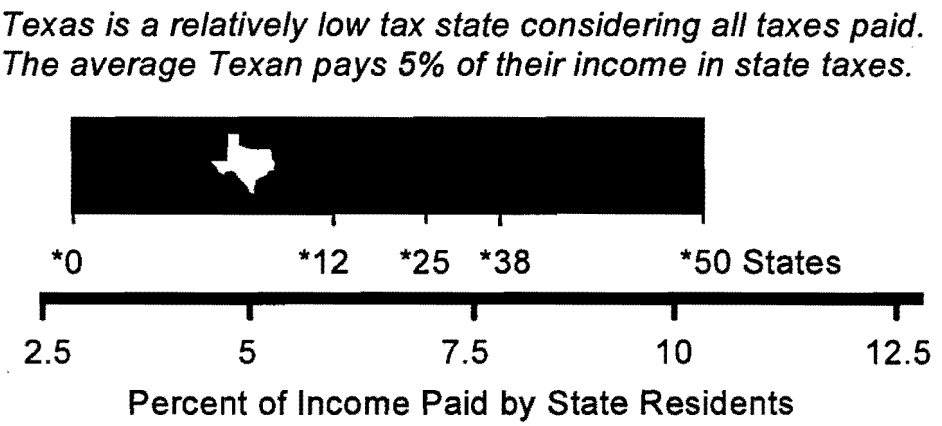


Figure 4. 1996 State Tax Rate as a Percent of Income

Discussions of state transportation funding usually begin with the gasoline tax rate. The federal tax rate is 4.86¢ per liter. State tax rates vary from 2¢ to 9.5¢ per liter (Table 3). Texas' tax rate of 5.28¢ per liter ties it with six other states and the District of Columbia for 21st highest. Unfortunately, this simple comparison masks several different state policies regarding the funds raised by the state motor fuel taxes. Texas' dedication of 25% of motor fuels tax revenues to public school funding is only one example of these differences.

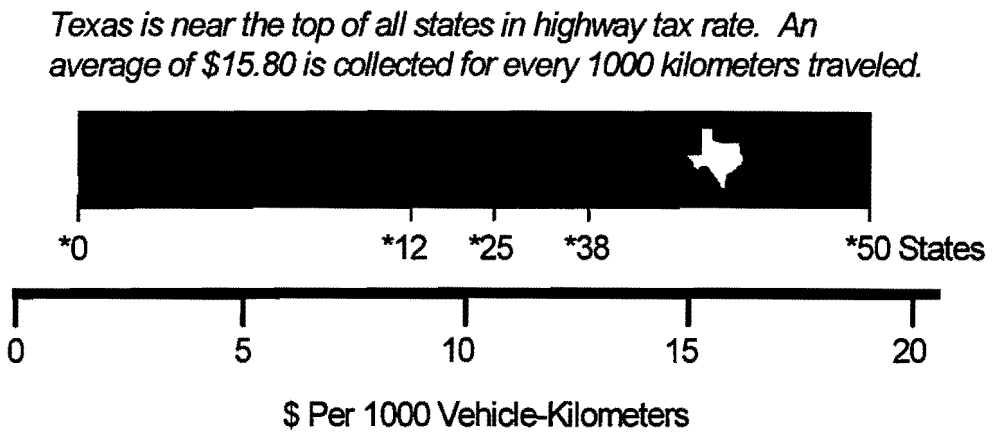
More relevant is the comparison between the transportation taxes or fees and the funding that goes to transportation uses. Expressing those numbers in a ratio with vehicle travel distance allows state-to-state comparisons. Figure 5 illustrates that Texas is in the upper quarter of all states in the state and local roadway tax rate. These include all taxes, fees, and tolls raised, not just those where the revenue is dedicated to highway or transportation uses. While there is some taxing potential remaining before Texas becomes the most expensive state for highway use, two factors must be kept in mind.

- A 25% increase in the state tax and toll revenue rate would put Texas at the most expensive of all states. A 25% increase is relatively small in relation to the identified needs.

Table 3. State Gasoline Tax Rates, December 1, 1997

State	*Gasoline Tax*	
	Rate (cents per liter)	*Effective Date*
Alabama	4.8	6/01/92
Alaska*	2.1	7/01/61
Arizona	4.8	7/01/90
Arkansas*	4.9	7/01/96
California	4.8	1/01/94
Colorado	5.8	1/01/91
Connecticut	9.5	7/01/97
Delaware	6.1	1/01/95
District of Columbia	5.3	10/01/94
Florida*	3.4	1/01/97
Georgia	2.0	7/01/71
Hawaii*	4.2	7/01/91
Idaho	6.6	4/01/96
Illinois	5.0	1/01/90
Indiana*	4.0	4/01/88
Iowa	5.3	1/01/89
Kansas	4.8	7/01/92
Kentucky	4.3	7/15/94
Louisiana	5.3	1/01/90
Maine	5.0	7/17/91
Maryland	6.2	5/01/92
Massachusetts	5.5	1/01/91
Michigan	5.0	8/01/97
Minnesota	5.3	5/01/88
Mississippi*	4.9	7/01/93
Missouri	4.5	4/01/96
Montana*	7.1	7/01/94
Nebraska*	6.7	4/01/97
Nevada	6.3	10/01/92
New Hampshire	4.9	6/07/93
New Jersey	2.8	7/01/88
New Mexico*	5.0	7/01/96
New York	6.0	4/01/97
North Carolina	6.0	1/01/97
North Dakota	5.3	1/01/96
Ohio	5.8	7/01/93
Oklahoma*	4.5	7/01/89
Oregon	6.3	1/01/93
Pennsylvania	6.8	5/01/97
Rhode Island	7.7	7/08/94
South Carolina*	4.2	1/01/89
South Dakota	5.5	5/01/97
Tennessee*	5.3	4/01/89
Texas	5.3	10/01/91
Utah	6.5	7/01/97
Vermont	5.3	8/01/97
Virginia	4.6	7/01/92
Washington	6.1	4/01/91
West Virginia	6.7	5/01/93
Wisconsin	6.3	4/01/97
Wyoming	2.4	7/01/89
Federal Tax	4.9	10/01/97

*State with statutory restriction limiting state motor fuels tax revenues to be used for highways only.
Source: (4,5,6)



*Note: The number of states where the tax rate is lower.

Source: (4)

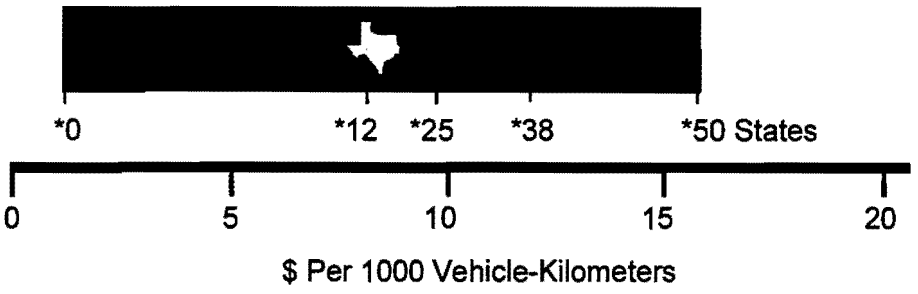
Figure 5. Highway User Tax Rate–State and Local Taxes

- There would almost certainly be adverse economic and development effects if Texas unilaterally raises its transportation tax rate significantly above all other states. Some of these effects would occur even before Texas reached the highest existing rate.

Texas ranks fairly low, however, in regards to the amount of transportation revenue used for highways (Figure 6). The difference between the transportation-related tax rate (Figure 5) and taxes used for highways in Texas is the largest disparity of any U.S. state. A significant challenge to funding Texas' transportation system is the difference in perception between Texas highway users, who pay a greater than average tax rate per kilometer compared to other states, and Texas' transportation officials, who receive one of the lowest percentages of that state tax when compared to other states.

The relationship between transportation and overall tax rate suggests that a focus on measures that will increase funding for transportation from a broad range of sources is appropriate. Focusing only on transportation funds received by TxDOT misses the reality as viewed by the taxpayers, just as only focusing on motor fuel taxes and vehicle registration fees misses the mark about the low overall level of taxation in Texas.

Texas ranks 14th of all states in state and local taxes used for highways.
Slightly less than $9 per 1000 kilometers traveled is spent on state and local roads.



*Note: The number of states where the tax rate is lower.
Source: (4)

Figure 6. State and Local Highway Expenditure Rate

Evaluating Revenue Sources

Revenue options that are successfully integrated into government systems have several attributes. This report analyzes the relevant impacts and identifies the actions with a high potential for successful implementation. While all of the options do not satisfy all of the criteria listed below (as many existing taxes and fees do not), each option identified in the report conforms to many of the elements. The recommended options are those with the fewest significant negatives and highest degree of positive attributes. The point values listed in Table 4 and described below are used in each chapter to evaluate the financing options.

- Revenue Derived—The funding amount that might be generated from a specific revenue generator is a concern, as is consistency over time. The potential for evasion of the tax fee is also considered.
- Equity—Equity for different income, regional, or demographic groups is a consideration.
- Economic Effects—If fees or taxes are too high, the beneficial effects of improved transportation may be overshadowed by the adverse impact of transportation cost increases. The positive or negative economic impacts of improved transportation is considered.

- Collection Effort—The amount of administrative and enforcement activity required to collect the taxes or fees is an indicator of the collection efficiency and general public acceptance.
- Industry or Public Support—Revenue options that are supported by the public or the affected industries, or which appear likely to gain their support based on experience in Texas or other states, will be good candidates for any campaign to raise transportation funding.
- Legislative Action Required—The requirement for legislative action to implement revenue generating ideas is considered, as well as the possible acceptance of the ideas by the public and the Texas Legislature.
- Procedural Actions Required—TxDOT or other state agencies may need to adapt their procedures for revenue collection or their general operating processes to take advantage of new tax or fee policies.
- National or State Focus—Some revenue generating ideas can be approved and successful at the state level, but others may need a broader, national level approach or authorization.

Table 4. Revenue Source Evaluation Criteria

Evaluation Criteria	Possibility of Raising Revenue for TxDOT's Program				
	Revenue Success Likely		Neutral	Revenue Success Unlikely	
	5 points	4	3	2	1 point
Revenue derived	Consistent revenue, low evasion potential			Inconsistent revenue, high evasion potential	
Equity	Income and regional equity			Inequities in region and income effects	
Economic effects	Low adverse effects			High adverse effects	
Collection effort	Low effort			High effort	
Industry or public support	High support			High negatives	
Legislative action	Few actions and supportable effort			Several actions and difficult to pass legislation	
Procedural action	Few or minor changes			Several or significant changes	
National/state issues	State issue			National issue	

CHAPTER 3
GENERAL CONCEPTS AND BROAD-BASED FINANCIAL OPPORTUNITIES

The issue of transportation revenue is one that has been a problem at several points in the last century. This report discusses several revenue sources that are considered new or innovative for transportation purposes. Many of these are well known instruments being applied in other public finance areas or by the private sector.

This chapter focuses on significant funding concepts that can apply to more than one mode, or can be mode-neutral. These ideas can be linked to the modal funding chapters that follow and also indicate the degree of interconnectedness in funding, as well as operating a transportation system for the 21st Century. This chapter also provides a brief summary of some non-revenue actions that enhance TxDOT's ability to meet its identified needs.

Context for Revenue Enhancing Actions

There are actions that TxDOT and the state can take to address the funding challenges. The goals of more construction, operation, and maintenance activities for all modes can be achieved in part by recognizing and aggressively pursuing other actions as well as revenue increases. The actions highlighted below are not a comprehensive assessment, nor should it be implied that similar levels of benefits can be derived from each alternative. This report concentrates on the revenue options, but it is useful to recognize that the transportation funding problem has many aspects to a successful resolution.

> . . . recognizing and aggressively pursuing these other options . . .

- **Changes to the Unified Transportation Program (UTP) Procedures**

  If revenue maximization is the goal of TxDOT's overall program, some policies of the project selection process within the UTP should be altered. Rather than selecting projects based on overall cost effectiveness or even public sector cost effectiveness,

TxDOT might open the potential project list to the private sector. TxDOT could allow private bidders to propose financing options before any public sector funding is committed. This could occur after the environmental clearances have been obtained and the "ranking procedure" identifies the most cost effective projects, but before TxDOT proceeds to let any construction contracts. Projects are typically in the UTP for several years as plans and project approvals are finalized. This would allow private sector bidders to examine projects in significant detail to assess their interest. While this runs counter to typical practices, it is a way to offer the best, most cost effective projects to the private sector—something that is crucial if private funding is going to be significantly increased. The private sector will value not only the project itself but also the environmental approvals and rights-of-way that have been obtained. This allows state funding to be directed to projects that cannot compete in the private sector markets.

- **Efficiencies Within TxDOT**

The Sunset Legislation, TxDOT's Business Improvement Projects, and other efforts have already identified changes that can improve the amount of service or construction delivered to Texans per dollar expended. TxDOT will continue identifying improvements that will increase the funding available for construction, operation, and maintenance activities. These improvements have the effect of funding more projects and programs per tax dollar than in the past.

- **Support for Local Governments**

One approach to improve the transportation system is to assist other governmental agencies in funding and performing transportation functions. A significant portion of the people and goods movement occurs on city and county roads. These groups have their own funding sources, but they are not always as diverse or large as they need to be. There may be capacity increase options, operational improvements, or demand management actions that local governments wish to pursue. TxDOT can support these in a variety of ways and have an effect similar to raising revenue—more

improvement projects, programs, or strategies are implemented for Texas' transportation system.

- **"Unapproved" Projects**

  Some of the projects implied by TxDOT's Transportation Needs Revenue Assessment (1) cannot be constructed even if funding is available. This statement does not dispute the Needs Assessment, but rather, indicates the difference between "needs" and what might be constructed after environmental, social, and public concerns are addressed. The answers to these concerns may be improvements that are even more costly than estimated, or it could be that the "no-build" alternative is chosen. This does not imply that the needs do not exist; it means that some projects will not be part of TxDOT's program, and the funding needs may be different than projected.

- **Existing Sources**

  While this report covers several innovative or unused methods of raising transportation revenue, it also suggests the potential for increasing revenue from the existing motor fuel tax and vehicle registration fees. There is both significant revenue potential and some desirable effects from raising the taxes and fees related to "consumption" of transportation services or capacity.

- **Support from the Private Sector**

  Many innovative funding methods use tools that are well known to the private sector, and many of those are identified in this report. There are three other groups of options that the private sector could participate in to the benefit of TxDOT—as an information partner, in demand management activities, and improving TxDOT's operating strategies.

  The common interests of TxDOT and the business community in enhancing the transportation network to benefit economic prosperity is well recognized in TxDOT's strategic plan. One aspect of the relationship that might be expanded is to identify the

benefits that the business community sees from important projects or from the overall program. Support from citizens and businesses is a key part of the transportation funding and improvement program.

Businesses that support demand management programs, in particular those that focus on addressing urban congestion, can greatly increase TxDOT's "buying power" by encouraging more efficient use of the transportation capacity that has been constructed.

There has been much discussion about the practice of state agencies operating like businesses; there may still be significant financial benefits that TxDOT can achieve by continuing the implementation of these ideas.

The Future of Transportation Funding?

This report offers several methods to increase or create revenue to fund transportation improvements in Texas. Practical concerns dictate that most of these must be compatible with the existing framework of dedicated funding from user fees. This is a familiar practice to the public and is relatively consistent with the "user pays" concept. The dedicated funding approach is consistent with the notion that the taxes and fees should be returned to the users in the form of programs and projects.

In recent years, however, the interpretation of the "dedicated" part of the concept has changed.

- The U.S. Highway Trust Fund has been used for budget deficit reduction. This may stop with the new federal transportation legislation, but if the Trust Fund is included in the overall budget rather than being a separate budget, there will continue to be pressure to not spend all of the funds that were collected for transportation.
- TxDOT's budget has included a larger portion of the Department of Public Safety in the budget over the last few fiscal years. This is a transportation-related expense, and the issue of how the DPS should be funded is not the point raised here; the concern is

that it is an unexpected expense that was not included in TxDOT's budget plan 10 or 15 years ago.

- A variety of urban improvement programs have been funded in Houston (with overwhelming public support) by a city program that uses transit authority funding for a variety of transportation activities. This reallocation of funds means that money in the City of Houston budget (that is not tied to a particular spending category) can be used for other programs.
- In many states, as well as at the national level, an increasing number of activities are termed "transportation-related" and included in DOT budgets. Again, the issue of concern in this research project is that projections and budgeting are difficult when unexpected expenses are included in agency budget requirements.

. . . the dedicated funding concept may not be held as strongly by decision makers as by those in the transportation profession.

All these actions point to the possibility that the dedicated funding concept may not be held as strongly by decision makers as by those in the transportation profession. While this does not mean that wholesale change is in order, the examination of some of the basic assumptions is pertinent, and TxDOT should increase its information activities to educate the public and legislators as to the importance of transportation to Texas' economic and social future.

Looking to other countries offers several lessons on the advantages and disadvantages of allowing transportation user charges to flow into general funds and spending from general funds for transportation improvements. The European experience, in particular, includes many countries with good road systems that are funded from general revenue budgets and user fees. This suggests that there may be techniques to obtain more revenue in transportation user charges if the concept of a dedicated revenue source for transportation is eliminated. Separating the decisions about what is done with the money and how the money is collected may be a key to wider public acceptance of the innovative revenue concepts discussed in this report, particularly those that increase the direct user charges such as toll roadways or value pricing.

The need to improve the type and amount of information to the public is not directly related to expectations of future funding alternatives—it is a good idea no matter what the future holds. The information, and the support it will inevitably bring, can form the basis of a "safety net" if transportation should have to compete with other government activities for general revenue funding. Beyond that, however, there may be some very real benefits if TxDOT is able to more directly target transportation taxes on the activities that cause the needs.

Higher fees for travel in areas with air quality problems or on congested roads have a political consideration, but the available technology makes it much easier to directly change users now than in the past. The new technology, as evidenced by programs such as automated toll collection and the Lone Star card, also offer ways to address some of the difficult economic equity questions. Higher prices for some of the public's transportation choices (for instance, higher prices for driving on congested roads during peak hours) can also help address the broad quality-of-life problems such as air quality, mobility, and economic development that are an increasing part of the policy debate. The key is understanding and policy, however, not technology.

State Infrastructure Banks

Until recently, state Departments of Transportation (SDOTs) could only use federal grants on Federal Highway Administration (FHWA) approved projects. The National Highway System Designation Act (NHSDA) of 1995 modified this. Along with allowing other innovative financing methods, it authorized a State Infrastructure Bank (SIB) Pilot Program for 10 states, Texas being one. Subsequent to the initial authorization of 10 SIBs, U.S. DOT provided $150 million in 1997 for the SIB program and eliminated the 10-state restriction. To date, 38 states and Puerto Rico have SIBs.

In addition, NHSDA directed U.S. DOT to review and report to Congress the financial condition of these SIBs (7). The 10 initial states anticipated investing $323 million in projects with a combined value of $1.6 billion. This 5:1 ratio between project value and SIB assistance is the kind of significant returns that SIBs were designed to achieve (8).

SIBs give DOTs access to an almost infinite assortment of funding

Under the SIB legislation, states can capitalize SIBs with up to 10% of their annual federal highway and transit funds, excluding apportionment for demonstration projects under ISTEA and those for the Congestion Mitigation and Air Quality program (7). The SIB concept is important because it gives DOTs access to an almost infinite assortment of funding possibilities; they are unrestricted in the type of financial instruments they can use. For example, SIBs can use the federal (equity) capital for direct loans, for leveraging bonds for loans, for insuring credit, or for loan guarantees (7). Additionally, the recipient of SIB funds can be either a public or private entity, as long as the funds are used for transportation projects. The financing is repaid to the SIB, enabling future transportation projects to be funded.

The following examples demonstrate how some states are using their SIBs.

- Ohio has used $42.9 million of its SIB to fund accelerated construction of a toll highway project and a parking facility. It also has agreements for street projects, a transit bridge, and access road improvements to an industrial park (8).

- Arizona plans to leverage their federal fund money as Ohio intends. Initially capitalized with $64 million in federal funds and $7.5 million in state funds, the Arizona SIB would leverage this with tax-exempt revenue bonds and make initial loans for transportation projects using $20 million in equity capital in addition to their bond proceeds. The state estimates that by 2017, loan repayments plus interest will increase its equity base almost fourfold, which could be used to support larger bond issues (7).

- Missouri has loaned $29.2 million on the Cape Girardeau Bridge (to be operated as a toll bridge) and a program of improvements in Springfield. The Springfield projects will be repaid by locally dedicated sales tax increment financing and the State Highway Fund (8).

- California plans to invest a portion of their SIB's federal capital to attract private lenders and investors. They believe that an SIB investment of 10% in some projects would spur private lenders and investors to fund the remaining 90% of a project cost (8). This has the effect of leveraging their fund by a factor of nine.

