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16. Abstract This research examined financing tools that are applicable to rural and small urban area projects undertaken by the Texas Department of Transportation. It documents district experience with some of these tools and lessons learned. Pass-Through Tolling Agreements (PTA) have been popular recently, so case studies of their use in Texas were examined in detail. It was found that districts lack planning tools to conduct proper cost and benefit analyses for partnership projects.				
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Chapter 1. Introduction

1.1 Background

Rural and small urban areas (“RSUA”) face unique challenges in meeting transportation system capacity and maintenance demands. With a relatively thin population spread over large areas, an extensive road network is required. However, maintenance costs are high and worsening, due to growing intercity and interstate truck traffic in addition to farming, ranching, quarrying, and petroleum production trucking. To focus attention on RSUA needs, the Center for Transportation (CTR) and the Texas Department of Transportation (TxDOT) hosted the 9th International Conference on Low Volume Roads in June 2007.

In the last twenty years, funding for transportation has dwindled due to erosion of the gas tax. Moreover, RSUA usually receives less in funding allocations than they pay in gas taxes (just as largely rural states like Texas are federal gas tax donors). Therefore, RSUA are struggling to maintain their existing road networks, let alone being able to add capacity where needed. This research addresses the unique financing and planning needs of rural and small urban areas of Texas.

1.1.1 Choices

Faced with reduced funding, RSUA have been forced to postpone expansion needs. The same situation was being encountered in urban areas of Texas until a few years ago, when several districts started using toll financing to advance added capacity projects. However, CTR has found that toll revenue feasibility is highly dependent on time savings, travel time reliability, and better connectivity (Persad et al., 2004). To assist districts in screening projects for toll suitability, CTR developed a toll candidate selection tool in TxDOT research project 0-4637. In a step-by-step process, the user can analyze candidate projects and rate them according to traffic, land-use, economic, and social benefits before undertaking revenue studies.

Tolling is more feasible in congested urban areas, whereas RSUA projects may never generate sufficient traffic to attract investors. Besides being applicable to only certain projects, tolling also has a number of bondholder and legislated restrictions. For example, toll revenue estimates must exceed costs by 25-33% to provide a confidence cushion for investors, making revenue and costs estimates critical. Toll revenue from one district cannot be shared with other districts. Public resistance to tolling is more pronounced in non-urban areas. TxDOT is prohibited from converting a non-tolled facility to tolling unless:

- It was open to traffic as a high-occupancy vehicle lane by May 1, 2005;
- It was open to traffic as a turnpike project before September 1, 2005;
- It was designated a toll project in a Metropolitan Planning Organization (MPO) plan prior to September 1, 2005;
- It was designated a toll project before the contract to construct was awarded;
- It expands capacity without eliminating existing non-tolled lanes;
- Or the department conducts a public hearing and obtains county and voter approval of the conversion.

These restrictions make toll projects difficult to develop in non-urban areas. On the other hand, RSUA projects are likely to produce land use and economic benefits that can be leveraged for partnerships and alternative financing methods. This research is intended to aid RSUA in determining the financing tools appropriate to each type of project, and to provide guidance on developing partnerships and packaging cost- and risk-sharing agreements.

1.1.2 Alternative financing tools

Because of the inadequacy of the gas tax system to continue financing transportation needs, a number of alternative financing options have been authorized during the past two (78th and 79th) legislative sessions. House Bill 3588 from the 78th Legislature provided TxDOT and local jurisdictions with innovative tools to plan, finance, develop and operate infrastructure, including local bonding and the Texas Mobility Fund. The 79th Legislature saw House Bill 2702 make refinements to the provisions of HB 3588, authorizing Pass-Through Tolling Agreements (PTA) and Private Activity Bonds (PAB).

The Federal Highway Bill (SAFETEA:LU) reauthorization of 2005 also provided Texas with new opportunities, including tax-exemption of Private Activity Bonds (PAB), GARVEE bonds, and Transportation Development Credits (TDC). TDCs are a financing tool that allows states to use their federal obligation authority without the requirement of non-federal matching dollars.

It is important to match projects with the right financing tools. In recent research projects CTR has developed methodologies for defining project benefits before considering financing methods, defining the market served by a facility, and identifying innovative financing tools. A variety of new forms of funding are being planned but seldom has the long-term funding required for such projects been evaluated relative to the future socioeconomic characteristics of the population.

In this report, guidance is provided on specific financing tools. It includes the factors that need to be considered in implementing each financing tool, such as restrictions, potential pitfalls, risks, feasibility, leveraging of transportation funds, modifications required, etc. In addition, partnerships and agreements are also important.

1.1.3 Partnerships

All of the innovative financing tools now available to RSUA require partnerships involving TxDOT, local entities, and/or private entities. Recent legislation permits new partnering arrangements for developing transportation facilities. Under the Interlocal Cooperation Act a local government may agree to enter into and make payments under an agreement with another local government for the design, development, financing, construction, maintenance, and operation of a toll or non-toll facility on the state highway system. Special-purpose transportation districts/corporations can be formed, with the power to borrow and raise revenues. Other partnership arrangements include Regional Mobility Authorities (RMA), and Mobility Alliances.

RMAs are entities created by one or more counties with the authority to construct, maintain and operate transportation projects within their region. A “region” is defined as a metropolitan statistical area (MSA) and any county contiguous to that MSA, or two

adjacent TxDOT districts. This definition is used with respect to “toll systems” and the use of concession fees. RMAs are allowed to accept unsolicited bids and can enter into Comprehensive Development Agreements (CDA) with private entities for the construction, maintenance and operation of transportation projects. HB 3588 also amended chapter 202 of the Transportation Code allowing RMAs to purchase an option to acquire property for possible use in or in connection with a transportation facility before a final decision was made on whether the facility would be located on this property.

As of March 2007, seven RMAs had been created in Texas, as shown in Figure 1.1.

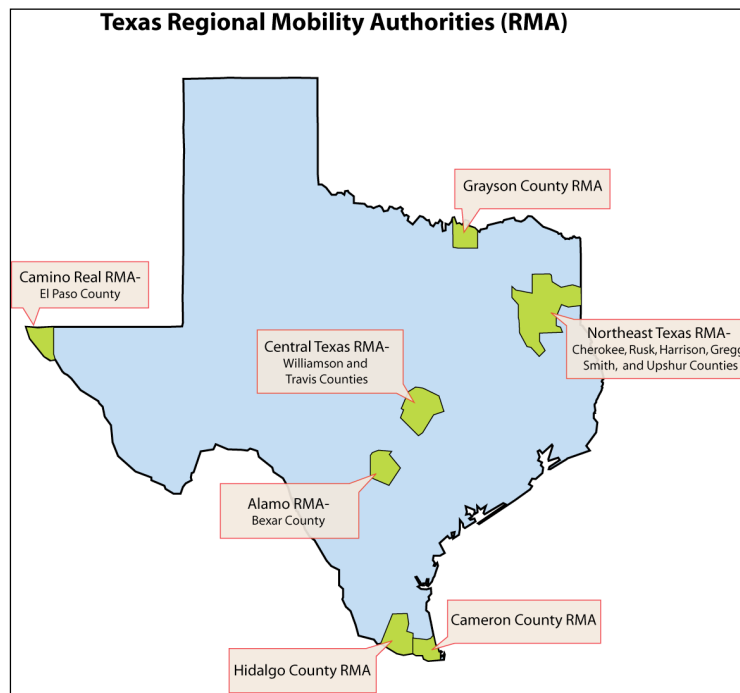


Figure 1.1: Texas Regional Mobility Authorities (RMA) as of March 2007

The Northeast Texas RMA could be considered a success story for a small-urban RMA. The RMA was initially formed by Gregg and Smith Counties in October 2004 and was the fifth RMA created in Texas. In June 2006 Cherokee, Rusk, Harrison, and Upshur counties joined the RMA and it became the first RMA to expand (NET RMA overview Online: <http://www.netrma.org/history.asp>).

The Cameron County RMA has been innovative in selecting its initial projects and the tools to develop and finance these projects. The signature projects are the second causeway for Port Isabel/Padre Island and the West Loop Project in Brownsville, both of which are being proposed as toll projects. The RMA is in negotiations for nine PTA projects with TxDOT and is developing plans with the city of Harlingen on the North Rail Relocation Project.

RMAs may not be suitable for some situations. The South Central Texas Mobility Alliance (Alliance) was created in May 2005 when its members opted against RMA formation due to financial reasons, according to Judge Richard Evans of Bandera County

(Transportation Commission Meeting Minutes, November 17, 2005). The purpose of the alliance is to collaborate with TxDOT San Antonio District Staff to develop a comprehensive mobility plan building on the statewide plan, and to identify, evaluate and prioritize projects for inclusion in the Texas Unified Transportation Plan (UTP). The Alliance is comprised of Atascosa, Bandera, Comal, Frio, Guadalupe, Kendall, Kerr, Medina, McMullen, Uvalde and Wilson counties: rural counties that surround Bexar county and San Antonio.

The Alliance has identified corridors of significance for statewide and regional mobility taking into account existing and expected traffic flow, and then selected projects that would enhance mobility and safety through added capacity, improved connectivity or new relief routes. The project types for many of the corridors were Super-Two roadways, upgrading of four lane sections in urban areas with medians or continuous left turn lanes, and providing relief routes. The Alliance proposed using PTA for the majority of roads in Comal County and for a blended match of Category 1 and 11 to the priority projects to leverage additional dollars. The local participation would be through donation of right of way, right of way costs and additional partnerships in the future.

1.1.4 Agreements

Partnerships for developing transportation facilities require formal agreements. Recent legislation has granted state and local authorities great flexibility in entering into public-public and public-private agreements, including:

- Political subdivisions have flexibility in determining how their property may be used for highway purposes. They may consent to the use; convey title; convey rights or easements; and lease, lend, or grant the property to TxDOT.
- County Toll Authorities, RTAs, and RMAs are allowed to transfer assets among themselves.
- HB 3588 allowed the Department and RMAs to purchase options to acquire property for possible use or in connection with a transportation facility, before a final decision is made on the location of the facility.
- If a county, RMA or RTA enters into an agreement with a private entity that includes the collection of tolls by that entity, the county must approve a methodology for the setting of tolls, increases to tolls, plans to collect tolls including penalties, and any change to the approved methodology. The length of a concession term may not be longer than 50 years.

Equitable cost- and risk-sharing are essential components of such agreements. CTR identified the elements of cost and risk sharing agreements in TxDOT research project 0-5020 and developed 44 best practices, 17 relevant to the public sector, and 27 that apply to the private sector. One result of that research was a series of recommendations on structuring public-private partnerships.

HB 3588 included new code allowing for the use of Comprehensive Development Agreements (CDA). CDA is an agreement with private entities for the design, construction, financing, acquisition, maintenance and operation of turnpike projects. The department was allowed to accept unsolicited CDA proposals and to put out a request for competing proposals if the unsolicited proposal was considered viable. Similarly, RMAs are able to use CDAs to construct, maintain, repair, operate, extend or expand transportation projects. HB2702 made revisions regarding the use of CDAs and

authorized the use of CDAs for projects on both tolled and non-tolled elements including rail projects, for projects in which the private entity has an interest and projects financed wholly or partly with PAB. CTR conducted a comprehensive analysis of the Central Texas EDA for SH 130 and compiled a database of lessons learned regarding teaming structures and communications. The issues of competing routes and non-compete clauses were addressed by CTR in TxDOT research project 0-5020.

1.2 Research Tasks

This research addresses the unique financing and planning needs of rural and small urban areas (RSUA) of Texas. The research plan was structured to address two key TxDOT needs:

1. Guidance to rural/small urban areas (RSUA) on financing tools and partnerships for advancing locally important projects, and associated planning tools
2. Desirable modifications to planning tools to customize them for RSUA projects

The results are intended to aid RSUA in determining financing and planning tools appropriate to each type of project. They are also intended to provide guidance on developing partnerships, and on packaging cost- and risk-sharing agreements. Two primary outputs of the research were identified:

1. Guidebook with info that can be used to develop innovatively financed projects in RSUA, including available tools, procedures for using such tools, examples of success, potential pitfalls, matching projects with appropriate tools, and partnering with local government and/or the private sector.
2. Guidance on features of tools that need to be modified for RSUA applications.

The following tasks were completed in the period September 2007 to November 2008:

Task 1. Analyze financing and planning tools for rural and small urban area projects

The objective of this task was to develop information for TxDOT district and division staff and potential partners on the financing tools available for projects in rural and small urban areas (RSUA) of Texas, and associated planning tools.

CTR conducted a thorough review of recent and pending legislation on tools for transportation financing at the state and federal level. CTR then analyzed these financing tools for specific conditions associated with their application, procedures, requirements for qualifying, other legal and planning requirements, required data collection, and associated tools for acquiring and processing data. The focus was on application in rural and small urban settings.

CTR analyzed several financing tools including local and private activity bonding and pass-through agreements for RSUA settings. Contributions of right-of-way, drainage and utilities, materials, and inspection staff, and other tools for leveraging transportation funds were also evaluated, as well as planning tools for supporting the financing tools.

In addition, CTR documented financial feasibility, economic impacts, political feasibility, social or equity concerns, and legal, technical, and institutional concerns and risks. CTR compiled all of this information for creation of the first section of a guidebook for districts and agencies interested in partnering with TxDOT on projects.

At the end of this task CTR submitted a technical memorandum on financing and planning tools for rural and small urban areas of Texas.

Task 2. Develop lessons learned in using financing and associated planning tools

The objective of this task was to identify examples of success, lessons learned, and potential pitfalls associated with the tools identified in Task 1. The experience of the Tyler district with the Loop 49 toll project was considered particularly relevant to provide lessons learned.

CTR made extensive contacts with TxDOT districts as well as other state DOTs to identify cases where innovative financing tools have been used, or are proposed to be used. CTR cast a wide net to capture relevant cases, including internationally where applicable. However, the focus of CTR's analysis remained on rural and small urban area applications. Experiences in TxDOT districts were collected through a questionnaire (Appendix A), interviews and in-depth discussions.

CTR gathered detailed information on each of the identified cases based on the criteria identified in Task 1. These case studies were designed to provide insight into the practical application of innovative financing measures and how to overcome the technical, political, institutional, and other barriers to implementation. CTR captured and synthesized the experience of smaller districts in advancing cooperative projects, and the tools they developed to facilitate the process. The results were compiled and condensed into a set of "Case Studies and Lessons Learned", submitted as a technical memorandum and subsequently included in the guidebook developed later in Task 4.

Task 3: Develop decision-making/guidance tool for financing and developing RSUA projects

The objective of this task was to develop a draft version of a tool to guide decision-making in financing and developing RSUA projects.

