

1. Report No. FHWA/TX-03/4160-9		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle THE FUNDING AND FINANCING OF MANAGED LANES PROJECTS				5. Report Date September 2002	
				6. Performing Organization Code	
7. Author(s) Tina Collier and Ginger Daniels Goodin				8. Performing Organization Report No. Report 4160-9	
9. Performing Organization Name and Address Texas Transportation Institute The Texas A&M University System College Station, Texas 77843-3135				10. Work Unit No. (TRAVIS)	
				11. Contract or Grant No. Project No. 0-4160	
12. Sponsoring Agency Name and Address Texas Department of Transportation Research and Technology Implementation Office P. O. Box 5080 Austin, Texas 78763-5080				13. Type of Report and Period Covered Research: April 2002 – August 2002	
				14. Sponsoring Agency Code	
15. Supplementary Notes Research performed in cooperation with the Texas Department of Transportation and the U.S. Department of Transportation, Federal Highway Administration. Research Project Title: Operating Freeways with Managed Lanes					
16. Abstract The managed lane concept is currently being considered on major freeway projects in Texas cities. While the high-occupancy vehicle (HOV) concept is familiar in most urban areas, motorists are less familiar with managed lanes. The term "managed lanes" encompasses a variety of facility types, including HOV lanes, high-occupancy toll (HOT) lanes, single-occupancy vehicle (SOV) express lanes, special use lanes, and truck lanes. The premise of the managed lanes concept is to increase freeway efficiency and provide free flow operations for certain freeway users by packaging various operational and design strategies. The strategies deployed offer the flexibility to be adjusted to match changing corridor and regional goals. This report documents research on the funding and financing of managed lanes projects. This report highlights the financial aspects of operating managed lanes projects. Additionally, it discusses innovative financing techniques and their applicability to various types of projects. The report describes various financing and funding strategies for given managed lane project scenarios. Successful implementation of a managed lanes project will require careful planning and a willing community. Managed lanes projects can be successfully implemented when the project is designed around the goals of the community or region. These goals will affect project financing too. It is important to match the financing with the goals of the project.					
17. Key Words Managed Lanes, Financing, Funding, HOT, HOT Lanes			18. Distribution Statement No restrictions. This document is available to the public through NTIS: National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161		
19. Security Classif.(of this report) Unclassified		20. Security Classif.(of this page) Unclassified		21. No. of Pages 48	22. Price

THE FUNDING AND FINANCING OF MANAGED LANES PROJECTS

by

Tina Collier
Assistant Transportation Researcher
Texas Transportation Institute

and

Ginger Daniels Goodin, P.E.
Associate Research Engineer
Texas Transportation Institute

Report 4160-9
Project Number 0-4160
Research Project Title: Operating Freeways with Managed Lanes

Sponsored by the
Texas Department of Transportation
In Cooperation with
U.S. Department of Transportation
Federal Highway Administration

September 2002

TEXAS TRANSPORTATION INSTITUTE
The Texas A&M University System
College Station, TX 77843-3135

DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the Texas Department of Transportation (TxDOT) or the Federal Highway Administration (FHWA). This report does not constitute a standard, specification, or regulation and it is not intended for construction, bidding, or permit purposes. The researcher in charge of this task of the project was Tina Collier. The engineers in charge of the overall research project were Beverly Kuhn, Texas P.E. #80308 and Ginger Daniels Goodin, Texas P.E. #64560.

ACKNOWLEDGMENTS

This project was conducted in cooperation with TxDOT and FHWA. The authors would like to thank the project director, Carlos Lopez from the Traffic Operations Division of TxDOT, for his leadership and guidance. The authors are grateful to the following individuals from TxDOT who make up the Project Monitoring Committee for their time, initiative, and valuable input provided to the project:

Michael Behrens, Administration
Bill Garbade, Austin District
John Kelly, San Antonio District
Jay Nelson, Dallas District
Mary Owen, Tyler District
Richard Skopik, Waco District

Additionally, the authors would like to extend their sincere appreciation to the Task Advisory Committee. The thoughtful insight of each of these individuals was vital to the research.

Mike Strech, Assistant Director
Harris County Toll Road Authority

Susan Buse
North Texas Toll Authority

Terry Thornton
Harris County

Matt MacGregor, LBJ Project Manager,
TxDOT – Dallas District

Chris Anderson
North Texas Toll Authority

Teresa Lemons
TxDOT – Texas Turnpike Authority

Mark Bouma
North Texas Toll Authority

Howard Lyons
TxDOT – Transportation Planning &
Programming

Rick Herrington
North Texas Toll Authority

Kelly Kirkland
TxDOT – Finance Division

Karen Grosskopf
FHWA – Texas Division

Aaron Kocian
TxDOT – Legislative Affairs Office

Judy Friesenhahn, P.E.
TxDOT – San Antonio District

Pamela Bailey Campbell
Parsons Brinckerhoff Consult

TABLE OF CONTENTS

	Page
LIST OF FIGURES.....	ix
LIST OF TABLES	x
CHAPTER 1. INTRODUCTION	1
CHAPTER 2. BACKGROUND	3
MANAGED LANES.....	4
CHAPTER 3. FUNDING AND FINANCING METHODS.....	7
CASH MANAGEMENT TECHNIQUES	8
Advance Construction.....	8
Tapered Match.....	9
Flexible Match.....	9
Toll Credits.....	10
DEBT FINANCING	11
Municipal Bonds	11
Grant Anticipation Revenue Vehicles (GARVEE).....	11
CREDIT ASSISTANCE	12
Section 129 Loans	12
State Infrastructure Banks (SIBs).....	13
Transportation Infrastructure Finance and Innovation Act (TIFIA)	14
Innovative Tolling.....	15
SUMMARY	15
CHAPTER 4. NEW APPROACHES FOR DEVELOPING MANAGED LANES PROJECTS.....	17
REGIONAL MOBILITY AUTHORITIES	17
PUBLIC-PRIVATE PARTNERSHIPS	17
DESIGN/BUILD.....	21
OTHER CONSIDERATIONS	22
Shadow Tolls.....	22
Special Assessment Districts.....	22
Tax Increment Financing	23
Development Impact Fees.....	23
Other.....	24
CHAPTER 5. CONCLUSIONS.....	25
APPENDIX.....	27
CALIFORNIA.....	27
SR 91	27
I-15, San Diego	28
The Tollroads, Southern California.....	30
SR 125.....	31
TEXAS.....	32
I-10, Katy Freeway.....	32
MANAGED LANES AND TOLLROADS IN TEXAS.....	33
President George Bush Turnpike	33

Central Texas Turnpike Project.....	34
REFERENCES.....	37

LIST OF FIGURES

	Page
Figure 1. Funding and Financing Strategies (<i>adapted from 1</i>).	7

LIST OF TABLES

	Page
Table 1. Comparative Summary of 2005 Traffic Levels	30

CHAPTER 1. INTRODUCTION

This report documents research into the funding and financing aspects of managed lanes projects. The report has been prepared under one task of the multi-task TxDOT project 0-4160, “Operating Freeways with Managed Lanes.”

The term “managed lanes” encompasses a variety of facility types, including high-occupancy vehicle (HOV) lanes, high-occupancy toll (HOT) lanes, single-occupancy vehicle (SOV) express lanes, special use lanes, and truck lanes. The premise of the managed lanes concept is to increase freeway efficiency and provide free-flow operations for certain freeway users by packaging various operational and design strategies. The types of operational and design actions that could be used include the following:

- variations in vehicle group eligibility (e.g., HOV, SOV, truck, low emissions vehicle (LEV));
- period-based eligibility (e.g., time-of-day, day-of-week);
- pricing;
- physical control (e.g., continuous barriers to limit direct access, gates); and
- operational control (e.g., ramp meters, lane assignment, reversible freeway lanes, driver information).

Most of these actions offer flexibility for adjustment to match changing corridor and regional goals.

There is no one facility currently in operation that embraces the complete range of managed lane strategies. There are, however, several projects putting lane management into practice by using one or more of the above strategies. Researchers have explored funding and financing techniques used to implement these projects, as well as mechanisms that may be available for use in future projects.

This report highlights the financial aspects of implementing managed lanes projects. Additionally, innovative financing techniques and their applicability to various types of projects are discussed. The report describes various financing and funding strategies for given managed lane project scenarios.

The following questions will be answered in the review of managed lane facilities currently in operation:

- What is the purpose of the project?
- How was project construction financed?
- How are maintenance and operations funded?
- What is the extent, if any, of private sector involvement?
- What are the financial terms of the project?
- What institutional, legislative, or policy issues needed to be addressed?

- What lessons can we learn from the financing and funding of implemented projects that will assist TxDOT in determining the most effective means of bringing necessary projects to fruition?

CHAPTER 2. BACKGROUND

The Texas Department of Transportation is expected to receive approximately \$2.3 billion in federal funding for Fiscal Year (FY) 2003. This money will be designated for many different functions and obligations of the department including the National Highway System (NHS) fund, the Interstate System (IS) fund, the Interstate Maintenance (IM) fund, the Transportation Enhancement (TE) fund, safety funds, bridge program funds, and many others. Even with the apportionment from the federal government, TxDOT expects to fund only 36 percent of the needed projects. How to fund transportation projects, in general, and managed lanes projects, in particular, is an issue that TxDOT officials must grapple with daily.

Beginning with the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the Federal government has responded to the growing gap between funding and need. ISTEA created a loan program whereby states could lend Federal funds to toll projects and this legislation permitted certain toll revenue expenditures to serve as credit in meeting the required non-Federal matching funds.

In 1994, the Federal Highway Administration (FHWA) launched an important initiative that asked states to identify barriers to project funding and financing. The program was designated TE-045 since it was a “test and evaluation” program. The program identified new techniques to leverage Federal monies and provided for more flexibility in receiving and using Federal funds.