- Michigan indicated that its SIB would use its federal capital for direct loans, for leveraging tax-exempt revenue bonds, for subsidizing interest rates, for insuring credit or loan guarantees, and issuing letters of credit (7).

- According to the Federal Highway Administration (7), SIBs could leverage their equity capital base by multiples from between two to four times.

The creation of SIBs are not without some legal barriers. Some states have indicated that legislative action might be required to use SIBs to their fullest capacity. For example, Minnesota is prohibited from charging interest to a private entity, and repayments of non-interest bearing loans are currently deposited in the state's general fund. Exposure of the state to debt has been the concern of several states, notably in South Carolina where a change in the state constitution would be required for its SIB to guarantee loans using the full faith and credit of the state. Oregon, as well, prohibits lending the credit of the state.

Also, private sector involvement might be severely inhibited since the Internal Revenue Code restricts private involvement in tax-exempt debt, which a number of states intend on using with their SIBs. According to the U.S. General Accounting Office (7), tax exemption does not apply to a bond issue under the following conditions:

1. More than 10% of the debt is used to make loans to the private sector; or,
2. More than 5% of the proceeds or $5 million (whichever is less) is used to make loans to the private sector.

The GAO (7) noted, however, that facility bonds are tax-exempt as long as certain conditions are met. The facilities supported by these bonds must meet volume and statutory

requirements, and at least 95% of the bond issue's net proceeds must be used to provide specific facilities, such as airports, docks and wharves, and mass-transit facilities.

FUNDING TEXAS TRANSPORTATION

The Texas highway SIB is in operation, and the transit SIB will soon be formed under rules recently approved by the Federal Transit Administration. Non-highway mode projects are currently ineligible for Texas SIB assistance. This focus is too narrow and, in fact, undermines many of the types of projects that SIBs were intended to address. Port facilities, for example, could be eligible for SIB assistance, since they can generate revenue to directly repay loans, as well as being direct and indirect economic contributors to the state (9). The highway SIB can be used to assist connector projects between the road system and port facilities.

It appears that SIBs offer Texas a significant amount of flexibility in the financing of infrastructure needs. They can expedite project completion, increase private investment, expand the number of financially feasible projects, and increase the amount of state and local investment. However, for Texas to take full advantage of the SIB concept, Texas should:

- Pursue strategies that increase private investment, while not affecting the tax-exempt status of bond issues.
- Explore the creation of a state-funded SIB program that could provide additional funds for highway construction or could broaden the SIB coverage to non-highway/ transit modes.

The key to an SIB's success is attracting the needed debt capital.

The key to an SIB's success, though, is whether it can attract the needed debt capital to leverage the federally funded equity capital. Those individuals and institutions that provide tax-exempt debt capital are the most risk averse investors. They often require coverage ratios (earnings before interest and taxes divided by interest payments) on the order of three to one. Unfortunately,

revenues from toll facilities are some of the most difficult to estimate with any degree of accuracy.

Water port and airport facilities are not always certain successes either, but partnerships between TxDOT and the governing authorities of these operations may be able to move projects forward quicker than either group working alone. A multimodal Texas SIB may be the way for TxDOT to be involved in the improvement process in a more supportive role.

Revenue Stream Credits

Section 1044 of the Intermodal Surface Transportation Efficiency Act (ISTEA) permits states to use certain revenues from toll facilities as a credit toward the non-federal matching required for any program authorized under ISTEA and Title 23, United States Code. According to Section 1044 (a), these toll revenues must meet two stipulations:

1. They must be from toll facilities built, improved, or maintained without federal funds; and,
2. They must be reinvested in the construction or maintenance of highways, bridges, or tunnels that serve the public purpose of interstate commerce.

Thus, toll credits reduce the amount of state funds needed to meet federal match requirements, thereby increasing the state funding available for 100% state-funded projects.

To earn the credit, states must certify to the U.S. Secretary of Transportation that they have met the Maintenance of Effort (MOE) provision of Section 1044 (b). This requires that the state maintain or exceed its non-federal transportation capital expenditures for the average of the preceding three fiscal years.

The preeminent example of the use of toll credits for non-federal matching requirements is New Jersey, principally because Section 1044 was specifically adopted for its benefit. In FY

1996, the NJDOT received toll credits for non-federal matching of over $250 million, almost $60 million more than they received in their first year of eligibility.

FUNDING TEXAS TRANSPORTATION

TxDOT has not yet taken advantage of these toll credits. TTI recommends that Texas take advantage of these credits to the extent possible to substitute for the state's match. Toll credits would enable Texas to either reduce the amount it expends on federal-aid projects or alternatively, increase the number of state-sponsored projects that can be funded. The toll road projects in Dallas and Houston currently generate approximately $120 million in annual revenue (4). Using this revenue stream as the federal match for road improvements would make a similar amount available for state-funded projects.

World Bank Funding

The World Bank funds infrastructure projects similar to those TxDOT constructs. The Bank might be a source of technical assistance to TxDOT as it broadens its funding possibilities since the World Bank has used many different funding mechanisms on a project and country basis. However, the World Bank policies do not appear to be consistent with the U.S. standard of living. They typically fund projects and programs in developing countries.

TxDOT may, however, benefit from World Bank funded projects in Mexico. The Mexican government is improving its transportation network to take advantage of the North American Free Trade Act. One aspect of this is the east-west rail and highway network in northern Mexico. Some of this transport occurs on U.S. roads because they are higher quality and provide faster service. To the extent that the Mexican network is improved, this transport demand is reduced on the U.S. side of the border.

Using Transportation Facilities as Development Sites

In places where a transportation agency owns land that is not currently being used for transportation purposes, there is an opportunity for generating revenues. By leasing undeveloped land, subsurface rights, or air rights surrounding the transportation facility, governmental jurisdictions can generate a steady and dependable cash flow. Examples of this practice (10) include:

- The Orange County (CA) Transit District constructed a transit center and parking lot that form the bottom two floors of a 10-story office building.
- A developer in Boston negotiated a long-term lease for air rights over a portion of the Massachusetts Turnpike with the lease proceeds to be used for turnpike improvements.
- The Denver Regional Transit District leased air rights over the Civic Center Transit Facility. This lease will provide $55 million over a 15-year period.
- In Miami, a lease agreement allowed a private developer to build 60,000 square meters of office and retail space and a 300-room hotel adjacent to the Dadeland South Station in exchange for a payment of 4% of the unadjusted gross income for each year of the lease.

The Federal Highway Administration encourages states to identify and capitalize on available commercial income resources. To that end, the Federal Highway Administration is reviewing some of the restrictions on conducting commerce along the National Highway System. Several kinds of income-generating activities are possible without compromising safety. State DOTs can earn revenue through a variety of methods, including leasing public facilities and/or rights-of-way to private entities, profit-sharing, and selling advertising space. These activities can free up state funds for other highway projects. Activities that states are using or have proposed include: leasing sub-surface Interstate rights-of-way for communication lines; defraying the cost of electronic freeway management systems by offering limited advertising space; and designing, financing, building, leasing, and/or operating transportation service facilities such as rest areas along Interstate highways (11).

FUNDING TEXAS TRANSPORTATION

While there is not a significant amount of unused property in the TxDOT system, there are undoubtedly areas where air rights could provide a development opportunity for either public or private groups. Particularly in the relatively dense downtown areas of the state, there may be opportunities to turn relatively unsightly or divisive transportation corridors into development opportunities. The relocation of I-30 in Fort Worth is such an opportunity. While a project that large is somewhat rare, as freeways, streets, or transit facilities are reconstructed throughout the state, planners and engineers should be actively considering joint development possibilities.

The need for telecommunications infrastructure in Texas also presents an opportunity—one that will not exist for many years. TxDOT's highways and private railroad lines represent the only two comprehensive corridor systems in Texas. As fiber optic cable is installed throughout the state, TxDOT has the opportunity to lease space for "exclusive use" within its rights-of-way for money (or other compensation) or exchange it for TxDOT services. If TxDOT chooses to not pursue this strategy in the next five or 10 years, the opportunity will probably be gone, and fibers will have been placed in railroad or other utility rights-of-way. One approach is to have TxDOT partner with telecommunications companies to construct and provide operations and maintenance responsibilities in exchange for a share of the cable capacity and revenue from selling "excess" fiber optic cable capacity (12).

Reward for Local Support of Transportation

The current Unified Transportation Program (UTP) project selection procedures use cost effectiveness rankings for many categories. The cost element is typically the cost of constructing the project. The most frequent exception to this is when more than a minimum local match is provided. By reducing the total cost to TxDOT, cities and regions support projects that are of significant priority to the local transport system. TxDOT receives projects at "below market" costs, and local governments or landowners are rewarded for their contributions. This excellent use of incentives might be extended to a broader application.

FUNDING TEXAS TRANSPORTATION

Extending the local support concept from a project basis to the entire TxDOT program could have significant benefits. The goal of the strategy would be for local and regional groups to participate in project funding to a greater degree than they do. This should not reward an area on the basis of total funding magnitude but rather on "effort" to support transportation improvement. (If a magnitude measure like "total dollars contributed" were used, the large population cities or districts would always "win," and smaller cities would have few reasons to change their current practice.) Existing TxDOT practice rewards participation on individual projects, but not on the general program.

Key aspects of this proposal are noted below. The final version of the program would have to be negotiated, but any reward system should consider these elements.

- **Include all local transportation fees**—The reward system should be based on revenues from all transport modes that TxDOT funds. User fees (such as tolls and fares), dedicated taxes (such as local option sales taxes), and any other source would be included.

The reward system should be based on revenues from all transport modes that TxDOT funds.

- **Allow creativity**—The goal is to obtain revenues for transportation improvements. Unlimited flexibility on how the local funding is generated will allow local areas to capitalize on their strengths. This philosophy should also lead local agencies and groups to more aggressively pursue other funding options highlighted in this report.

- **Balance the formula**—Using several measures that are comparable across modes such as persons, person-kilometers of travel, or ton-kilometers along with the magnitude values will provide fair competition between small and large population

centers, tourist or "flow through" communities and isolated areas, and highway/transit areas with highway only areas.

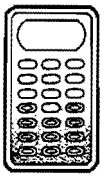
- **Adjust for median income**—If the goal is to reward "effort," some allowance for "ability to pay" should be included.

- **Begin with a fairly modest program**—Testing the concept and the local response are important before a significant amount of funds are allocated in this way.

An example of how this proposal would operate is that the "effort" would be measured in non-mandatory (exclude state and federal taxes and matching fund requirements) transportation taxes per person and per person-kilometer. Funds from a separate discretionary category would be allocated to each TxDOT District based on: 1) the percentage above or below the state average per person or per person-kilometer value and 2) the amount of persons or person-kilometers.

Areas with higher contribution rates would be rewarded more than areas with low rates, and funds would be allocated in relation to both "effort" and size or amount of travel. This proposal also somewhat reinforces the requirements for reduced travel in areas with poor air quality in that "effort" is measured in per kilometer of travel.

Evaluation of Options



While all five funding alternatives represent good ideas and should be pursued when possible, the most useful appear to be revenue stream credits, the state infrastructure bank program, and the reward for local support (Table 5).

The use of revenue stream credits is an idea with many positive aspects, the only negative being the effort that TxDOT must make to document the amount of toll revenue and highway expenditures. While the revenue derived for TxDOT is modest in relation to the annual budget, it can be a growing part of the program. Toll road and value pricing projects will be a more

significant part of the funding packages in the future, and revenue stream credits is a way to get "double-duty" out of this money.

Table 5. Evaluation of Broad-Based Funding Alternatives

Revenue Source Evaluation Criteria	*State Infrastructure Banks*	*Revenue Stream Credits*	*World Bank Funding*	*Development Sites*	*Reward Local Support*
Revenue derived	4	3	1	2	3
Equity	5	5	4	5	4
Economic effects	5	5	5	4	4
Collection effort	3	5	1	1	3
Industry or public support	4	5	3	3	4
Legislative action	3	5	3	3	5
Procedural action	5	3	5	2	3
National/State issues	3	5	5	5	5
Total	32	36	27	25	31

Note: Criteria are scored on a scale from 5 (this factor is not an impediment to enacting the revenue alternative or this alternative can substantially improve the Texas transportation funding situation) to 1 (this factor represents a significant barrier to using the financing mechanism or this alternative will not improve the Texas transportation funding situation).

The highway SIB is already performing well, and a similar program for transit will begin soon now that the Federal Transit Administration regulations have been finalized (13). The idea behind the SIB should be extended to other modes and to intermodal facilities. The ability to identify worthwhile projects and participate to the extent needed to move a project from "not quite viable" to "financially possible" is the key to successfully using the SIB. Choosing projects wisely is not without risk, and the effort needed to implement and monitor the projects is not insignificant, but there are significant benefits if some public money can be combined with significant private investment. Extending the modes covered by SIBs, or beginning new modal SIBs, will require action at both the state and federal level.

If the equity issue can be resolved, the local support reward program has the potential to create incentives for increasing transportation funding. This idea would take advantage of local creativity in revenue generation and allow local governments to fashion a program that responds to community interests. The effort needed to enact and support such a program will be greater than many TxDOT efforts, but it is a state and local issue and thus can be customized to meet

Texas' needs and Texas' opportunities. The extra revenue could be dedicated to local projects and programs, but putting the focus on transportation as an issue with local input and support would improve TxDOT's funding position.

Using transportation corridors or locations as development sites is not a bad idea, but the potential for generating revenue is limited by the economic health of a community and the availability of TxDOT rights-of-way. Where land is not being developed, or where the economy is not in a "boom" phase, it may be difficult to fully capitalize on the development potential because of the difficulties associated with joint developing property with a governmental entity. Use of air rights or subsurface rights may be the best possibilities for TxDOT. Beginning the discussion process early in a project will give TxDOT a much better chance of success, particularly if this is in the advanced planning stages.

Texas projects probably do not qualify as World Bank development sites due to income levels and access to capital. The economic effects and actions needed to apply for World Bank assistance are not a problem, and TxDOT might encourage projects along the Texas-Mexico border to pursue funding.

Conclusion—Concepts for Funding Texas Transportation

The techniques and actions identified in this chapter are consistent with solving the needs of more than one transportation system element. They will be referred to in succeeding chapters. The toll revenue credit and joint development ideas are relatively easy to enact in that the difficulties are related to agreeing on project specifics, which are not trivial items, but which are within TxDOT's ability to negotiate, compared to legislative changes.

Opening State Infrastructure Banks for other modes and intermodal facilities will move TxDOT away from highway-only funding and towards a mode-neutral transportation system. There are many other steps required before this journey is complete, but allowing projects in more modes to compete for SIB attention is an important sign. The Federal Transit Administration regulations and funding have recently become available (13); this is an important

step in public transportation funding. Using federal and/or state funds for other modal SIBs will similarly improve access to financing options.

A "reward" program designed as an incentive to increasing local transportation funding contributions is an extension of the existing TxDOT project level procedure. Project cost elements that are voluntarily paid for by other entities are subtracted from the project cost before the cost effectiveness calculation is performed. A reward program would accomplish the same goal on a much larger scale. A system focus, rather than individual modes or facilities, rewards areas regardless of their modal focus, unlike the motor fuels tax-based formula. Allowing creativity in how the funds are generated is an important part of this program, and it should reinforce interest by local agencies in using other techniques identified in this report.

CHAPTER 4

NEW AND INNOVATIVE REVENUE SOURCES FOR HIGHWAY FINANCE

This chapter identifies innovative financing mechanisms that will allow TxDOT to meet its responsibilities relative to maintenance, construction, and reconstruction of the highway portion of the Texas transportation system. The discussion describes the major strategies, the legislative framework, and implementation issues.

Overview

The most significant source of revenues for highways is, and will probably continue to be, user charges. In addition to the large sums of additional revenue that could be obtained with modest increases in the current levels of state motor fuel taxes and vehicle registration fees, new user charges based on vehicle-kilometers traveled are promising sources of additional transportation funding at relatively modest annual levels per vehicle. The significant remaining variables in this political equation are not the need for new financing ideas, but rather the importance that Texas residents and businesses place on transportation as an aspect of their quality of life and economic competitiveness. If transportation is important to Texans, a good public information campaign that emphasizes the issues and what happens if Texas does not address them will create support for increased funding to achieve a safer and more efficient system. If Texans are content with the projections of system conditions, the ideas in this report may not be widely accepted and, therefore, may only marginally improve highways.

The strategies covered in this chapter are divided into five major categories:

- Public/Private Cost-Sharing Options
- Highway Funding Efficiencies
- Private or Public/Private Toll Roads
- Value Pricing
- Broad-Based Tax/Fee Approaches

The specific mechanisms and examples of their application are described, the benefits identified, and the situations where they would be most applicable are noted.

Public/Private Cost-Sharing Options—Private Property Owner Contributions

Owner contributions include arrangements in which private property owners give land or funds to the state or local highway agencies. The land represents roadway right-of-way, and the cash is used to pay for a portion of the cost of a new public facility. Contributions are usually made to increase the priority of a project by reducing its public cost, to enhance private land development projects, or to provide special access to an existing or proposed facility (14). Contributions are often forthcoming as a private funding supplement in areas where businesses or private citizens have a strong interest in development.

❖
Private developers or public agencies can initiate this funding mechanism.
❖

Generally, the private sector approaches the transportation agency with a development project and its corresponding transportation needs or improvements (10). Cities and regions also work together to secure property donations to increase the cost effectiveness of transportation projects.

The numerous examples of this funding mechanism include:

- The Friendswood Development Company and Woodlands Development Corporation in Houston, for example, have contributed funds to accelerate the completion of highway sections and regularly expedite transportation improvements by providing contributions ranging from 15 to 20% of the project's cost.
- A private, nonprofit development organization provided the impetus for improving streets in downtown Pittsburgh. Total renovations costing $13 million to $14 million were funded 75% federally and 25% locally (15).
- Tennessee has set up partnerships with private developers at regional shopping centers to build new interchanges to handle traffic. The construction of the interchanges was 100% funded by private sources, with ownership transferred to the state for future maintenance and operation (16).
- In Arizona, several interchanges have been constructed under public/private joint funding. An interim roadway which will be converted to full freeway in the future

(Estrelle Freeway) has been constructed on rights-of-way donated by land owners (16).

- In Arkansas, the Department of Transportation is working with a developer to construct an interchange connection which is on the local area's long-range transportation plan (16).
- In Nebraska, a private museum has been proposed that would require an Interstate highway interchange. The promoters of the museum will pay for the required construction (16).

FUNDING TEXAS HIGHWAYS

In 1984, the Texas Legislature authorized the creation of Texas Transportation Corporations and Road Utility Districts. Texas Transportation Corporations may work directly with property owners to conduct preliminary and final alignment studies; receive land and cash contributions; retain staff, consultants, engineering services, etc.; establish appropriate formulas for proportionate sharing of costs among property owners; and borrow funds to meet expenses. Road Utility Districts are similar to municipal water districts and may issue bonds supported by levying property taxes or assessing fees for the purpose of financing, constructing, acquiring, and improving arterial or main feeder roads and related projects. A Road Utility District requires 100% approval by property owners within a proposed district, which may explain why only two RUDs have been formed (10).

While Navigation Districts and Metropolitan Transit Authorities have been fairly active in funding ports and transit systems with little or no financial assistance from TxDOT, Road Utility Districts and Transportation Corporations have rarely been used despite TxDOT support for the concept. Apparently, property owners are reluctant to impose additional taxes and fees on themselves for highway projects, in significant measure because they believe that they have already paid for highway projects through motor fuel taxes and vehicle registration fees. As TxDOT's funding crisis becomes more evident and demand for roads continues to grow, this reluctance will be easier to overcome but will still require work. Developers will not want to risk access limitations if they can be overcome by reasonable contributions to road projects.

Another limitation of this particular funding mechanism is the number of counties that may participate in a given Road Utility District or Transportation Corporation. There are projects such as Texas Trunk System developments that may encompass a large number of counties. TxDOT could form partnerships with each affected local Road Utility District or Transportation Corporation, but the practical difficulties of negotiating multiple partnership agreements for a single project and equitably apportioning the level of funding participation could be formidable on larger, potentially more important projects. Hence, it might be worthwhile to seek new legislation permitting the creation of multi-county private contribution mechanisms.

While the concept of forming partnerships with groups of local property owners to share the cost of transportation improvement projects is straightforward, implementing partnerships for highway projects raises a number of issues including how the area encompassed by a RUD or Transportation Corporation should be defined (i.e., who will benefit from the project and should be expected to pay for it) and how the respective shares of project funding from TxDOT and the property owners should be determined. These can be overcome using the approach currently used by TxDOT's Unified Transportation Program—subtracting the private contributions from the project cost and calculating cost-effectiveness on the basis of public cost.