Elements of the framework were designed to include:

- Input of project characteristics and scope
- Preliminary estimation of project costs and funding
- Preliminary estimation/characterization of project benefits and revenues
- Evaluation of the factors that impact the applicability and feasibility of a variety of financing tools
- Shortlisting of feasible financing tools, and linkage to specific case study examples
- Linkage to guidelines for partnerships and agreements.

Four stages were envisioned:

1. Record specific information about the characteristics, scope, costs, impacts, constraints and benefits of the proposed project.
2. Generate a list of recommended tool(s) to finance the proposed project. Additional financing tool(s) that might be considered, but may be less appropriate or feasible would also be listed.
3. For each financing tool listed, provide detailed information about the different factors impacting its applicability and feasibility, guidelines for its use, and examples where it was used, including contacts.
4. Provide guidelines for developing partnerships and agreements, including coordination with existing organizations such as MPOs and adjacent authorities.

The framework was only conceptual and was to be refined based on the results of Tasks 1 and 2. The process by which decisions on project financing are made were documented to find a logical relationship. The data required to move from one stage to another were also documented to identify requirements. However, from the data on using financing tools and case studies the researchers were unable to establish a consistent linkage between steps 1 and 2 above.

As the findings became clear, CTR presented the results to the TxDOT Monitoring Committee. CTR recommended that the focus of the tool be on stages 2-4, and this was accepted by the committee.

Task 4. Develop guidelines for partnering with TxDOT

The objective of this task was to develop guidelines for TxDOT staff as well as other groups interested in partnering with TxDOT. This task was timed to run in parallel with Task 3.

CTR examined a wide range of examples of new partnerships. Included in the analyses were alternatives to RMAs that may be more applicable to rural and small urban areas, the parties that must be involved, how they can be brought into the process, and how to include Metropolitan Planning Organizations in the coordination process.

Themes explored in this task included:

- Technical constraints: What technical constraints exist?
- Political context: How to gain acceptance for bond issues, increases in fees, charges or sales taxes to fund transportation projects?
- Financial considerations: What are the associated costs?
- Economic context: How would the proposal bring economic benefits to the community?
- Social context: What would be the impact on and response from various social groups?
- Institutional and legal context: What barriers have to be overcome?

The lessons learned from Task 2 were combined with the results of this task into a formal research product which was submitted at the end of this task.

Product P1: Guidebook for rural and small urban areas on financing tools and partnerships for advancing locally important projects, and associated planning tools.

Task 5. Identify features of planning tools that require modification for rural areas

The objective of this task was to provide TxDOT with a set of modification recommendations for the planning tools identified in Task 1, based on actual experience with those tools as documented in Tasks 2 and 3.

Through interviews with district staff CTR sought to identify planning tools used to establish the feasibility of projects for specific methods of financing. However, district experience with such tools is very limited, especially with regard to conducting cost/benefit analysis. Therefore, the focus of this task shifted to analyzing the requirements for conducting cost/benefit analyses in the context of partnership projects.

The results of this task are documented in the lessons learned and recommendations chapters of this report.

Task 6: Prepare refined version of decision-making/guidance tool for financing and developing RSUA projects

The objectives of this task were to (a) update the framework considering the outcome of Tasks 4 and 5, (b) complete the embedding of data on guidelines for financing tools, partnerships, and agreements, and (c) complete the coding to ensure a user-friendly application.

Based on the outcome and issues raised during Tasks 4 and 5, the research team re-evaluated each component of the framework described in Task 3. As a result, the decision tool originally envisaged was re-scoped as a guidance tool in user-friendly electronic format.

The final tool includes all the data included in the research product P1 as well as additional material from the case studies and material developed after the submission of P1. The tool was demonstrated to the TxDOT Project Monitoring Committee and submitted as an additional product P2.

Product P2: Guidebook for rural and small urban areas on financing tools and partnerships for advancing locally important projects, and associated planning tools, in electronic format.

Task 7. Project documentation

This task covered the preparation of this research report 0-6034-1, which documents the research performed, findings and recommendations. A project summary report 0-6034-S, which summarizes this detailed research effort, is submitted separately. These reports provide recommendations on financing tools for rural and small urban area projects, and guidance to the districts and local entities interested in partnering with TxDOT on such projects.

1.3 Organization of This Report

This chapter presented the background and justification for this research effort, and the research plan. In Chapter 2, sources for funding the construction of a project are presented. In Chapter 3, sources of revenues to repay project cost are discussed. Chapter 4 discusses benefits and risk-sharing in partnerships. Chapter 5 presents case studies on partnership projects. Chapter 6 discusses the lessons learned from the case studies. Chapter 7 presents conclusions and recommendations.

Chapter 2. Project Funding

2.1 Chapter Introduction

With traditional transportation revenue sources lagging and maintenance demanding more attention, non-urban areas have less funding for new projects. This research documents alternative financing tools for rural and small urban area projects. In this chapter, construction funding is addressed.

2.1.1 Project financing

Project financing involves two aspects:

- (1) Funds for construction and operation of a project (negative cash flow), and
- (2) Revenue derived from the project (positive cash flow).

Traditionally in TxDOT projects, revenue was accumulated before construction could be funded. However, since the late 1990's, TxDOT has had the authority to borrow funds, and to repay the loans with a mix of revenue options, including tolls. In many cases, TxDOT has been able to partner with local government or private entities to share the borrowing burden and to tap into additional revenue sources to repay debt.

However, TxDOT experience with partnership projects has been limited, especially in rural districts, so concepts such as revenues and reimbursement are often misunderstood. Nevertheless, if construction funding is treated as a distinct issue from revenue, it is easier to see that each project must generate sufficient revenue to repay its costs. This chapter shows that there are multiple options for construction funding. The next chapter will present options for deriving revenue from projects. Each permutation of funding and revenue is a potential financing technique.

2.1.2 Construction Funding Sources

There are two main sources for funding the construction of a transportation project, namely, grants and debt. These can be further categorized as:

- Grants:
 - Federal and/or state grants
 - Contributions from local and/or private entities
- Debt:
 - Bonds
 - Loans

Each of these will be discussed in more detail next. Additional details are provided in Appendix B.

2.2 Grants

2.2.1 Federal grants

In the traditional system for financing major transportation infrastructure, project cost is largely covered by federal grants managed by state DOTs (see State grants next). The most recent federal transportation funding re-authorization, SAFETEA-LU, was in 2005. In addition, there are a few federal programs that provide grants:

- Community development block grants: These federal grants can be for a variety of community development programs, but with respect to transportation are generally geared toward transit projects. Commuter and passenger rail projects are eligible, and in certain cases those may include rail crossings and signal progression projects.
- Rural safety program: This program was enacted in SAFETEA-LU. The money could be used to make low-cost safety improvements such as signage, pavement markings, and guardrails and traffic lights on rural roads. While some states have a process in place and the Federal Highway Administration did issue guidance on the program to its field offices, the U.S. Department of Transportation has yet to issue final regulations on rural planning requirements.
- Intelligent Transportation Systems (ITS) program: The Regional ITS Program sets aside funds from larger Congestion Mitigation and Air Quality (CMAQ) and Metropolitan Mobility (MM) Funding Programs and allows for the implementation of regional ITS Initiatives. These projects could include partial funding for emergency evacuation routes and driver information systems.

2.2.2 State grants

The state DOT manages federal grants as well as its own transportation funds. TxDOT divides those funds into 12 pools or funding categories, as shown in Table 2.1 (across 2 pages). The table also shows the starting point for project selection, the selection process, and the usual federal-state-local split of costs (called “matching”). Projects are selected from the state’s Unified Transportation Program, with a small number funded from the Transportation Commission’s discretionary funds.

Table 2.1: TxDOT Funding Categories

Strategy	Funding Category	Starting Point	Selection Process	Usual Cost Split
Maintain It. These categories are part of the SPP – Statewide Preservation Program	1 - Preventive Maintenance and Rehabilitation	TxDOT District	Projects selected by districts.	Federal 90% State 10% <i>or</i> Federal 80% State 20% <i>or</i> State 100%
	6 - Structures Replacement and Rehabilitation	TxDOT District	Commission approves projects statewide on a cost-benefit basis using the Texas Eligible Bridge Selection System (TEBSS).	Federal 80% State 20% <i>or</i> Federal 80% State 10% Local 10% <i>or</i> State 100%
	8 - Safety Federal Hazard Elimination Program, Federal Safe Routes to School, Federal High Risk Rural Roads, Federal Rail Highway Crossing and Safety Bond Program	TxDOT District	Projects selected statewide by federally mandated safety indices and prioritized listing. Commission allocates funds to districts. Projects selected and approved by commission on a per-project basis for Federal Safety Routes to School Program.	Federal 90% State 10% <i>or</i> State 100% <i>or</i> Federal 100%
Build It. These categories are part of the SMP – Statewide Mobility Program	2 - Metropolitan Area Corridor Projects	TxDOT District	Commission approves projects in corridors. Projects scheduled by consensus of districts.	Federal 80% State 20% <i>or</i> State 100%
	3 - Urban Area Corridor Projects	TxDOT District	Commission approves projects in corridors. Projects scheduled by consensus of districts.	Federal 80% State 20% <i>or</i> State 100%
	4 - Statewide Connectivity Corridor Projects	TxDOT District	Commission approves projects in corridors. Projects scheduled by consensus of districts.	Federal 80% State 20% <i>or</i> State 100%
	5 - Congestion Mitigation and Air Quality Improvement	MPO	Projects selected by MPOs in consultation with TxDOT and the Texas Commission on Environmental Air Quality and funded by districts.	Federal 80% State 20% <i>or</i> Federal 80% Local 20%

Strategy	Funding Category	Starting Point	Selection Process	Usual Cost Split
			Commission allocates money based on population percentages within areas failing to meet air quality standards.	
	7 - Metropolitan Mobility/ Rehabilitation	MPO	Projects selected by MPOs in consultation with TxDOT and funded by district's Allocation Program. Commission allocates money based on population.	Federal 80% State 20% <i>or</i> Federal 80% Local 20% <i>or</i> State 100%
	9 - Transportation Enhancements	TxDOT District	Local entities make recommendations and a TxDOT committee reviews them. Projects selected and approved by commission on a per-project basis.	Federal 80% State 20% <i>or</i> Federal 80% Local 20%
	10 - Supplemental Transportation Projects State Park Roads, Railroad Grade Crossings Replanking, Railroad Signal Maintenance, Construction Landscaping, Coordinated Border Infrastructure Program and Congressional High Priority Projects	TxDOT District, Texas Parks and Wildlife Department, Other (federal allocation)	Projects selected statewide by Traffic Operations Division or Texas Parks and Wildlife Department, local projects selected by districts. Commission allocates funds to districts or approves participation in federal programs with allocation formulas. Coordinated Border Infrastructure Program funds are allocated to districts according to the federal formula.	State 100% <i>or</i> Federal 80% State 20% <i>or</i> Federal 80% Local 20% <i>or</i> Federal 100%
	11 - District Discretionary	TxDOT District	Projects selected by districts. Commission allocates money through Allocation Program.	Federal 80% State 20% <i>or</i> Federal 80% Local 20% <i>or</i> State 100%
	12 - Strategic Priority	Commission	Commission selects these projects on a project-specific basis.	Federal 80% State 20% <i>or</i> State 100%

Source: TxDOT, 2008.

- Toll equity: In addition to other grants, the state is authorized to grant up to \$800 million annually towards the cost of toll projects.

2.2.3 Local contributions

In many cases local contributions to project cost can assist in advancing projects. Potential sources of local contributions include:

- Private funds, such as from landowners, developers, or businesses: For example, in Travis County, Wells Branch Parkway Extension connecting the new SH 130 to IH-35 was funded 50-50 by private developers and county bond money. In another example, Alcoa funded a roadway relocation in Denton County.
- Local government general funds: The Texas Transportation Code indicates that counties have the ability to use their own general funds to contribute to transportation improvements. Counties may make contributions to facilitate primary and secondary road construction, and may use their general funds for “curbs, gutters, drainage ways, sound barriers, sidewalks, and all other features or appurtenances conducive to the public safety and convenience.”
- Mix of public and private contributions: A federal provision called “Flexible Match” allows the non-federal share of project costs to be a “variety of public and private contributions” and gives the opportunity “to match Federal highway funds with certain other types of state, local or other Federal funds or donations.” The Pennsylvania DOT has used flexible match for accelerating the construction of projects (FHWA, 2007).
- Tapered match: This federal provision allows a federally funded project to begin with either the federal or state/local share in hand, provided that by end of construction the requisite match is complete. TxDOT began using this strategy in 2000. There are certain restrictions, such as the state must allocate its share before construction begins. One advantage of this procedure is that the state is able to protect right-of-way or begin utility relocation with its own funds before Federal approval of construction plans.
- Transportation development credits (TDC): TDCs can be earned when a local, state or private entity uses its own funds, typically from toll revenues, for capital transportation investment. The Federal government then gives ‘credit’ to the states for these investments toward the non-Federal share of certain transportation projects. SAFETEA-LU allows these credits (previously called toll equity) to be used on a pro rata basis. In February 2006, the Texas Transportation Commission adopted new rules allowing these credits to be applied as the local match for federally funded transit and rail projects. Seventy five percent of the state’s locally earned credits are awarded by the Commission. These are granted to projects within the region in which they were earned under a competitive process.

2.3 Debt

Transportation debt can be issued by the state, an authority, or even the private sector, provided that it is guaranteed by existing or new revenue streams. Such revenue could include taxes on fuel or other taxes, tolls, fees, dedicated sales, etc. (TRB, 1998). Debt could be in the form of bonds or loans.

2.3.1 Bonds

There are a variety of bonding options for procuring project capital. Government-issued bonds can have tax advantages for investors:

- Tax-exempt bonds: The interest earned by an investor in these bonds is tax-exempt. As a result, investors are willing to accept a lower interest rate on these investments.
- Tax credit bonds: Instead of the issuer paying interest to the bondholders, the federal government provides tax credits to them. In effect, these are a form of interest free financing for the issuer in that he is only responsible for repaying the principal. These bonds are more advantageous to the issuer than tax-exempt bonds (TRB, 1998).