Later, the National Highway System Designation Act of 1995 (NHS) codified many of the innovations of the TE-045 program and went much further to close the gap. This act established a State Infrastructure Bank (SIB) Pilot Program, broadened the use of Federal aid in retiring the costs of debt financing, expanded the types of commitments available to meet the non-Federal matching requirements, and increased the Federal matching ratio for toll projects.

The Transportation Equity Act for the 21st Century (TEA-21) attempts to provide even more flexibility in funding and financing major projects. TEA-21 continued the SIB program and provided for more flexibility in meeting the non-Federal match requirements. TEA-21 also enacted the Transportation Infrastructure Finance and Innovation Act (TIFIA) to provide \$10.6 billion in credit assistance to major projects of national importance.

TxDOT has also responded to the challenge by reviewing its planning and programming procedures. TxDOT conducts statewide planning through the Unified Transportation Program (UTP). The UTP is TxDOT’s 10-year statewide plan for transportation project development. Currently, the UTP has 34 funding categories. A directive of the governor has asked TxDOT to simplify the planning process and provide for connectivity of the system. TxDOT is updating the UTP and has proposed consolidating the 34 funding categories into 12 categories. This will allow for changes in the project selection process.

The changes are designed to provide more flexibility at the district level and also to enhance corridor connectivity. The new plan will utilize six working groups that will evaluate and prioritize proposed projects.

It is evident that states and the Federal government must work together to meet the demands for an effective, safe, and reliable transportation system. Much of this legislation puts control of projects into the hands of local decision-makers. Many innovative financing measures are ideally suited to managed lanes projects. A basic understanding of the programs will enable decision-makers to pursue financing that is most appropriate to a particular project. Additionally, many of these strategies may be used in tandem with other strategies.

It is also important to distinguish “funding” from “financing.” Typically, transportation agencies will have a project in the long-term planning process. Whether or not that project is realized will depend on available funding. Therefore, a project in development may be implemented when or if monies (i.e., funding) become available. Ultimately, all projects need a source of funding whether it be grants, taxes, special assessments or toll revenues.

Conversely, financing refers to the methodology used to secure funding. In this scenario a need for a project is identified and often a project can be developed to match types of financing that may be available. An innovative financing approach can offer more flexibility than the traditional payment-reimbursement method that is most often used for transportation projects. Likewise, innovative financing methods for new transportation solutions can spur an infusion of funding from non-traditional sources such as private sector investment. Not only do financing techniques identify possible alternative funding sources, they often result in project acceleration. Critical projects may be advanced sooner than would be possible under the old process, sometimes by as much as 20 years sooner.

MANAGED LANES

Many of the managed lanes projects under development in Texas will incorporate a user fee structure to obtain the desired operating characteristics. The fact that a project has a dedicated revenue stream makes it a more likely candidate for non-traditional funding. Additionally, these projects may attract private sector investment.

The key to successful implementation of a managed lanes project will be matching the desires and needs of the community with specific project goals. Financing can be accomplished in a number of ways be it tolling, a special transportation tax, pricing, revenue bonds, a number of different kinds of loans, commercial vehicle fees, or tourist fees. The goals of the region and the local agencies developing the managed lanes project will determine the candidate methods for financing that should be explored further. Successful projects will find mechanisms that balance those goals with financing criteria.

The [appendix](#) of this report highlights the few managed projects that have been implemented around the county. The financing approaches used for each are unique. One project was developed completely by the private sector, three others are collaborative efforts between several agencies and the last one is being undertaken by TxDOT using a multitude of strategies to enhance the financial feasibility of the project. In each case, various options for financing were explored and careful consideration was given to the project goals. By matching regional goals and project expectations, a successful financing structure can be developed.

CHAPTER 3. FUNDING AND FINANCING METHODS

In addition to the traditional pay-as-you-go method of reimbursement, many new funding and financing techniques exist today. Often managed lanes projects are large, complex projects. This may require the state department of transportation to obligate funds for several years before a project even begins. As a result other projects may be pushed back even further in the funding pipeline. In an effort to ease this burden on transportation departments, the Federal government has made available many new techniques for financing and funding projects. For the most part these new methods can be divided into two categories, cash management tools and credit enhancement and/or investment tools. The report will explain in more detail what each tool can accomplish. Figure 1 below graphically represents how some of the funding mechanisms may be used for different types of projects. The shaded area indicates that managed lanes projects can encompass each of the three broad categories.

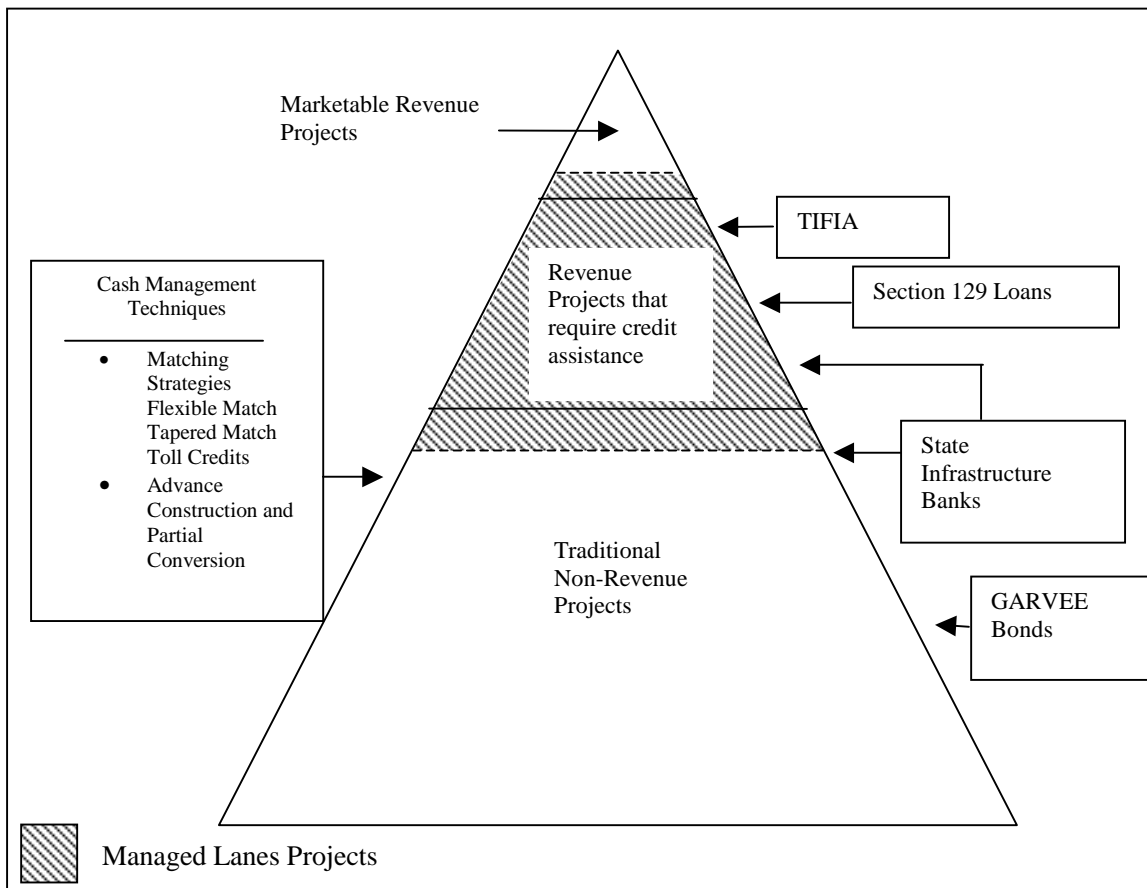


Figure 1. Funding and Financing Strategies (adapted from 1).

As the pyramid indicates, most projects fall into the traditional non-revenue category. These are projects that will require typical grant funding for their implementation. The top of the pyramid represents the very small percentage of projects that can be marketable

revenue projects on a stand-alone basis. These are the types of projects that are able to show revenues that provide the level of debt coverage necessary to obtain investment grade ratings and sell sufficient debt to fully finance a project. These projects are typically developed on high-volume corridors where user fees support maintenance and operations of the facility as well as the debt service on the initial capital costs.

The middle [section](#) of the pyramid is most likely where a managed lanes project would fit. Often these projects are substantial undertakings that will require leveraging monies from every available source. Ideally, the projects are attractive to private investors so some risks shift from public entities to the capital market. A project needs a tremendous amount of agency cooperation to guide it through the development process. Every effort should be made to include any and all interested parties from the earliest stages of project planning. Not only does this foster a collaborative attitude, but it may also help identify potential financing sources and investment opportunities.

These methods may be used alone or in concert with one another to finance a project. Each is designed to offer more flexibility in an effort to make projects more feasible and to get them implemented sooner. The effect of these efforts has been the ability to leverage state and federal funds.

CASH MANAGEMENT TECHNIQUES

Advance Construction

Advance Construction is a cash flow management tool that allows a state to begin a project without sufficient Federal-aid obligation authority to complete the project. By utilizing this technique a state may begin a project with state funds and at a later time, when Federal-aid funding or obligation authority is available, convert the project to a Federal-aid project. This allows a state to move a project forward even if the state does not have obligation authority for the project. Before the fall of 2000, TxDOT only used Advance Construction approximately 25 percent of the time and generally this was done at the end of the fiscal year. Now TxDOT is taking advantage of the program to more closely match expenditures with obligation authority. In fact, Advance Construction is being used on all TxDOT right-of-way purchases. This is an especially useful tool for TxDOT at a time when the department is attempting to advance several large projects at the same time that consume much of the state's obligation authority.