Public/Private Cost-Sharing Options—Institutionalized Cost Sharing

Some states have established legal procedures to regulate cost-sharing with multiple private parties whose properties are directly served by a transportation improvement. Four methods are in use in the United States:

- ***Negotiated developer agreements***;
- ***Impact fees***;
- ***Special assessment districts***; and
- ***Tax increment financing districts***.

Negotiated Developer Agreements

This financing mechanism is a technique where the private developer agrees to contribute resources to a transportation project in exchange for changes in zoning and building regulations or for a special building permit. Due to statutory and judicial restraints placed on development fees, other mechanisms such as impact fees, exactions, and other fees, negotiated agreements between the public and private sectors have become more prevalent.

There are numerous examples illustrating the impact of negotiated developer agreements. These are typically associated with larger development areas.

- In Orange County, California, the Irvine Company agreed to provide $60 million in local transportation improvements as part of developing Irvine Center, a 195 hectare complex located in the triangle formed by the Santa Ana, San Diego, and Laguna freeways. The improvements included three freeway exit ramps, two parkways, and 14 projects related to traffic control.
- Developers in Fairfax County, Virginia, offered more than $80 million worth of road improvements. This included a $20 million contribution by Homart Development Company, builder of Tysons Corner II, and a $32 million contribution by Hazel-Peterson Company, developer of Fair Lakes.
- In northern San Diego County, Shapell Industries, developer of Rancho Carmel—a 600 hectare mixed use development project—agreed to provide 33 capital infrastructure projects at a total cost $57.5 million. Included are arterial roads, freeway overpasses and interchanges, park-and-ride facilities, and traffic control systems.
- Developers of the Howard Hughes complex in west Los Angeles contributed $20 million toward off-site transportation improvements, including arterial widening, intersection improvements, signal upgrading, and new freeway ramp construction.
- Developers of the Hacienda Business Park in Alameda County, California, pledged $80 million in local transportation improvements to facilitate traffic around the development. The funds were used to construct two new freeway interchanges, widen

two freeways (each by two lanes), install a computer-controlled traffic signal system, and provide sound barriers and landscaping.

- A group of developers in New York provided $31.5 million to the city's rail transit system. This amount represented a portion of the $100 million package the developers provided for their housing and commercial project. The contribution was a result of negotiations with the planning commission to change the zoning of the project site from industrial to residential use (10).

FUNDING TEXAS HIGHWAYS

While this approach has been used on a small scale in many cities and on a larger scale in a few large developments, there is potential to expand usage to Texas' larger cities. This is certainly the case for freeways and major streets, but negotiated agreements may also be useful for other modes as well. Taking advantage of this option, however, will require TxDOT to investigate private sector development and transportation plans and the private sector to be more involved in identifying locations where common interests lie. Locations where developers can assist TxDOT in improving existing roads to meet new travel demands can be a win-win proposition if projects are constructed before their scheduled date.

Impact Fees

Impact fees are charges imposed on new development as a condition for some regulatory approval of the development. This form of alternative transportation capital finance flows out of local government's power to regulate land development. Local governments have increasingly turned to their police powers to offset their inability to employ "innovative" methods of taxation. Local governments may exercise the police powers to protect the health, safety, and welfare of the public. Thus, exactions are an exercise of the police power if they can be fitted within the category of protection of the public from the harmful consequences of new development. Exactions founded on other bases would risk being held to be a form of taxation and, thus, would be illegal in most states, including Texas.

The primary appeal of an exaction is that it does not require the increase of taxes. Since only new development must pay the charges, a community can attain a desired level of transportation service at no cost to existing residents and taxpayers. Another advantage is that impact fees are responsive to both inflation and growth (17).

One example of the use of impact fees to help finance a major highway project is the San Joaquin Hills Corridor in California's Orange County, a $1.2 billion financing effort that combined a $1 billion issue of toll revenue bonds, $111 million in state funds, $97 million in investment earnings, $39 million in subordinated debt by the private construction contractor, and $31 million in private development impact fees (14).

FUNDING TEXAS HIGHWAYS

Although impact fees have been used successfully in a few instances to help finance large-scale highway improvements, they have most often been used by local governments for smaller, local transportation improvements.

Special Assessments

Special assessments are charges imposed on owners of property to pay for government programs designed primarily to benefit the owners of that property, such as the construction of roads serving previously underdeveloped areas or the expansion of the road system serving rapidly growing areas. Special assessments are used to pay for infrastructure development designed to benefit a class of property owners, whereas impact fees are used to enable government to provide infrastructure required by the planned activity of some property owner. Special assessments thus can be applied to a somewhat broader range of situations than impact fees. Also, impact fees depend on government's regulatory power, while special assessments depend on its power to tax. In concept, individual assessments should be distributed across property owners in proportion to benefits from the program. In practice, a simple formula (e.g., a specified percentage of assessed value) is used (18).

The major advantage of the special assessment is that a defined area can be charged the costs of improvements provided primarily for the benefit of that area without necessitating a general tax or fee increase. An important advantage, in some cases, is that future special assessment payments can be readily bonded. When contrasted with the impact fee, the special assessment has the advantage of stable receipts, much less litigation, and less complex administration (17).

Virginia has shown that special assessment districts can be used successfully to finance a major highway improvement project. The Route 28 special assessment district in Fairfax and Loudoun Counties uses a special assessment property tax district to finance the improvement of a 22 kilometer roadway that Virginia Department of Transportation could not fund alone. Phase I of the project costs approximately $160 million and added from two to six lanes to various sections of the highway and constructed three major interchanges. A proposed Phase II would increase the roadway to eight lanes and add nine interchanges to convert the highway to a full freeway. The Route 28 corridor has great commercial development potential which has been stifled by inadequate highway transportation capacity. It is estimated that the funds raised from the special assessment district will finance approximately 80% of the cost of the project, with the remaining 20% being funded by the Virginia Department of Transportation (19).

FUNDING TEXAS HIGHWAYS

Special assessments, because they focus on property owners with particular benefits from a project, appear to be a viable strategy to fund some projects, possibly including other modes or intermodal facilities. The key is having a project with definable impacts and quantifiable benefits to land owners in a particular area. Land owners should be more willing to accept a special assessment for a specific project than they will accept an impact fee for an undetermined project. There will, however, be resistance to paying for a project that "my taxes should pay for."

The logical application of this technique is in growing suburban areas around the large Texas cities. Many of the major city governments—Austin, Dallas, Fort Worth, and Houston—are pursuing programs to rehabilitate and refocus commercial and residential development in

near-town neighborhoods. While not necessarily opposed to new suburban development, they may not place a priority on projects in these areas, particularly when they are outside the city limits. Development in unincorporated areas or smaller cities relies more on the state roadway system for transportation service, and TxDOT is in position to guide strategies for funding that system.

Tax Increment Financing

Tax increment financing pays for the public improvements that development will require by pledging anticipated tax revenues to be received from increased assessed valuations resulting from the development. Tax increment financing is a technique that has evolved in urban areas. It allows a community to obtain in the present the fiscal benefit of future increases in the tax base by issuing bonds.

Typically, property taxes are the pledge that secures these bonds, but there is no general obligation of the issuing jurisdiction to go along with the pledge. Since there is no general obligation, there is no need for a referendum, even though ad valorem taxes will be used to make principal and interest payments. This lack of a referendum requirement has been a frequent subject of litigation. While property tax increments are the most common basis for tax increment finance, other tax revenues, such as sales taxes, are also used. Tax increment bonds have been used primarily for redevelopment projects. The use of tax increment financing is limited because of the difficulty of structuring tax increment debt issues to the satisfaction of bond buyers (17).

FUNDING TEXAS HIGHWAYS

This technique is identified for two reasons. 1) TxDOT may be in a position to assist local governments in using this financing technique to construct their own road system improvements. If local governments have easier access to road funding methods, their demands on TxDOT revenue will be lessened or could be focused on other projects that more directly support TxDOT priorities. 2) The 1997 Texas Legislature provided TxDOT with the ability to use Tax Increment Finance (TIF) Districts. This technique should be examined for every new

location transportation project that TxDOT participates in. It should also be useful in cases where facilities are significantly expanded, such as where a street or rural road is improved to a highway. Tax increment financing districts are another way of identifying benefits from transportation projects and appropriately taxing them.

Highway Funding Efficiencies

The National Highway System Designation Act (NHSDA) of 1995 provided authorization to use several techniques that increase the flexibility of highway funding mechanisms. Several of these are noted here, along with the results of a General Accounting Office (GAO) survey (7) of expected state reaction to the options. The funding changes have corollaries in improvements to highway design and construction practices, such as the use of life cycle costing procedures.

> . . . moving funding practices toward an environment that is more familiar to the private sector.

All of these options can be viewed as moving state and federal transportation funding practices toward an environment that is more familiar to the private sector. As such, these may not appear "innovative," but they are relatively new "tools" for the TxDOT funding "toolbox." They will not all be generally applicable, but TxDOT should examine them.

Advanced Construction. This allows states to begin a federal-aid project in its transportation plan with its own funds before accumulating the full federal funds reimbursement. When federal funds become available for the "advance construction" project, the U.S. Department of Transportation remits the money to the state. This essentially saves the state money from expenses associated with delays, which can be significant for larger projects that require funding from several fiscal year budgets. It does require, however, that higher percentages of state funding be spent on a project in the early stages. This is not always desirable. The increased flexibility offered by this provision, however, should be welcomed as an improvement in planning and programming transportation projects.

In a survey of 15 states, GAO (7) reported that 14 states believed this provision of the NHSDA would be of great use or some use for them, while one state did not respond.

Use of Federal Funds to Defray Certain Costs of Debt Instruments. This permits the Secretary of Transportation to reimburse a state for expenses incurred for interest payments, retirement of debt, debt issuance costs, and other expenses associated with the issuance of debt instruments to finance highways. These costs can be as much as 5% of the value of debt issued. While they have not been a significant cost element in most states, as different funding arrangements are used, these real business operation costs will make up a larger portion of a state DOT budget.

GAO (7) reported that of 15 states responding to their survey, only one state believed this provision to be of great use, eight thought it would be of some use, while six thought it would be of little or no use to them. This is perhaps more an indication of the small number of states that plan to use debt financing for transportation projects rather than an indication of the benefits of this provision.

Loans of Federal Highway Funds to Public or Private Entities. The federal share of a project's funds may be loaned to construct a toll or other project with a dedicated revenue source. The GAO survey (7) revealed that only one state thought this tool to be of great use, six thought it would be of some use, while the remaining nine states believed it to be of little or no use to them. This mechanism requires more focus by the state DOTs. The fact that states do not see this as a benefit indicates that it is somewhat misunderstood or that state regulations prohibit this funding option. The benefit of using funds in this way is that it further increases the amount of flexibility in transportation funding.

Increased Flexibility Provided for State Match. The value of donated funds, materials, or services may be credited toward the state match on eligible projects. This is similar to the toll revenue credit option noted in the General Concepts chapter in that more elements of state funding practice are eligible as matching funds. Actions of this type offer essentially free

funding for TxDOT. With relatively little effort, TxDOT can get credit for actions and revenue that are already occurring. The GAO survey (7) respondents said that this provision would at least be of some use to them. Six states affirm that it would be of great use, eight said it would be of some use, and one responded that it would be of little or no use to them.

Private or Public/Private Toll Roads

Private development of a transportation facility is feasible when the facility has the potential to generate enough revenue to provide a competitive return to investors or when a public agency is willing to provide a sufficient subsidy to make the investment attractive. In the case of highways, the primary potential source of revenue is tolls. If this source of revenue is not sufficient and there is a clear public purpose in the project, public funds could pay a portion of the cost, either up front or over a period of years (18).

Tolls can be a significant part of the financing for specific construction projects, especially projects that expand or "retrofit" urban highways, but their annual contribution to highway funding is difficult to project. Some toll projects can be self supporting, but the list of possible toll projects expands greatly if private and public funds are mixed as needed to provide a financially attractive project. At the same time, even projects for roadways with small traffic volumes (e.g., rural portions of the Texas Trunk System) could be tolled, and the toll revenues would defray some of the project cost and provide a revenue stream that can be "used" again as a match for federal funding to other projects.

Nationally, toll revenues have been a small proportion of total highway revenues, although significant in a few states. Toll revenues constitute less than 5% of total national highway revenues. The legal authority to develop toll highways is usually derived from state enabling legislation and typically includes the issuance of tax-exempt bonds with various state or local government guarantees.

Toll facilities are undergoing a resurgence in the U.S., especially as urban facilities. The advent of automatic vehicle identification or electronic toll collection increases the viability of

toll roads. Not only are the delays associated with urban toll collection eliminated, but the automated billing reduces popular opposition to tolling. Financial technology has also had visible impact on the viability of toll roads. New financial products, lowered interest rates, tax exemption, and government guarantees have improved the market for toll-backed bonds. At the same time, the opportunities to combine toll-backed debt with other revenues has increased the inventory of potentially toll-viable facilities (14).

In 1988-89, California and Virginia initiated the modern era's toll-financed concession programs—public-use toll roads conceived, financed, and developed by private, for-profit enterprises with state roles confined to right-of-way condemnation, limited protection from liability and competition, and regulation of toll rates and profits. These projects have combined road developer's equity, adjacent property owners' land contributions, and several forms of toll-backed taxable debt for their financing (14).

FUNDING TEXAS HIGHWAYS

There are several legislative measures and other arrangements that relate to TxDOT's participation in toll highway projects. TxDOT can enter into agreements with private entities or other governmental agencies. Private toll companies, such as Camino Columbia, Inc. in the Laredo area, can obtain franchises from the Texas Transportation Commission (20). There are two regional toll road authorities that are pursuing significant toll networks in Houston and Dallas with voter and traveler approval.

The Harris County Toll Road Authority (HCTRA) and Texas Department of Transportation (TxDOT) have joined together to build most of an outer loop around the city of Houston as a toll highway. While no single financing technique is "innovative," the pooling of resources was necessary to make the package successful: 1) TxDOT provided HCTRA with right-of-way at no cost (a value of approximately $83 million); 2) TxDOT paid for frontage roads, access ramps, and interchanges with state and federal funds at a cost of $236 million; 3) HCTRA issued bonds for half of the total cost of the mainline toll facility, to be backed by toll

revenues; and 4) TxDOT provided $90 million toward the toll facility with state and federal funds (20).

The George Bush Turnpike is a $463 million project that began as a joint effort of the Texas Department of Transportation and the Texas Turnpike Authority (now a division of TxDOT). The turnpike connects the northern suburban cities in the Dallas metropolitan area to relieve congestion and support future economic growth. The project financing plan includes a $135 million loan from TxDOT, $308 million of TTA revenue bonds, and a $20 million TTA Capital Improvement Fund contribution for a total cash contribution of $463 million, plus local right-of-way donations from Dallas, Collin, and Denton Counties valued at $40 million. The loans were used to pay bond holders until the revenue stream from tolls began. The project was transferred to the newly created North Texas Tollway Authority.

Substantial benefits of the toll road concept include not only the reduced public agency cost to develop infrastructure projects, but also the creation of another revenue source. Tolls paid by motorists can be used as a "soft match" for other federal funds, as described in the General Concepts chapter of this report. These toll revenue streams could thus be thought of as having a double impact on reducing TxDOT's funding needs.

TxDOT districts can intensify their efforts to solicit county and municipal contributions (via right-of-way contributions, impact fees, and special assessments) to partially fund highway projects. In this connection, a greater effort might be made at the TxDOT district level to explain how the priority of projects can be affected by reducing TxDOT's cost through local government and private subsidies.

. . . the priority of projects can be affected by reducing TxDOT's cost through local government and private subsidies.

Through Transportation Corporations, the private sector can also make donations and contributions that lower TxDOT's costs for specific projects and thereby increase their cost effectiveness rating. In this connection, TxDOT might be able to raise significant amounts of private equity by allowing the private sector to competitively bid for the right to retrofit urban

highways and convert them (or portions of the roadway) to private toll roads. Projects that involve major improvements to heavily traveled urban arterials are ideal candidates for competitive bidding by the private sector, especially if TxDOT obtains the required environmental clearances for the project before putting it out to tender. The contract could be awarded in one of four ways:

- To the bidder offering the highest annual lease payment;
- To the bidder offering the highest marginal-return schedule;
- To the bidder charging the lowest toll rates;
- To the bidder offering the highest up-front bonus payment (given a fixed annual lease payment set by TxDOT in advance).

From the standpoint of new revenue sources for highways, the last alternative (highest up-front bonus payment) would provide the most funds to TxDOT. Any of these options would require reworking the project selection process to offer projects for private bidders before TxDOT funding is allocated. It might result in less TxDOT money, but more projects, in large urban areas.

Value Pricing

A previous estimate of the revenue impacts from "value" or "congestion" pricing, applied to all highways in the U.S., was that pricing could yield revenues of $210 billion per year, at pricing levels ranging up to 30¢ per kilometer on the most congested facilities (21). When federal expenditures amount to $20 to $30 billion per year, one can understand the interest in this technique. Value pricing is the application of user surcharges on congested highway facilities during peak periods. Its goal is to provide an alternative to slow, congested travel. Depending on which of several variations are used, it can discourage some vehicle trips and shift other trips to alternate destinations, routes, times, or modes of travel. The claimed benefits of pricing include increased speeds for those able to pay, increased transit productivity, and reduced pollution, driver cost, and energy use. Furthermore, pricing could raise large amounts of revenue which could be used for improvements to the transportation system. And it would increase

equity among road users by narrowing the wide gap between the cost impact that users place on the system and what they pay through current road-use charges (21).

Despite its great promise of economic benefits and its demonstrated technological feasibility, full-scale value pricing has been implemented only once, in downtown Singapore. In the 1970s, many cities around the world evaluated congestion pricing proposals and universally rejected them. **Today's environment is different.** Because of dramatic increases in the level, duration, and pervasiveness of congestion, the relatively minor impact of traditional congestion-management techniques and the need for new sources of transportation funding, interest in congestion pricing has recently resurfaced. In Europe, the cities of Bergen, Norway, Oslo, Norway, and Milan, Italy, have implemented congestion charges for entering central areas. In the U.S., New York, Los Angeles, San Francisco, Houston, San Diego, Minneapolis, and Seattle have completed studies (21), although they are either still in the experimental phase or have been rejected.

FUNDING TEXAS HIGHWAYS

Value pricing experiments and projects in Texas include:

- New toll roads,
- Existing toll highways and bridges, and
- Special use facilities such as high-occupancy toll facilities (HO/T) (where buses, carpools, and paying single-occupant vehicles bypass congested traffic).

These might provide the most politically acceptable near-term opportunities since they would not require tolling a previously general-use facility. Although such facilities would allow only small-scale experiments, they could provide a wealth of information about travel and land use-related responses, administrative and enforcement procedures, technological capabilities, and the legal implications of implementing surcharges. Such information is required before large-scale pricing applications should be promoted or would be accepted (21).

Several key developments and activities in states and metropolitan planning organizations relating to value pricing and other market-based pricing policies can be monitored to evaluate the future of this technique. These include:

- The new private-sector variable toll facility on SR 91 in Orange County, California,
- The Washington State DOT's privatization initiative that attempted (but ultimately failed) to promote public/private partnerships (including pricing projects) in the Puget Sound region,
- The Metropolitan Washington Council of Government's proposed study of congestion pricing in the National Capital region,
- The New Jersey DOT's statewide market-based auto pricing initiative,
- The California Air Resource Board's evaluation of market-based approaches in four metropolitan areas,
- San Diego's I-15 high-occupancy vehicle and toll (HO/T) facility demonstration project,
- Provision for two-person vehicles to use the Katy Freeway (I-10, Houston) high-occupancy vehicle lane in Houston during the three-or-more person time periods,
- The Maine Turnpike's recreational variable traffic toll implemented during the summer of 1995, and
- International congestion pricing activities in Singapore, Hong Kong, the United Kingdom, Norway, Sweden, and France (20).

The combined high-occupancy vehicle lane and toll highway (termed HO/T) concept has also been discussed as a significant part of the transportation funding and operations package in Austin, Dallas, San Antonio, Houston, and metropolitan areas. The concept has the potential to make high-occupancy vehicle lanes more palatable (because they can fill up the lane with vehicles), provide more opportunities for managing the operation of a separate facility (using price to vary the volume), and raise enough revenue to at least cover operations costs if not also help re-pay construction bonds. If two-lane HO/T facilities are constructed, there is the possibility for significantly greater revenue (usually the buses and carpools can be accommodated

in a single lane; the extra lane will carry, almost solely, paying vehicles). Public opinion, and not technology, will be the ultimate arbiter of the feasibility of this concept.

The Motor Fuels Tax

Given TxDOT's stated needs under various quality scenarios ranging from "Holding the Line" to "Meeting Optimal Needs," it is clear that, despite the obvious viability of the various public/private cost-sharing, toll road, and privatization options discussed elsewhere, additional or increased broad-based fees and/or taxes will be necessary to meet revenue needs. As noted earlier, the tax on gasoline and diesel fuel provides the largest source of revenue (47%) for highway construction and maintenance activities (also includes planning, design, environmental, and other studies necessary for construction). Various fees, primarily automobile and commercial vehicle registration fees, provide the other major source of highway activity revenue.