State Bonds: The state has the following options for bond debt:

- Texas Mobility Fund: This fund was established by the state legislature as a mechanism for leveraging the state's credit to attract bond investors, and was capitalized with funds from various state fees, e.g., traffic violations. It is also backed by general revenue funds. Legislation requires that in any given year the fund contain at least 110% of the debt service requirements for that year. Bonds have to be approved by the state's voters, and in November 2006 a limit of \$4 billion was approved. As of early 2008, over \$1.75 billion in bonds have been issued. TMF funds are allocated by the Texas Transportation Commission to Regional Mobility Authorities and other entities on the basis of their ability to repay the debt over 30 years.
- Grant Anticipation Bonds: These bonds are called GARVEE or GAN bonds, and are bonds a state can issue backed by anticipated future federal grants. For example, in the late 1990s Massachusetts issued \$1.5 billion of Grant Anticipation Notes (GANs) to pay for the Central Artery. One quarter of that state's obligation authority between FY 2007 and 2009 (i.e., the amount of money that is expected to be received from the Federal government for highway spending) will go toward repaying the GANs.
- Proposition 12 Bonding Authority: "In November 2007, Texas voters approved Proposition 12, which authorized the Texas Transportation Commission to issue up to \$5 billion in general obligation bonds to fund highway improvements. Once approved, bonds authorized under Proposition 12 are general obligations of the state, and the state is required to repay the debt. TxDOT currently uses bonding as an innovative financing tool." (Texas Department of Transportation Funding Challenge Findings and Analysis, 2008). General obligation bonds are not new revenues to the State; however, they would be new revenues to TxDOT. The funds are applicable to projects funded through the State Highway Fund, pending enabling legislation.

Local Bonds: Local entities historically have issued bonds (called municipal bonds) to finance their needs. Typically such bonds have to be approved by local voters. Bonding options include:

- General obligation bonds: These are bonds backed by the full credit of the issuing entity. General revenues from local taxes and fees are used to repay the bonds.
- Limited obligation bonds: These are bonds issued to finance specific projects, and are typically backed by a specific package of taxes and fees, e.g., a temporary increase on the local sales tax. The tax package dies when the debt is retired.

Local governments are authorized to issue bonds to fund the costs of state highways within the county and extensions into adjacent counties, and to pledge for the payment of the bonds:

- Revenues from any source,
- Taxes (subject to any applicable constitutional limitation), or
- A combination of revenue and taxes.

In the last legislative session, SB 683 was filed to permit Fort Bend County Municipal Utility District to issue bonds to construct road facilities including state highways and turnpikes, and to impose a property tax to repay those bonds. The revenue to be pledged for local bonding expressly includes payments under a pass-through agreement with TxDOT.

Local bonding is particularly suited to rural project financing because the benefits are to the local economy and can only be recaptured through local revenue measures. A district in which bonds are issued for transportation projects will not lose any of its previous share of gas taxes (since funding allocation formulas are prohibited from being revised). Local bonding therefore is an effective way of leveraging state and federal funds. Other leveraging mechanisms include contribution of right-of-way, drainage and utilities, materials, and inspection staff.

Private Activity Bonds (PAB): In the past the private sector was at a disadvantage in the bond market because of the tax advantages allowed for government-issued bonds. Private issuers had to offer higher interest rates to offset taxes. That restriction was relaxed in 2005 under SAFETEA-LU to allow up to \$15 billion in PABs to have tax-exempt status. PABs allow investors to issue tax-exempt bonds for projects that improve public infrastructure. PABs are an attractive mechanism for investors because of the tax advantages.

HB 2702 provided enacting legislation that allowed TxDOT to establish a program for utilizing PAB, once the Attorney General had made a determination that highway facilities and freight transfer facilities are PAB-eligible under the Internal Revenue Code. Texas was the first state to apply to use PABs and in October 2006, received authority from the FHWA for the use of \$1.86 billion in PABs for SH 121 in the Dallas district. For that project TxDOT was allowed to apply for the PAB funding on behalf of the prospective private investors subject to the proviso that the private investors would become the ultimate borrowers and repay the PABs.

The U.S. Secretary of Transportation allocates the approved SAFETEA-LU bonding capacity among qualified facilities, and as of January 2008, \$3.3 billion was allocated for 5 projects, including \$288 million for the LBJ Freeway in Dallas.

2.3.2 Loans

Three sources of loans are available for transportation projects, two federal and one at the state level.

Section 129 Loans: These are federally-financed loans that 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. The objectives of the program include (AASHTO, 2006a):

- Attract private or local funding by providing easy financing
- Accelerate projects slated for grants in later years of a STIP
- Provide “gap” funding or initial “seed” funding for projects that are difficult to finance
- Assist eligible private sector projects that have a public purpose, e.g.:
 - Intermodal freight transfer
 - Truck stop electrification
 - Car sharing
 - Rail-highway crossing elimination

The primary benefits to the borrowers include:

- Low interest rate (below market),
- Long terms (maximum loan term 30 years),
- Mitigating start-up risk- repayments begin 5 years after construction
- Possibly more lenient underwriting (for public purpose projects).

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 the program to leverage all available funding.

TIFIA Loans: Under the Transportation Infrastructure Finance and Innovation Act (TIFIA), enacted as part of TEA-21 in 1998, the USDOT can provide credit assistance to major surface transportation projects. The program was continued under SAFETEA-LU. (AASHTO, 2006b). The program is designed to leverage private investment by providing subordinate debt. A total of \$610 million is authorized through 2009 to pay the subsidy cost of interest. The program also allows the use of TIFIA loans to refinance long-term project debt.

The TIFIA program offers three types of financial assistance:

- Secured (Direct) Loan: Maximum term of 35 years from substantial completion. Repayments must start 5 years after substantial completion.
- Loan Guarantee: Guarantees a project sponsor’s repayments to non-Federal lender. Loan repayments to lender must commence no later than 5 years after substantial completion of project.

- Line of Credit: Contingent loan available for draws as needed up to 10 years after substantial completion of project.

TIFIA assistance provides a number of benefits:

- Improved access to capital markets,
- Flexible repayment terms,
- Potentially more favorable interest rates than can be found in private capital markets,
- Earlier completion of capital intensive projects that otherwise might be delayed or not built because of the market's uncertainty over the timing of revenues.

Two Texas projects have TIFIA loans:

- The Central Texas Turnpike Project: \$917 million TIFIA out of \$3.7 billion total project financing.
- The US 183-A project near Austin: \$66 million out of \$339 million project financing.

State Infrastructure Bank (SIB): The SIB program was created in the National Highway System Act of 1995, allowing states to establish banks specifically for federal-aid-eligible infrastructure projects. The program was initially capitalized with \$150 million of federal general revenue funds, and required states to match federal funds 20-80. SIB objectives and benefits are similar to those for TIFIA and Section 129 loans. The program is a revolving fund, with repayments from older loans providing capital for new loans. Over 30 states now participate in the program, and as of late 2006, Texas SIB had 62 loan agreements totaling \$294 million. Notable projects include SH 45 in Austin, and international bridges in El Paso and Laredo.

SIBs can be used to help local communities by providing both financial and technical assistance. Many communities are willing to dedicate local revenue sources to complete important projects but either do not have well-established credit ratings or lack experience in capital financing. In addition, SIBs can be a mechanism by which localities can pool funds thereby lowering the cost of capital through lower interest rates (FHWA, 2007b).

2.4 Chapter Summary

This chapter presented options for construction funding. The main categories discussed were grants in the form of federal and state grants or contributions from local and private sources, and debt in the form of bonds or loans. Additional details are provided in Appendix B. As TxDOT moves from the traditional mechanism of accumulating revenue before funding construction to borrowing and repayment, it becomes more important to have accurate cost and revenue estimates. The next chapter will present options for deriving revenue from projects. Each permutation of funding and revenue is a potential financing technique.

Chapter 3. Project Revenue

3.1 Chapter Introduction

To pay for the debt incurred in constructing a project, the borrower must identify revenue streams, preferably directly attributable to the project benefits. Examples of revenue streams include:

- Reimbursements in the form of grants and contributions
- Sale or leases of assets, including concession agreements
- Fees and fines
- Taxes
- Tolls

Each of these will be discussed in more detail next. Additional details are provided in Appendix C.

3.2 Reimbursements

Reimbursement to the entity paying for the construction of a project may take the form of grants or contributions. Some of these may be spread through a payback period and may be based on actual usage of the facility.

3.2.1 Pass-through agreements (PTA)

PTAs are a mechanism to reimburse local jurisdictions, TxDOT, or the private sector on a per-vehicle or per-vehicle-mile basis for the principal costs expended to construct transportation facilities. The fee "is determined by the number of vehicles using a toll or non-toll facility on the state highway system, [and] paid to the entity that financed the construction of the facility" (TxDOT, 2007a). The reimbursement rate may decrease or be capped for higher traffic volumes. PTAs can also be utilized for rail infrastructure with the reimbursement being made on per-rail-car or per-ton-mile basis.

Essentially, "In a pass-through financing agreement the developer agrees to finance, construct, maintain and/or operate a project on the state highway system. TxDOT reimburses the developer the cost of the project rather than assessing a toll directly on users. TxDOT makes periodic payments based on the number and types of vehicles using the facility." Furthermore, "Pass-through financing projects do not require toll plazas or toll collection equipment. In fact, they look like typical non-tolled facilities. The difference is that the monies typically paid by the motorist in conventional tolling are paid by TxDOT" (TxDOT, 2007b).

HB 2702 provided amendments that allowed:

- Private entities to reimburse TxDOT for development and construction of a highway project under a PTA. This provision allows TxDOT to assist counties and other local entities that do not have adequate experience in road construction or need to finance the project over a period of time.

- TxDOT to delegate oversight authority and development of PTA projects to a municipality, county Regional Mobility Authority (RMA) or Regional Toll Authority (RTA).

PTAs have been an exceptionally popular financing tool, with many counties and cities petitioning the Texas Transportation Commission for such projects. Areas developing PTAs include Grayson, Bastrop and Lee Counties, Del Rio, Pharr, and El Paso. Two of the PTA applications were developed from unsolicited proposals that the private sector developed. Several of the case studies provided by the districts and presented later in this report document their experience with PTAs.

3.2.2 Availability Payments

This mechanism is a variation on PTAs in which the state pays the constructor according to a lane-mile availability formula, i.e., how much of the time the facility is actually available for use. In effect, the constructor is encouraged to minimize disruptions and lane closures. The state may collect tolls from users of the facility (through a separate contractor). In rural situations the tolls may have to be low to attract traffic, but the economic activity stimulated may generate other revenue.

3.3 Sales and Leases

3.3.1 Sale of assets

This is a one-time source of revenue derived from selling off assets. Examples of assets include surplus right-of-way or other property, or even roads. For example, the Canadian government sold the 407ETR Toll Road near Toronto to a private consortium for 3.1 billion Canadian dollars in 1999. However, in general most local entities do not have significant surplus assets that can be sold to repay debt.

3.3.2 Leases and concessions

Leasing assets is an option for generating a revenue stream. For example, in 2004 the City of Chicago leased the Chicago Skyway toll road for 99 years to a private consortium for an upfront payment of \$1.82 billion. Of more relevance to rural entities, many agencies lease their public right-of-way to utilities such as for cell phone towers and other easements, and to advertisers for billboards and electronic advertising signs. Another option for public-private partnerships is to procure surplus right-of-way and lease it back to roadside service concessions such as gas stations, motels, etc.

3.4 Fees and Fines

3.4.1 Fees

There are a variety of options for charging fees to those who might benefit from the construction of a transportation facility:

- Traffic impact fee from developers: This is typically a one-time fee charged to a developer whose project will add traffic to a region and require expansions/modifications to existing facilities. The fee is in proportion to the amount of additional traffic estimated to be generated by the development. Many rural

entities are reluctant to levy such a fee because of concern it might discourage development. However, unless revenue will be gained from users of the development, traffic impact due to development is a real cost that must be paid from other revenues.

- Property development fees: This is similar to a traffic impact fee, but may be assessed as a percentage of the proposed investment.
- Utility installation fee: Lubbock has decided to institute a utility franchise fee to leverage Texas Mobility Fund (TMF) money. The utility fee will be charged on all new utility installations, and is anticipated to raise about \$70 million over time. The leveraged TMF money is pledged for transportation purposes, including development of the Lubbock outer loop. In effect, this is similar to a property development fee.
- Transportation utility fee: This fee is levied on property owners in proportion to the amount of traffic estimated to be generated by the property. It is similar to a traffic impact fee, except it is a monthly fee which is added to utility bills.
- Transportation fees: Many local entities impose fees on local vehicle transactions to pay for transportation. Examples include fees on vehicle rentals and leases, levies on vehicle insurance, and parking fees. Some of these fees are collected as a sales tax or surcharge which means they end up in the general revenue fund. Dedicating these fees to a transportation fund allows for better control and transparency.
- Vehicle ownership fees: The state DOT charges vehicle owners in Texas approximately \$60 to \$70 annually to register each vehicle, raising about \$1 billion per year in revenues. Many states are considering charging higher registration fees, for example, Colorado has proposed raising the registration fee by \$100. In addition, annual inspection fees are \$12.50, with an additional \$16 fee for emissions inspection in air-quality non-attainment counties.
- Road access fees: The idea of a road access fee has been raised recently. Vehicle owners would be charged a flat rate for having access to the road network, a more direct justification of a vehicle registration fee. Along similar lines, the idea of a road maintenance fee has been suggested, especially for heavy vehicles.

3.4.2 Fines

In 2003, the state legislature increased the fines for speeding and other traffic violations and dedicated that excess revenue to the Texas Mobility Fund. For fiscal years 2005, 2006 and 2007 respectively, \$117 million, \$84 million and \$140 million were collected from that source. Local entities also have the option to levy fines and dedicate that revenue toward transportation debt.

3.5 Taxes

One purpose of a transportation system is to support economic activity and development. Development may be reflected in an increase in property values, while economic activity is often measured as the volume of sales or transactions in the region. Reasonable taxes on such activity are justifiable to pay for providing government services.

3.5.1 Property Taxes

Most local governments levy a tax on the value of property in their jurisdictions to pay for local services such as schools, police, etc., and to support debt incurred for infrastructure investments. In most cases, the government is required to get voter approval to undertake the debt and to raise the taxes, and the specific tax must end when the debt is retired.

- Special tax districts: Local governments can authorize the establishment of special districts with the authority to sell bonds and levy taxes. Local transportation districts have existed in Texas since the mid-1990s.
- Tax increment financing: This tool allows local governments to sell bonds backed by property taxes on the future increase in value of properties created by the bond-financed investment. It is necessary to make a careful estimation of the likely growth in development and property values.

3.5.2 Sales Taxes

Texas applies a 6% tax on sales of specified goods in the state. In addition, local governments levy another 1.5% to 2.5% to support their own activities, including public transportation. In special cases, they levy another 2% to 8% tax on hotel, car rental and recreation bills, usually to support a sports stadium or similar undertaking. Many local entities designate part of their sales taxes for transportation, and request temporary increases for specific bond packages. For example, in 1986 voters in the Bay Area near San Francisco approved an increase in the local sales tax from 6.5% to 7% for 15 years to pay for a \$990 million bond to improve transportation in Alameda County.