Partial conversion of Advance Construction is a similar technique in that states begin a project with non-Federal money and then convert the project at a later time with the exception that partial conversion allows for the project to be transferred to a Federal-aid project in phases. TxDOT is taking advantage of partial conversion more often as the agency becomes more accustomed to the process. This technique may be useful in developing managed lane projects that will be accomplished in several phases.

Additionally, Section 308 of the NHS Act eliminated the restriction on the authorization to one year beyond the fiscal year of authorization. Essentially, this allows FHWA to

approve any Advance Construction project as long as it is in the state transportation improvement plan and meets the other requirements for a Federal-aid highway. This tool allows TxDOT to implement Advance Construction projects based on anticipated apportionments beyond the authorization period of Federal aid. TxDOT is able to use obligation authority and the accompanying cash reimbursements in increments to manage the cash flow needs of a project or projects.

In the case of a managed lanes project with a variable revenue stream, this tool can be especially useful in the early years of a project when the amount of Federal funds needed is uncertain since there is no revenue history. The project can be partially converted as needed in relation to revenue income. This strategy eases the obligation authority burden on the project and allows those Federal monies to be used on other projects.

Tapered Match

Tapered match allows a project sponsor to vary the amount of the non-Federal match over time as long as the Federal contribution does not exceed the Federal limit. This allows a project to move forward even if the state does not have the required local match at the present time. TxDOT began using this strategy in the fall of 2000 and uses it on projects that require a state match. This alleviates the requirement that the state match the Federal contribution on a payment-by-payment basis. Section 1302 of TEA-21 removed this requirement and now the non-Federal requirement is assessed on a project basis rather than payment basis. This means that Federal contribution can be as high as 100 percent at the start of the project and be phased down over time.

This technique is useful for projects that will produce a revenue stream either through tolls or special taxes but need time for those revenues to accumulate. This is ideally suited to a managed lane facility that will use pricing to manage demand. It will allow for fluctuations in the system to be tweaked until a balance is reached between revenue and level of service. For instance, a project utilizing tapered match may begin using 100 percent Federal funds and then the locally generated revenue will cover the final 20 percent of the project costs.

Flexible Match

Flexible Match allows the non-Federal project costs to be a variety of public and private contributions. Provisions in the NHS Act and TEA-21 allow for flexibility in the matching requirements. The result is the opportunity to match Federal highway funds with certain other types of state, local or other Federal funds or donations. Flexible match can be particularly useful if a public (e.g., city or county) or private entity has a vested interest in implementing a project. These entities may contribute funds, rights-of-way (ROW), materials, and in some cases services toward meeting the non-Federal matching requirements. In fiscal year 2001, TxDOT received over \$88 million from cities, counties, and private sources to help fund highway construction. This tool may be very useful in a managed lanes project that is depending on private equity for financing. For instance, a developer that will benefit from facility improvements that increase or

improve access may wish to donate ROW or fund preliminary studies. These activities can contribute to the non-Federal match for a managed lanes project.

Toll Credits

Section 1044 of ISTEA permits states to apply toll revenues that are used for capital expenditures to build or improve public highways as credits toward the non-Federal matching requirements for all Federal-aid projects. The value of the credit earned is determined by the amount of toll revenues that are used for capital expenditures on public highway facilities that serve interstate travel. If sufficient credits are available, this provision allows the Federal share of a project to be increased to 100 percent. To qualify for the credit a state department of transportation's non-Federal highway and transit capital expenditures must equal or exceed the average of prior years. This calculation is known as the maintenance of effort (MOE). The state must establish a credit accounting system, and the credits remain available until they are used.

Toll credits may be earned on a project that a public, quasi-public, or private entity operates. Although TxDOT does not currently operate any tollroads, the department has received approval for approximately \$154 million worth of toll credits. These credits are the result of expenditures by the North Texas Toll Authority and the Harris County Tollroad Authority. In this instance, these agencies may operate a managed lane facility and receive toll credits that TxDOT may be able to apply toward the non-Federal matching share of other transportation projects. To date, TxDOT has used \$8.5 million of toll credits for public transportation projects and \$12.2 million as matching share for construction projects.

However, expenditures for routine maintenance, debt service, or costs associated with collecting tolls may not count towards toll credits. States can apply toll credits toward the non-Federal matching share of Federal-aid highway projects or toward the non-Federal matching share of any transit project. Toll credits have been so successful in Florida that this approach is now being used on almost all new projects. Subsequently, most of Florida's Federal-aid highway program uses Federal monies exclusively.

The techniques described above are examples of innovations that can be used to expedite a project as well as making it more financially feasible. Most of these mechanisms deal with applying monies or using credits that have already been earned. Other possibilities for funding and financing managed lane projects may come in the form of credit assistance or debt financing.

DEBT FINANCING

Municipal Bonds

Many projects are often too large to take advantage of the methods described above without some other assistance. In these circumstances, agencies may choose to issue municipal bonds. Municipal bonds differ from other capital market investments in that the interest yielded from these investments is tax-exempt. Of course, financing a project through the issuance of bonds comes with related costs such as interest payments and issuance costs. These costs must be measured against the costs of delaying construction and the resulting economic, safety and mobility costs. These benefits may outweigh the cost of borrowing. Additionally, recent legislation has allowed for more expenses related to bond issuance to be paid with Federal-aid reimbursement. These expenses include interest expenses, debt issuance costs, and commercial bond insurance. Since the development of a managed lanes project usually is a major undertaking involving major construction or reconstruction of facilities, every available avenue of financing must be explored. Often municipal bonds may be the way local entities choose to participate in the project.

Grant Anticipation Revenue Vehicles (GARVEE)

Recently, the Federal government has allowed states to use anticipated apportionments of Federal-aid highway funds toward the payment of debt service on bonds. GARVEE bonds are essentially instruments that allow projects that do not have a dedicated revenue source or other form of repayment to proceed with anticipated apportionments of Federal-aid monies. GARVEEs and partial conversions of Advance Construction are two techniques that work hand-in-hand. Section 308 of the NHS Act removed restrictions on the amount and timing of advance construction authorizations allowing them to extend beyond one fiscal year of authorization. Previously, states could apply Advance Construction for up to only one year beyond the current apportionment period. Now a state may obligate Federal funds for debt service over a longer period. This is critical to a GARVEE-funded project since GARVEE bonds are issued based on anticipated grants of Federal monies in the subsequent appropriations cycles.

A state, a political subdivision of a state or a public authority can issue GARVEEs. There is also considerable flexibility in structuring the terms of the bond. It is up to the discretion of the issuer, whether a state infrastructure bank or a non-profit corporation, to determine interest rate, terms of obligation, required reserves, or bond insurance.

Many states have been reluctant to issue GARVEE bonds. In fact, Texas has not specifically approved the use of GARVEE bonds for transportation projects. This reluctance stems from the fact that the bonds obligate future Federal-aid funds and a state must decide how much future aid it is willing to obligate while not knowing for certain how much the state will receive in sum.

GARVEEs are dependent on future Federal-aid apportionments and there is no guarantee that the Federal highway program will be re-authorized when the legislation expires in

2003. Many capital markets see this as having a higher level of risk if it is a stand-alone GARVEE without any other pledged funding sources. This has led to two different types of GARVEEs.

Non-recourse GARVEEs – These bonds are issued with only the future Federal-aid apportionments as security to investors. Since these bonds are risky, the interest rate is generally higher and therefore the bonds are more expensive.

Back-stopped GARVEEs – In the case of back-stopped GARVEEs, states will pledge a secondary source of revenue in case future Federal funds are not available. This pledge may be from state fuel taxes or property taxes or any other source of revenue. The advantage a back-stopped GARVEE offers is usually a lower interest rate.

CREDIT ASSISTANCE

Perhaps the most meaningful financing mechanisms to a managed lanes project are the innovations in Federal credit assistance programs. The programs are generally suited to projects with a dedicated revenue source, as is the case with most managed lanes projects. This assistance may come in the form of Federal loans to state departments of transportation or as Federal credit enhancements. Although most states would prefer Federal grants for transportation projects, loans will often result in getting a project completed sooner. Credit enhancements offer Federal funds as stand-by collateral to investors. This often results in more favorable terms for debt financing.

There are three techniques that provide states with credit assistance options. Section 129 loans allow states to use Federal-aid highway apportionments to make direct loans to projects that have a dedicated revenue stream. Federal-aid highway apportionments may also be used to capitalize a state infrastructure bank that can then offer project loans or credit enhancements. The third technique allows the United States Department of Transportation (USDOT) to directly provide loans to projects of national importance. The Transportation Infrastructure Finance and Innovation Act (TIFIA) made this action possible.

Section 129 Loans

These loans can be made to any project that is eligible for Federal-aid highway funding as long as the project has a dedicated revenue source to repay the loan. This revenue source can be in the form of a toll or a special tax. Federal funds cannot be used as a revenue source. The President George Bush Turnpike (Highway 190) in Dallas was the first project to take advantage of Section 129 loans and is an excellent example of a project that utilized a Section 129 loan to leverage all available funding. The cooperation of several agencies made this project possible. The loans allow for money to be circulated and reinvested. The state may make a direct loan to a project using Federal-aid monies. The loan is then repaid with project revenues and the money can be reinvested in other transportation projects. This is a way to leverage monies to make the project more viable and to perhaps attract additional investors or money.

Repayment of Section 129 loans begins within five years of a project opening to traffic. The term limit is 30 years from the date of authorization of the Federal funds. The state may determine any interest rate for the loan as long as it is at or below market rates. Setting the interest rate can be a conundrum for states. Setting a lower interest rate will lower the cost of borrowing for the project; however, the payments on the debt service of the loan may lag behind the present value of money. Therefore, the reinvestment capabilities are not as beneficial as they could be if current market rates are used. Often Section 129 loans are best used as subordinate loans to other debt. The loan acts as more of a credit enhancement in this capacity and improves the debt coverage to senior liens.