Traditionally, the Legislature has met increased highway needs through a periodic increase in motor fuel taxes. Since 1972, the Legislature has increased the gasoline and diesel fuel tax rates once temporarily and three times permanently from 1.3¢ per liter on gasoline and 1.7¢ per liter on diesel fuel to the current 5.28¢ per liter on both fuels. A recent history of the revenue yield from motor fuel taxes is shown in Figure 7.

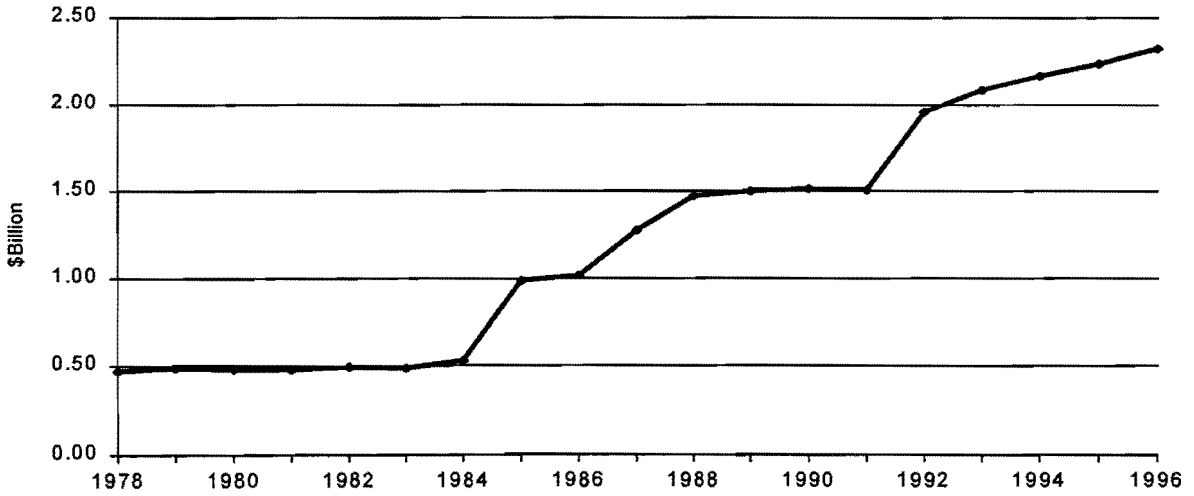


Figure 7. Motor Fuels Tax Revenue in Texas

For fiscal year 1997, motor fuel tax revenues should reach $2.4 billion, yielding a 7.9% annual growth rate since 1972. During the period 1983 through 1992, collections rose at an average annual rate of 16.6%, compared to the 3.9% annual rate for the period 1992 to 1997. Legislated rate increases, however, are responsible for most of the growth. Since 1972, the underlying base of motor fuel consumption has grown at a 2.3% average annual rate. Additionally, the figures presented above are gross fuel tax revenues, not tax revenues received by TxDOT. Under provisions of the state Constitution, TxDOT receives 75% of motor fuel tax revenues, with the Available School Fund receiving the remaining 25%.

Funding Texas Highways

The existing motor fuel tax is based on a cents-per-liter rate. There have been discussions about moving toward a sales tax on motor fuels that would be levied on a percent basis. The rationale is that as construction costs rise with inflation, there should be some "indexing" for highway fund revenue. Motor fuels tax increases can provide this but are more difficult to obtain than tax revenue increases based on sales taxes, when the price of fuel increases.

While this might be an attractive option, there are three considerations. A sales tax may not be a motor fuel tax as designated in the Texas Constitution and, therefore, may not be dedicated to transportation funding. The connection between the use of fuel and the use of transportation facilities would be reduced; as the price of fuel rises, consumption and travel (and therefore the need for highways) would fall. Any revision to the motor fuels tax structure may also initially be revenue neutral, with some political "capital" expended for no revenue increase.

While an Attorney General's opinion could resolve the first issue, the other two appear to be problems that are not worth addressing. Focusing on increasing the per liter motor fuels tax represents a better use of TxDOT's resources.

It is estimated, given current consumption levels, that each one cent increase in the motor fuels tax will raise approximately $103 million in additional revenue. As such, if the motor fuels tax alone were used to finance additional revenue needs, the increases in the motor fuel tax shown in Table 6 would be necessary to meet the funding requirements outlined in TxDOT's four strategic planning scenarios.

Table 6. Texas Fuel Tax Increases Required to Meet TxDOT Scenario Needs

TxDOT Scenario	*State Fuel Tax Increase Needed (¢ per liter)*	*Resulting Total State Tax per Liter*	*Additional Gross Tax Revenue ($ billion)*[1]	*TxDOT Portion ($ billion)*[2]	*Available School Fund Portion ($ billion)*[2]
Losing Ground	-	5.3¢	-0-	-0-	-0-
Holding the Line	6.3¢	11.6¢	$2.47	$1.85	$0.62
Gaining Ground	15.3¢	20.6¢	$6.00	$4.50	$1.50
Meeting Optimal Needs	26.9¢	32.2¢	$10.50	$7.87	$2.63

[1] Based on current consumption levels.
[2] 75% of revenue to TxDOT, 25% to Available School Fund.

If the motor fuels tax were used as the sole source of additional funds, a tax increase of 120%—6.3¢ per liter—would be necessary to just meet the "Holding the Line" scenario which, in turn, meets only 48% of the transportation system's identified needs. Scenarios 3 and 4 would require motor fuels tax increases of 290% and 510%, respectively.

Vehicle Registration Fees

As noted previously, the other significant tax/fee revenue source is the collection of vehicle registration fees. Like the motor fuels tax, they are correctly perceived as a user fee. For commercial and private vehicles alike, the fee is based on the type and weight of the vehicle.

An advantage that makes vehicle registration fees attractive as a revenue source is the fact that, unlike the fuels tax, it all accrues to TxDOT and Texas counties. In order to capitalize on this fact and provide a significant source of revenue, one option to consider is developing a vehicle registration fee system that accounts for highway construction and maintenance fund needs in different areas of the state based on the number of roadway lane-kilometers and amount of travel. As such, costs are more closely attributed to the areas in which the costs are incurred. Further, costs associated with capacity building are more directly attributed to where the needs are greatest and where the benefits would occur. Table 7 summarizes two measures of the relative level of need in each metropolitan area—the number of registered vehicles and the daily vehicle travel per lane-kilometer of roadway.

FUNDING TEXAS HIGHWAYS

As an example, a prototype funding scheme is outlined for the three "new revenue needed" scenarios of the Transportation Needs Revenue Assessment. The highway revenue needs described in that report were divided into mobility, preservation, and safety. TTI's analysis combined the preservation and safety goals into one area. The funding needs (in excess of existing sources) identified in Table 8 were:

- Holding the Line—$1.5 billion total additional needs—55% mobility, 45% preservation/safety.
- Gaining Ground—$3.9 billion total additional needs—31% mobility, 69% preservation/safety.
- Meeting Optimal Needs—$6.7 billion total additional needs—45% mobility, 55% preservation/safety.

Table 7. Basic Information for Revenue Increase Alternatives

Metropolitan Area (MSA)	Ⓐ *1996-97 Registered Vehicles (1000)*	Ⓑ *Percent of Vehicles (%)*	Ⓒ *Lane Kilometers of Roadway*	Ⓓ *Daily Travel (million vehicle kilometers)*	Ⓔ *Travel Density (vehicle kilometers per lane kilometer)*[1]	Ⓕ *Mobility Need Ratio (% of state average)*[2]	Ⓖ *Mobility Share*[3] *(%)*
Abilene	115	0.7	1,853	2.7	1,477	83	0.31
Amarillo	189	1.2	2,798	4.7	1,683	94	0.58
Austin	841	5.5	8,000	28.5	3,562	199	5.46
Beaumont-Port Arthur	313	2.1	3,379	10.8	3,183	178	1.82
Houston-Galveston-Brazoria	3,339	21.9	16,464	93.8	5,699	319	34.66
Brownsville-Harlingen	177	1.2	2,446	5.8	2,368	132	0.77
Bryan-College Station	91	0.6	1,227	2.9	2,373	133	0.39
Corpus Christi	278	1.8	3,600	8.9	2,482	139	1.26
Dallas	2,472	16.2	16,947	73.4	4,334	242	19.51
El Paso	400	2.6	2,301	11.2	4,857	272	3.54
Fort Worth-Arlington	1,275	8.3	7,875	41.2	5,227	292	12.14
Killeen-Temple	217	1.4	3,325	7.7	2,307	129	0.91
Laredo	90	0.6	1,446	2.4	1,681	94	0.27
Longview-Marshall	197	1.3	4,249	7.7	1,821	102	0.65
Lubbock	197	1.3	2,619	4.2	1,604	90	0.58
McAllen-Edinburg-Mission	257	1.7	3,062	8.6	2,819	158	1.32
Midland	105	0.7	1,497	2.3	1,553	87	0.30
Odessa	110	0.7	1,492	2.1	1,427	80	0.29
San Angelo	93	0.6	1,526	1.9	1,263	71	0.21
San Antonio	1,118	7.3	8,335	35.0	4,199	235	8.55
Sherman-Denison	97	0.6	1,889	3.4	1,784	100	0.31
Texarkana	76	0.5	1,863	3.6	1,930	108	0.27
Tyler	156	1.0	2,415	6.1	2,535	142	0.72
Victoria	73	0.5	1,153	2.2	1,948	109	0.26
Waco	170	1.1	2,565	6.6	2,592	145	0.80
Wichita Falls	122	0.8	2,549	3.4	1,323	74	0.29
Metro Area Total	12,571	82	106,873	381	3,568	199	96.17
Remainder of state (Non-Metro)	2,703	18	188,296	147	779	44	3.83
Statewide Total	15,274	100	295,169	528	1,789	--	100%

[1] Daily travel ÷ lane kilometers of roadway.
[2] (Travel density ÷ 1,627) x 100%.
[3] (Mobility need ratio x registered vehicle) ÷ state total of need ratio x vehicles.
Source: Texas Transportation Institute Analysis.

Table 8. Additional Annual Needs for TxDOT Scenarios

Scenario	*Annual Additional Funds Needed*[1]				
	Preservation and Safety		*Mobility*		*Total ($ million)*
	($ million)	*(%)*	*($ million)*	*(%)*	
Holding the Line	674	(45%)	831	(55%)	1,505
Gaining Ground	2,666	(69%)	1,185	(31%)	3,851
Meeting Optimal Needs	3,708	(55%)	2,991	(45%)	6,699

[1] Relative to Losing Ground Scenario (Continuation of Existing Trends)

Source: (1)

The prototype funding scheme includes the following process to allocate the revenue needs to metropolitan and rural needs.

- Metropolitan area (MSA) boundaries are used to identify areas of economic (or market) delineation and, hence, are particularly appropriate for this analysis. The 26 Texas MSAs are treated as individual units, and all non-MSA areas are treated as one group.
- Total revenue needs are divided into a mobility category and a preservation and safety category using TxDOT's Transportation Needs Revenue Assessment (1) data. The revenue needs used in the calculation are the difference between the existing revenue projections (Losing Ground scenario) and the scenarios used in the analysis. The analysis assumes all revenues included in the Losing Ground scenario will be collected.
- The maintenance needs for each scenario are distributed equally to all vehicles in the state, regardless of location.
- The additional mobility needs for each scenario are distributed to vehicles in each MSA according to the traffic congestion level. The mobility need ratio (Column F in Table 7) indicates the ratio of each MSA (or the remainder group) to the statewide average. The ratio value for each area is multiplied by the number of registered vehicles to weight the congestion level by the magnitude of the problem. This value

for each area is divided by the sum of all values to get the area's "share" of the statewide mobility problem. The mobility share is divided by the number of vehicles to estimate the revenue needed from each vehicle to attain the scenario needs.

- The preservation/safety fee and the mobility fee are added to calculate the additional registration fee for each MSA.

Tables 9, 10, and 11 indicate the costs for highway maintenance and capacity-building that would be charged under this plan in each of TxDOT's Transportation Needs Revenue Assessment scenarios that require additional revenue (Holding the Line, Gaining Ground, and Meeting Optimal Needs).

- Holding the Line Scenario (Table 9)—The preservation and safety program in the scenario would require $44 per registered vehicle. The annual additional capacity fee for metropolitan area mobility projects would range from near $20 to less than $90. Most of the total annual fees in Table 9 are less than $100.
- Gaining Ground Scenario (Table 10)—The increased emphasis on preservation and safety programs in this scenario is evident in the $174 per year additional vehicle registration fee for those programs. The metropolitan mobility fees would range from $27 to $123, a 42% increase from the Holding the Line scenario. All of the annual fees would exceed $200, with fees in Houston, Dallas, and Fort Worth approaching $300.
- Meeting Optimal Needs (Table 11)—Approximately 55% of the additional needs in this scenario are for preservation and safety programs, resulting in a statewide fee of more than $240 annually. The mobility fees would range from $42 for the non-metro areas and $69 in San Angelo to $310 in the Houston area.

Table 9. Fees Needed for the Holding the Line Scenario

Metropolitan Area (MSA)	Ⓐ *Preservation/Safety Revenue Needed ($ million)*	Ⓑ *Mobility Revenue Needed ($ million)*	Ⓒ *Preservation/ Safety Fee ($)*	Ⓓ *Mobility Fee ($)*	Ⓔ *Total Annual Fee ($)*	Ⓕ *Monthly Fee ($)*
Abilene	$ 5.1	$ 2.6	$ 44.14	$ 22.35	$ 66.49	$ 5.54
Amarillo	8.4	4.8	44.14	25.47	69.61	5.80
Austin	37.1	45.3	44.14	53.91	98.05	8.17
Beaumont-Port Arthur	13.8	15.1	44.14	48.17	92.31	7.69
Houston-Galveston-Brazoria	147.4	288.0	44.14	86.25	130.39	10.87
Brownsville-Harlingen	7.8	6.4	44.14	35.84	79.98	6.67
Bryan-College Station	4.0	3.3	44.14	35.92	80.06	6.67
Corpus Christi	12.3	10.5	44.14	37.56	81.70	6.81
Dallas	109.1	162.1	44.14	65.58	109.73	9.14
El Paso	17.7	29.4	44.14	73.50	117.65	9.80
Fort Worth-Arlington	56.3	100.9	44.14	79.10	123.24	10.27
Killeen-Temple	9.6	7.6	44.14	34.92	79.06	6.59
Laredo	4.0	2.3	44.14	25.44	69.58	5.80
Longview-Marshall	8.7	5.4	44.14	27.56	71.71	5.98
Lubbock	8.7	4.8	44.14	24.27	68.41	5.70
McAllen-Edinburg-Mission	11.3	11.0	44.14	42.66	86.80	7.23
Midland	4.6	2.5	44.14	23.50	67.64	5.64
Odessa	4.9	2.4	44.14	21.59	65.73	5.48
San Angelo	4.1	1.8	44.14	19.12	63.26	5.27
San Antonio	49.3	71.0	44.14	63.55	107.69	8.97
Sherman-Denison	4.3	2.6	44.14	26.99	71.14	5.93
Texarkana	3.4	2.2	44.14	29.21	73.35	6.11
Tyler	6.9	6.0	44.14	38.36	82.50	6.88
Victoria	3.2	2.2	44.14	29.48	73.62	6.13
Waco	7.5	6.7	44.14	39.23	83.37	6.95
Wichita Falls	5.4	2.4	44.14	20.02	64.16	5.35
Remainder of State (Non-Metro)	$ 119	$ 32	$ 44.14	$ 11.79	$ 55.93	$ 4.66
Statewide Total	$ 674	$ 831				

Ⓐ See Table 8.

Ⓑ See Table 8.

Ⓒ = Ⓐ times Ⓑ from Table 7.

Ⓓ = Ⓑ times Ⓖ from Table 7.

Ⓔ = Ⓒ + Ⓓ.

Ⓕ = Ⓔ divided by 12.

Table 10. Fees Needed for the Gaining Ground Scenario

Metropolitan Area (MSA)	Ⓐ *Preservation/Safety Revenue Needed ($ million)*	Ⓑ *Mobility Revenue Needed ($ million)*	Ⓒ *Preservation/ Safety Fee ($)*	Ⓓ *Mobility Fee ($)*	Ⓔ *Total Annual Fee ($)*	Ⓕ *Monthly Fee ($)*
Abilene	$ 20.0	$ 3.6	$ 174.53	$ 31.87	$ 206.40	$ 17.20
Amarillo	33.0	6.9	174.53	36.31	210.83	17.57
Austin	146.8	64.7	174.53	76.85	251.38	20.95
Beaumont-Port Arthur	54.7	21.5	174.53	68.67	243.20	20.27
Houston-Galveston-Brazoria	582.8	410.6	174.53	122.97	297.49	24.79
Brownsville-Harlingen	31.0	9.1	174.53	51.10	225.62	18.80
Bryan-College Station	15.9	4.7	174.53	51.21	225.73	18.81
Corpus Christi	48.6	14.9	174.53	53.55	228.08	19.01
Dallas	431.5	231.2	174.53	93.50	268.03	22.34
El Paso	69.9	41.9	174.53	104.79	279.32	23.28
Fort Worth-Arlington	222.6	143.8	174.53	112.77	287.29	23.94
Killeen-Temple	37.9	10.8	174.53	49.78	224.31	18.69
Laredo	15.7	3.3	174.53	36.26	210.79	17.57
Longview-Marshall	34.4	7.8	174.53	39.30	213.82	17.82
Lubbock	34.4	6.8	174.53	34.60	209.13	17.43
McAllen-Edinburg-Mission	44.9	15.6	174.53	60.82	235.35	19.61
Midland	18.4	3.5	174.53	33.51	208.03	17.34
Odessa	19.2	3.4	174.53	30.78	205.31	17.11
San Angelo	16.2	2.5	174.53	27.26	201.79	16.82
San Antonio	195.1	101.3	174.53	90.60	265.13	22.09
Sherman-Denison	16.9	3.7	174.53	38.48	213.01	17.75
Texarkana	13.3	3.2	174.53	41.65	216.17	18.01
Tyler	27.3	8.6	174.53	54.69	229.22	19.10
Victoria	12.8	3.1	174.53	42.02	216.55	18.05
Waco	29.6	9.5	174.53	55.92	230.45	19.20
Wichita Falls	21.3	3.5	174.53	28.54	203.07	16.92
Remainder of State (Non-Metro)	$ 472	$ 45.4	$ 174.53	$ 16.80	$ 191.33	$ 15.94
Statewide Total	2,666	1,185				

Ⓐ See Table 8.

Ⓑ See Table 8.

Ⓒ = Ⓐ times Ⓑ from Table 7.

Ⓓ = Ⓑ times Ⓖ from Table 7.

Ⓔ = Ⓒ+Ⓓ.

Ⓕ = Ⓔ divided by 12.

Table 11. Fees Needed for the Meeting Optimal Needs Scenario

Metropolitan Area (MSA)	Ⓐ *Preservation/Safety Revenue Needed ($ million)*	Ⓑ *Mobility Revenue Needed ($ million)*	Ⓒ *Preservation/ Safety Fee ($)*	Ⓓ *Mobility Fee ($)*	Ⓔ *Total Annual Fee ($)*	Ⓕ *Monthly Fee ($)*
Abilene	$ 27.8	$ 9.2	$ 242.76	$ 80.45	$ 323.21	$ 26.93
Amarillo	45.9	17.3	242.76	91.65	334.42	27.87
Austin	204.2	163.2	242.76	194.01	436.78	36.40
Beaumont-Port Arthur	76.0	54.3	242.76	173.35	416.12	34.68
Houston-Galveston-Brazoria	810.7	1,036.6	242.76	310.42	553.18	46.10
Brownsville-Harlingen	43.1	22.9	242.76	128.99	371.75	30.98
Bryan-College Station	22.1	11.8	242.76	129.27	372.03	31.00
Corpus Christi	67.6	37.6	242.76	135.18	377.94	31.50
Dallas	600.2	583.5	242.76	236.04	478.80	39.90
El Paso	97.2	105.9	242.76	264.54	507.31	42.28
Fort Worth-Arlington	309.6	363.0	242.76	284.67	527.44	43.95
Killeen-Temple	52.7	27.3	242.76	125.67	368.44	30.70
Laredo	21.8	8.2	242.76	91.55	334.31	27.86
Longview-Marshall	47.9	19.6	242.76	99.20	341.97	28.50
Lubbock	47.8	17.2	242.76	87.35	330.12	27.51
McAllen-Edinburg-Mission	62.4	39.5	242.76	153.54	396.30	33.03
Midland	25.6	8.9	242.76	84.59	327.35	27.28
Odessa	26.7	8.6	242.76	77.71	320.47	26.71
San Angelo	22.5	6.4	242.76	68.82	311.58	25.97
San Antonio	271.4	255.7	242.76	228.72	471.49	39.29
Sherman-Denison	23.5	9.4	242.76	97.15	339.92	28.33
Texarkana	18.5	8.0	242.76	105.13	347.90	28.99
Tyler	38.0	21.6	242.76	138.06	380.82	31.74
Victoria	17.8	7.8	242.76	106.08	348.85	29.07
Waco	41.2	24.0	242.76	141.18	383.94	31.99
Wichita Falls	29.7	8.8	242.76	72.05	314.82	26.23
Remainder of State (Non-Metro)	$ 656	$ 115	$ 242.76	$ 42.42	$ 285.18	$ 23.77
Statewide Total	$ 3,708	$ 2,991				

Ⓐ See Table 8.