- Dedicated sales tax: In San Antonio, the sales tax was increased 0.25% to fund transportation, including the local public transportation authority VIA. The proceeds of the tax are dedicated as follows: 25% to leverage TxDOT Highway Funds, 25% for city street construction, maintenance and operations, and the remaining 50% of the funds for transit services and, depending on the level of the sales tax, the development of High Occupancy Vehicle (HOV) lanes.
- Vehicle-related sales taxes: The federal government levies a tax of 18.4 cents per gallon on the purchase of gasoline and 24.4 cents a gallon on diesel, the proceeds being deposited in the federal Highway Fund and disbursed to the states according to formulas established in each renewal of federal highway funding. In addition, the states levy their own gas tax to fund transportation. In Texas, the state tax is 20 cents a gallon on gas and diesel, and the proceeds go into the state highway fund. This tax is not indexed for inflation or tagged to the price of gas, and has not been increased since 1993, when the typical price of gas, including taxes, was about \$1.25 a gallon. State and national leaders have been reluctant to support increases in the gas tax, and some have even proposed eliminating it each time the price of gas spikes. Local jurisdictions could consider taxes on other vehicle-related sales, such as tires, parts, and repairs.

3.6 Tolls

As transportation revenue from gas taxes has stagnated and lost buying power over the years, agencies have sought to re-introduce tolling. Toll roads were built as far back as colonial times in the U.S., fell out of favor during the canal building era of the 1800s, then returned with the introduction of the automobile in the early 1900s. Several toll roads were built in the northeast and Midwest before the interstate highway system began in 1956. With a dedicated and significant gas tax to support the interstate system, tolling was no longer viable. However, in the 1980s privatization of government services stimulated new interest in tolling, and California was one of the pioneers. Despite several notorious setbacks, most states now use tolling to fund expansions to their networks.

Tolling takes advantage of two economic principles:

- Users of a utility should pay in proportion to their consumption. In this respect tolling is more of a direct charge than the gas tax, which has been muddied by increasing vehicle fuel efficiency.
- Through competition, the private sector provides better services and innovations than the government. In using tolled facilities, customers have the choice of a premium service for a price.

However, tolling requires appropriate conditions to be economically successful. Customers must experience real time savings to be willing to pay, and the cost must be compatible with users' value of time. Generally, neither condition pertains in rural and small urban areas. Therefore tolling is more applicable in highly congested and high income urban areas. Tolling can be applied in several ways.

3.6.1 Corridor tolling

In the most common application, vehicles pay to use a corridor. Typical cost in the U.S. is between 10 to 25 cents per mile. The road must be exclusive to those who pay, either through toll booths or electronic tag accounts. However, in rural segments toll corridors are likely to be underused compared to alternative non-tolled routes and may not earn break-even revenue.

3.6.2 Cordon tolling

In this application, vehicles entering a zone pay a toll. It is suitable for congested sectors, but requires viable public transportation alternatives, including park-and-rides. The most famous example is the London cordon toll, where vehicles pay a daily fee of about \$16 (U.S.) to enter the Greater London area. An elaborate network of cameras and enforcement is required, but the system has been credited with reducing congestion by over 20%. The revenue is used to repay debt incurred in expanding the public transportation system. There have been some complaints from businesses of reduced sales, but overall the program has been deemed a success. Few rural and small urban areas would find cordon tolling applicable. Parking fees are a simplified variation to reduce congestion in downtown areas.

3.6.3 Freight tolling

It is widely recognized that heavy vehicles cause greater damage to the road pavement than passenger vehicles. In Germany, all trucks are required to pay tolls based on the distance traveled inside that country. On U.S. toll roads, multi-axle vehicles are charged more than passenger vehicles. However, efforts in the U.S. to have the freight sector pay a greater share of infrastructure costs have been stymied by the argument that the cost would be passed on to consumers. Trucks also contribute to congestion, and there have been several proposals to establish truck-only facilities. In Atlanta there is a study on converting HOV lanes to truck lanes.

3.6.4 VMT or Mileage Tolling

This is a mechanism whereby vehicles are charged based on vehicle miles traveled (VMT)—a direct road user fee. Pilot tests have been conducted in Oregon and Washington States using GPS devices to record miles driven in specific areas. The primary objective of this area-wide tolling is to replace the gas tax as the revenue source for the transportation system. Estimates of a viable VMT toll range from 5 to 10 cents per mile. The complexity of distance-based tolling is relatively high and requires uniform application area-wide, as well as cooperation across jurisdictions. To be effective it has to be implemented state-wide.

3.6.5 Congestion Pricing

This is a variation on tolling that involves charging users more for using the system during congested periods- typically the morning and afternoon rush hours. It is implemented on the SR 91 Toll Road in California, where users pay \$1.20 each way during night and weekend low periods, and as much as \$10 one-way on Friday afternoons. The operating authority reserves the right to restrict access in order to maintain free flow conditions, and even guarantees drivers their money back if they experience delays. Congestion pricing is only applicable to corridors with severe and recurring congestion.

3.7 Chapter Summary

In this chapter, options for repaying the debt incurred in constructing a project were presented. Reimbursements, leases, fees, taxes and tolls were discussed. Additional details are provided in Appendix C.

Project financing consists of funding for construction, and repayment of those funds. If construction funding is treated as a distinct issue from repayment, it is easier to see that each project must generate sufficient revenue to repay its costs. Each permutation of funding and revenue is a potential financing technique.

Chapter 4. Partnerships

4.1 Chapter Introduction

As TxDOT moves from the traditional financing process of accumulating revenue before funding construction to one of borrowing and repayment, it becomes more important to have an understanding of partnerships, risk sharing, and agreements. Risks, costs, and benefits must be properly assessed to ensure that they are equitably shared. In this chapter, requirements for agreements between TxDOT, local entities, and the private sector are discussed.

4.1.1 Worldwide trends

Worldwide, governments struggle with the challenge of finding a balance between cost efficiency and speed in delivering their objectives. While public sector options are often constrained, it is expected that the private sector can implement better skills, deliver faster work, and provide superior services. Haynes and Roden contend that the private sector is better able to understand “the market place and the need for competitiveness” and “knows, that to be successful, it must not only respond to the needs of its customers, but strive constantly to improve its services” (Haynes & Roden, 1999).

An effective transportation system capable of supporting commerce as well as public services is vital to the success of local economies. As transportation departments struggle with a shortage of public funds to meet the needs of aging infrastructure and growing demand, it is not surprising that the private sector is concerned about investment in transportation infrastructure (Haynes & Roden, 1999).

4.1.2 Private sector investment in infrastructure

Private sector financing of infrastructure has gained momentum globally. According to a study conducted by the World Bank, private investment in transportation in developing countries in 2006 was \$7.1 billion (U.S.), or about 10% of the \$69 billion spent on private projects worldwide (Figure 4.1) (Kikeri & Phipps, 2007). Demand for partnerships between the public and private sectors is particularly high in areas with substantial economic and population growth.

A report published by the World Bank in 2000 highly promoted private sector involvement for the construction, management and maintenance of toll roads. The World Bank’s author, Silva, claimed that the majority of privately financed projects have been very successful, aside from a handful that experienced only minor issues (Shaoul et al., 2005). Additionally, it also claims to have evaluated 75 roads and highways projects, where eighty three percent were rated unsatisfactory; however, it failed to provide evidence or citation for its study (Shaoul et al., 2005).

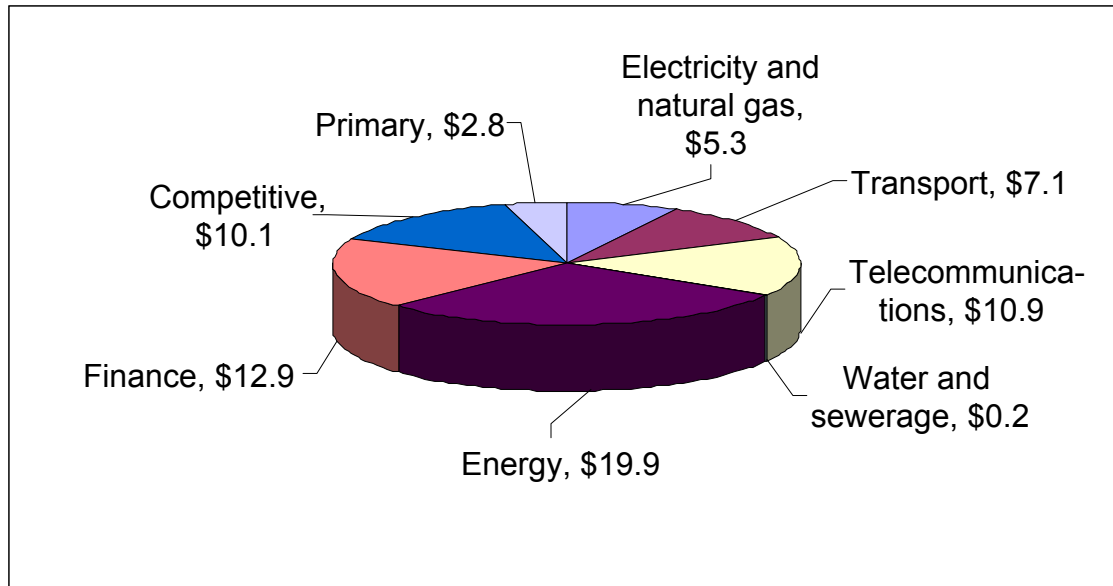


Figure 4.1: Worldwide private infrastructure projects, US\$ billion, by sector, 2006

Source: World Bank, Private Infrastructure Project Database, 2006.

The general view from experts has been that private road financing is positive, despite costly failures of toll roads in Mexico, Thailand and Hungary that ultimately had to be taken back into the public's hands. With regard to the Australian experience and its government's implementation of the build, own, operate and transfer (BOOT) scheme for roads, the private sector has had very high profits and people are not so convinced that these high profits were justified by the costs to the public, both explicit and implicit.

Surprisingly there is little empirical financial research on the use of private finance for roads. Shaoul et al. claim that this may largely be in part because for roads, unlike "hospitals or schools, the business cases used to support the case for private finance in preference to public finance have not been placed in the public domain for reasons of 'commercial confidentiality', even after financial close" (Shaoul et al., 2005).

Furthermore, the transactions associated with roadway financing are far more complicated and based upon considerably lengthy agreements that can make examination difficult for an outside party. Shaoul et al. also argue that a tremendous amount of information is withheld from the public along with the details of the financial arrangements making analysis impossible and hard to attain the public's trust (Shaoul et al., 2005). It is necessary to understand what are the benefits and risks to the private and public sectors and how these can be shared, to help prevent similar mistrust in the future.

4.2 Benefit Assessment

No expenditure can be justified unless the benefits are equal to or greater than the cost. TxDOT computes a cost-effectiveness index (CEI), the value of time savings created versus cost, when determining the feasibility of certain projects that are

programmed at headquarters level. However, most projects are selected at the district level, and each district uses its own prioritization formula.

4.2.1 Estimating project benefits

Table 4.1 is a list of the benefits of transportation improvements. Benefits differ depending on whether the facility is tolled or not. The immediate traffic impacts of a facility would be improvements in mobility, accessibility and reliability, and possible shifts in mode use and trip timing. With greater flexibility in travel behavior, travel demand increases. Regarding impacts on the wider population, safety and pollution should improve. The public would also enjoy greater access to services and lower transportation costs. These benefits translate into access to more goods and services, which stimulate development and generate economic activity.

Table 4.1: Benefits of Transportation Improvements

	Factor	Non-Tolled Facility	Tolled Facility
Traffic Effects	Mobility, congestion, reliability	Improvements	Significant improvements
	Time savings	Improved	Significant for those who can pay; small for others
	Route-, trip time- and mode shifting	Trip attraction; increased use of single-occupant vehicles	Potential changes depending on toll regime (preferential rates, congestion pricing, etc.)
	Travel behavior	Greater flexibility	Significant changes
	Travel demand	Increased	Short-term increase, medium-term dampening, long-term increase
Social Impacts	Safety and pollution	Generally positive changes	Positive changes
	Access to services	Improved	Improved if new road; reduced if conversion to tolling
	Transportation costs and benefits	Improved	Re-distributed
Economic and Land Use Effects	Destination access and market connectivity	Improved	Changes in access, improvement in connectivity
	Development patterns	Along corridor and connectors	Concentrated development at nodes and along connectors
	Economic activity	Generally positive: boosted tax revenues	Increased: business relocations, employment increases, boosted tax revenues

(Adapted from Persad et al, 2005)

The difficult part of assessing project benefits is translating each of them into dollars, and determining which ones should be counted and which are spin-offs of others.

However, when costs are to be shared, it is important that project benefits are quantified. Estimation and categorization of benefits are even more necessary when each party supports a project for different specific benefits. Estimation is critical when revenue will be derived from the project.

4.2.2 Converting benefits into revenue

Each of the effects listed in Table 4.1 is a potential source of revenue to pay for a transportation improvement. However, in Chapter 3 it was seen that there is a finite set of revenue options that are feasible and ‘bankable.’ Estimating the revenue increase in any of those options due to a proposed project is complex.

Tolling has become popular as a way to convert transportation benefits into revenue. However, the estimation of toll revenues is uncertain. For example, a 2004 Standard & Poor’s report evaluated the accuracy of year-one traffic projections on 87 toll projects and found that traffic forecasts were overestimated by 20–30% (Bain, 2004). Bain found that, on average, actual toll traffic was overestimated by 42% in those areas with no history of tolling compared to 19% in areas with a history of tolling.

A follow up analysis in 2005 by Standard & Poor’s found that the errors associated with truck forecasts were substantially higher than those observed for private cars (e.g., light vehicles). The forecasting error measured for trucks were 33 percent compared to 26 percent for light vehicles. Truckers pay between two and five times the tariff levied on cars – although sometimes the figure can be as much as 10 times. Given the high revenue margin brought in by trucks, truck forecasting error is a serious issue when trucks are projected to be more than an insignificant fraction of the toll road traffic. For example, on a typical toll road trucks may contribute 25 percent of total revenues, although they account for less than 10 percent of total traffic.

4.3 Planning Tools

The planning tools required to support innovative financing are generally not suited to RSUA. For example, toll traffic and revenue models are calibrated for urban settings and therefore overestimate the feasibility of rural projects. In addition, urban and rural populations tend to have different values of time and willingness to pay for time savings. There is a need for better understanding of traffic distribution between tolled and non-tolled roads, especially in rural settings.

4.3.1 Planning assumptions

Transportation planning is based on numerous assumptions regarding local demographic growth and development, local and national economic growth, and travel patterns, among others. For toll projects, additional complicating factor include the estimated time savings and the value of time to potential toll road users, willingness to pay tolls, and price elasticity.