State Infrastructure Banks

Texas has used state infrastructure banks for a number of years now with great success. New legislation affecting the SIB program makes SIB loans even more attractive. A SIB is essentially a revolving loan fund that can be capitalized with Federal-aid highway funds and state funds. This money is recycled in much the same way the Section 129 loan money is re-circulated.

SIBs may provide assistance in various ways. The SIB may make direct loans, which it can tailor in any way to meet a project's needs. The SIB may also provide short-term loans, issue grant anticipation notes (GANs) or GARVEEs, where it is legally permissible; and provide credit enhancements, all in an effort to bolster a project's attractiveness to the private capital markets. Each of these is an example of combining techniques to improve a project's financial feasibility.

However, TEA-21 limited the SIB program's ability to capitalize with Federal funds to four states: California, Florida, Missouri, and Rhode Island. This meant that other states, such as Texas, could use state money only to capitalize the fund. Recently, Texas has been given the ability to use Federal funds for capitalization again. Through an amendment to Section 1511(b) of TEA-21, Texas was added to the original list of four states in the TEA-21 SIB pilot. However, Texas has not chosen to modify its Cooperative Agreement with the Federal Highway Administration to participate. Instead, Texas is seeking permission from the FHWA to establish two separate accounts within the SIB. One account would continue to operate under the rules in effect through the ISTEA legislation. The rules under these provisions allow the fund to operate with no federal restrictions on the money. In other words, once the money is deposited it becomes state money and the state may use it at its own discretion. Under the TEA-21 rules Federal monies deposited must be used in adherence to other Federal guidelines. If Texas is granted permission to establish two separate accounts and decides to participate in the TEA-21 SIB pilot program utilizing Federal funds, SIB loans can continue to be important components in the managed lanes financing scheme.

Other states have also enacted legislation that makes SIB loans an even more viable prospect for funding. For instance, South Carolina's SIB is highly leveraged through its bonding authority. The SIB has issued more than \$1.2 billion in revenue bonds for approved projects and plans to issue another \$800 million in the next several years.

South Carolina is ambitiously pursuing what it has deemed “27 in 7.” The state is relying primarily on the SIB to complete 27 years of road and bridge projects in seven years.

Arizona’s SIB, known as the Highway Expansion and Loan Extension Program (HELP), has an innovative financing mechanism called Board Funding Obligations (BFOs). BFOs are short-term funding obligations issued by the State Transportation Board that are purchased by the state treasury and paid back with Arizona Department of Transportation (ADOT) program funds. ADOT estimates that leveraging this new funding source will allow the department to accelerate an estimated \$600 million in highway projects (1).

Transportation Infrastructure Finance and Innovation Act (TIFIA)

The Transportation Infrastructure Finance and Innovation Act was authorized by Congress in 1998. The TIFIA allows the USDOT to provide direct credit assistance of up to 33 percent of project costs to sponsors of major transportation projects. This assistance may be in the form of a loan, a loan guarantee or a line of credit. The TIFIA program goals are similar to SIBs and Section 129 loans in that the program provides credit rather than grants to projects. There are, however, two significant differences between the programs. First, the USDOT directly negotiates with private and public sponsors of eligible transportation projects. Secondly, TIFIA does not draw loan funds from those already apportioned to other states. The legislation, which continues through FY 2003, provided a \$10.6 billion credit to assist projects and budget authority for \$530 million to cover the USDOT costs to reduce defaults and cover interest rate swings.

A TIFIA loan or credit enhancement may improve a project’s financial feasibility. This may be especially important to managed lanes projects that involve tolling because it provides an insurance of sorts that makes the project more attractive to private capital markets. The credit assistance allows capital markets to achieve a balance between flexible credit terms and repayment while providing security.

Public and private entities may apply for TIFIA credit assistance. These may include state DOTs, local governments, transit agencies, special authorities or districts, railroad companies, private firms, or consortia. In order to qualify, each project must have a cost of at least \$100 million with two exceptions. Project costs can be as low as \$30 million if the primary purpose of the project is to install intelligent transportation systems. The second exception waives the \$100 million requirement if the cost of the project amounts to at least 50 percent of the state’s apportionment of Federal-aid highway funds.

TIFIA seeks to maximize investment from other sources such as the private market. A TIFIA loan typically will have a junior claim to project revenues. A dedicated revenue source, such as user fees, tolls, or special taxes, serves to attract investment from non-Federal sources. Loan guarantees serve to provide additional security for the senior level debt holders and reduce the perceived risk inherent in project financing. Lines of credit can be particularly important in the early years of a managed lanes project when project revenues are most likely to be less than originally forecasted. These lines of credit allow for up to 20 percent of the line to be converted to a loan.

Innovative Tolling

Changes in Federal laws over the last 10 years have increased the ability to use tolling on Federal-aid highways. These laws permit tolling on most non-interstate highways and on some interstate highways as long as the sponsor dedicates revenues first to retiring debt and operating and maintaining the facility.

The new laws also established a pilot program that would allow for up to three interstate reconstruction and/or rehabilitation projects to convert from free facilities to tolled interstates. At this time, no projects have been advanced under this program. This pilot program was considered for the Katy Freeway reconstruction but as the law is currently written, all toll revenue collected on the facility must be used on that same facility. The project sponsors of the Katy reconstruction felt this was too restricting. The FHWA plans to ask Congress to consider modifying the legislation.

TEA-21 also continued the value-pricing program. This program is a key component in most managed lanes projects. The premise behind a managed lanes project is to use certain operating characteristics to manage demand, and pricing is one way to do this. Value pricing has been an effective strategy to manage demand and generate revenue, if that is a goal of the project. In fact, the managed lanes on I-15 in San Diego have been so successful that it is now a fully self-supporting project.

The pricing scheme can be devised to achieve project goals. For instance, HOVs could travel for free if ride-sharing were an objective. If shifting travel out of the peak period is a goal, discounts could be offered for traveling at times other than the peak period. Pricing in this way effectively manages the lanes.

SUMMARY

Each of the funding and financing mechanisms described in this [chapter](#) illustrates innovative strategies that can be used to accelerate projects and/or make them financially feasible. The strategies may be used alone or when used in tandem with one another can greatly enhance the viability of a project.

As noted previously, the financing mechanism chosen should reflect the goals of the community and the objective of the project. Different programs will offer different benefits and at different costs. For instance, South Carolina's aggressive program relies primarily on funding from the SIB. Initially, the SIB received a substantial infusion of money from the General Revenue Fund. The SIB then issues bonds backed by future Federal-aid dollars. In this way the monies are leveraged.

In Texas, the Central Texas Turnpike project is of national importance to improve mobility and offer an alternative route to I-35, one of the most congested stretches of the roadway in the nation. Since this was a project of national importance, TxDOT was able to secure a TIFIA loan and by packaging each of the four elements of the system into one project, TxDOT effectively leveraged over \$600 million dollars since the loan was for the entire project rather than just one segment. Consequently, the project became a better

investment to the capital markets and TxDOT received better investment grade ratings effectively lowering the cost of borrowing.

Both of these examples demonstrate different techniques that may be used to finance a project. There are pros and cons to each. Careful attention should be given to each funding mechanism and the goals of the project should dictate which direction to take.

CHAPTER 4. NEW APPROACHES FOR DEVELOPING MANAGED LANES PROJECTS

The previous [chapter](#) examined financing mechanisms that are available as a result of Federal action. This chapter will explore new options that may be used in combination with other programs.

REGIONAL MOBILITY AUTHORITIES

In the 2001 Texas legislative session, the legislature proposed a new law that would allow for more flexibility and control by local entities in developing projects that would meet the needs of the region. The voters approved this legislation with overwhelming support in November 2001. A Regional Mobility Authority (RMA) may be comprised of one or more counties that have agreed to the formation of the authority. The commissioners' court of each county drafts a resolution supporting the RMA, and the Texas Transportation Commission may approve the petition. An RMA would then develop, finance, construct, operate and maintain each facility.

The RMA is designed to allow projects to proceed to implementation faster than through the traditional TxDOT process. Additional legislation must be passed to give RMAs bonding authority and powers of eminent domain, but it is assumed this will be done in the next legislative session beginning in January 2003. An RMA would then have the ability to issue bonds to finance projects. Typically, these projects will be turnpike projects and thus, have a dedicated revenue stream. Most of the funding mechanisms described earlier will also be available to an RMA. Financing of certain projects through an RMA will free resources for TxDOT to devote funds to other needed transportation projects that may not be financially feasible as a toll project or, as in the case of most managed lanes projects, the available resources may be leveraged to enable a project to move forward by enhancing the financial viability of the project.

PUBLIC-PRIVATE PARTNERSHIPS

Increasingly, governments are looking to the private sector for participation in these large, complex managed lanes projects. Indeed, many of the Federal programs identified in the previous [chapter](#) strive for inclusion of the private sector not only as investors but also as active participants in project development, construction, and operation.

The amount of private sector involvement spans a broad spectrum from participation in the up-front development process to nearly complete ownership, as was the case of the California Private Transportation Company (CPTC) in implementing State Route 91 (SR 91) in California. This project is often described as one of the first managed lanes projects ever implemented. There was a strong need for the project but the California Department of Transportation (CALTRANS) and the local governments lacked available funds to complete the project. The CPTC stepped in and responded to a proposal to implement the project as a congestion pricing pilot project. The franchise agreement between CPTC and CALTRANS stipulated the terms of the partnership that included:

- CPTC would be solely responsible for construction and operating costs.
- CPTC would set the toll rates for the term of the franchise agreement.
- CPTC's return on investment was restricted to a base cap of 17 percent; however, increased person throughput would add an incentive to raise the cap to 23 percent.
- A non-compete clause and other legal protections for CTPC.