Ⓑ See Table 8.

Ⓒ = Ⓐ times Ⓑ from Table 7.

Ⓓ = Ⓑ times Ⓖ from Table 7.

Ⓔ = Ⓒ+Ⓓ.

Ⓕ = Ⓔ divided by 12.

It is important to note that in Tables 9, 10, and 11, no differentiation is made between private automobiles and pickup trucks and commercial trucks, buses, and tractor/trailer combinations. A separate estimate was made to analyze an alternative that would reflect the findings of highway cost allocation studies (21). For this analysis, private passenger automobiles and pickup trucks were assigned 59.2% of highway costs. As illustrated in Table 12, private vehicle costs in the Gaining Ground scenario drop by 40.8% (the cost percentage assigned to trucks, buses, and tractor/trailer combinations) and range from a high of $176 per year to a low of $119 per year in MSAs. Under this funding scheme, vehicles registered in non-MSA areas would pay $113 per year. Commercial trucks and buses would, however, pay an average of $1,972 more each year based on a weight scheme similar to one currently in place.

One other approach to revenue generation would be to combine a statewide motor fuels tax increase with the additional vehicle registration fee. Tables 13 and 14 present a blend of the distributed vehicle registration fees and a 2.6¢ per liter increase in the motor fuels tax for the Gaining Ground scenario. The 2.6¢ per liter fee would raise $772.5 million for highway purposes (the remainder of the revenue goes to the Available School Fund); the needs in each scenario were reduced by that amount. Table 13 presents the estimated cost if fees are evenly distributed to all vehicles (similar to Tables 9, 10, and 11). Table 14 illustrates the private vehicle fees for the scheme where highway cost allocation methods are used.

The fees in Table 13 include $140 for preservation and safety and from $13 (non-MSA fee) to $98 in mobility fees. Under the Table 14 scenario, additional vehicle registration fees would range from a high of $141 per year to a low of $95 in MSA areas, while vehicles registered in non-MSA areas would be charged $91 per year. This combination of motor fuel taxes and vehicle registration fee increases would yield revenue sufficient to meet the funding needs in the Gaining Ground Scenario.

Table 12. Fees Needed if Only Private Vehicle Costs are Assessed for the Gaining Ground Scenario

Metropolitan Area (MSA)	Ⓐ *Preservation/Safety Revenue Needed ($ million)*	Ⓑ *Mobility Revenue Needed ($ million)*	Ⓒ *Preservation/ Safety Fee ($)*	Ⓓ *Mobility Fee ($)*	Ⓔ *Total Annual Fee ($)*	Ⓕ *Monthly Fee ($)*
Abilene	$ 11.8	$ 2.2	$ 103.32	$ 18.87	$ 122.19	$ 10.18
Amarillo	19.5	4.1	103.32	21.49	124.81	10.40
Austin	86.9	38.3	103.32	45.50	148.82	12.40
Beaumont-Port Arthur	32.4	12.7	103.32	40.65	143.97	12.00
Houston-Galveston-Brazoria	345.0	243.1	103.32	72.80	176.12	14.68
Brownsville-Harlingen	18.3	5.4	103.32	30.25	133.57	11.13
Bryan-College Station	9.4	2.8	103.32	30.31	133.63	11.14
Corpus Christi	28.8	8.8	103.32	31.70	135.02	11.25
Dallas	255.4	136.8	103.32	55.35	158.67	13.22
El Paso	41.4	24.8	103.32	62.04	165.36	13.78
Fort Worth-Arlington	131.8	85.1	103.32	66.76	170.08	14.17
Killeen-Temple	22.4	6.4	103.32	29.47	132.79	11.07
Laredo	9.3	1.9	103.32	21.47	124.79	10.40
Longview-Marshall	20.4	4.6	103.32	23.26	126.58	10.55
Lubbock	20.4	4.0	103.32	20.49	123.81	10.32
McAllen-Edinburg-Mission	26.6	9.3	103.32	36.01	139.33	11.61
Midland	10.9	2.1	103.32	19.84	123.16	10.26
Odessa	11.4	2.0	103.32	18.22	121.54	10.13
San Angelo	9.6	1.5	103.32	16.14	119.46	9.95
San Antonio	115.5	60.0	103.32	53.64	156.96	13.08
Sherman-Denison	10.0	2.2	103.32	22.78	126.10	10.51
Texarkana	7.9	1.9	103.32	24.66	127.97	10.66
Tyler	16.2	5.1	103.32	32.38	135.70	11.31
Victoria	7.6	1.8	103.32	24.88	128.20	10.68
Waco	17.5	5.6	103.32	33.11	136.43	11.37
Wichita Falls	12.6	2.1	103.32	16.90	120.22	10.02
Remainder of State (Non-Metro)	$ 279	$ 27	$ 103.32	$ 9.95	$ 113.27	$ 9.44
Statewide Total	$ 1,578	$ 701				

Ⓐ See Table 8.

Ⓑ See Table 8.

Ⓒ = Ⓐ times Ⓑ from Table 7.

Ⓓ = Ⓑ times Ⓖ from Table 7.

Ⓔ = Ⓒ+Ⓓ.

Ⓕ = Ⓔ divided by 12.

Table 13. Fees Needed for the Gaining Ground Scenario with a 2.6¢ per Liter Fuel Tax Increase

Metropolitan Area (MSA)	Ⓐ *Preservation/Safety Revenue Needed ($ million)*	Ⓑ *Mobility Revenue Needed ($ million)*	Ⓒ *Preservation/ Safety Fee ($)*	Ⓓ *Mobility Fee ($)*	Ⓔ *Total Annual Fee ($)*	Ⓕ *Monthly Fee ($)*
Abilene	$ 16.0	$ 2.9	$ 139.51	$ 25.48	$ 164.99	$ 13.75
Amarillo	26.4	5.5	139.51	29.02	168.54	14.04
Austin	117.4	51.7	139.51	61.44	200.95	16.75
Beaumont-Port Arthur	43.7	17.2	139.51	54.89	194.41	16.20
Houston-Galveston-Brazoria	465.9	328.3	139.51	98.30	237.81	19.82
Brownsville-Harlingen	24.8	7.2	139.51	40.84	180.36	15.03
Bryan-College Station	12.7	3.7	139.51	40.93	180.45	15.04
Corpus Christi	38.9	11.9	139.51	42.81	182.32	15.19
Dallas	344.9	184.8	139.51	74.74	214.26	17.85
El Paso	55.8	33.5	139.51	83.77	223.28	18.61
Fort Worth-Arlington	177.9	115.0	139.51	90.14	229.66	19.14
Killeen-Temple	30.3	8.6	139.51	39.80	179.31	14.94
Laredo	12.5	2.6	139.51	28.99	168.50	14.04
Longview-Marshall	27.5	6.2	139.51	31.41	170.93	14.24
Lubbock	27.5	5.5	139.51	27.66	167.17	13.93
McAllen-Edinburg-Mission	35.9	12.5	139.51	48.62	188.13	15.68
Midland	14.7	2.8	139.51	26.79	166.30	13.86
Odessa	15.4	2.7	139.51	24.61	164.12	13.68
San Angelo	12.9	2.0	139.51	21.79	161.30	13.44
San Antonio	156.0	81.0	139.51	72.43	211.94	17.66
Sherman-Denison	13.5	3.0	139.51	30.76	170.28	14.19
Texarkana	10.6	2.5	139.51	33.29	172.80	14.40
Tyler	21.8	6.8	139.51	43.72	183.23	15.27
Victoria	10.2	2.5	139.51	33.59	173.10	14.43
Waco	23.7	7.6	139.51	44.70	184.22	15.35
Wichita Falls	17.0	2.8	139.51	22.82	162.33	13.53
Remainder of State (Non-Metro)	$ 377	$ 36	$ 139.51	$ 13.43	$ 152.95	$ 12.75
Statewide Total	$2,131	$ 947				

Ⓐ See Table 8.

Ⓑ See Table 8.

Ⓒ = Ⓐ times Ⓑ from Table 7.

Ⓓ = Ⓑ times Ⓖ from Table 7.

Ⓔ = Ⓒ + Ⓓ.

Ⓕ = Ⓔ divided by 12.

Table 14. Fees Needed if Only Private Vehicle Costs are Assessed and Fuel Tax is Increased 2.6¢ per Liter—Gaining Ground Scenario

Metropolitan Area (MSA)	Ⓐ *Preservation/Safety Revenue Needed ($ million)*	Ⓑ *Mobility Revenue Needed ($ million)*	Ⓒ *Preservation/ Safety Fee ($)*	Ⓓ *Mobility Fee ($)*	Ⓔ *Total Annual Fee ($)*	Ⓕ *Monthly Fee ($)*
Abilene	$ 9.5	$ 1.7	$ 82.59	$ 15.08	$ 97.67	$ 8.14
Amarillo	15.6	3.3	82.59	17.18	99.77	8.31
Austin	69.5	30.6	82.59	36.37	118.96	9.91
Beaumont-Port Arthur	25.9	10.2	82.59	32.50	115.09	9.59
Houston-Galveston-Brazoria	275.8	194.3	82.59	58.19	140.78	11.73
Brownsville-Harlingen	14.7	4.3	82.59	24.18	106.77	8.90
Bryan-College Station	7.5	2.2	82.59	24.23	106.82	8.90
Corpus Christi	23.0	7.1	82.59	25.34	107.93	8.99
Dallas	204.2	109.4	82.59	44.25	126.84	10.57
El Paso	33.1	19.8	82.59	49.59	132.18	11.02
Fort Worth-Arlington	105.3	68.1	82.59	53.37	135.96	11.33
Killeen-Temple	17.9	5.1	82.59	23.56	106.15	8.85
Laredo	7.4	1.5	82.59	17.16	99.75	8.31
Longview-Marshall	16.3	3.7	82.59	18.60	101.19	8.43
Lubbock	16.3	3.2	82.59	16.38	98.97	8.25
McAllen-Edinburg-Mission	21.2	7.4	82.59	28.78	111.37	9.28
Midland	8.7	1.7	82.59	15.86	98.45	8.20
Odessa	9.1	1.6	82.59	14.57	97.16	8.10
San Angelo	7.6	1.2	82.59	12.90	95.49	7.96
San Antonio	92.3	47.9	82.59	42.88	125.47	10.46
Sherman-Denison	8.0	1.8	82.59	18.21	100.80	8.40
Texarkana	6.3	1.5	82.59	19.71	102.30	8.53
Tyler	12.9	4.0	82.59	25.88	108.47	9.04
Victoria	6.1	1.5	82.59	19.89	102.48	8.54
Waco	14.0	4.5	82.59	26.47	109.06	9.09
Wichita Falls	10.1	1.7	82.59	13.51	96.10	8.01
Remainder of State (Non-Metro)	$ 223	$ 21	$ 82.59	$ 7.95	$ 90.54	$ 7.55
Statewide Total	$1.262	$ 561				

Ⓐ See Table 8.

Ⓑ See Table 8.

Ⓒ = Ⓐ times Ⓑ from Table 7.

Ⓓ = Ⓑ times Ⓖ from Table 7.

Ⓔ = Ⓒ+Ⓓ.

Ⓕ = Ⓔ divided by 12.

Obviously, increases in motor fuel taxes and vehicle registration fees require legislative actions. Further, motor fuel taxes are a revenue source that the legislature and TxDOT are both familiar with from a policy, implementation, and collection standpoint. Collecting vehicle registration fees as proposed in this section, however, represents a new program of fee/tax assessment and will require extensive investigation and a supporting information campaign to establish a viable implementation, collection, and enforcement strategy and to establish the need for higher transportation fees. Significant implementation issues remain, including:

- In order to make the registration fee more palatable, will a quarterly or monthly payment plan be available? If so, how can they be most conveniently collected?
- Would it be possible for the registration fee to be pre-paid (much like a withholding plan) and debits made against an account with something similar to the Lone Star Card?
- Could an estimated fee be added on to the price of the motor fuel and the balance paid or a refund made based on distance calculated when the vehicle is inspected?
- Is the registration fee sufficiently high as to cause people to seek ways to avoid paying the fee by falsely registering their automobiles in other counties? The insurance industry has faced this problem with its rate structure, and TxDOT would benefit from its experience.
- Dedicating any revenue from the additional mobility fee to the mobility needs of the metropolitan area, or increasing the amount of roadway projects in the area by a similar amount, may be necessary to gain support for this alternative. These fees might also be enabled as part of state legislation similar to the transit authority situation. Any revenue plan would be subject to voter approval, but the funds raised would remain in the area, substantially increasing the chance of passing the fee increase.

Each of these issues, along with others, will require careful and diligent study and will likely involve the use of innovative solutions if such a plan is to be workable. The first step in such a process is to establish contact with appropriate research and tax administration officials at the Office of the Comptroller. An informal interagency working group should be established to

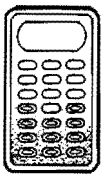
investigate what collection and enforcement procedures might be established should such a tax/fee system be enacted. Once this first step is accomplished and if the plan proves to be sound at that stage, the administration and collection costs can be estimated as an offset against the additional revenue received. This working group can assess with some specificity what form of this plan will be most workable.

Once preliminary procedural concepts are established and cost estimates derived, implementation requires a public awareness/acceptance campaign. At that point, it seems clear there are three fundamental messages that must be communicated:

- The need to protect the people's investment in the existing system must be clear. Fundamental to that message is not only the public's understanding of the value of the highway system, but also the costs of doing nothing.
- All of the funding alternatives must be presented. The costs of any alternative always seem high if it is compared to zero.
- The fairness of this concept must be stressed. It taxes usage, assigns an equal fee to everyone to protect the current investment, levies an additional fee in areas where additional capacity is needed, and assigns appropriate costs to commercial vehicles.

Evaluation of Options

The funding options discussed in the chapter are scored against the criteria in Table 15. The financial needs on the highway system are very significant, and it will take a mix of these ideas and those in the broad-based category to substantially address the problems.



The package of fund use efficiency options ranks the highest of all the highway funding alternatives. The real effect of these options, however, is to improve the flexibility in using funds, rather than generating significant new revenue. Many of the ideas have been, or are being, enacted by state DOTs as ways to manage cash flow and projects. They are rapidly becoming part of normal business practices.

Table 15. Evaluation of Highway Funding Alternatives

Revenue Source Evaluation Criteria	*Private Property Owner Contribution*	*Public/ Private Cost-Sharing*	*Highway Fund Efficiencies*	*Private Toll Roads*	*Value Pricing*	*Fuel Tax and Vehicle Registration*
Revenue derived	2	2	2	3	2	5
Equity	5	4	5	3	3	4
Economic effects	4	4	5	4	4	4
Collection effort	2	2	4	2	3	5
Industry or public support	3	3	5	3	3	2
Legislative action	5	5	5	4	5	1
Procedural action	3	3	4	2	3	3
National/State issues	5	5	5	5	5	3
Total	29	28	35	26	28	27

Note: Criteria are scored on a scale from 5 (this factor is not an impediment to enacting the revenue alternative or this alternative can substantially improve the Texas transportation funding situation) to 1 (this factor represents a significant barrier to using the financing mechanism or this alternative will not improve the Texas transportation funding situation).

The other options can be separated into those that require TxDOT to work with other governmental agencies or the public to win project approval and those that also require TxDOT to work with private businesses to identify opportunities.

Value pricing and fuel tax and/or vehicle registration fee increases must be sold to the public on the merits of what will be provided and the cost effectiveness of the expenditures. Since it is a new concept, value pricing appears to the public to be a substantially different way of paying for transportation. Improvements in technology, however, have made it possible to more directly do what has been tried for decades—charge motorists for using roads. The more direct method (toll roads) is a significant step up on the scale of intrusiveness from the way motor fuel taxes are collected, and this will take a public information campaign to overcome.

Fuel tax and registration fee increases are well understood and usually resisted. But they also generate significant revenue. If the public supports transportation and if TxDOT is able to identify significant returns for the public's investment, some fee increases are possible. Finding methods to dedicate new or locally approved revenue generated to the local area will improve the chances of tax or fee increases being supported.

Contributions by private property owners or cost sharing on projects can be used to generate new revenue for TxDOT's program or to make private projects financially viable. The potential revenue from these techniques varies by type of project and by the health of the local economy and the development market. There is more effort required to make these techniques work because, typically, the opportunity exists in the advanced planning or early design phases of a project. TxDOT staff are very busy getting public input, performing various studies, and developing plans at this stage. While adding a "public solicitation for joint development" requirement at this level will add another job task, it may result in a partner identifying some design or operational changes that make the project more marketable as a joint development opportunity.

There may be opportunities for private toll road development, but most of these types of projects will be joint participation efforts between the state and a private firm. The lesson that might be learned from the recent toll highway projects in Dallas and Houston and other studies in other Texas cities is that user charge facilities are supported in some corridors. Support is not universal, and a significant public information campaign is needed to generate that support, but private and public/private toll projects can succeed. The scores for collection effort and procedural changes are related to the differences from conventional projects which do not require as much attention to funding and project coordination issues as a toll project will. The key financial issue is the early consideration of range of funding possibilities—this is somewhat of a procedural change for TxDOT, but it is very important if toll projects are to be appropriately considered.

Conclusion—Funding Texas Highways

From this analysis, it seems clear that in order to meet TxDOT's funding requirements as identified in the Transportation Needs Revenue Assessment (1), a blend of several revenue sources must be used. In order to meet TxDOT's revenue needs as identified in the three improvement scenarios, it is very unlikely either public/private ventures, toll roads, fuel taxes, or registration

✧
. . . a blend of several revenue sources must be used.
✧

fees on their own will be sufficient or politically palatable. Each have their own merits, but none of the alternatives alone produce sufficient revenue at rates that are, at the same time, politically attainable. Further, it seems equally clear that whatever alternatives are ultimately selected, an extensive and comprehensive communications effort must be undertaken in order for their necessity to be made evident to the public.

CHAPTER 5
PUBLIC TRANSPORTATION REVENUE SOURCES

Public transportation services in Texas perform a number of important roles. Transit provides the only means of transportation for many residents. Particularly as the Texas rural population gets older, public transportation will be an important element for all Texans—not just residents in the big cities. Access to a private vehicle is not universal, and public transportation in the U.S. and Texas responds to the needs of the transportation disadvantaged in a society that emphasizes mobility. The ability to get to work, school, social services, shopping, and other locations is a key component of our economy—public transportation provides the link for citizens without cars, or those who are unable to drive, and those who choose not to drive.

Overview

Public transportation funding will benefit from three specific actions. A coordinated strategic plan produced by TxDOT, transit operators, and transportation associations will focus attention on the common interests of these two groups and make other actions more achievable. Reestablishing the local match requirement will illustrate the support of communities for transit service. Leveraging this local support to generate revenue from a variety of private and state sources is the third element of this approach.

Background

Public transportation also enhances the travel options of other individuals. Transit helps address concerns related to mobility, traffic congestion, and the environment in larger cities. Transit plays a key role in many metropolitan areas serving between 25% and 40% of work trips to the downtown areas (23, 24).

Ensuring stable funding from federal, state, and local sources is important to the continued operation of transit services in rural, small urban, and large metropolitan areas

throughout Texas. Currently, public transportation services in Texas are funded by a combination of federal, state, and local sources, as well as passenger revenues. The exact funding sources and levels vary by the type of transit service provided and the geographic area served.

The Metropolitan Transit Authorities (MTAs) serving the seven large urban areas in the state have legislative authority to implement a local sales tax with voter approval. These systems rely primarily on the local sales tax revenues, user fares, and federal funding received directly from the Federal Transit Administration (FTA). No additional state transit funding is provided to the MTAs.

Transit systems in smaller communities and rural areas also receive a combination of federal, state, and local funding. TxDOT, through its Public Transportation Division, is responsible for administering the state funding for the small urban and rural systems, as well as federal funding for services focusing on the elderly and individuals with special needs. The state share is provided from the Public Transportation Fund (PTF), which is allocated from general revenues, Fund 6 (Highway Trust Fund), and other sources. The PTF funding is appropriated by the Texas Legislature each biennium.