Traffic forecasts are particularly sensitive to assumptions about population and employment growth (both forecasted totals and the allocation of growth within regions to sub-areas), development and land use scenarios, and future year economic growth (e.g., gross state product, gross domestic (GDP)).

Steady state assumptions in models assume no changes to the transportation network in terms of both the extent and capacity of the system. Improvements to competing alternatives or other substitute services are thus largely ignored (Trommer, 2006; Kerali, 2005).

4.3.2 Modeling tools

Analysis of project feasibility requires estimation of traffic demand. To estimate long-term traffic patterns transportation planners use the four-step modeling process, namely, trip generation, trip distribution, mode choice, and traffic assignment. Since the 1980s a number of transportation modeling programs have been created offering improved traffic analysis capabilities. Among the list of programs, a select few have emerged as the most widely used and accepted programs in the marketplace. The programs can be separated into two categories:

Land Use & Economic Impacts Tools

TRANUS
REMI
RUBMRIO

Traffic Analysis Tools

TransCAD
DYNASMART
CORSIM & VISSIM
VISTA

4.3.3 Toll feasibility tools

Toll project feasibility analysis is typically a three-stage process: sketch level, intermediate, and investment grade. TxDOT's Turnpike Authority Division (TTA) splits the sketch level into screening and conceptual levels, and the intermediate level into project-specific and detailed analysis levels. A road is considered toll-feasible if toll diversion models show it pulling 10–15% of corridor traffic passing defined screen lines. However, assumptions regarding truck usage of toll roads tend to be simplistic. For example, the models often estimate the number of trucks that will use the toll road as similar to the truck traffic percentage on existing non-toll facilities. This results in the overestimation of truck usage of toll roads. A more rigorous consideration of the factors that influence truck usage of particular roads is required to ensure a more robust forecasting of truck traffic.

In the U.S., financing and bond agencies only accept toll traffic and revenue forecasts from three consultants: Wilbur Smith, URS Corporation, and Vollmer Associates LLP. To develop the traffic and revenue forecasts necessary to determine the financial feasibility of the SH 130 project in Austin, Vollmer and URS were engaged. They used population, employment, and median household income data from the Capital Area Metropolitan Planning Organization (CAMPO) to assign a percentage of traffic volumes at selected screenlines to specific routes. The CAMPO data were adjusted using aerial photographs that help in analyzing the potential for future growth within the screenlines.

In establishing the toll revenue forecasts, the consultants made the following assumptions:

- The forecasting model made a differentiation between weekday and weekend traffic. Weekend traffic was assumed to be half that of weekday traffic volumes.

- It will take 5 years for the toll road to achieve 100% of its projected traffic.
- The construction of major connector facilities within certain time constraints is assumed.
- Transponder users will receive a 10% discount off the toll rate. Transponder use will range from 25–40% at startup to 50–75% by 2025.

4.3.4 Project development tools

In developing a transportation project, a number of activities require public involvement or external approval. Cooperative projects introduce new complications and require new planning tools:

Financing decisions: Advocates and stakeholders must understand the new realities of project financing and the commitments required to advance a project.

Design elements: With limited funding, a phased approach to project construction may be required. Design decisions may include a reduced cross-section, fewer overpasses, and limited access in the case of toll projects.

Cost estimation: Cost estimating tools used by TxDOT are not calibrated for toll projects, and with a limited history of toll projects in Texas, cost data is sparse.

Public support: Visual representation of project features may be necessary to mollify objections to increased local contribution to project cost.

Communications: Active dissemination of project benefits and changes is critical to the success of cooperative projects.

4.4 Risk Sharing

All projects have risks. In undertaking debt to construct a project, the borrower's risks include:

- Public opposition
- Unknown costs due to delays and overruns
- Development not occurring where or when forecasted
- Suppression or displacement of economic activity
- Possibility of revenues not meeting commitments
- Loss of political support.

4.4.1 Risk allocation

Risks should be assigned to the party best able to mitigate them. The key to successful partnerships is the ability to strike a balance in the allocation of risks among the partners, while allowing each the opportunity to achieve his objectives.

Principal responsibilities associated with road projects include project design, construction, and maintenance. Toll projects have additional requirements, including toll collection and legal issues entailed with final road ownership/transfer of ownership (Fishbein & Babbar, 1999). In general, the private sector bears greater risks than the public sector (Table 4.2), such as the risks of increased construction costs (over time the cost of fuel rises and has an effect on construction costs), operation cost overruns, delayed services, and other risks such as unexpected findings during the environmental phase (e.g., an archeological site, sensitive wetlands, etc.) that can cost time and money to the budget.

Table 4.2: Private and Public Sector Individual and Shared Risks

Type of risk	Public sector	Private sector	Shared
Design and construction		Mostly with the DBFO Company, but provision for compensation in the event of changes. Detailed design undertaken by DBFO Company, but Government usually has already borne costs of initial route design.	
Latent/ Inherent defects		Defects, including those on existing roads and structures, which arise during the 30-year contract period lie with the DBFO Company.	
Delivery/ Timing		Delay risks lie with the DBFO Company and have an impact on revenue except in the case of delays due to government changes, in which case compensation may be payable.	
Planning	Generally taken through the statutory planning stages by the public agency.		
Traffic/ Volume			Downside risk with private sector; upside risk with public sector.

Type of risk	Public sector	Private sector	Shared
Operation and maintenance		DBFO Company responsible for maintaining road to provide the service specified in the contract. Failure to do so can result in the award of penalty points. Closure of lanes can result in reduced payments to the DBFO Company	
Protestor action			Varies between projects. On some projects it is entirely borne by the DBFO Company, on others it is shared with the public sector.
Force majeure			Most force majeure risks lie with the Government but the contract definition is very limited (for example, it excludes extreme weather), and the risk is shared because equity holders are not compensated if termination occurs as a result of a force majeure event.
Indemnity/ Insurance		Insurance and indemnity risks lie with the DBFO Company which indemnifies the public against all claims from third parties arising from the design, maintenance and operation of the road.	
Legislative		Risks of legislative changes are with the DBFO Company except where the law is discriminatory against DBFO companies or roads. No compensation for lower revenues due to non-discriminatory laws which have effect of suppressing traffic.	

(Source: Haynes & Roden, 1999)

Traffic risk has a substantial effect on the cost of constructing the road and is widely regarded as the highest area of risk for the private sector, as it is intimately tied to the revenue. Insufficient traffic levels pose a substantial risk to the private sector.

Preconstruction risks include acquisition of right-of-way, maintaining environmental compliance, and other requirements that must be addressed prior to construction that often cause project overruns or delays. Right-of-way acquisition is usually a risk borne by the public sector, whereas the scheduling and environmental permitting, compliance and agency coordination is typically a responsibility borne by the private sector. During the construction phase, the private sector can bear more risk than the public, as unpredictable occurrences, such as poor weather or unforeseen subsurface geologic issues could arise, causing costly project delays. The public sector is not as much at risk during this phase because it only controls aspects of the project that involve specific activities under its control, such as connecting roads or interchanges.

Risks that both the public and private sectors share include force majeure and political changes. Force majeure is an event that involves risks beyond the private and public sector's control. Environmental hazards, floods, earthquakes, landslides, or a war that inhibits a facility from generating earnings is considered force majeure. Typically it is the private sector that takes the responsibility and risk for these events; however, during these events if the private sector cannot recoup revenue to pay on its investment (the facility), the public sector may cover the risk. Political changes involve actions that the government takes that can adversely affect the built facility's anticipated earnings, posing a risk to both sectors (Fishbein & Babbar, 1999).

Overall, the private sector assumes substantial risks in designing, building and operating a road and is expected to be able to manage these risks better than the public sector. "The placing of risk appropriately is likely to provide better value for money. The fact that the procurement process for each scheme was highly competitive gives assurance that the terms obtained were the best obtainable from the market for deals of this type." (Highways Agency: About DBFOs, n.d.).

4.4.2 Financial Issues

Investment banks require a projected annual revenue/expense ratio of 1.25 to 1.30 to consider a project as viable and for it to earn a AAA bond rating. Weaker bond ratings force up the lending interest rate, while tax-exempt bonds attract favorable lower rates. To hedge against low revenue in the early years, bond companies often require a reserve fund of 20–25% of the bond amount. Guaranteeing to cover bond payments or expenses can reduce the amount borrowed. For example, TxDOT will cover maintenance costs for SH 130 of approximately \$800 million over 35 years.

Borrowing is initially more expensive to the public sector than traditional financing because of administrative and legal costs coupled with debt issue costs and interest payments, as well as the profit margin required by investors. Moreover, if the contractors are aware of the revenue estimates for the project, they may bid up to that level. The public sector must have a competitive bidding process and must establish a set of tools for evaluating bids. Evaluation must include both technical and financial aspects of bids and a way to compare the value of each.

4.4.3 Public Funding Support

There is a wide range of options available for government support of private investment in roads, with varying degrees of risk exposure and ability to attract financing (Figure 4.2). Four of these options appear to be the most beneficial, by balancing the government exposure with the private sector's desire to make a reasonable return on its investment. These options are grants, subordinated loans, revenue guarantees, and shadow tolling.

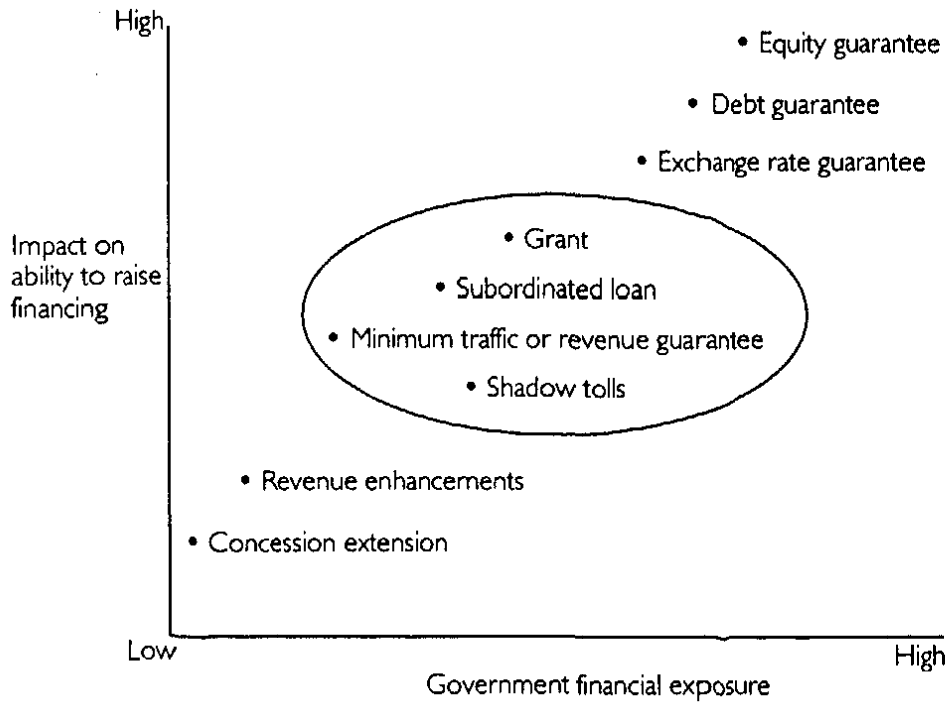


Figure 4.2: Range of Options for Government Support

(Source: Fishbein & Babbar, 1999)

4.5 Shadow Tolling

Shadow tolling originated in Europe and was championed by the World Bank in the 1970s and 1980s (Shaoul et al., 2005). It has allowed transportation infrastructure to be privately financed through the promise of public funds (Haynes & Roden, 1999). The British government has used shadow tolling as a way to stimulate investment and create new public infrastructure. The United States has also begun to use this method. Pass-Through Tolling used in Texas is a slightly modified form of shadow tolling.

Britain was one of the first countries to use private finance for its infrastructure needs (Shaoul et al., 2005). Initially, nearly all early private finance projects for roads in Britain were for the construction of tunnels and bridges. However, with time the government wanted private financing to be extended to roadway improvements and maintenance. Hence, it drew up proposals to include roadway improvement and

maintenance under its existing Private Finance Initiative (PFI) policy, so it could invite the private sector “to extend or enhance a road to the government’s requirements, operate and maintain both it and a further stretch of road for 30 years” (Shaoul et al., 2005). The time period of 30 years was specifically chosen because debt finance typically has a repayment period of at least 20 years, and to ensure a return to equity investors the project’s repayment timeframe was specified accordingly (Shaoul et al., 2005).

The first projects to be undertaken in Britain as Design Build Finance and Operate (DBFO) included (Journal of Transport Economics and Policy, 2001):

- Widening of a road near Leeds (estimated capital value: £214 million);
- Widening of a road between Alconbury/Peterborough (estimated capital value: £128 million);
- Improvements to a road between Swindon and Gloucester (estimated capital value: £ 9.4 million)
- Improvements to a road between Carlisle and Newcastle-Upon-Thyne (estimated capital value: £9.4 million)

Eleven DBFO contracts have been signed in the UK, of which the first eight are complete and were paid for primarily with the shadow toll mechanism, based on the number of vehicles using the facility after it was completed (Highways Agency, About DBFOs, n.d.).

4.5.1 UK government policy

The first shadow toll scheme to be executed in the UK was in 1997. The government originally wanted to introduce direct tolls to the public but opted not to, as its financial advisors and the private sector warned that direct toll user charges could jeopardize the policy of road privatization entirely if there was public opposition. For that reason, the government devised a scheme that would offer a “workable method of acclimatizing the private sector to the concept of payment per vehicle as a precursor to the introduction of user paid toll roads” referred to as shadow tolling (Highways Agency, 1997).

The government’s intent was that shadow tolling would only be a transitional approach to direct tolling and would ultimately move the private sector into privately financing roads. The government therefore “included clauses in the contracts that would enable direct tolls to be paid by road users to the government,” according to a report published by the National Audit Office (NAO) in 1998 (Shaoul et al., 2005). Thus, the provider was compensated “directly from the contracting public sector entity, not the user, in the form of a fixed fee per vehicle (shadow tolls), which was monitored at various points on the road” (Debande, 2001).

As a result, “the contracting public sector entity paid directly for the use road services” (Debande, 2001) with public funds, without making it seem like it is paying for the road use service. The government justified this method of privatized road financing for two reasons: it is a way of providing investments that the government cannot afford; and this method of financing provides value for money, and enables the partnering local governmental entity to transfer the majority of risks (Shaoul et al., 2005).