The facility is now in the process of being sold back to a public entity. CPTC and the Orange County Transportation Authority (OCTA) have signed a Memorandum of Understanding to complete the transaction. Although before the sale of the franchise agreement can transpire the OCTA needs legislative authority to collect tolls on the road. There has been controversy surrounding the project including allegations of CALTRANS not meeting its mission of providing a safe transportation system for the traveling public (see [appendix](#)). However, this first foray into a public-private partnership for a managed lanes project may be deemed a success. The project succeeded in achieving its initial goal of maintaining free-flow conditions at 50 MPH in the express lanes.

Obviously, private investment backed by public debt assurance can make a project more financially feasible. In some cases, this may be the only way to make a project feasible. However, there are risks for all parties associated with any type of partnership.

From the public perspective, risks to consider include:

- Private sector financial viability – private investors must understand that for a project to be successful it must meet the goals of that community. This may conflict with the investors' expected rate of return on their investments. Expectations from and of each participant must be clearly defined from the onset of any project.
- Price gouging – the public entity undertaking the partnership must take steps to prevent even the perception of price gouging by the private company. In areas with limited choices and overwhelming need, there may be an inclination to raise prices to unrealistic levels in an attempt to recover high start-up costs as quickly as possible.
- Higher borrowing costs – the private sector often can implement a project at a lower cost than a governmental agency. However, when assessing the project costs, in most cases, it will be necessary to account for the higher cost of borrowing because private entities are generally not tax-exempt. This means that a higher taxable interest rate will be paid on bonded debt, reducing the amount of capital costs that can be financed. The concept of tax-exempt financing for public projects will be discussed in more detail later but it is important to note that a facility that is privately owned or is considered a "private activity bond" will incur taxable debt.
- Project "ownership" – each public and private entity will have its own decision-making authority. A project runs the risk of conflicting goals and objectives if this is not agreed upon at the earliest stages of project development.

The private sector investor also has risks to contend with, including:

- Public policy – the leadership of public entities, as well as elected officials, may change in the course of project construction and even after implementation. A private investor will need assurances that agreements will be honored throughout the term of the project agreement.
- Project development – a project must receive reasonable assurances that it will move forward before private partners are likely to make a commitment and risk a substantial amount of their money. This means having necessary political support, environmental clearances, and in some instances, designated rights-of-way.
- Competition – a project must have a reasonable chance of success. Private investors will view nearby transportation enhancements as competition to the project and possibly diminished return on investment (2). This was probably the most contentious issue in developing and operating the SR 91 Express Lanes. The franchise agreement between CPTC and CALTRANS prohibited CALTRANS from making improvements to any facilities within the corridor that might have negatively impacted the revenue stream. This led to considerable animosity between the traveling public and all parties associated with the project. The public saw CPTC as profiteers with no regard for the greater public good and viewed CALTRANS as a public agency failing to protect the safety of the public. Obviously, equitable terms must be negotiated by each party for a partnership to be successful.

As mentioned previously, the Federal Highway Administration and the U.S. Department of Transportation are encouraging the use of public-private partnerships to finance some of the nation's most critically needed transportation infrastructure projects. Managed lanes projects may not fall into this category even though they may be necessary to relieve regional congestion. One way to make these types of projects easier to finance on a fully privatized basis would be to offer tax-exempt investment. Currently, the United States Tax Code does not allow for private companies to develop public infrastructure facilities with tax-exempt bonds if they are privately owned or controlled. Where the tax code does allow for tax-exempt bonding, such as airports, wharf facilities, and other infrastructure facilities, state volume caps on the amount of project costs that can be financed with tax-exempt bonds force these large transportation projects into the taxable capital market (3).

The current tax code, in essence, discourages equity investment in these infrastructure projects, although this is quite common in other countries. However, by granting tax-exempt status for these investments, overall project costs could be lowered by as much as 25 percent (3). This lower borrowing cost translates into more leverage for the revenue sources available. Congress has tried to spur private investment in highway infrastructure by addressing this issue. The 106th Congress considered the Summary of Highway Innovation and Cost Savings Act (HICSA), which would allow private companies to issue tax-exempt bonds. The Act proposed this as part of a pilot project that would allow for tax-exempt bond financing for projects. The pilot program proposed

a total of \$15 billion in tax-exemptions. Ultimately, this Act did not pass but may be revisited in the next session (4).

This tax issue can also impact any maintenance and operation agreements that might be negotiated, especially in the case of a managed lanes project. The current tax code places restrictions on the type and term of management contracts for even government-owned projects if it is subject to a long-term management contract. These rules include a prohibition on any compensation based on a share of net profits. This places any private investment in a build-transfer-operate scenario, whereby a private entity constructs a facility, transfers the facility to government ownership and contracts for private operation into a higher-cost taxable debt market.

Another advantage to private-public financing is the equity that is created with a private sector capital investment in a project. This can be most beneficial to a managed lanes project that might require a few years to ramp-up to its full financial viability. This transfers project risk from the public sector to the private enterprise. The capital investment is also likely to reduce the amount of debt needed to implement the project. While a true equity investment in a project by a private investor has many benefits, it is also very expensive compared to tax-exempt financing or even taxable bond financing. Few public entities can grant the necessary level of returns on investment that will attract the private investor to make a true equity investment.

Many private enterprises are looking for ways to invest in the infrastructure market without the tax burden. Ironically, one way to do this utilizes a 1963 Internal Revenue Service (IRS) ruling, Rev. Rule 63-20, which states that state and local governments have the right to finance public projects through non-profit corporations that issue debt on behalf of the government sponsor. These non-profit corporations are known as 63-20 corporations in reference to the IRS rule number. Financing large managed lanes projects through a 63-20 corporation would allow for government sponsors to contract with private companies for development and construction of a project using many of the cost-savings measures employed by the private sector. However, in order to maintain the tax-exempt status, private companies are prohibited from making a true equity investment in the project. This lack of long-term positive potential minimizes the private sector's incentive to reduce up-front costs. The non-profit corporation may also enter into management contracts with the private sector for maintenance and operation of a facility but the IRS limits the terms (3).

Public-private partnerships may be the most effective means of getting large, necessary projects implemented sooner. The ability to structure a project to obtain financing in the capital market will dictate the ultimate feasibility of a project. As more 63-20 corporations are formed, the capital markets become more accustomed to highway infrastructure investment, tax advantages are maximized, and private sector streamlining practices are utilized, perhaps the United States will see the kinds of private investment in infrastructure that have benefited other countries.

DESIGN/BUILD

One concept that dovetails with public-private partnerships is the notion of design/build. The concept is not statutorily allowed in Texas but the last legislature granted the Texas Turnpike Authority (TTA) permission to develop four projects using this mechanism. It is known locally as an Exclusive Development Agreement (EDA). State Highway 130 is the first major project to utilize an EDA. By employing EDAs the state hopes to shift project risk to private project developers and, at the same time, make the project more financially feasible by implementing it sooner rather than later, thereby taking advantage of associated costs in today's dollars as opposed to future dollars. The result is to attract more private investment, bring the project to implementation quickly, and reduce overall project costs.

The concept works by combining Federal, state, and local investments to encourage a private developer or developers to fill the funding gap. Usually a consortium is formed that may include design engineers, right-of-way agents, environmental specialists, financial advisors and even legal counsel. The consortium negotiates a deal with the other parties, such as the state department of transportation or the local transportation authority, that will allow it to build, operate and lease a facility. This can happen in two different ways. A consortium may build and operate a facility for a specified time and when the debt is retired ownership will revert to the public entity. Alternatively, a developer may build a facility, transfer the ownership to the governmental entity and then lease the facility from the entity.

TTA is partnering with the consortium to do the design/build and assist in right-of-way acquisition. The authority will have ownership of the facility and will also be responsible for operations. TTA utilized several financing mechanisms to assemble the financial plan for SH 130. The use of an EDA added value to the project because the capital markets regard protections such as guaranteed price, guaranteed start date, insurance, surety bonds and other contractual requirements of the consortium as minimizing risks.

Design/build arrangements lend themselves to large, complex projects, like a managed lanes project. Most often these projects include a toll operation that allows a private investor to see a return on investment and usually this can be accomplished sooner when using a design/build technique.

The South Carolina Department of Transportation tried a slightly different approach for one of its "27 in 7" projects. The department identified a need for a project and rather than doing the original design work in-house, the department identified the available funding and issued a requests for proposal that asked the developers what they could build for the amount of money that was available. The result is the \$232 million Carolina Bays Parkway (5).

Design/build also encourages innovation on the part of the consortium. This is critical to managed lanes projects. Managed lanes are a fairly new concept that will require new technologies. Private companies will now have an incentive to invest in developing new

technologies that can be used in this arena. Allowing the private sector to invest in the project will have added benefits by taking advantage of more efficient management and operations.

OTHER CONSIDERATIONS

Shadow Tolls

A shadow toll is a per-vehicle payment made to a private project developer. It is essentially a toll but in the absence of tollbooths and the fact that motorists do not directly pay a toll, the term shadow tolling was coined (4). In the case of shadow tolling, an entity, usually a government entity, awards a concession to a private developer to build, operate, and maintain a facility. The government then makes payments to the private developer. The payments may be based on vehicle type, traffic volume and service or distance traveled. This shifts some of the risk associated with revenue from traffic volume to the developer and encourages expeditious project implementation. The faster a roadway is open the sooner a developer can start collecting payments.