Other states use different funding mechanisms for public transit, including dedicated revenues. This chapter summarizes existing funding procedures and identifies possible approaches for funding public transportation in Texas. Revenue sources, dedicated funding programs, local matching requirements, and other information related to support are explored. Techniques for further consideration in Texas are presented based on this information. Several of the general approaches were identified as applicable to public transportation operations and facilities. More detailed information is contained in a separate report completed as part of this study (25).

State Support for Public Transit in Texas

State funding for transit comes from the State Public Transportation Fund (PTF). State capital and operating support is provided to rural and small urban transit systems. Although a local funding match was previously required, this mandate was removed by the legislature in 1995. State funding for the various types of transit services in the state are highlighted next.

Metropolitan Transit Authorities (MTAs). The state does not provide funding for the seven Metropolitan Transit Authorities (MTAs) in Austin, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, and San Antonio. State legislation allows for the creation of MTAs by approval of citizens in the service area and for the authorization of a dedicated sales tax to support the development and operation of transit services and facilities. Sales tax revenues received by the MTAs in 1996 totaled approximately $765 million. The sales tax revenues provide a stable source of funding for the MTAs.

Small Urbanized Areas. Twenty of the 25 small urban areas in the state with populations between 50,000 to 200,000 have public transit services. These systems receive both federal and state funds. Federal funds come from FTA Section 5307 grants or Governor's Apportionment. These funds can be used for capital, operating, and planning expenses. The level of federal funding is based on all cities in this population range. The Transportation Commission allocates funding among the system based on the needs assessment conducted by the department. The systems apply directly to FTA for the federal funds. State funding for the small urban systems is appropriated by the legislature each biennium. The state funds come from the PTF, which is allocated from general revenues, Fund 6, and other sources.

Rural Areas. Transit services in rural communities with populations under 50,000 are funded through a combination of the FTA Section 5311 program, the state PTF, and local sources. Currently, 41 rural transit systems operate in the state. TxDOT acts as the grants administrator for the federal funds. State funds are allocated by the legislature each biennium. State funds currently comprise more than twice the federal funding,

which has decreased in the last few years. In 1996, the FTA funds were $6.7 million, down from $8 million in 1995. The requirement for a local match to the state fund was eliminated by state legislation in 1995.

Private, Non-Profit Agencies. The FTA Section 5310 Program provides federal funds for 80% of the capital costs of vehicles, radios, and computer equipment used by private, non-profit organizations providing transportation services to the elderly and individuals with special needs. No funding is provided for operating expenses, however. TxDOT is responsible for administering this program, although no additional state funds are provided. The 20% match, as well as the operating expenses, must come from local sources.

Possible Approaches for Additional Consideration in Texas

This section provides an overview of funding practices that could be considered for use in Texas. The approaches used in other states, including the sources of revenues, dedicated funding programs, local match requirements, and authorization for local dedicated revenues were examined as part of this assessment (25). In addition, current state policies, taxes, and fees for transit in Texas were examined.

Dedicated Funding for Transit Service in Texas

✣
Twenty states have established dedicated funding programs for public transit . . .
✣

Twenty states have established dedicated funding programs for public transit. These include many states with populations comparable to Texas. The source of dedicated revenues varies among states. Eight states use a portion of the state highway or transportation fund for transit. Other sources of dedicated state funds include sales tax revenues, general revenues, motor vehicle sales taxes, license plate fees, bonds, the state capital construction fund, the parish transportation fund, cigarette taxes, and state lottery proceeds. In all cases, the dedicated funding for transit was

established through state legislation, although additional executive orders or agency policies were also used in two states, and voter initiative was used in one state.

The following common elements are evident in the states where revenues are dedicated to transit.

Broad agency support—The state DOTs, the state transit association, transit agencies, and highway interests often worked together to secure legislation on the important elements of the programs.

Emphasis on stability—The dedicated programs were established to provide transit agencies with stable funding to allow long-term planning similar to the highway system.

Multimodal funding—The dedicated funding was often part of the general broadening of state departments of transportation mission and responsibility.

Social service issue—As the population of older Americans grows, the need to provide mobility to those who cannot drive or do not have access to an automobile has increased. Public transit services support individuals who are not well served by the automobile; this is particularly important in supporting the welfare-to-work program.

Other Funding

Supporting transit through general revenues is the most common approach used in the U.S. Twenty-two states use general revenues to finance all or a portion of the state's share. In 11 states, the general revenue fund is the only source of support, while in 11 other states, general revenues are used in combination with other programs.

After general revenues, the second most common source of funds to support public transit is the state gasoline or fuel tax. Eighteen states allocate a portion of the fuel tax to transit. The

amount of gasoline or fuel tax varies by state, as does the percentage allocated to public transportation.

Twelve states use other motor vehicle related taxes to support public transportation. These include taxes or fees on vehicle licenses, titles, and registration. Nine states allocate a portion of the general sales tax to transit, while eight states use a percentage of the sales tax on motor vehicles. Six states—Arizona, Massachusetts, New Jersey, Oregon, Pennsylvania, and South Dakota—allocate a portion of the state lottery or casino proceeds to transit. Only West Virginia and Pennsylvania use property taxes to fund the state share of public transportation services.

Other examples of funding sources include taxes on tires, rental and lease vehicles, personal income, and a portion of motor vehicle fines and motor carrier permit fees.

FUNDING TEXAS PUBLIC TRANSPORTATION

A number of state revenue sources could be considered to support a dedicated fund for public transit in Texas. A variety of taxes related to transportation are currently collected in the state. A transit or transportation generated percentage of the existing tax revenues could be identified. These funds could then be earmarked as dedicated revenues for transit or appropriated by the legislature. Other sources of funds that might be appropriate to support transit in Texas include state lottery proceeds, toll revenues, heavy truck fees, and other sources.

The experience in other states suggests that the support of TxDOT, Texas Transit Association, Texas Good Roads and Transportation Association, and a range of social service groups will be needed to enact as a dedicated funding approach. Without this coordinated effort and support, revenue dedication from any source will be unlikely. In addition, a champion or champions within the executive branch and the legislature will be critical to the success of establishing a dedicated funding source.

Reestablish a Local Match Requirement

Reestablishing the local matching requirement on state funds represents another option. Twenty-eight states require that the local agency, service operator, or jurisdiction provide a match for state funds. The match requirements vary between 10% and 50% for capital and operating expenses. This approach emphasizes a federal, state, and local partnership to fund and support public transportation. Local revenue, even if it is modest, helps show the commitment to public transportation.

Of the 28 states that require a local match, 19 states mandate a local match on both capital and operating funds, while six states require a match only on capital funds and three only on operating assistance. The three states that mandate a local match only on operating assistance do not provide state funds for capital needs. Two of the six states that require matching funds only on capital programs do not provide any state funding for transit operations. Three states provide funding for both capital and operating expenses but require a match for only the capital program.

Some states, such as Maryland and Virginia, vary the amount of local participation by category of expenditure. Others, like Minnesota, also vary the local participation by the population within the area served. In addition, state funds are used in 30 states, including Texas, as part of the local match for federal programs. Forty states require that local funds be used to help meet the federal matching share. Texas does not require rural and small city transit agencies to provide matching funds for federal capital and operating programs. The state does require private non-profit agencies to provide a match for federal capital funds, however.

Funding Texas Public Transportation

Twenty-six states have legislation allowing the creation of local dedicated funding for transit. In most cases, the use of a local taxing option requires voter approval. The most common sources of local dedicated funding include sales taxes, property taxes, and motor fuel taxes. The use of local sales taxes based on voter approval is allowed in the seven largest Texas metropolitan areas. A local option tax in smaller urban and rural areas could be considered. This

tax would not raise a significant amount of new funding, but the support this process would illustrate makes other funding options more achievable. The support of local communities, small urban and rural systems, the Texas Transit Association, and other groups is critical for this approach to be feasible.

Repaying Bonds and Certificates of Participation

This financing technique uses tax-exempt bonds or certificates of participation issued by a state agency and secured by a specific revenue source. The state entity, which may be formed just for this purpose or which may have other responsibilities, issues the tax-exempt bonds. The maturity date of the bonds are matched to the lease terms of the vehicles or other equipment purchased with the proceeds. The state then leases the buses or other capital elements to transit operators, who may use a combination of federal and local funds to pay off the bonds. This approach has been used in California, where the California Transit Finance Corporation (CTFC) purchased buses for multiple systems in the state (26).

FUNDING TEXAS PUBLIC TRANSPORTATION

. . . but in Texas it would appear to be most useful for smaller agencies.

While not a new source of funds, this approach provides an additional method of supporting public transit. Although this technique has been used in other states for large and small transit agencies, in Texas it would appear to be most appropriate for smaller agencies. The revenue source that is required could be state revenues, or it could be toll revenue. Florida and New Jersey use their toll revenue credits (described in the general funding options chapter of this report) to support their public transportation systems. Small urban and rural systems could particularly benefit from access to funding options.

State Revolving Loan Fund

The FTA allows states to create Revolving Loan Funds to support the capital needs of public and private non-profit transit services. Federal funds can be combined into a State Revolving Loan Fund, which can be used to purchase vehicles and other capital equipment that is leased or sold to transit operators. Loans from a State Revolving Fund can also be made to transit agencies for the purchase of vehicles, facilities, or other needed capital items. This technique can provide an ongoing source of capital funds. Since the interest or lease payments are considered program income, they do not need to be returned to the FTA but can be retained in the fund for future projects. The Arkansas Department of Transportation is in the process of establishing a Revolving Loan Fund Program for leasing vans for rural health and human services (26).

FUNDING TEXAS PUBLIC TRANSPORTATION

Consideration could be given to establishing a Revolving Loan Fund in Texas. Perhaps a better way of accomplishing this goal, however, is to fund the transit portion of the State Infrastructure Bank now that the Federal Transit Administration has approved the regulations. The technique and results are essentially the same. The rules governing the existing SIB would need to be changed, however, so that projects other than highway construction would be eligible. In addition, TxDOT could reexamine its approach to multimodal project selection in light of an expanded SIB. Selecting which projects or programs benefit from the SIB will be a significant part of the success.

Lease Payments

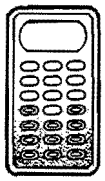
Most FTA capital program funds can be used to finance the principal and interest costs associated with leases or loans for transit vehicles and other equipment. Prior approval from FTA is required on discretionary funds but not formula funds. The same technique can be used on the capital and interest costs associated with contracting for services. The major benefit of this approach is that it allows a consistent basis for cash flow needs (26).

FUNDING TEXAS PUBLIC TRANSPORTATION

Lease payment financing might offer a way to expand to other markets . . .

Leases and loans can be used in Texas. For example, this approach might be used to develop new or expanded services. Lease payment financing might offer a way to expand to other markets if TxDOT assisted local agencies with implementing the vehicle acquisition.

Evaluation of Options



In contrast to the other modal financial solutions, there are no clearly outstanding improvements that are identified for the transit service (Table 16). While several of the broad-based funding ideas will be able to assist transit agencies in their funding situation, the transit-specific ideas suffer from a variety of problems. Most of the issues can be traced to lack of public knowledge or concern about transit service and its role in the Texas economy.

Table 16. Evaluation of Public Transportation Funding Alternatives

Revenue Source Evaluation Criteria	*Dedicated Funding*	*Local Match Requirements*	*Bonds and Certificates*	*State Loan Fund*	*Lease Payments*
Revenue derived	4	2	3	3	1
Equity	3	3	4	5	5
Economic effects	3	4	3	5	4
Collection effort	1	2	2	1	2
Industry or public support	2	1	4	2	2
Legislative action	2	2	2	1	2
Procedural action	2	2	2	1	2
National/State issues	5	5	4	4	5
Total	22	21	24	22	23

Note: Criteria are scored on a scale from 5 (this factor is not an impediment to enacting the revenue alternative or this alternative can substantially improve the Texas transportation funding situation) to 1 (this factor represents a significant barrier to using the financing mechanism or this alternative will not improve the Texas transportation funding situation).

Actions that would directly or indirectly cause a tax creation or tax increase, like the dedicated funding and local match requirement, score low on the effort needed to get the public

to support the fees and the effort required to collect fees. While they might have relatively low economic effects and the revenue can be collected equitably, the changes and support needed to enact these ideas will require a significant effort.

Bonds and certificates of participation can provide a method to support public transportation and represent perhaps the best of the transit possibilities. The fact that a revenue source would have to guarantee the bonds and the agencies would repay the funds would be a problem. Small transit agencies need more options for procuring equipment, and bonds can provide them, but bonds do not provide more transit funding.

The State Loan Fund approach could raise funds for future state projects and equipment, but it would operate very similarly to the State Infrastructure Bank for transit. The SIB might also fund lease payments for transit vehicles. Again, while this is not new funding and it would be repaid by transit agencies, many smaller systems need access to better procurement procedures or can benefit from better deals obtained by volume purchasing.

Conclusion—Funding Texas Public Transportation

As outlined in the General Concepts chapter, there are several techniques that could be considered to fund public transportation in Texas. Establishing a dedicated source of state funding to support rural and small city transit services and facilities represents the first approach TxDOT may wish to consider. Nineteen states currently have dedicated funding programs for transit. There are a number of approaches and techniques from these states that could be used as models for Texas. Reestablishing a local match requirement would also provide an indication of the federal, state, and local partnership needed to support public transportation.

Opening the State Infrastructure Bank to transit projects and using revenue stream credits for transit capital and operating assistance represent applications of existing programs to the benefit of public transportation. Establishing a program to use toll revenue credits could be used to fund a variety of transportation improvements, including public transit. The toll revenue credit

programs in Florida and New Jersey provide two examples of this approach that could be used as models in Texas.

A coordinated approach involving TxDOT, transit agencies, transit organizations, local communities, and other groups will be needed to advance any of these techniques. Establishing an ongoing partnership among these organizations, agreeing on a common set of priorities, and implementing a coordinated program represent steps in developing ongoing stable sources of funding for public transit in Texas.

CHAPTER 6
REVENUE SOURCES FOR GENERAL AVIATION

Texas has about 280 publicly-owned general aviation airports, and TxDOT has been charged with finding funding for them. General aviation airports have distinct needs and distinct funding problems. Perhaps one of the biggest hindrances to general aviation funding is lack of knowledge; local citizens are unaware that their county or city sponsors an airport nor do they realize the impact that the airport has on their community.

Overview

General aviation plays an important role in transportation for many Texas communities. Financing airports and other facilities would be easier if decision makers better understood the contribution of general aviation to the Texas economy. Specific actions identified in this chapter include local applications of a variety of innovative funding ideas supported by the Federal Aviation Administration's Innovative Demonstration Program, a strategic approach to direct state funding to the most important areas, and dedicating the state sales tax receipts from general aviation-related activities. The lynchpin of these actions, however, is identifying the importance of general aviation to the Texas economy.

Background

General aviation airports have considerable impact on the Texas economy. A 1993 Center for Transportation Research report (27) states that general aviation is responsible for between 5,350 and 7,000 jobs; this employment creates a payroll in the range of $166 million to $218 million. Statewide, the general aviation impact on the economy as a result of sales is between $1.4 billion and $1.8 billion. General aviation airports also provide services that are vital to smaller communities, from making emergency medical services available to transporting executives to manufacturing plants to bringing tourists, and recreational hunting and fishing.

The airports are scattered all across the state, and every county either has, or would like to have, one. These airports look primarily to the state for funding or, in some cases where they are eligible, to the federal government because they are limited in their ability to produce any income on their own. With federal funding becoming more limited, the state must determine the value of each airport to the Texas Airport System Plan and decide if the airport merits continued state support.

General aviation airports serve small communities with small tax bases which are incapable of supporting large, non-income producing services, like general aviation airports. For this reason, funding sources that do not require repayment are preferable, because there is no revenue stream to tap to fund these facilities.

General aviation airports present unusual funding challenges for several reasons.

- Unlike highways, general aviation airports are usually owned by a local governing entity, such as a city or county.
- Cities and counties have resources that are significantly less than the state.
- General aviation airports are virtually invisible, hidden away from public view, so the public may be unaware that their county or city sponsors an airport.
- General aviation airports are usually located in areas of low population; people in these areas **drive** and they drive their own vehicles. They don't fly.
- The perception exists that aviation is not the transportation mode for the masses (so why should "I" pay for it?).

What Is Available?

Unlike commercial service airports that can make up funding shortfalls by airport-generated revenue and local sources, general aviation airports do not have the ability to generate revenue consistent with their needs.

Over the past few years, funding from the federal Airport Improvement Program has declined, with most of the cuts being made in the area of general aviation. Particularly hard hit

have been reliever airports, those airports that are designated to attract activity away from the larger, commercial airports. Reliever funding has been cut from 10% to 5% of the Airport Improvement Program; the amount that is actually available for reliever airports is only 3%, after reductions are made for special commitments to commercial service airports. In September 1996, the Airport and Airway Improvement Act of 1982 was reauthorized bringing several changes, particularly for relievers. Following a General Accounting Office report on the effectiveness of reliever airports, Congress changed the AIP distribution formula by adding to the state apportionment the funding that was previously designated for relievers (5%) along with the funding percentage for nonprimary commercial service airports (1.5%). The state apportionment now contains funding for all general aviation airports, including relievers. The federal funds available must now provide funding for over 180 federally eligible general aviation airports including the state's 21 reliever airports. What this means is that, while relievers remain a federally designated class, the state is now responsible for all general aviation airports, including relievers.

Constraints to the Federal Aviation Administration's ability to continue its historic level of direct funding due to efforts to balance the federal budget brought about a recently implemented innovative funding project. In June 1997, the FAA announced authorization of the Innovative Financing Demonstration Program which would permit airports to use small amounts of AIP funding for debt issues. The program also aims to reduce the time and costs involved in getting airport infrastructure projects started. The program is the product of state and airport sponsors input and will permit funding for residential relocation in support of a noise mitigation program; construction of a new runway at a general aviation airport; funding in conjunction with a state block grant, for projects at general aviation, reliever, and non-primary commercial airports; and allowing credit enhancement using an AIP grant in support of bonds issued to construct a new runway at a non-primary commercial airport.

Currently, the total annual funding available in Texas is $26.7 million from all sources ($18.7 million from federal sources and $8.0 million from state sources). Annual needs, however, are $58.7 million for general aviation airports (excluding relievers) plus $60.0 million

for reliever general aviation airports, for a total of $118.7 million. This leaves a shortfall of $92 million every year.

Survey of Selected States

A survey of aviation staff at selected departments of transportation across the country showed that people charged with finding revenue to finance general aviation had one thing in common—they were frustrated. When asked what sort of innovative funding they were trying, most admitted they knew of relatively few new ways of raising money. Several illustrative responses are given below.

Minnesota. Minnesota Aviation Development admitted to having no great ideas or any innovative funding sources. A small airport that had received a little help from the federal Economic Development Agency and the Rockford, Illinois, airport used its airport property in many different ways including a rock quarry. Parallel taxiways were used for winter brake testing (i.e., testing brakes in icy conditions) at International Falls and Baudette; those airports were compensated for the use.

Another Minnesota general aviation airport held a drag race; funds raised probably did not cover the damage done to the runway, and closing the airport for three days did not engender positive attitudes by the displaced pilots.

Illinois. The Illinois aviation division helps general aviation airports by participating 50-50 with local governments to conduct planning studies for airport layout plans and master plans. If and when projects come to fruition, the state is reimbursed. Other means that are used in Illinois are farming on nonessential airport land, encouraging groups that support their local airports to sponsor fly-in breakfasts, and hosting air shows and open houses.

California. California's aviation department aids the state's 210 publicly owned general aviation airports with an appropriation of $8 million a year; most of the state's smaller airports receive about $10,000 to help pay for utilities and insurance premiums. The state

itself doesn't fund a lot of capital improvements. Many of the airports are owned by county or city governments that include the airports in their local budgets.

Virginia. Virginia's Department of Aviation began a program in 1987 under the guidance of Governor Jerry Bliles who recognized that transportation meant economic development. The governor asked business leaders to serve on the Commission on Transportation 21st Century (COT21). Out of the Commission came a half cent sales tax which was dedicated to the Commonwealth Transportation Trust Fund to be used solely for transportation. Of the total, 2.4% of the trust fund, or $10.1 million, was dedicated to aviation in the first year; the 1997 amount was $14 million. The funds are administered by the Virginia Aviation Board with 40% going to air carrier entitlements for medium sized or smaller hub airports and 40% to the air carrier and reliever discretionary fund where airports in this category must apply for these funds. The remaining 20% is dedicated to general aviation. Any balances at the end of year are rolled into the following year. This funding allows the Department of Aviation to contribute up to 8% of the state/local portion on capital improvements. The smallest general aviation airports receive funding for only safety and preservation projects. Capital programs are funded from a sales tax on aircraft.