The British government maintained that the use of shadow tolls would be a more economically feasible approach overall than traditional road financing and could also promote more investment from the private sector. In addition to acting as a stimulator in

private investment, it could also facilitate “greater private sector efficiency and innovation” (Shaoul et al., 2005). However, some experts like Walker and Con Walker argue that the DBFO mechanisms that facilitate shadow tolling “constitute government-licensed monopolies with powers akin to taxation, and as such an alienation of revenue streams from the public to the private sector” (Shaoul et al., 2005).

4.5.2 Calculating Reimbursement

The following tables and figure illustrate the operation of the shadow toll mechanism. The hypothetical road in this example is a 100 km length of road with no differentiation in the shadow toll rates between heavy goods vehicles and other vehicles. It uses three scenarios to project future traffic growth (Table 4.3). Using the four shadow toll bands bid by the DBFO Company (Figure 4.3) produces different estimates of shadow toll payments for a future year (Table 4.4) (Haynes & Roden, 1999).

Table 4.3: Scenarios to Project Future Traffic Growth

	Low Growth	Best Estimate	High Growth
(A) Annual average daily traffic	8,000	12,000	20,000
(B) Road length (km)	100	100	100
(C) Total average daily vehicle kilometers (A x B)	800,000	1.2 million	2 million
(D) Total annual vehicle kilometers (C x 365)	292 million	438 million	730 million

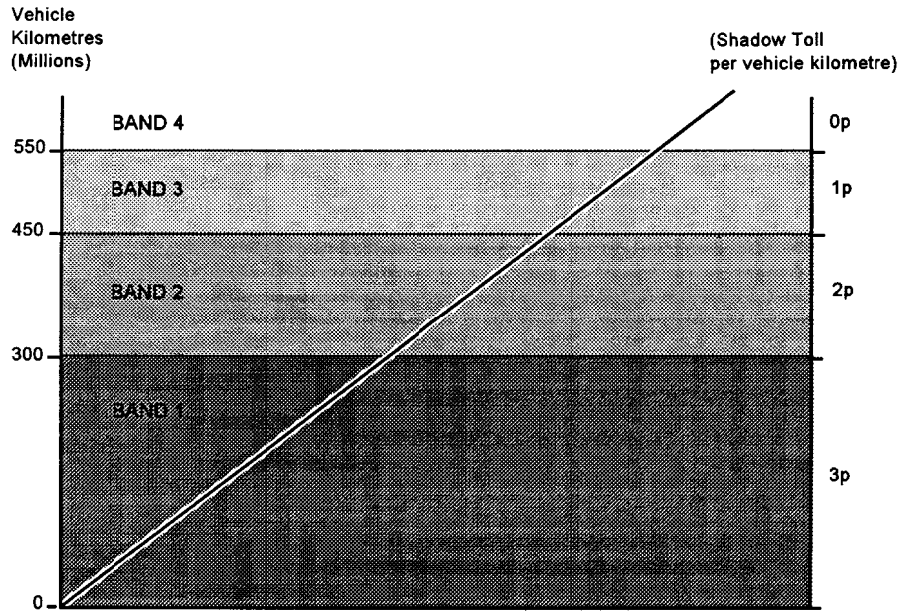


Figure 4.3: Typical Banding Structure Proposed by Bidders

Table 4.4: Annual Traffic Flow and Shadow Toll Payments Under the Three Traffic Growth Scenarios

Traffic Band	Band Size	Shadow Toll	Low Growth		Best Estimate		High Growth	
			Vkm	£m	Vkm	£m	Vkm	£m
Band 4	Over 550	0p	0	0	0	0	180	0
Band 3	450-550	1p	0	0	0	0	100	1.00
Band 2	300-450	2p	0	0	138	2.76	150	3.00
Band 1	0-300	3p	292	8.76	300	9.00	300	9.00
Total Annual Traffic (millions of vehicle kilometers)			292		438		730	
Total Annual Payments (£ millions)				8.76		11.76		13.00

(Source: Haynes & Roden, 1999, pp. 46-47).

4.6 Pass-Through Tolling in Texas

Pass-Through Toll Agreements (PTA) are the Texas version of shadow tolling. Even though relatively new, PTAs have been very popular since the first agreement was authorized in 2005. In fact, between August 2005 and October 2007, thirteen contracts were executed.

4.6.1 Growth Trends

Similar to the rest of the United States, the state of Texas has experienced substantial population changes and growth over the past 40 years (Table 4.5).

Table 4.5: National Growth and Texas Growth Changes from 1970 to 2000

Year	Nation		Texas	
	Population	% change	Population	% change
1970	203,302,031	13.4	11,196,730	16.9
1980	226,542,199	11.4	14,229,191	27.1
1990	248,790,873	9.8	16,986,510	19.4
2000	281,421,906	13.1	20,851,820	22.8

Source: U.S. Census Bureau

During the past 25 years, the population of Texas increased by 57% and road use in Texas grew by an astounding 95%. State road capacity however, only grew by 8%. Moreover, demographers estimate that over the next 25 years in Texas (TxDOT, Keep Texas Moving: Why We are Doing It):

- Population will increase an estimated 64%
- Road use will grow an estimated 214%
- Without new funding methods, state road capacity will only grow 6%.

Texas government has struggled to keep pace with growing demand for infrastructure as well as maintenance and rehabilitation of the existing system.

4.6.2 Legislative Measures

In light of the inadequacy of the gas tax in meeting the needs of Texas road financing, alternative financing options were authorized during the past two legislative

sessions. House Bill 3588 from the 78th legislature permitted TxDOT to enter into an agreement with a public or private entity to utilize Pass-Through Toll Agreements as a mechanism to reimburse local jurisdictions or private entities “on a per-vehicle or per-vehicle mile basis for the principal costs expended to construct transportation facilities.” Moreover, the legislation allows for the department to use the revenue generated from the PTA facilities for reimbursement of construction, maintenance or operation cost paid upfront by the developer. The reimbursement rate must be negotiated during the agreement and may decrease or be capped for higher traffic volumes.

- The enactment of HB 2702 from the 79th Legislature saw House Bill 2702 make refinements to provisions of HB 3588, with the following amendments:
- Private entities to reimburse TxDOT for development and construction of a highway project under a PTA. This provision allows TxDOT to assist counties and other local entities that do not have adequate experience in road construction or need to finance the project over a period of time.
- TxDOT to delegate oversight authority and development of PTA projects to a municipality, county Regional Mobility Authority (RMA) or Regional Toll Authority (RTA).

4.6.3 Open for Business

Pass-Through Financing “benefits local entities the most, as it provides a way for local governments to accelerate needed transportation projects within their area on the state highway system, that would have otherwise taken many years to complete using traditional funds from the state program” (TxDOT: Open for Business, 2007). With Pass-Through Financing, a project developer pays for the upfront costs of the project and then gets reimbursed for a negotiated amount of upfront construction costs once the facility is open to the public for use; the reimbursement rate is fixed (e.g., 0.10 cents per vehicle mile traveled) based on the number of vehicles that utilize the facility and payments are made to the developer each year for an agreed time period.

In Texas, Pass-Through Toll Financing offers a number of benefits to both users and the state. Projects can be financed using private funds or a combination of public and private capital. Payments are based on the use of the facility, and there is an incentive for developers and investors to conceive projects which will generate sufficient revenue to cover their investments. Additionally, use-based fees are implemented without charging drivers or affecting roadway demand. For the state, additional incentives to choose worthwhile projects are built into the selection process. Risk is shared between the contractor/operator and the state. Because the contractor assumes the initial traffic risk, the state can more effectively calculate its total project cost in advance (Texas Department of Transportation, TxDOT's Strategic Plan 2007-2011).

4.6.4 Funding for PTAs

In Texas, PTA funding is derived from the Strategic Texas Mobility Fund. State Sen. Steve Ogden authored the legislation that created Proposition 14, which was approved by voters in 2003 enabling TxDOT to issue \$3 billion of bonds to establish the Texas Mobility fund. Texas Mobility Fund debt is backed by the state’s general obligation pledge, as well as revenue from the state fuel tax and other fees.

PTAs have been an exceptionally popular financing tool, with many counties and cities across Texas petitioning the TxDOT Commission for such projects. Between August 2005 and October 2007, 13 PTAs had been executed by TxDOT, in partnerships with 10 different counties, 2 cities and 1 private developer. TxDOT commitments in PTAs passed between August 2005 and October 2007 have a maximum capped amount of about \$1.16 billion based on the high traffic scenarios, with the annual amounts depending on the traffic attracted by each facility (Table 4.6). **Note:** the lower traffic scenarios result in payments being stretched out over a longer period, while the higher traffic scenarios result in higher payouts initially followed by lower amounts in the out years.

Table 4.6: Summary of Annual TxDOT PTA Commitment Amounts (13 Agreements)

Repayment Year*	Lower Traffic Scenario	Higher Traffic Scenario
2008	\$ 22,427,235.00	\$ 39,553,652.00
2009	\$ 43,816,787.00	\$ 77,478,339.00
2010	\$ 76,163,054.00	\$ 127,037,739.00
2011	\$ 76,163,054.00	\$ 127,037,739.00
2012	\$ 76,163,054.00	\$ 127,037,739.00
2013	\$ 76,163,054.00	\$ 123,037,739.00
2014	\$ 76,163,054.00	\$ 111,532,219.00
2015	\$ 73,496,387.00	\$ 111,532,219.00
2016	\$ 70,829,720.00	\$ 111,532,219.00
2017	\$ 70,829,720.00	\$ 111,532,219.00
2018	\$ 70,829,720.00	\$ 71,978,567.00
2019	\$ 67,076,960.00	\$ 37,407,367.00
2020	\$ 67,076,960.00	\$ 24,542,167.00
2021	\$ 67,076,960.00	\$ 17,500,000.00
2022	\$ 67,076,960.00	\$ 17,500,000.00
2023	\$ 63,580,725.00	\$ 17,500,000.00
2024	\$ 63,580,725.00	\$ 17,500,000.00
2025	\$ 47,799,100.00	\$ 17,500,000.00
2026	\$ 47,799,100.00	\$ 17,500,000.00
2027	\$ 47,799,100.00	\$ 17,500,000.00
2028	\$ 31,771,000.00	
2029	\$ 22,082,500.00	

**Assuming a project completion date 3 years from execution of agreement.
(Source: 13 TxDOT PTA contracts)*

However, funding for the PTA program has been exhausted and additional PTAs are on hold, with future resources contingent upon commission action (E. Hilton,

personal communication, July 1, 2008). Future funds will have come from bonds which must either have a revenue stream for repayment, or backing from state general revenue.

4.6.5 PTA Criteria

According to the Texas Administrative Code, Title 43 Chapter 5 Subsection E, a project is potentially eligible for PTA funding if it meets the following criteria (TxDOT: Application Guidelines for Pass-Through Financing of Highway Projects, 2008):

- (1) financial benefits to the state;
- (2) local public support for the project;
- (3) for a highway project, whether the project is in the department's Unified Transportation Program;
- (4) the extent to which the project will relieve congestion on the state highway system;
- (5) potential benefits to regional air quality that may be derived from the project;
- (6) the compatibility of the proposed project with existing and planned transportation facilities;
- (7) the entity's experience in developing highway projects, if the proposer is a public entity and if the proposal is for the development of a highway project by that entity;
- (8) the entity's experience in developing railway projects, if the proposer is a public entity and if the proposal is for the development of a railway project by that entity;
- (9) the qualifications of the proposer to accomplish the proposed work, if the proposer is a private entity and if the proposal is for the development of a project by that entity;
- (10) the financial capability of the proposer to make all projected pass-through payments, if the proposal is for the development of a project by the department; and
- (11) whether the entity has or intends to designate a contiguous geographic area in the jurisdiction of the entity as a transportation reinvestment zone under Transportation Code, Chapter 222, Subchapter E, if the proposer is a public entity.

These criteria do not address the technical aspects of the project nor its benefits in comparison to cost. Potentially, any project can qualify if it is on the Unified Transportation Plan (UTP) and public support can be demonstrated. It is not specified that the project should be or will become part of the state highway system. The flexibility of the criteria has allowed a variety of projects to qualify for PTA funding.

4.7 Chapter Summary

In this chapter, requirements for agreements between TxDOT, local entities, and the private sector were presented. Benefit assessment, planning tools, and risk sharing were discussed. Examples of partnerships were discussed in detail, focusing on balancing the government exposure with the private sector's desire to make a reasonable return on its investment. Shadow tolling was seen to be a balanced choice. Experience with shadow tolling in Britain and Texas was reviewed.

Chapter 5. Texas Case Studies

5.1 Chapter Introduction

This chapter presents recent TxDOT experience in using innovative financing in rural and small urban areas. The information was derived through a questionnaire, interviews and in-depth discussions with 23 TxDOT districts and local governments. The interview questionnaire is shown in Appendix A. Each case study follows the general format of the questionnaire, and additional details are provided in Appendix D.

5.1.1 Jefferson County, Port Arthur, FM 365

Status: Pass-through Toll Agreement failed.

Project Characteristics:

Control-Section-Job (CSJ) 0932-01-101: Widen FM 365, a road located within an area of high commercial development identified as a major economic stimulator for the city.