The payments may come from many different sources, such as a supplemental tax or the general revenue fund. They can also be subordinated debt to other revenue streams. Pledging shadow tolls may also encourage private investment in start-up projects that have uncertain traffic projections. Typically traffic is easier to predict on a “free” road as opposed to a tollroad. Where gaps may occur, a government entity can pledge a guaranteed amount to make up any losses. A cap on profits can also be negotiated to prevent any real or perceived windfall by the developer.

Shadow tolls may be especially useful in areas where transportation improvements are needed but tolling is politically or socially unacceptable. This concept is also useful for reconstruction or upgrading of projects. This technique is better at attracting private capital investment in reconstruction because historical data on traffic volumes is available. Shadow tolls can also be linked to road maintenance thereby providing an incentive for the private investor to build a high quality project (6).

Lastly, shadow tolls may be an appropriate method to maximize the efficiency of a managed lanes project. Many toll authorities face social pressures to alter their operations to achieve environmental or social objectives or to better manage demand. These pressures may include reducing tolls for high-occupancy vehicles, reduction of tolls for off-peak travel, or construction of other special use lanes. However, where this is introduced after project financing, bond covenants will prohibit any actions that would cause toll revenues to drop below specific levels. Shadow tolling may be a mechanism for supplementing any calculated revenue loss per vehicle should these measures be implemented.

Special Assessment Districts

Another concept, similar to shadow tolling is the notion of special transportation assessment districts. This mechanism of financing may be a key to managed lanes.

Special assessments can take a two-pronged approach. In this scenario the recipient of the project benefits pays for a proportional cost of the project. For instance, a special assessment district could be created and a tax levied on the property owners in the district if a project was of substantial and primary benefit to this particular district. This mechanism may be useful for a managed lanes project that includes a transit component. For instance, a Bus Rapid Transit (BRT) line and station could be part of a transportation network. The rail station may influence land use that results in a high-density development. This development would receive a substantial benefit from being part of the network, therefore businesses or residents in the district could be charged a special assessment.

Tax Increment Financing

Similar to special assessment districts is Tax Increment Financing (TIF). In this approach, a special district is created and improvements are made within the district. Usually the improvements stimulate private sector development. Before development begins or improvements are made, the tax rate is frozen. The taxes continue to be paid but the difference between the original assessed tax and the tax on assessed value after the improvements (the increment) is deposited into a special account that is used to pay off the bonds that were sold to finance the improvements. This money can also be leveraged for more improvements in the district (4).

Development Impact Fees

These fees function in much the same way as special assessment districts. In this case, new infrastructure is built or improved with money that developers pay. The term developers, in this instance, refer to business developers or land developers rather than a project developer. Developers may pay the required fees in cash or by donating rights-of-way or anything else that the developer and the project sponsor may have negotiated. This infusion of cash and/or equity can greatly increase the financial viability of a project. The amount of development impact fees that will be collected over a period of time can be projected and the proceeds can be pledged to pay off bonds that may be issued to finance the project. Both the San Joaquin Hill and Foothill/Eastern Tollroads were implemented with development impact fees (7).

Special Assessment Districts, Tax Increment Financing and Development Impact Fees are complicated methods for financing managed lanes. Consideration should be given to goals of the project. Often these mechanisms may be more appropriate for a reconstruction project or to finance maintenance and operations of a facility. The ability of a new or added capacity project to stimulate economic development is a hotly debated issue. Often developers will recognize this opportunity and will make an equity investment in the project. Concession or franchise leases operate in much the same manner. The private sector beneficiary makes an investment in the project and increases the financial viability of the project.

Other

There are many other innovative mechanisms that may provide financial support for a managed lanes project. These might include road branding, utility franchise agreements, corporate sponsorship, or privatization of rest areas. Again, a successful project will match the financial package to the project goals.

It is also important to explore every possible source of funding. Managed lanes that include an HOV or BRT component are eligible for funding from the Federal Transit Administration using Section 5309 funds.

CHAPTER 5. CONCLUSIONS

The previous chapters described funding and financing methods that project sponsors may use for many different types of projects. The mechanisms available today reflect a shift from the traditional means of grant-based funding and address the realities of certain funding shortfalls. Federal and state governments, as well as state departments of transportation, are working collaboratively with other local entities and the private sector to maximize the effectiveness of every transportation improvement. Managed lanes are an innovative approach that seeks to balance the fiscal constraints of building new infrastructure, the demand for socially responsible development and the gridlock that stifles drivers on the most congested roadways.

The key to developing a successful project is to identify the project goals and match the financing to the purpose. Managed lanes, which typically involve a toll component, are being used more as a public policy tool as opposed to considering tolls as solely a financing mechanism. Managed lanes utilize various operating scenarios to maximize the operational efficiency of a facility. This makes a managed lanes facility inherently more risky to investors. Typically, investors will want to have some assurances that the debt service will be paid and that rate covenants will be maintained. Therefore, the question becomes, “what is being managed?” Again, this relates to the goal of the project. Is the facility being managed to increase high-occupancy vehicle usage? Is the facility being managed to increase transit use? Is the facility being managed to decrease single-occupant vehicle use? Is the facility being managed to provide an incentive to alternate fuel vehicles? Or is the facility being managed to maximize revenue generation?

Each of these questions must be answered when considering the financing for a managed lanes facility. Additionally, the relative importance of each answer must be weighed because the project goals may seek to do all of these things and more. The answers and the weight of each will determine the best route of financing. Each facet must work together to assemble a financing package that will result in a financially feasible project. The goals of the project will determine the type of cost-benefit analysis used in assessing the potential performance of a project.

Each of the financing mechanisms described in the report attempt to enhance the financial feasibility of a particular project. They can be combined and structured to receive the most possible benefits in the most cost-effective manner.

The U.S. Department of Transportation has achieved tremendous advances in making large, complex projects, such as managed lanes projects, more feasible. It has developed numerous programs to capitalize on all available resources. It has made leveraging Federal monies more accessible. Now, however, policy makers should make a concerted effort to change or update other laws and regulations that inhibit project development. Specific items to be addressed are:

- allowing for tax-exempt financing for “public good” projects,
- limiting personal liability of board members of “63-20 corporations,”

- modifying the limitations in the management contracts of tax-exempt financing,
- allowing for private equity investments in a project being developed with tax-exempt financing,
- clarifying conflicting rules among agencies on what monies can be used for which types of projects, such as Federal Transit Administration restrictions on tolling SOVs on HOV lanes, and
- passage of tax law that allows for lenders to receive tax credits rather than forcing them to rely on tax-exempt debt.

There are many more innovations that can and should be explored but are beyond the scope of this task. The [appendix](#) of this report highlights the few managed lanes projects that have been implemented around the country. It illustrates the financing methods used and the effectiveness of the methods. As more projects are developed as managed lanes, it will be necessary to take advantage of all available financing tools. The [appendix](#) will provide an example of how the various methods have been applied.

APPENDIX

CALIFORNIA

The California legislature has seen the need to close the funding gap between available resources and project need. In 1989, the California Assembly passed Assembly Bill (AB) 680, which authorized the state to develop and implement four projects based on public-private partnerships. These project agreements were signed with four different private partnerships between December 1990 and January 1991. It is important to note that shifting the risk to a private developer puts a tremendous burden on the private company. The state and private companies must continue to refine project agreements to share in the risks and rewards of transportation infrastructure development. Two of the four private developments, SR 91 and SR 125, have proceeded but not without overcoming many hurdles. One project, SR 57, in Orange County is in litigation with the state after requesting an extension for the proposed start date of the project. The franchise agreement for the proposed Mid-State Tollway through Alameda and Contra Costa counties was terminated due to tremendous political opposition (8).

Each of these scenarios emphasizes the risk placed on the private developer. If a public-private partnership is to work there must be a sharing in the risks. Developers have to face changing political will in the years required to bring a project to implementation. They are often at the mercy of other Federal and state agencies for environmental clearances to move forward. These other agencies may not have similar project goals. This may exacerbate an already frustrating situation.

SR 91

State Route 91 is the oldest operating managed lane facility in the country. The facility opened in 1995. The project provides two additional travel lanes in each direction. The lanes are separated from the mainlanes by plastic pylons and a painted buffer. The facility is 10 miles in length. A private company, California Private Transportation Company constructed, financed, and operates the project. The company leased right-of-way from CALTRANS in the median of the Riverside Freeway (SR 91). The project was praised for its innovation and it did ease congestion in the corridor. However, over time as the congestion increased on the adjacent free lanes, the project faced severe criticism from the public and some local officials. Critics cited the company's non-compete clause, which prevented CALTRANS from making any improvements in the corridor, as interfering with public safety. The company was accused of price gouging. Many legal battles ensued and, in April 2002, the Orange Country Transportation Agency signed a Memorandum of Understanding with CPTC to sell the facility to the OCTA. The OCTA agreed to pay CPTC \$207.5 million for the road and the franchise agreement (9). This move is expected to eliminate any interest that CPTC has in the project. The accounting firm of Ernst & Young has determined that this is a fair representation of the value of the road (10).

The OCTA will finance this expenditure with a combination of cash, bonds, and toll revenues from the project. But first the authority must obtain legislative approval to toll.

The OCTA also expects the Riverside County voters to approve reauthorization of Measure A in November. Measure A is similar to Orange County's Measure M which is a one-half cent sales tax dedicated to transportation improvements. Once the road is under public control again, Riverside County hopes to work with Orange County to make \$498 million in improvements on the freeway.

Traffic and revenue forecasts expect the road to collect \$20.8 million in tolls this year and nearly double that by 2010. The cost to pay for the road over the next 30 years is expected to be \$13 million per year. In 2003, after operating and maintenance costs, the road is expected to have net revenues of \$14 million. Clearly, revenue is exceeding operations and maintenance costs and will continue to do so even more in the next 30 years (11).