Missouri. The Missouri Department of Transportation recently began a state transportation revolving fund to use for all transportation modes except highways. The transportation revolving fund offers loans at low interest rates to the different modes, including airports. The greatest use will probably be for hangars, since hangar construction cannot be funded with state or federal money. The revolving fund will also be used for taxiways or for apron expansion.

Missouri currently taxes aviation fuel, but the revenue goes into the state's general fund. Total revenue from aviation fuel is $15 million annually, of which $5 million is from sources other than commercial. From the general fund, the Missouri Aviation Division receives an annual appropriation of about $640,000 a year. They also receive a total of

about $1.1 million in state funding. As a federal block grant state, Missouri receives about $5.2 million, but they anticipated that figure being cut to less than $3 million.

Funding Texas General Aviation

In a recent study (28) done for the Texas Department of Transportation by TTI, several options for financing Texas general aviation airports were explored. Among them were sales tax on aviation fuels, sales tax on aviation-related industries, and aircraft and pilot fees. These issues and implementation considerations are discussed below.

Excise and sales tax on aviation fuels. Texas does not impose either an excise tax or a sales tax on aviation fuels (avgas and Jet A). Forty-eight states do and many dedicate the revenue to airport development.

The potential revenue that could be realized from a sales tax of 2.1¢ per liter on avgas and 1.1¢ per liter on Jet A fuel (the national averages) is illustrated in Table 17. As can be seen from the table, the approximately $5 million in revenue that general aviation could generate would not meet the need.

Table 18 shows the revenue that could be generated from sales tax on commercial air carrier fuel consumption. The revenue is sufficient to meet the needs of general aviation, **but a tax on fuel is not practical for Texas**. It has historically been opposed by commercial carriers who reason that they would receive no benefit from the sales tax, and they would most likely purchase their fuel in a state that did not impose such a tax.

Table 17. Estimated General Aviation Fuel Excise Tax Revenue in Texas from Avgas and Jet A Consumption, 1994 to 2003

Year	*Avgas Fuel*		*Jet A Fuel*		*Total Revenue ($ millions)*
	Liters (millions)	*Revenue ($ millions) (@ 2.1¢ per liter)*	*Liters (millions)*	*Revenue ($ millions) (@ 1.1¢ per liter)*	
1994	6.8	2.1	15.6	2.4	4.5
1995	6.8	2.1	16.3	2.5	4.6
1996	6.9	2.1	17.2	2.6	4.7
1997	6.9	2.1	17.9	2.8	4.9
1998	6.9	2.1	18.5	2.9	5.0
1999	7.0	2.1	19.0	3.0	5.1
2000	7.1	2.1	19.9	3.1	5.2
2001	7.1	2.1	20.4	3.2	5.3
2002	7.1	2.1	20.9	3.3	5.4
2003	7.1	2.1	21.7	3.4	5.5

Source: (28)

Table 18. Estimated Air Carrier Fuel Consumption and Excise Tax Revenue in Texas, 1994 to 2003

Year	*Fuel Consumption (millions of liters)*	*Excise Tax Revenue (tax rate = 1.1¢ per liter) ($ million)*
1994	488	76
1995	521	81
1996	549	85
1997	577	90
1998	603	94
1999	631	98
2000	658	102
2001	686	106
2002	713	111
2003	742	115

Source: (28)

Aircraft, Parts Sales, and Franchise Taxes. One source of revenue which shows promise is the sales and franchise taxes on aircraft parts and sales. The average revenue generated over the five-year period 1992-1996 is *$25 million* (Table 19). While this would not meet all general aviation requirements, dedicating these monies to general aviation would go a long way toward meeting the development needs.

The primary advantage to dedicating the aviation-related sales tax and franchise tax to general aviation airports is that no new taxes would be imposed, and the collection mechanism is already in place.

Table 19. Estimated State Sales and Franchise Taxes from Texas Aviation-Related Industries, 1992 to 1996

SIC Code	*Description*	*Tax Type*	*Tax Value ($ million)*				
			1992	*1993*	*1994*	*1995*	*1996*
372	Manufacture of Aircraft and Parts	Sales Tax	9.6	12.0	13.9	7.6	2.4
451	Air Transportation, Scheduled	Sales Tax	6.0	4.3	4.7	7.0	6.9
452	Air Transportation, Nonscheduled	Sales Tax	0.4	0.5	1.1	0.8	0.6
458	Airports, Flying Fields, and Airport Terminal Service	Sales Tax	4.7	5.1	5.4	5.6	6.4
45	Transportation by Air (Major SIC group)	Franchise Tax	3.3	3.1	5.2	5.2	5.0
TOTAL			24.0	25.1	30.3	26.5	21.2

Note: These estimates are based on gross sales, by SIC code, and the amount subject to state sales tax. SIC 372 includes SIC 3721 (aircraft sales), SIC 3724 (aircraft engines and engine parts), and SIC 3728 (aircraft parts and auxiliary equipment, NEC).

Source: (2)

Aircraft and Pilot Registration Fees. Twenty-six states currently assess aircraft registration fees; Texas is not among them. In some states, 100% of the fees are dedicated to aviation, and the fees range from $5 to $75 per year. Some states calculate the fees with formulas based on the manufacturer's list price, value, or gross weight. Table 20 shows the amount that could be generated from aircraft registration fees. Table 21 illustrates the revenue that could be raised by a pilot registration fee of between $10 and $50 per pilot.

Table 20. Forecast of Texas Registered Aircraft and Potential Fee Revenue

Year	*Number of Registered Aircraft*	*Fee Revenue (dollars)*			
		$5/aircraft	*$25/aircraft*	*$50/aircraft*	*$100/aircraft*
1993	21,580	$ 107,900	$ 539,500	$ 1,079,000	$ 2,158,000
1994	22,630	113,150	565,750	1,131,500	2,263,000
1995	23,600	118,000	590,000	1,180,000	2,360,000
1996	23,800	119,000	595,000	1,190,000	2,380,000
1997	23,950	119,750	598,750	1,197,500	2,395,000
1998	24,120	120,600	603,000	1,206,000	2,412,000

Source: (28)

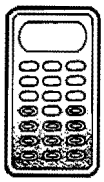
Table 21. Forecast of Texas Registered Pilots and Estimated Potential Registration Fee Revenue

Year	*Number of Registered Pilots*	*Fee Revenue (dollars)*		
		($10/pilot)	*($25/pilot)*	*($50/pilot)*
1993	53,100	$ 531,000	$ 1,327,500	$ 2,655,000
1994	53,900	539,000	1,347,500	2,695,000
1995	54,900	549,000	1,372,500	2,745,000
1996	56,000	560,000	1,400,000	2,800,000
1997	56,700	567,000	1,417,500	2,835,000
1998	57,500	575,000	1,437,500	2,875,000

Source: (28)

Fees of this type can demonstrate the commitment of the general aviation user to funding facilities for their use. As with the general aviation fuel tax, this would not generate sufficient income to meet annual needs, but it would accomplish two things: 1) it could be a user-funded component of a package of federal, state, and local actions to fund general aviation, and 2) it would generate a revenue stream that could be used to leverage other funding sources such as the Federal Innovative Financing Demonstration Program described earlier in this chapter.

Evaluation of Options



While not a specific funding source or financing option, the highest priority item for general aviation funding is educating communities about the airport's value and making the success and funding of the airport become a local priority. Many citizens are unaware that their county or city sponsors a general aviation airport. Greater local involvement and participation will make the community aware of the airport's economic impact.

Another early action item to resolving the funding problems is a strategic assessment of the airports that receive funding to determine the value of each to the Texas Airport System Plan. Funds can be directed to those airports that are the most important.

With these two actions to set some context for funding increases, the matrix in Table 22 provides an evaluation of specific actions.

Table 22. Revenue Source Evaluation Criteria Matrix

Evaluation Criteria	*Tax on General Aviation Fuels*	*Tax on Commercial Carrier Fuels*	*Dedication of Aircraft, Parts Sales, and Franchise Taxes*	*Aircraft and Pilot Registration Fees*
Revenue Derived	5	5	5	1
Equity	5	1	5	3
Economic Effects	3	2	5	2
Industry or public support	1	1	5	1
Legislative action	2	1	3	1
Procedural action	2	2	4	1
National/State issues	5	5	5	5
Total	23	17	32	14

Texas is one of only two states that does not impose an aircraft fuel tax. Although proposed during several legislative sessions, the industry has always strongly opposed such a tax. While a tax on fuels used in general aviation aircraft is possible, a tax on the fuels used by commercial service carriers does not appear to be feasible.

The dedication of aviation-related sales tax revenues is the preferred alternative. This alternative would be a consistent source of revenue, is equitable, does not have adverse economic impacts, does not require new collection efforts, is supported by the industry, does not require procedural changes, is state focused, but, historically, has not been supported by the legislature. The legislature does not like the dedication of sales tax revenues.

The aircraft and pilot registration fees alternative has been explored many times, and a number of states have adopted this alternative. The revenues derived from such programs are not sufficient, nor are they intended to pay for capital costs of developing airports. There simply are not enough pilots or aircraft owners. Such programs are generally aimed at funding safety and pilot information programs and should be enacted as a way for users to support improvements to the airport system. And the collection costs are high relative to the revenue derived.

Conclusions—Funding Texas General Aviation

The most pervasive theme in general aviation airport funding is that no single answer will fix the problem. Individual airports have tried many ideas, from putting a golf course on airport property to leasing space for billboards to applying for grants from the Small Business Administration to leasing nonessential space for business or industrial purposes. However, these solutions will not provide the funding that these airports need.

Funding general aviation airports is a long-term problem that requires long-term solutions. However, some steps can be taken in the short–term to lay the groundwork for the future. It will require a combination of ideas and a willingness on the part of all parties—the airports, the pilots and operators, communities, the state—with vested interests in the airports to meet the needs. The job will take:

- Educating the communities about the airport's value and making the success and funding of the airport become a local priority. Many citizens are unaware that their county or city sponsors a general aviation airport. Greater local involvement

and participation will make the community aware of the economic impact that the airport has.

- Examining the airports receiving funding to determine the value of each to the Texas Airport System Plan and directing funding to those deemed to be most important.
- Seeking innovative implementation of creative funding ideas, such as the FAA's Innovative Financing Demonstration Program.
- Generating revenue from aircraft pilots and operators via license or registration fees, to show they are "doing their part."
- Dedicating or appropriating aviation-related sales tax and franchise tax revenue to developing the state's general aviation airports.

CHAPTER 7
FUNDING FOR PORTS AND WATERWAYS

Texas ports and waterways have three essential funding needs: 1) the need for maintenance on the Texas Gulf Intracoastal Waterway (Texas GIWW), 2) the need for harbor maintenance, and 3) the need for Texas ports to be competitive with other Gulf Coast ports. These funding requirements are particularly acute for the small ports.

Overview

We recommend that the state place a tax on marine fuel, in a sufficient amount to cover estimated Texas GIWW dredging maintenance, and that the state legislature amend the Texas Water Code to permit the navigation districts to charge a fee for import and export tonnage passing through their ports.

Additionally, the chapter concludes with a discussion on methods in which the state can assist small ports in being competitive with their counterparts in other states in terms of capital improvement and economic development. We recommend that the state consider either a state loan program or a state grant program specifically targeted for small ports.

The maintenance funding needs for harbors and the Texas GIWW arise because of impending federal cutbacks in the budget of the U.S. Army Corps of Engineers, who maintain the U.S. waterway system, and the loss of significant amounts of the U.S. Harbor Maintenance Fee Trust Fund, which was earmarked for harbor maintenance at U.S. public ports.

The consequence of cutting back on these sources of funds means that either the state of Texas supply the funds or, alternatively, the ports supply these funds to maintain the level of productivity on the Texas ports and waterway system. Unfortunately, the small Texas ports do not have the financial self-sufficiency to fulfill all of this need, so a combination of responses is appropriate (9).

To complicate matters, the Texas GIWW is the responsibility of the federal government, not the state of Texas. TxDOT's only obligation is to provide locations for dredging operations, for which the state has appropriated approximately $1.7 million per year.

Background

The economic benefits of increased trade flows, facilitated by the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trade (GATT), that would accrue to Texas will substantially rely on the efficiency of the state's intermodal infrastructure to carry added traffic. The Texas seaports and inland waterways are vital components of the intermodal system infrastructure.

The Gulf Intracoastal Waterway (GIWW) extends from St. Marks River, Florida, to Brownsville, Texas, a distance of 1,770 kilometers. Approximately 100 million metric tons of cargo (average of the last 10 years) are moved along the GIWW each year. The Texas portion of the GIWW is 680 kilometers long and carries an average of 66 million metric tons of cargo annually (29), with petroleum and chemical-related cargo comprising 89% of total tonnage. The U.S. Army Corps of Engineers maintain the Texas GIWW at a width of 38.1 meters and at a depth of 3.7 meters.

The Texas GIWW directly links the 12 large-ship ports of Texas and enables Texas to connect to the two largest waterways in the U.S., the Mississippi and Ohio Rivers. These major waterways serve a population of nearly 80 million. The eastern portion of the GIWW serves an additional population of about 20 million. The Texas GIWW allows trade access from Texas to over 40% of the U.S. population.

Economic Importance to Texas

The Texas GIWW serves as an economic catalyst as well. According to the Galveston District of the U.S. Army Corps of Engineers (30), the Texas GIWW provides 145,000 jobs for Texans and pumps $20 billion annually into the Texas economy.

Texas has 12 large-ship ports and 15 ports for smaller ships that together move an average of about 317 million metric tons of cargo annually. This is about 17% of the total U.S. port tonnage and over 50% of the state's foreign imports and exports. The ports of Houston, Corpus Christi, Texas City, and Port Arthur are among the top 20 U.S. ports in tonnage handled. The Port of Houston is the second ranked port in the nation in terms of tonnage and ranked first in tanker services at U.S. ports.

A recent economic impact study (9) estimated that the Texas port system directly and indirectly provided in 1994:

- Nearly 1 million jobs to Texans.
- Total personal income of over $30 billion.
- Business sales of over $178 billion.
- Almost $5 billion in local and state taxes.
- Over $9 billion in federal taxes.

The Texas GIWW is economically vital to the state, and it provides efficient movement of cargo to and from the Texas ports. The movement of more than 73 million metric tons of cargo now on the Texas GIWW takes about 40,000 barges. In comparison, this cargo movement would take over 570,000 rail cars, or over 3 million semi-trailer trucks (31).

Should the Texas GIWW experience reductions in cargo movement and/or transference of this cargo to land transportation, Texas would suffer economically. Not only would waterborne cargo employment decline, but the shift to road transportation would cause an increase in congestion and pollution and increase urban and rural transportation needs. The U.S. Army Corps of Engineers is considering a 15% reduction in operations and maintenance funds. If this were to occur, Texas would see the following impacts:

- If the fund reduction results in permanent reduction of 1% of Texas GIWW tonnage, almost 2,000 jobs would be lost, over $370 million in business sales would be lost, and over $10 million in state and local taxes would be lost annually.

- If the 15% reduction results in a transference of Texas GIWW tonnage to truck transportation, for every 1% transferred to truck, over $1.4 million per year increase in roadway, congestion, and pollution costs would be experienced.
- If the 15% reduction results in a transference of Texas GIWW tonnage to rail transportation, for every 1% transferred to rail, over $400,000 per year in increased pollution cost would be experienced.

Financing Options—Overview of Current Efforts

New financing techniques have centered on private sector financing and the use of private sector techniques. Foreign countries have attempted to convert their ports to private sector operations to become more productive. Privatization has taken the following forms, some of which can be considered as public-private partnerships (32):

- Sale of shares, used primarily in the United Kingdom.
- Sale of assets, which involves competitive bidding and has been attempted in Colombia.
- Lease or concessions of terminals, which involves taking bids or direct negotiations for lease or concession of terminal areas but allows the authority to retain title to the assets. This has been used in the U.S. and Canada.
- Licensing certain private functions (e.g., stevedoring, towing, piloting) to qualified parties in return for a percentage of the gross revenue.
- Lease of adjoining land for development by the terminal operator, in which the terminal operator is responsible for the total costs of development and equipment.
- Management contracts of certain specialized terminals (e.g., containers) in which the private party pays a fee for providing such service.

To promote private financing of "public goods," the U.S. government allows the interest payments of bonds issued by public agencies to be exempt from federal income tax, thus lowering the interest rate for the issuer. The "public goods" in ports that qualify as exempt facilities include the docks, wharves, related storage, and training facilities subject to certain

limitations. Generally, port facility issuers must comply with the following rules to issue tax-exempt bonds (32):

1. The facility must be government-owned, although leasing the facility to a non-governmental entity is permitted under certain restrictions.
2. Office space and office buildings do not qualify for tax-exemption unless they fall within certain definitions regarding functional relatedness.
3. At least 95% of the net proceeds of the bonds must be used to finance capital costs of the exempt facility, leaving at most 5% to be allocated to non-conforming uses, such as issuance costs which can be a high as 2%.
4. Public approval of the bonds are required.
5. The weighted average maturity of the bonds cannot exceed 120% of the reasonably expected economic life of the facility.
6. No more than 25% of the net proceeds can be used to acquire land or an interest therein.

Proposed Policy Changes from Port Authorities

In response to these restrictions, the American Association of Port Authorities (AAPA) supports the following policies that would substantially increase the public port authorities' ability to finance new construction and facility rehabilitation (33):

1. Establish a list of public activities that can be financed with public activity bonds.
2. Expand the definition of functionally related facilities to include rail and other transportation-related facilities necessary for cargo/passenger movement.
3. Increase the annual issuance limit for bank qualified tax exempt bonds from $10 million to $25 million.
4. Revise the federal government rule that only allows 5% of the bond proceeds to be used for uses other than direct funding. The former rule allowed 90% or more of the net proceeds to be used for capital funding.

Dredging Maintenance Needs of the Texas GIWW

An important part of Texas port economies is the barge traffic that flows through the entire Texas GIWW. According to surveys (31), Texas port authorities insist that proper maintenance dredging of the Texas GIWW would ensure expeditious movement of barges which would, in turn, increase the efficiency of port operations. Also, some port authorities have linked their future strategic plans to the operation of the Texas GIWW. For many of the smaller ship ports, the Texas GIWW is indispensable to their economic survival; this is especially the case for ports that primarily function as recreational facilities.

The Texas GIWW is a 1970s facility that needs refurbishing and continued maintenance. Unfortunately, reductions in operations and maintenance funding for the U.S. Army Corps of Engineers have persisted for the last several years and will continue at a level 15% below previous years (34). This is a serious impediment to operations, maintenance, and improvements of the Texas GIWW.

The estimates of future annual dredging funding needs due to a 15% reduction in U.S. Army Corps of Engineers operation and maintenance budget range from:

- **Optimistically**, only about $2 million will be needed annually based on the assumption that operation and maintenance funds will be restored at the end of 4 years ($7.7 million total in current dollars);
- **Pessimistically**, about $10 million will be needed annually for the next 50 years, based on the assumption that the 15% reduction in operation and maintenance funding for the Corps will continue for that long ($786 million total in current dollars).

Funding Texas Waterways

Barge operators pay a 5.28¢ per liter federal tax; however, this impost is insufficient to meet the needs of maintenance on the Texas GIWW. The federal government has proposed a

21.1¢ per liter increase in the federal tax. Not surprisingly, barge operators are protesting this proposed increase (34).

Congress apparently intends to reduce the responsibilities of the federal government and correspondingly increase the obligations of the states. Therefore, we propose that a state tax be placed on the distillate fuel purchased by barge operators and that the state establish a trust fund.

Based on an estimated need of between approximately $2 million and $10 million annually, and considering the effect of compounding interest, an annual fuel usage on the Texas GIWW of approximately 46.9 million liters, and a trust fund interest rate of 5% per annum, a tax of:

- 3.9¢ per liter, in the **optimistic** case, would generate $7.5 million in collections (approximately $2 million annually) and over $0.2 million in interest over four years;
- 18¢ per liter, in the **pessimistic** case, would generate, $523 million in collections (approximately $10 million annually) and $262 million in interest over 50 years.

A state tax on marine fuel has the advantages of being:

- A user tax—the primary beneficiaries, barge operators, would be taxed;
- Administratively efficient—collection effort, processing, enforcement, and evasion costs are all quite low; and
- A source of significant and flexible revenue.

. . . imposition of a state tax would be preferable . . . since revenue would remain in the state . . .

The major disadvantage of a state tax on marine fuel would be the political opposition from barge operators, who contend that the increase in operating costs would drive out a number of firms engaging in barge operation, thus reducing the supply of this type of transportation. The state tax would require legislative approval at a time when tax increases are not easily obtained. The tax, however, is a user fee and is consistent with the philosophy of "user pays." The

imposition of a state tax would be preferable to the federal tax, however, since revenue would remain in the state for the benefit of operators along the Texas GIWW.