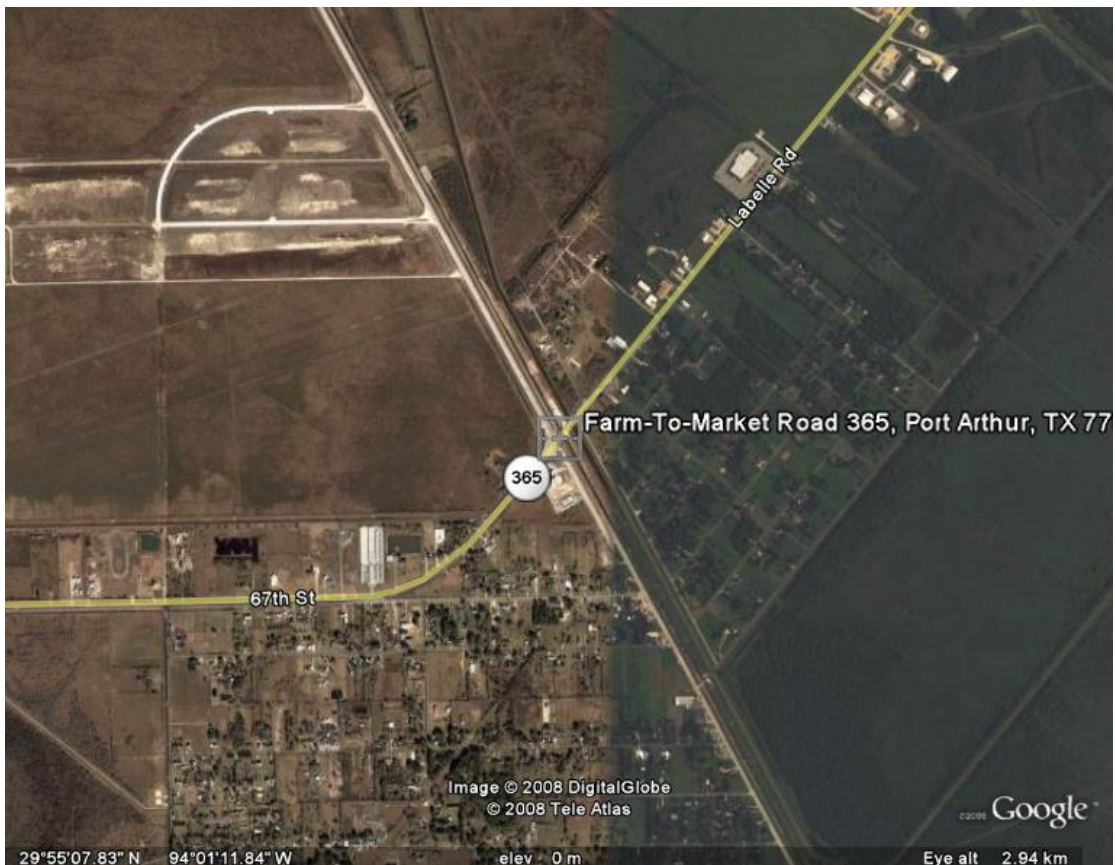


Figure 5.1: FM 365 Project Location

Partners: City of Port Arthur and the TxDOT Beaumont District

According to the Beaumont District's Transportation Planning and Development Director, the city had identified this project as a major way to facilitate economic development in an area. PTA negotiations were initiated, but failed in the final stages. It is unclear whether the failure was due to the tensions between the partners or if it was the damages to the local economy from the devastation of Hurricane Rita. Regardless of what went wrong during the process, TxDOT is still trying to move this project forward through traditional financing mechanisms (P. Lujan, personal communication, 2008).

Benefits: Will help facilitate economic development in the area.

Financing Tool: PTA sought. Future economic benefits not considered as repayment mechanism.

Lessons Learned:

- Miscommunication can be detrimental to a working relationship
 - Incomplete disclosure of expectations between the partners created tension during the final stages of the project and ultimately the city withdrew from the project.
- Full disclosure on all details is essential
 - According to interviews conducted with TxDOT staff, the city did not understand that in PTAs TxDOT does not reimburse interest, only some or all of the principal amount invested.
- Don't ask for too much
 - The city was requesting to be reimbursed for everything they put in and it was just too much risk for TxDOT to cover all costs.

5.1.2 Montgomery County, FM 1488

Status: Agreement executed

Project Characteristics:

CSJ: 1417-01-026. The first authorized PTA in Texas was executed by the Houston District to widen FM 1488 between FM 2978 and Texas 242 located in Montgomery County, improvements to FM 1484, FM 1485, FM 1488, and FM 1314, and constructing and potentially operating direct connectors from SH 242 to I-45.

Partners: Montgomery County and the TxDOT Houston District

Formally referred to as the Montgomery County Transportation Program, the five major road construction projects to take place in Montgomery County were approved by the citizens of Montgomery County for road construction projects. The election, held in

September of 2005, established \$160 million dollars of bond money for road construction projects, of which \$100 million was dedicated specifically for PTAs (W. Nauman, personal communication, 2008).

According to the contract, the Department has committed to a total contribution of \$33,080,000 for the cost of the projects and the Developer will contribute \$186,323,000. Funds to the Developer are comprised of Category 1 (Rehabilitation) and Category 11 funds (District Discretionary); the Department will only reimburse the Developer for construction expenditures associated with the construction costs made for the highway improvement (W. Nauman, personal communication, 2008).

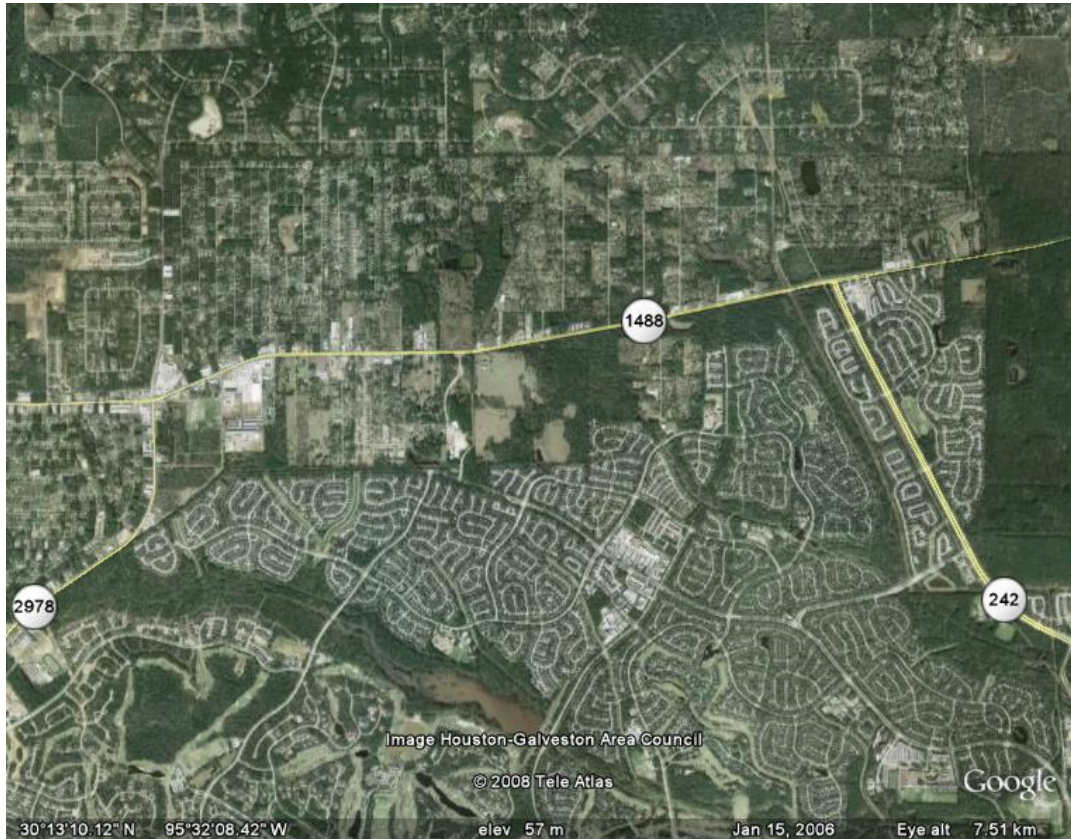


Figure 5.2: FM 1488 Project Location

Benefits: Time frame identified for the project is approximately 4 years, roughly half the timetable of what it would have taken TxDOT to complete alone using traditional funding. Ensuring that the project meets its aggressive schedule was the MCTP program manager of the Houston based firm Pate Engineers, who believes that the project could only be moved along by setting aggressive schedules.

Risks: There is some doubt that the schedule for the project can be met, as it was described in 2005 by the Precinct 2 Commissioner, Craig Doyal as “very optimistic.” Commissioner Doyle reported that “it takes time to get the pieces in place and make progress” and “it is [was] taking more time than any of us had hoped it would.” Not only is there doubt that the project will be completed on schedule, but TxDOT expressed

concerns about the County's ability to develop and construct all three highway improvements within the estimated budget. Some phases of development, such as archeological testing, cannot be avoided and take an extensive amount of time. The longer the project takes to get to construction, the more expensive it is likely to be. In essence, the longer the project takes to develop and construct, the more the project will cost the County since the reimbursement amount from TxDOT is fixed according to the agreement.

Financing Tool: PTA plus city bond money to be repaid through existing tax structure.

Lessons Learned:

- Scheduling
 - Hold meetings early on in the course of action for discussion of interim submittal of items (that weren't specifically covered in the agreement)
 - Monthly project meetings should be ongoing throughout the entire process to allow for the project team to discuss the status, resolve conflicts, and create needed action items for the project (W. Nauman, personal communication, 2008).
- Working relationship
 - TxDOT District office and the Administration staff worked cooperatively with the County to determine roles and responsibilities and negotiate favorable terms.
- Develop reasonable cost estimates
 - It is important to develop reasonable cost estimates for the project in which all parties are comfortable.
- Terms and conditions must be spelled out in the agreement
 - Reimbursement amounts
 - Roles and responsibilities of each entity should be defined as part of the process
 - It is also necessary for all entities to understand what laws and regulations must be followed in order to develop this project as a pass-through project and the associated effects on the timeline and cost of the project.

5.1.3 Weatherford, FM 51/SH 171

Status: PTA executed

Project Characteristics:

Widen FM 51/SH 171 from Interstate Highway 20 south to Causble Road and add eastbound frontage road on Interstate 20 between FM 51/SH 171 and FM 2552.

Partners:

- City of Weatherford and the TxDOT Fort Worth District

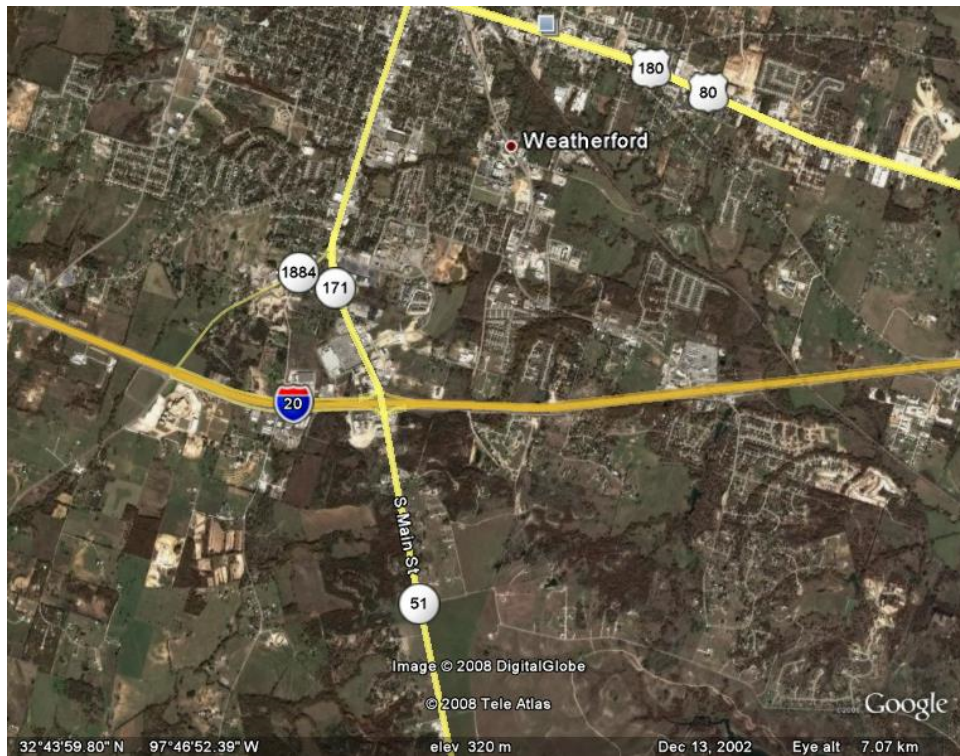


Figure 5.3: FM 51/SH 171 Project Location

Benefits: According to J. Cordary of TxDOT, the partners involved anticipated economic activity that would be stimulated by the project’s added capacity in an area that was developing primarily as commercial/retail. Furthermore, he indicated that due to these foreseen economic benefits, that the department did not officially conduct any cost benefit analysis for their identified revenue stream; that would be more on the city’s side of the equation (J. Cordary, personal communication, 2008).

Risks: With regard to risks, TxDOT was mainly concerned that there would be some difficulty in the construction of this project since the city had never done a TxDOT project before. Surely there would be a learning curve associated with its first time in the process, especially with the construction phase of the project. Trying to make the city understand what all will be involved and what needs to be done (e.g. intense agency coordination for environmental, cultural and historical areas) to complete the construction phase was difficult due to the city’s lack of TxDOT project experience.

Financing Tool: The total amount that TxDOT will pay for this project is \$52,443,517. The city is up-fronting \$1,970,404 derived from certificate of obligation bonds, which Terry Hughes of the city of Weatherford claims were a good fit for this project because “it [the project] was needed” (T. Hughes, personal communication, 2008) and was available at the time (J. Cordary, personal communication, 2008).

Lessons Learned:

- Have a very good educational component in developing this process
 - A good educational component would enable the developer (the city in this case) to gain knowledge about the transportation development process. If the city had been better educated about TxDOT’s processes, it would have been more aware of and realistic about the timeframes with regard to preliminary design, project management for PTAs, and have a general understanding of what is involved, especially with the environmental constraints, rules and regulations.
- Ensure that people coming into this process gain a full understanding of it.
 - There are a lot of elements tied to the construction of the project that have impacts on its timeframe. People certainly need to understand this process thoroughly, especially the political constraints and the local government ties (J. Cordary, personal communication, 2008).

5.1.4 Titus County, US 271, FM 2348 and FM 1000

Status: PTA executed

Project Characteristics:

CSJ: 0221-05-080; 2240-01-013; and 1226-01-013: The scope of work consists of constructing the following three (3) new Highway Improvements: US 271 (West Loop) from FM 3417 to US 67, FM 1000 (East Loop) from US 271 (new) to FM 1735, and FM 2348 (East Loop) from US 67 to SH 49.

Partners:

- Titus County and the TxDOT Atlanta District

Benefits: The project will result in greater mobility for local and regional travelers, increased efficiency and safety for the movement of people and goods throughout the region, enhanced economic opportunities, and will aid in the preservation of the state, county, and local roadway system. Essentially, the project will provide a loop system that moves industrial truck-traffic and through-traffic away from the city center and moves local traffic on city streets and county roads for a more efficient use of existing and proposed facilities.

Utilizing the pass-through toll funding program and pulling system projects forward by 15 years or more may save over \$90 million in project inflation which also benefits both the County and TxDOT. Titus County expects to have new east and west loops constructed around Mt. Pleasant much sooner than could have been realized through conventional funding methods. Investment in the transportation infrastructure yields

economic benefits to an area and although the county bears much of the project risk, they believe the project benefits outweigh the assumed risk (D. Simmons, personal communication, 2008).