The report by Ernst & Young initially shows that the project has lost money for the past three years. This accounting includes depreciation costs and the cost of refinancing \$135 million of debt last year. However, the project is expected to generate total net revenues of \$736 million by 2030. The project may generate even more revenue since OCTA can take advantage of tax-exempt debt that can be refinanced at today's lower interest rates.

Additionally, Orange County plans to make several changes to the operation of this managed lane facility. The OCTA plans to lower tolls to allow for more throughput in the corridor rather than revenue maximization. Plans are to allow 3+ carpoolers to travel on the express lanes for free.

Many things have changed since CPTC first conceptualized SR 91. New legislation has made public-private partnerships much easier and many new programs make these partnerships beneficial to all the parties involved and more acceptable to the public. The Federal government has done more to leverage the limited funding that is available to states by offering lines of credit, credit assistance, the TIFIA program and others. It is likely that the strictly private developments of SR 91 and others like it, such as the Dulles Greenway, are a thing of the past.

Today innovations in funding and financing have made it easier to increase a project's financial viability through cooperative means. Private developers are encouraged to work with state departments of transportation and other agencies for project implementation. There are safeguards in place to prevent windfalls by the private developers. A project may be seen by the public as a cooperative venture to improve mobility and ease congestion.

I-15, San Diego

The I-15 FasTrak project began as a three-year pilot of the FHWA Congestion Pricing Program. The I-15 facility consists of two reversible, barrier-separated lanes in an eight-mile stretch. The program allows for SOV buy-in to the lanes that are designated for HOV use. The toll charged changes dynamically based on traffic conditions in the express lanes and typically ranges from \$.50 to \$4.00 but can go as high as \$8.00.

The initial cost of construction of the two lanes in the median of I-15 was \$31.5 million. The lanes were originally built to serve only HOVs and this construction was funded through the traditional funding process. Since the FasTrak program was instituted the lanes generate approximately \$1.2 million in revenue annually. The San Diego Association of Governments (SANDAG) operates the lanes and spends \$430,000 a year on operations. SANDAG spends an additional \$60,000 a year on enforcement. The remainder of the net revenue funds transit and HOV improvements in the region (12).

Work is currently underway to expand this managed lanes facility. The project needs approximately \$535 million to fund the freeway improvements and transit expansion. The project is to occur in three phases. Ultimately the facility will extend the project north to Escondido for a total of 20 miles of managed lanes. Most of the project is planned as a four-lane facility. This means the current two-lane reversible facility will be expanded to four lanes. The lower 17 miles of the project will be constructed with a moveable barrier to optimize traffic operations. The project also proposes more access to the facility including several direct access points to provide for a Bus Rapid Transit (BRT) system. The BRT component is intended to deliver rail service quality with the traditional flexibility of a bus system.

Wilbur Smith Associates is under contract to assess the financial viability of this project. It is important to keep in mind the goals of the project when considering the feasibility. The goals of this project are to significantly increase capacity in the I-15 corridor with a special emphasis on high-occupancy vehicles (13).

The consultant has identified five scenarios for further evaluation. They include:

- Flat Rate Toll – all vehicles entering the managed lanes would be assessed the same toll regardless of entry. The rate could be different for HOVs and SOVs.
- Flat Rate Toll with a Maximum – this scenario is similar to the one above except that a maximum toll rate would be given,
- Standard per Mile Rate – each vehicle is charged a standard per-mile rate based on the distance traveled. There are minimum and maximum charges based on a five mile and 15 mile trip, respectively.
- Skewed per Mile Rate – this scenario is the same as the one above except that the per mile rate may vary depending on point of entry,
- Standard Rate per Segment – this scenario would charge a toll for each segment between access and egress points.

Two additional sensitivity tests were also done to determine the impacts of different project configurations or changing the local definition of HOV. The first evaluated the implications of a standard per mile charge without a moveable barrier. The second tested the effects on traffic and revenue if the regional definition of HOV were to change to 3+ as opposed to the current 2+ occupants required.

Each of the above tests and scenarios were performed with two specific criteria: 1) rates that managed demand to ensure targeted levels of service were maintained; and, 2) rates that maximized revenue potential. A demand management criterion was always given the top priority since that is a goal of the project. [Table 1](#) below provides a comparative summary of the test results ([13](#)).

Table 1. Comparative Summary of 2005 Traffic Levels ([13](#)).

	Flat Rate Toll	Flat Rate with Maximum	Standard Per Mile Rate	Skewed Per Mile Rate	Standard Rate per Segment	Standard per mile w/o moveable barrier	HOV = 3+
Toll trips (000s)	20.6	22.2	21.3	19.8	31.0	11.2	52.4
Toll VMT (000s)	270.9	250.3	192.6	205.0	211.0	90.3	499.6
Avg. toll trip length	13.2	11.3	9.0	10.4	6.8	8.1	9.5
Annual revenue (000s)	\$7,654	\$7,848	\$7,784	\$7,183	\$7,688	\$4,274	\$16,259
Revenue per toll vehicle	\$1.23	\$1.17	\$1.21	\$1.20	\$0.82	\$1.26	\$1.03
Avg. peak period toll	\$1.80	\$1.59	\$1.82	\$1.62	\$1.35	\$2.18	\$1.76

The [table](#) above shows that in most cases the revenue potential for each scenario is very similar with the exception of changing the HOV requirement to 3+.

SANDAG, CALTRANS, FHWA, the Federal Transit Administration (FTA) and other local partners are working together to secure financing for the project. Thus far SANDAG and CALTRANS have secured \$150 million for construction and SANDAG will receive \$960,000 from FHWA as part of the Value Pricing Program.

The Tollroads, Southern California

On June 13, 2002, the public agency that manages the Foothills and Eastern Toll Roads in Orange County voted to move forward with a plan to consolidate this organization with its sister agency that manages the San Joaquin Hills Toll Road ([14](#)). For several years, the Transportation Corridor Agencies (TCA) in Orange County have had a mission of building publicly owned tollroads in the region. To date 51 miles of a proposed 67-mile system is complete. By combining, the two agencies will be able to restructure the debt, reduce operating costs, and hopefully provide enough revenue to complete the tollroad system.

The financial health of the San Joaquin Hills Toll Road (SR 73) has been in question for some time. The bonds used to finance the road were recently downgraded to below an investment grade rating by one rating agency. This particular tollroad stretches 15 miles from I-5 near San Juan Capistrano to I-405 in Newport Beach. The corridor was designed to offer an alternative to drivers from the heavily congested portions of I-5 and I-405 and is supposed to operate at a level of service (LOS) C but often deteriorates to LOS E during the peak periods. Dynamic pricing is used to manage demand in the

corridor. A premium toll is implemented during the peak period and off-peak discounts are offered to electronic toll collection customers in an effort to spread demand.

The congestion on the tollroad and the lowered level of service decreases the likelihood that motorists will pay to travel on the roadway. This has had a serious impact on the revenue generated for the project. SR 73 revenues have not reached over 90 percent of its projected values since 1997 when it first opened (15). TCA finance staff, bond underwriters, legal counsel, and independent financial consultants have evaluated the financial viability of the project. They deemed that consolidating with the other agency is the best opportunity to avoid a covenant violation of the current bonds for the project. It will also prevent a third party from assuming control of the tollroad and setting tolls at the maximum level thus exacerbating the problem.

The Foothill/Eastern Transportation Corridor Agency sees the financial viability of the San Joaquin Hills Transportation Corridor Agency directly impacting the viability of its own agency. Therefore, the two agencies hope that plans can move forward for combining the agencies to the mutual benefit of the agencies and motorists.

All three tollroads and the possible extension of the Foothill-South were constructed through innovative financing. The agencies instituted a development impact fee that is used to finance the initial construction of the toll facilities. As the facilities are constructed they are deeded to CALTRANS and CALTRANS provides maintenance on the facilities. Each agency is responsible for operations and toll collection. The FY 2002 projected revenue of the combined agencies is \$132.2 million and \$112.6 million will go to debt service (14).

SR 125

The San Miguel Mountain Parkway (SR 125) in San Diego is one of the four demonstration projects authorized by the California Assembly through (AB) 680. AB 680 allows for the private development of tollroads. California Transportation Ventures (CTV) is currently developing the project. The parkway will be 11.2 miles of controlled-access, high-capacity tollroad. The southern 9.5 miles of the parkway will be privately financed through a limited partnership with the state of California. The partnership will finance and build the roadway and transfer ownership to the state. The partnership will then lease the facility for operations and maintenance for 35 years. Control of the parkway then reverts back to the state at no cost (4).

The northern 1.5 mile section is being financed through a combination of Federal and state funds and will operate as a freeway.

The partnership has the sole discretion during the franchise period to modify toll rates. It is also authorized to realize a profit of no more than 18.5 percent of the total investment. The project is being designed with an HOV component so it will in essence be operated as a managed lane facility.

These are just a few examples that reiterate the need to develop a cohesive project team from the very earliest stages of a project. With continued refinement of legislation and building relationships and partnerships with other agencies, public-private partnerships can be one of the most viable means of project implementation.

TEXAS

I-10, Katy Freeway

The Houston Metropolitan Transit Authority (METRO) and TxDOT began managing the HOV lane on I-10, also known as the Katy Freeway, as part of the FHWA Congestion Pricing program. The program, tagged QuickRide, allows high occupancy vehicle with only two occupants (HOV2s) to buy access to the HOV lane during the 3+ restriction. The facility is a one-lane, 13 mile, barrier-separated facility. The 3+ restriction is only in effect in the morning and afternoon peak periods. The QuickRide program has been successful on the Katy Freeway and has achieved the project goals of better utilization of the HOV lane, increasing throughput in the corridor, and increasing speeds on the mainlanes all without degrading the service of either the mainlanes or the HOV lane.