A state fuel tax of 3.9¢ or 18¢ per liter would increase average barge charges per ton-kilometer to 1.03¢ and 1.10¢, respectively. These increases amount to only 2% and 8% in average charge rate (current charges are $1.01). In comparison, average rail charges are 2.7¢ per ton-kilometer while average truck charges per ton-kilometer are 5.7¢ (35). In the worst case, barge savings over rail would be reduced from 62% to 59% on a per ton-kilometer basis.

Additionally, the length of an average haul for barge operators on the Texas GIWW is 140 kilometers. This is not an efficient distance for rail operators, and it is likely that rail operators would charge more than 2.7¢ per ton-kilometer to meet their required return on investment.

Because the increases in average per ton-kilometer charges would not significantly reduce the barge industry's price advantage, and because the short-haul would increase average rail costs, we conclude that the barge industry would be able to pass through all of the added costs with essentially no decrease in tonnage.

Harbor Maintenance at Ports

In 1986, Congress passed the Water Resources Act, in which the Harbor Maintenance Fee was established to defray up to 40% of the harbor maintenance costs and have the beneficiaries of the maintenance share these costs. Actually, this fee is an ad-valorem tax assessed on the cargo shipped and is equal to 12.5¢ per $100 cargo valuation. Unfortunately, shippers have filed suit in federal court pointing out that the tax is unconstitutional; it is not a use fee but a tax on commerce. This tax will be repealed and the proceeds collected will be rebated to the shippers. Foreign shippers have also pointed out that a tax on imports violates the General Agreement on Tariffs and Trade (GATT).

This leaves the financing of harbor maintenance in a precarious position for Texas ports. For many years, harbor maintenance has been subsidized by the federal government. However, in the current political situation, all evidence suggests that federal subsidies will be reduced, and the states or the ports will have to bear the financial burden of maintaining their own harbors.

It is assumed that the larger public ports in Texas—Houston, Corpus Christi, and Port Arthur—have a sufficient tax base and revenue charges, such as wharfage and dockage fees that are supported by high cargo volumes, to fund needed maintenance and dredging of their harbors. However, the other public ports of Texas may not have sufficient resources required to maintain their harbors. To estimate future needs, the following scenarios were analyzed:

- **Optimistically**, 15% cutback in the operations and maintenance budget of the U.S. Corps of Engineers is temporary, lasting the next four years;
- **Pessimistically**, the 15% cutback in the operations and maintenance budget of the U.S. Corps of Engineers is long-term, lasting the next 50 years.

Based on these assumptions and the harbor maintenance needs estimated by the U.S. Army Corps of Engineers (34), optimistic and pessimistic estimates of harbor maintenance needs for the small ports are $1.7 million to $13.8 million annually.

Funding Texas Harbors

Although navigation districts created under Article III, Section 52 and Article XVI, Section 59 of the Texas Constitution have the authority to impose a general maintenance tax under Sections 61.236 and 62.160 of the Water Code (36) of up to 10¢ per $100 valuation, it is thought that increasing this tax to meet harbor maintenance needs is not a viable option for the navigation districts for the following reasons:

- Increasing personal and commercial property taxes may be politically untenable in the current environment;

- Increasing commercial property taxes would have a detrimental economic effect on current companies located within the navigation district and would inhibit future economic growth, the extent to which is unknown at this time; and,
- This type of tax, in effect, subsidizes the primary beneficiaries of a well maintained harbor—the carriers of imports and exports.

. . . there are significant benefits that could be gained at a modest cost and low impact on economic competitiveness . . .

*

Amending the Water Code to allow the navigation districts to impose a tonnage fee, however, would have significant benefits that could be gained at a modest cost and low impact on economic competitiveness of the harbor. This fee also matches well with funding options in other modes where local areas are asked to show their support for transportation. Therefore, asking the Legislature to provide the navigation districts with the authority to charge carriers a harbor maintenance fee in proportion to the tonnage carried in the harbor would be more appropriate.

Based on an estimated annual need of between $1.7 million and $13.8 million, and considering the effect of compounding interest, an annual import and export shipment of approximately 29 million metric tons for the small ports, and a trust fund interest rate of 5% per annum, a harbor maintenance fee of:

- 5.3¢ per import/export metric ton, in the **optimistic** case, would generate $1.65 million in collections and over $0.05 million in interest each year; or,
- 17.4¢ per import/export metric ton, in the **pessimistic** case, would generate, about $10.7 million in collections and $3.1 million in interest each year.

The major advantages of this fee would be that:

- The user/beneficiaries of needed harbor maintenance would be charged for the upkeep of the harbors;

- The fee would be a stable revenue source that would increase with volume; and
- It would remove the subsidizing of harbor maintenance by local employers and employees.

Critics of this type of fee can point to the following disadvantages:

- It would have a higher collection fee than with motor fuels, possibly as much as 5%;
- It may have opposition by major ports, since they have a well developed tax-base, have more financial strength than the smaller ports, and have a strong desire to protect the interest of their shippers; and
- The tonnage fee is disproportionately higher for low value cargo (i.e., higher cost per dollar value of one ton) and thus leads to economic inequities and inefficiencies.

Over 75% of the import and export tonnage is petroleum-related. Petroleum products have an average value of $143 per metric ton. The only cargo type that is lower in value than petroleum is waste, which has an average value of $44 per metric ton. The maintenance fees suggested amount to between 0.04% to 0.12% of the value of petroleum, and between 0.12% to 0.39% on waste. All other cargo costs would be lower. Hence, issues regarding economic equity and efficiency are of little practical consideration. It should be noted that an ad-valorem tax on imports and exports might be equitable, efficient, and provide a stable, high-potential source of revenue, but a tax on exports is unconstitutional, and a tax on imports violates the General Agreement on Tariffs and Trade (GATT).

The fee is not a perfect solution, in theoretical economic terms, to the problem of funding harbor maintenance. It is, though, a practical and feasible solution, presenting few economic distortions. The fee should be left to the option of the individual ports. We think the smaller ports would be more likely to take advantage of this fee-making authority.

Capital Improvement and Economic Development in Small Texas Ports

Of the 29 states that have ports, 17 states provide some state assistance to their port system. The form of the assistance can range from state loans at below market interest rates, grants, or tax rebates for shipping companies located within the state. For example, Oregon biennially appropriates $4 million in loans for small ports. The loans have a 5% interest for a maximum 20 years. Louisiana has a 10% local match required for approximately $16.5 million per year, which is funded by motor fuel taxes. Florida appropriates $8 million annually from general revenue funds for 50% matching grants to their ports. Since Texas does not provide assistance in any form to the ports, the Texas ports believe they are at a competitive disadvantage, noting that the subsidies from Gulf Coast states allow these ports to effectively reduce port charges.

Moving cargo through the small Texas ports engenders significant contributions to the Texas economy. The small ports contribute jobs and personal income to Texans. They provide businesses with revenue. And through all these economic activities, the Texas state and local governments receive needed tax revenues. While the small ports contribute only between 9% and 15% of the state total jobs, income, business revenue, and taxes, they are significant contributors to the economy of smaller communities. In addition to this diversification, they also offer the potential for expansion in areas away from the large cities with their congested road and rail networks.

Funding Small Texas Ports

If it is assumed that the Texas ports are at a competitive disadvantage due to the subsidies provided other Gulf Coast state ports, and further assumed that Texas ports require capital needs equal to other Gulf Coast states, the Texas port needs are approximately $12 million per year. The state can establish the following programs supported by per-liter taxes. The revenue estimates are based on fuel consumption growth rates for the last 10 years:

- A state loan program for small ports of $6 million per year (in nominal dollars), at an interest rate of 5% per annum, for up to a 20-year term; and,
- A state grant program for small ports of $6 million per year (in nominal dollars), for small ports which would be combined with a trust fund yielding 5% per year.

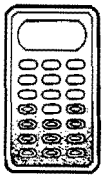
A tax rate of 0.06¢ per liter could be imposed on all distillate and residual fuel purchased in Texas. It is assumed that 25% of the impost would go to schools; therefore, a net of 0.04¢ per liter would be provided the ports for loans and grants. The 25% could be recouped by the fund by imposing a 25% match to be paid by the port. This fee is in the middle of the range of match ratios required in other Gulf Coast states.

The beneficiaries of improved port facilities would be trucks, rail, and vessels entering the ports, and these cargo carriers use distillate and residual fuel. State loan and grant funds would put the small Texas ports on a competitive footing with other Gulf Coast state's ports. Additionally, it would provide the small ports with the potential to increase economic activity within the port district and for the state as well. Funds for individual ports should be coordinated with state and local economic development plans to ensure that investment decisions are coordinated with sound strategic planning principles.

> . . . it would provide the small ports with the potential to increase economic activity . . .

A loan and grant program would require legislation, however, and it would require more administration costs in terms of developing procedures, personnel to qualify ports for loan/grants, and fees for trust fund management. Although the state loans yielding 5% interest would impose a slight opportunity cost (less than $1 million per year), the 0.06¢ per liter tax would adequately cover this opportunity cost.

Evaluation of Options



The key improvement options for Texas' ports and waterway system are identified in Table 23. The harbor maintenance fee and the state tax on distillate fuel appear to have a

reasonable chance of success. The state tax on marine fuels will be more difficult to implement due to the legislative changes that will be required. One important aspect of the recommendations is that the major groups with shipping interests are represented in solving the funding problem. Barge owners will pay higher fuel taxes, port authorities can levy harbor maintenance fees, and the maritime industry will support a state fund for smaller Texas ports.

Table 23. Evaluation of Port and Waterway Funding Alternatives

Revenue Source Evaluation Criteria	*State Tax on Marine Fuel*	*Harbor Maintenance Fee*	*State Tax on Distillate for Loan/Grant Program*
Revenue derived	4	3	4
Equity	3	4	3
Economic effects	3	4	5
Collection effort	4	3	4
Industry or public support	2	4	4
Legislative action	2	4	4
Procedural action	5	5	5
National/State issues	4	4	4
Total	27	31	33

Note: Criteria are scored on a scale from 5 (this factor is not an impediment to enacting the revenue alternative or this alternative can substantially improve the Texas transportation funding situation) to 1 (this factor represents a significant barrier to using the financing mechanism or this alternative will not improve the Texas transportation funding situation).

- State Marine Fuel Tax—The suggested tax rates would increase shipping rates between 2% and 8% while generating between $2 million and $10 million annually for the Texas GIWW. Keeping these funds in Texas will help advance the possibility of the tax being approved, as will the consistent focus on the user paying for services and infrastructure improvements. The barge industry will probably oppose this tax, but the taxes will not eliminate their cost advantage over rail, and the tax collection is administratively efficient.
- Harbor Maintenance Fee—The fee would be assessed on carriers in relation to their tonnage. While it would be more difficult to collect than the motor fuel tax that funds highways, the orientation is the same—the user pays and the user benefits. The navigation districts would have control over whether to enact the fee and over the amount of revenue raised from this tax, but a very small tax on the value of cargo

would generate enough money to make up for the reduction in the U.S. Corps of Engineers budget.

- State Tax on Distillate Fuel—This tax would be used to fund a grant and loan program that the state can use to assist small port operations. The program could be arranged so that matching funds from the local area would demonstrate support and extend the impact of state funding. The Legislative action necessary to begin the program would not be without opponents, but the relatively small tax rate, the inclusion of local community support as a factor in loan or grant decisions, and the fact that the users of port facilities will both pay and benefit from the taxes should offset the negatives of a tax increase.

Conclusion—Funding Texas Ports and Waterways

The 15% reduction in the U.S. Army Corps of Engineers operation and maintenance budget has created a funding need for the following: dredging maintenance for both the Texas GIWW and the harbors within the state navigation districts; and infrastructure and economic development needs for the state's small ports. The following sources of revenue and financing options are proposed:

- A state tax on marine fuel (up to 18¢ per liter) used by barge operators;
- Authorization of a harbor maintenance fee (up to 17.4¢ per metric ton) assessed on carriers of imports and exports;
- A low interest state loan program providing $6 million per year for small ports for infrastructure development; and,
- State grants to small ports of $6 million per year based on a port match of 25%.

The financing and revenue options have the effect of spreading the load for additional revenue between the three partners in the Texas ports and waterway system—local entities, the state, and the vessel operators. The support of all three groups is crucial to making progress on the funding needs, and the actions we propose meet the standard for politically and economically reasonable alternatives.

Expansion of the type of projects eligible for State Infrastructure Bank funding will also benefit the port and waterway system. Road projects that support intermodal connectivity are already eligible, but identifying private port projects that might require a relatively low percentage of public funding to improve ship and barge facilities can assist in relieving congestion on the roadway network in Texas.

CHAPTER 8
CONCLUSIONS AND SUMMARY OF RECOMMENDATIONS

The past few decades have seen significant change in the funding picture for transportation in Texas. The Interstate Highway System has been completed with 90% federal funding; transit agencies in the largest cities are funded by dedicated local sales taxes, and the state and federal motor fuel taxes have been substantially increased.

These changes, however, may be dwarfed by the range of funding options that will be available to transportation agencies in the next decade. More options are already available for managing project funding, speeding construction, and privatizing projects than were in place during the construction of the 65,000 kilometer Interstate Highway System. Toll highways and roads with some direct user charge are becoming standard parts of any large transportation corridor improvement study.

The common theme through this explosion in funding options is flexibility. As with the governmental trend toward localized decision making, transportation project funding is increasingly accomplished using a variety of creative techniques. Many of these are not entirely new in that they have been used in private business for years and by some other states or other levels of government. In transportation terms, however, these are innovative because the Texas highway and public transportation programs have been funded by taxes and fees dedicated to those efforts.

The move toward more flexible funding options is part of the trend away from purely dedicated taxes and fees for transportation as evidenced by legislative appropriations at the state and national level and, in fact, for a variety of governmental services at all levels. Decision-makers are increasingly focused on the outcome of programs and look to maximize the benefits to citizens regardless of the historic precedent for the use of funds.

Recommendation 1—Information Campaign

For transportation to compete for the attention of the public and decision-makers, there should be an **information campaign on the role and importance of transportation in our society and economy**. This should include a summary of the funding and transportation issues, the needs, and the consequences of doing nothing. While other specific actions have a more direct effect on increasing revenue, the education campaign states the case for why many options are necessary. It can be implemented at many levels—from a statewide level similar to the "Don't Mess with Texas" campaign, to meetings with state and local elected officials, to the program and project meetings conducted with local residents.

Recommendation 2—User Pays

Transportation programs have long been funded by consumers of transportation services. **The "user pays" philosophy will serve transportation well in the future and can be improved if it is modified to more closely associate the users and their impacts.** Technological advances make it much easier to identify drivers using congested roadways and charge them for their effect on congestion. The same technological advances also make it much easier to identify low-income users and charge them a lower rate, thus supporting the welfare-to-work program. This approach is one example of ways to fine-tune the "user pays" system. In the existing system of "pay at the pump," all vehicular use is treated as having equal value. Congested streets and highways, however, have adverse impacts on commerce, safety, and air quality brought on when those who cause the congestion are not required to pay for the negative consequences. The recommendation is not to move immediately to such a different system but rather to remember that users pay for system conditions under **any type of fee system**—under the current system, users pay for congestion by longer and unpredictable travel time. As users become more comfortable with the role of transportation and understand its impact on the Texas economy and quality of life, there will be opportunities to address congestion problems in ways that use pricing rather than additional concrete.

Recommendation 3—Optimize Fund Management

Many financing techniques that are considered innovative by transportation agencies are part of the normal operating procedures used by private businesses to manage cash flow and leverage funds. In the public sector and in an area such as transportation where funding sources are limited to a relatively few, large sources, the need for these techniques has not been recognized or appreciated. **As funding sources grow more diverse and more flexibility is allowed, TxDOT should take advantage of as many cash flow management and leveraging techniques as possible.** Many cash flow management ideas are noted in this report, including beginning construction of important projects with state funds before federal funds arrive, using state or federal funds to pay for elements of construction or financing that are not as easily permitted by the other (federal or state) source of funds, and structuring the public sector participation in private projects to improve the acceptance of the project by the investment community. Revenue or fund leveraging represents ways to significantly increase money available for transportation in Texas. Specific techniques include using public funds to support projects that are not supportable as purely private projects and using revenue from toll projects as a "soft match" for federal funds, thereby releasing state funds for other Texas priorities.

Recommendation 4—Mode Neutrality

Transportation improvement decisions are more complex today, not only because funding options have changed, but also because the range of possible improvements has greatly expanded. Urban areas particularly have several construction, operating, and mode options to choose from. Freight transport needs are also increasingly part of the decision matrix for TxDOT. **Recognizing this range of improvement options, TxDOT should pursue a program to reduce the modal divisions in project selection and funding. A key element of this activity is opening State Infrastructure Banks (SIBs) for modes and projects other than roadway construction.** While some of these changes, such as creating SIBs, will require legislative action, the changes are a reflection of the new methods of identifying improvements to the transportation system. Most of TxDOT's program will continue to be roadway construction and maintenance. An increasing percentage of roadway problems, whether congestion, safety, or

pavement damage related will, however, be resolved by other modes or by other types of road improvements. This is already the case in the large Texas cities, and as freeways and major streets are widened to fill the right-of-way, significant mobility improvements will come from using our existing transportation corridors more efficiently.

Recommendation 5—Reward Local Effort

Many of the innovative techniques identified in this report will require, or can benefit from, the participation of local governments or regional authorities. **TxDOT should create an incentive program for local entities to contribute to funding transportation improvements in all modes.** In much the same way the project selection process rewards efforts to reduce TxDOT's project cost, a reward program can encourage support for improvements and allow local groups to creatively optimize the mix of taxes, fees, financing arrangements, and donations that work best for that area. The program would reward areas that exhibited similar levels of "effort" as measured by per capita and per dollar of median family income to create a level playing field for all areas of the state.

Recommendation 6—Highway Funding

The most promising highway funding expansion techniques are greater use of **toll roadway** and **value pricing** projects that directly charge users of roadways, increases in **motor fuel taxes**, and **vehicle registration fees tied to local needs and voter approval.**

TxDOT will have to think differently about toll projects than in the past. If TxDOT and other public entities are willing to accept some risk along with the private sector, there may be many more toll projects that are financially feasible. There are a few opportunities for private-only toll projects or for public agencies, such as the existing toll highway authorities in Houston and Dallas and the TxDOT Turnpike Division, but relatively modest participation by TxDOT will greatly increase the kilometers of roadway that can be constructed.

Expansions of some existing roads can be funded, in part, by value pricing projects that charge users for premium services. Experiments with this type of project are underway, and TxDOT should know within five years if the technique is applicable in Texas. These projects might be combined with high-occupancy vehicle priority lanes or truck-only designations to support several Texas transportation objectives, including mobility, safety, and air quality.

Motor fuel taxes are the primary source of revenue in the United States, and none of the financing schemes in this report will change that in the next decade. And while not innovative, an increase of between 1¢ and 3¢ per liter will raise between $400 million and $1.1 billion. There is no other funding scheme that generates this magnitude of funding. This idea cannot be sold to the public and the legislature without identifying the importance of transportation to the Texas economy and the quality of life experienced by Texans.

Local option vehicle registration fees can provide funds for regional transportation needs and can be a way to assure citizens that funding will flow to local priorities. This report identified a method to estimate what those needs might be and how they might be allocated, but the additional amount can only be determined by the voters.

Recommendation 7—Public Transportation Funding

State and local public transportation officials, both agency and associations, must combine plans and efforts to generate support for funding transit. Transit systems can show commitment to solving the funding problem by generating local funds from fares, city contributions, donations, and other sources. This local support will make needed statewide actions—such as State Infrastructure Bank loans, state-assisted tax-exempt bonds, a revolving loan fund, and using credits from state revenue streams (e.g., toll highways)—much more palatable to the public and legislators.

Recommendation 8—Aviation Funding

Education and targeting the state funding and participation by local governments and aircraft operators are three important actions to improve general aviation in Texas. Education, because many local leaders do not understand the economic value of their small airports. **Targeted funding** because the Texas Airport System Plan should guide investment to the most important projects. The Federal Aviation Administration has a program that represents a similar partnership with broad funding and loan possibilities. And **local and operator participation** because it helps create a dependable revenue stream and demonstrates the commitment of those groups.

Recommendation 9—Ports and Waterway Funding

User fees on marine fuel and freight movement through Texas ports, combined with a state loan program, represent the needed partnership to develop revenue for improving the port and waterway system. The Texas Gulf Intracoastal Waterway dredging maintenance may be increasingly returned to the state level. Texas' small ports have funding and infrastructure needs that cannot be met by the local areas themselves. Shippers faced with unacceptable ship and barge traffic may choose one of two alternatives—either shipping by truck or rail (which already experience high levels of congestion), or choosing to relocate their businesses to other states. In either case, the citizens of Texas are the losers. Local ports, vessel operators, and the state should combine forces to fund the infrastructure and maintenance needs and retain a viable, needed mode that also offers significant relief to crowded land transportation facilities.

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