Currently, plans are underway to reconstruct the Katy Freeway. As part of the reconstruction, a managed lane facility is envisioned. The project is designed not only to improve operations in the corridor but also to foster region-wide economic development (16). Parsons Brinckerhoff, the project consultant, analyzed the financial viability of each proposed alternative. Ultimately, a locally preferred alternative of High Transit HOV-Special Use Lanes/Moderate SOV was chosen for the project. The facility has been issued a Record of Decision by FHWA and is moving forward.

The final design will most likely include four managed lanes separated from the mainlanes by plastic pylons. The facility will stretch approximately 20 miles from just inside Loop 610 west to the city of Katy. Current plans include four mainlanes in each direction, three frontage roads in each direction and four managed lanes in the median.

Since the Katy Freeway reconstruction has been planned for some time, most of the traditional routes of funding are being used. Many different funding categories are being utilized for this project. One of the new Federal funding programs, the Interstate Reconstruction and Rehabilitation Pilot Program, was pursued but was ultimately rejected as a funding source. However, Harris County is applying for a grant from FHWA under the Value Pricing program. Additionally, the Harris County Toll Road Authority (HCTRA) recently contacted the project partners to suggest collaboration on the project.

The HCTRA participation will include a \$250 million loan and another \$250 million grant. There are some legal issues that need to be addressed concerning this partnership. According to this plan, the four managed lanes will be tolled. Any discount that may be offered to HOVs is yet to be determined.

MANAGED LANES AND TOLLROADS IN TEXAS

The previous pages highlighted operating projects across the country. This section will focus on proposed projects that are being developed. Tollroads are common in two areas of Texas, the Dallas/Ft. Worth area and the Houston area. These areas also operate an extensive HOV network. The goals of TxDOT and the local agencies are to build a multi-modal transportation network. The proposed managed lanes on I-10 have already been discussed as an extension of the QuickRide program. In Dallas, I-635, the LBJ Freeway, is being studied as a possible managed lane facility. TxDOT, working with the North Texas Tollway Authority (NTTA), has some experience in using innovative financing to get major projects completed.

President George Bush Turnpike

The President George Bush Turnpike was the first project in the country to take advantage of a Section 129 loan. This facility is a 30-mile beltway around Dallas to the north. At an estimated cost of \$700 million, a project of this magnitude would have easily consumed all of the obligation authority for TxDOT for a number of years, thus delaying other needed projects. Additionally, TxDOT did not have legislative authority to issue bonds for project financing. Therefore, NTTA was given the responsibility for project implementation. However, traffic and revenue studies indicated that toll revenues alone would not be enough to generate an acceptable credit rating in the bond markets.

Working with new state and federal legislation, TxDOT was able to make a \$135 million loan to NTTA using surface transportation program (STP) funds. This loan increased the creditworthiness of the debt on the project so that the \$446 million in revenue bonds that NTTA issued for the project received a favorable rate on the market. Additionally, the loan lowered the amount of indebtedness that NTTA would have incurred because it reduced the amount of funds that were required as reserves.

The Section 129 loan is subordinate to the revenue bonds further enhancing the credit rating. The repayment terms of the loan are spread over 25 years and do not begin until 2004. This provides a degree of protection during the start-up of the project.

The department worked collaboratively with NTTA, three counties, and seven cities to make the project happen. Many innovative financing techniques were used to advance the project more quickly. This project and others in the Dallas Metroplex are helping to solve the region's mobility problems.

Like the President George Bush Turnpike, the LBJ Freeway is also a beltway around Dallas. This facility lies to the south of the George Bush Turnpike and is in need of expansion to meet the peak period demands in the corridor. This circumferential facility will provide connectivity to other major facilities in the Metroplex.

In conducting the initial Major Investment Study (MIS) for this corridor expansion, four areas of concern were identified that must be addressed. They are:

1. Compromises to mobility and safety at current and predicted congestion levels.
2. The inability to respond to changing traffic conditions, travel patterns and travel choices in a flexible manner.
3. Impacts of the freeway and arterial street network on the community.
4. Limited funding for transportation improvements (17).

Project planning has progressed and a preferred alternative has been identified that provides for a flexible operating strategy utilizing HOT lanes and an ultimate managed lane facility. This may include elements of real-time variable tolling, buy-in by multiple vehicle types and modes, and consideration for Bus Rapid Transit in the corridor (18).

The goals of the LBJ managed lanes project go beyond providing congestion relief. The project planners hope to make the LBJ project a catalyst for managed lane development in the Metroplex. The facility will be a multi-modal solution to regional mobility as well as a driver for economic development. The planners hope to:

- improve mobility;
- increase the region's economic competitiveness;
- increase the quality of life;
- increase system safety; and
- enhance environmental performance from the regional transportation system (18).

This facility will take advantage of all available options to make it financial feasible, including the use of the latest advances in electronic toll collection and “smart card” technology to manage the facility to achieve project goals.

Central Texas Turnpike Project

The Central Texas Turnpike Project (CTTP) consists of four components. They are SH 130, SH 45, Loop 1, and US 183A. The first of these components, SH 130, is moving forward and the Texas Turnpike Authority hopes to complete a revenue bond sale this summer.

Tollroads are a new phenomenon in Central Texas, as are HOV lanes, and so the concept of managing operational strategies to optimize the system may seem foreign. However, the tollroads are envisioned with the latest technology available making management of the lanes possible when conditions warrant.

The first phase of the project includes SH 130, SH 45, and Loop 1. These projects will take advantage of financing available with a TIFIA loan of approximately \$920 million.

The project will depend on revenue bond sales for additional financing. The project has also received a \$700 million grant from TxDOT as well as the contribution of rights-of-way by local agencies. In addition, SH 130 and US 183A will utilize new contracting ability that the legislature has just authorized. These projects are being implemented with Exclusive Development Agreements (EDA), essentially a design/build strategy. This helps the department know project costs before going to the bond market.

As noted earlier, TxDOT is using a combination of financing mechanisms to implement this project. The department has also taken steps to enhance the sale of revenue bonds in the capital market. TxDOT is responsible for all maintenance costs associated with the project. In addition, TxDOT will cover the operational expenses of the project in any years that project revenues fall short. This means that project revenues will first go towards paying off project debt and then surpluses will be used for operating expenses.

TTA has also taken a step towards identifying project risks and determining actions to mitigate these risks. This effort has encompassed the entire project including the project lenders. TTA has or will ensure that investment grade traffic and revenue studies are accepted by rating agencies, a peer review process is used in performing the traffic and revenue studies, reserves are adequately funded, including capitalized interest and revenue stabilization, rate covenants for toll rates, and an overall conservative financial plan (19).

Each of the project case studies included in this [appendix](#) presents a different approach to financing and funding. As the theory of managed lanes becomes more acceptable in transportation planning, the unique characteristics of each facility will play an important role in the approach to financing a facility.

REFERENCES

1. *Innovative Finance Primer*. Report FHWA-AD-02-004. FHWA, U.S. Department of Transportation, 2002.
2. *Value Express Lanes Regional Assessment (Phase One) Report*. Technical Report No. 2. Region 6 Planning and Environmental Section, Colorado Department of Transportation, October 2000.
3. K. Hedlund. *The Case for Tax-Exempt Financing of Public-Private Partnerships*. Reason Public Policy Institute, Los Angeles, California, 1998.
4. *Innovative Finance for Surface Transportation*. URL: www.innovativefinance.org/ [2 July, 2002]
5. R. Probst. State Department of Transportation Initiatives. In *Second National Conference on Transportation Finance*, Conference Proceedings 24, TRB, National Research Council, Washington, D.C., 2001, pp. 17-19.
6. R. Tillman. Life-Cycle Pricing of Capital Investments: Shadow Tolls. In *Second National Conference on Transportation Finance*, Conference Proceedings 24, TRB, National Research Council, Washington, D.C., 2001, pp. 92-93.
7. *The Selective Use of Shadow Tolls in the United States*. URS Greiner
8. *Caltrans Innovative Finance: Private Investment, Public Infrastructure*. URL: <http://www.dot.ca.gov/hq/paffairs/about/toll/status.htm> [9 July, 2002]
9. *Orange County Transportation Authority Reaches Agreement With CPTC to Purchase 91 Express Lanes Toll Road and Franchise Agreement*. URL: <http://www.octa.net/news/late/042302.asp> [8 July, 2002]
10. J. Lansner. 91 Lanes Profitable on Paper. In *The Orange County Register*, June 25, 2002.
11. P. Larsen. Report Fuels Purchase of 91 Tollway. In *The Orange County Register*, June 25, 2002.
12. T. Collier. I-15 FasTrak – San Diego, CA. In *Fast Lane Newsletter*, December 2001.
13. *LBJ Managed Lanes: Traffic and Revenue Study*. Wilbur Smith Associates, Dallas, Texas, October 2001.
14. *Toll Roads Newsletter*. URL: <http://www.tollroads.com/> [9 July, 2002]
15. *The Toll Roads*. URL: http://www.thetollroads.com/home/news_press_june04.htm [26 June, 2002]
16. *Katy Freeway*. URL: <http://www.katyfreeway.org/> [19 June, 2002]
17. *Major Investment Study for the I.H. 635 (LBJ Freeway) Corridor*. URL: <http://www.dot.state.tx.us/insdotdot/geodist/dal/mis/LBJ/lbjmis.htm> [24 May, 2002]
18. *Central Texas Turnpike Project Financial Plan as Required by Section 1305 of TEA-21*. Texas Turnpike Authority Division, Texas Department of Transportation, May 21, 2002.