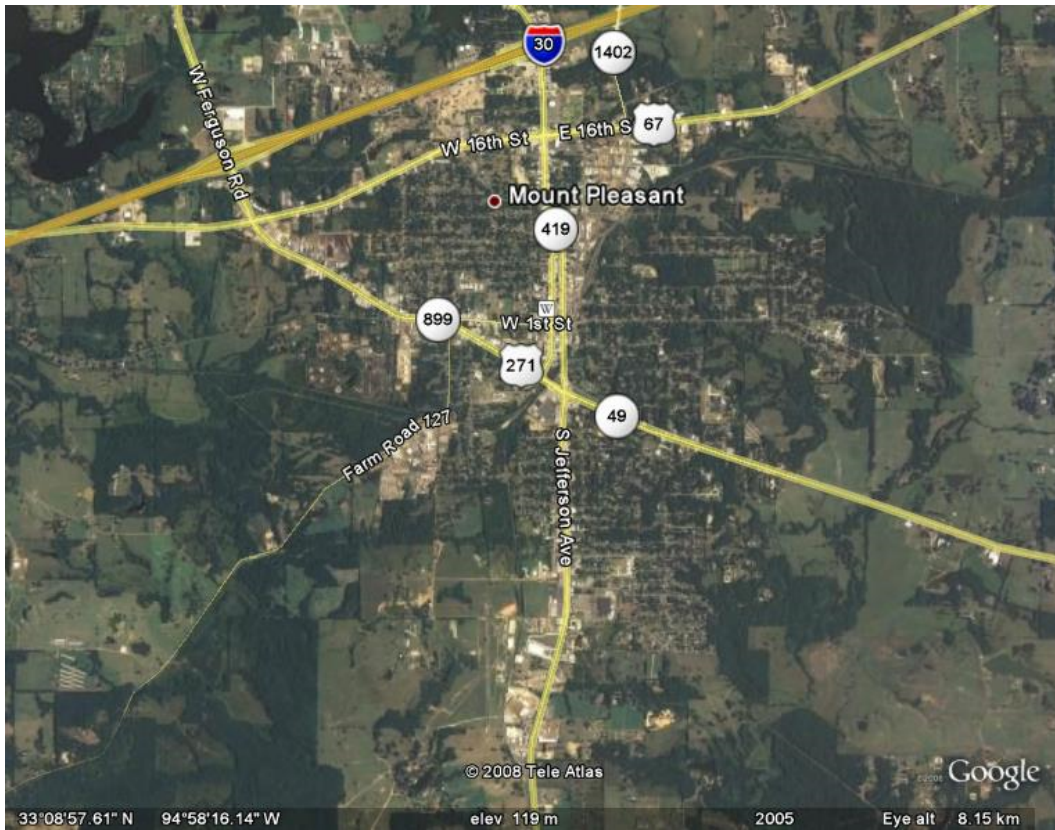


Figure 5.4: US 271 Project Location

Table 5.1: Estimated Construction Costs For US 271 Project

Project	Construction Cost
US 271	\$93.2 million
FM 2348	\$11 million
FM 1000	\$12.5 million
Total	\$116.7 million

With traditional financing, these facilities simply could not be constructed for at least 15 years. Titus County realized the importance of building these needed roadways sooner rather than later and had the support of the local citizens (evident by a bond initiative which passed by a 65% margin) to pay for the project costs up front as part of the pass-through toll funding process (D. Simmons, personal communication, 2008).

Risks: The inherent risk in this pass-through project is the ability for plan development, environmental clearance, ROW purchase, and construction to be completed within the estimated project budget.

Financing Tool: The development and construction of this project will be funded by a combination of Pass-Through, state, county, city, and local investor funds. According to the Pass-Through Toll Funding Agreement between Titus County and TxDOT, the County will pay for the development and construction of the project and TxDOT will reimburse the County a maximum of \$168,620,000 out of Category 12 (Strategic Priority) for the development and construction of this project. TxDOT will also contribute an additional \$13.3 million (\$2,402,577 of Congressional High Priority Corridor/Category 10 funds and \$10,897,423 of District Discretionary/Category 11 funds) (D. Simmons, personal communication, 2008).

A Conceptual Toll Feasibility Analysis was developed for the US 271 Relief Route and Pass-Through tolling analyses were developed for both FM 1000 and FM 2348. In addition, Value Engineering Studies were conducted by TxDOT in 2000 and by Titus County in 2007. These tools reflected that these highway improvements would not be likely candidates for toll projects (with bonding). The Conceptual Toll Feasibility Analysis for US 271 found that tolling the project using ETC generates enough revenue to pay for operation for the entire 40 year period, but does not pay for combined operation and maintenance costs until the 21st (no frontage roads) or 31st year (discontinuous frontage roads). The negative net revenue indicates that funding the project through bonds may not be possible. Therefore, \$122.3 M (discontinuous frontage roads) or \$104.7 M (no frontage roads) of supplemental funding would be required to construct the project. For both the FM 1000 and FM 2348, the Pass-through Tolling Analyses showed that although these projects have good potential for net revenue after operations without bonding as tolled facilities, they both have low feasibility for bonding. The results indicated the simple repayment mechanism (pass-through tolling) without maintenance, represents the least total financial cost and initial cost outlay to TxDOT:

- FM 1000 - \$14.6 million in 2004 dollars (\$37.57 million with long-term maintenance included in the calculation)
- FM 2328 - \$9.83 million in 2004 dollars (\$21.12 million with long-term maintenance included in the calculation) (D. Simmons, personal communication, 2008)

All three projects are currently in the schematic development phase and have not yet been finalized. Changes to the design are still being considered, leaving the final cost estimate somewhat uncertain. There are still major phases to be completed (i.e. environmental clearance, right of way purchase), each of which entail some risk for the county. The longer the project takes to get to construction, the more it will cost (D. Simmons, personal communication, 2008).

Lessons Learned:

- No lessons provided. There is concern about the cost estimate.

5.1.5 Grayson County, SH 289

Status: PTA executed.

Project Characteristics:

CSJ: 0091-01-037: Improvements to SH 289 from SH 56 to FM 120 in Grayson County and provide north south access to relieve congestion on US 75.

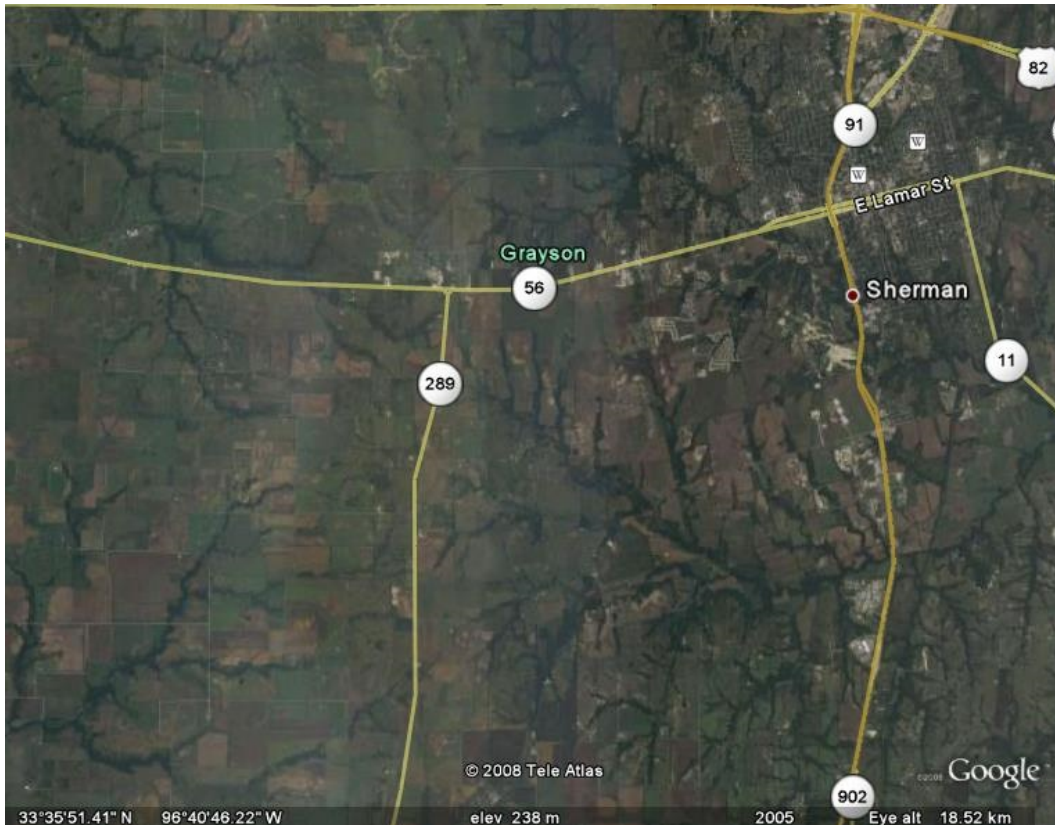


Figure 5.5: SH 289 Project Location

Partners:

- Grayson County and TxDOT Paris District.

Risks: The department did not know of any risks associated with the project, except that waiting for conventional funding would have placed this project in the year 2017 or even later.

Benefits: Allowing a local entity to finance the project and build it now will provide much needed relief to US 75, and in effect lower road user costs since it is cheaper to build the facility now, rather than in the future when construction prices are much higher (K. Harris, personal communication, 2008). Furthermore, the relief of congestion on US 75 would also increase the life of pavement, reducing maintenance costs and saving money for the citizens. This applies to US 82 and SH 56 that this proposed road crosses.

A comparison of future construction cost to today's cost also showed that this project was a good candidate for upfront financing (K. Harris, personal communication, 2008).

Financing Tool: Local upfront funding was \$42.5 M for construction. Maximum TxDOT PTA payment is \$84,506,000.

Lessons Learned:

- None provided. The researchers noted that no economic analysis was performed.

5.1.6 Hays County, San Marcos, FM 3407

Status: PTA executed

Project Characteristics:

CSJ: 2104-02-023: This project consists of the extension and widening of FM 3407 from its intersection at FM 2439 westward to intersect with RM 12.

Partners: City of San Marcos and the TxDOT Austin District

Benefits: None indicated except an improved transportation system

Risks: Standard issues that go along with any project arose for FM 3407. Some archeological issues where bones were found and there were some floodplain issues, but these were all resolved and the district did not provide any other known risks.

Financing Tool: For the FM 3407 project, the cost is about 43 million dollars. For the FM 110 project, the cost is estimated at 14.7 million dollars (no work has been started yet). Funding for the FM 110 project depends on a bond election in November 2008, but there was not any information available for the source of funds for FM 3407 (P. Crews-Weight, personal communication, 2008). Neither project had a formal cost benefit analysis conducted.

Initially there was some opposition to the PTA, and so the projects were put on hold after the new Commissioners Court took office. The projects were then put to a vote and the bond election did not pass. Rather than losing all of the projects, the County then renegotiated the Agreement to include other projects in lieu of RM 12. FM 110 remained an active project under the agreement. Ms. Crews-Weight of TxDOT was uncertain if there was any opposition to FM 110.

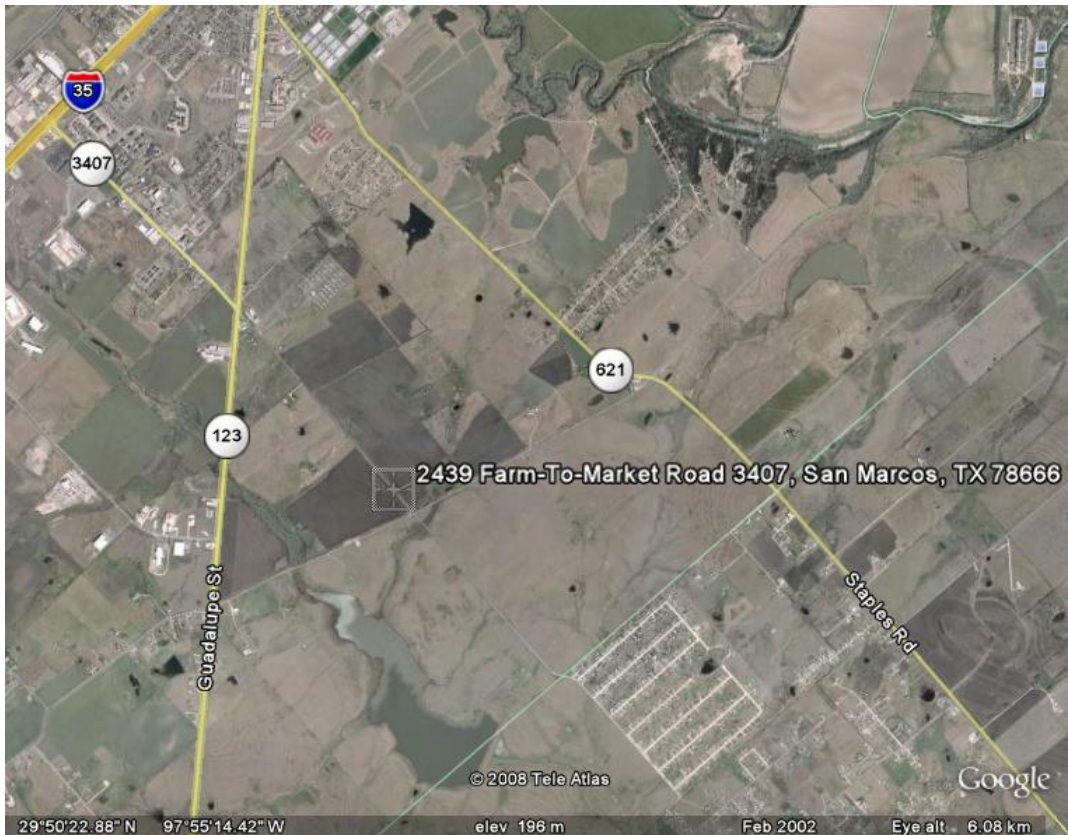


Figure 5.6: FM 3407 Project Location

The County's funding for FM 110 is dependent on the vote in November 2008. As of June 2008, there has not been any work started on the FM 110 except for the public involvement stages-so the Department did not have any concerns for this project yet and indicated that it won't have or know of any until the work starts. However, there is some concern for FM 3407, that all Federal and State rules and requirements are met for environmental, design and construction for this on-system roadway (P. Crews-Weight, personal communication, 2008).

Lessons Learned:

- Language in the agreement needs to be more specific
 - There needed to be more details in the agreement.
- Time frames in the agreement don't seem realistic
 - These timeframes have created a hardship for many TxDOT people who have to drop everything to try and meet the deadlines, accommodate review and coordination with agencies (P. Crews-Weight, personal communication, 2008).

5.1.7 Comal & Bexar Counties, San Antonio, FM 3487 & 2696, and SH 46

Project Characteristics:

FM 3487 and FM 2696 (CSJ: 2104-02-023), FM 3487 (Culebra Road), FM 2696 (Blanco Road), and SH 46 (CSJs: 0215-02-029; 0215-01-036;0215-02-046;0215-02-048; 0215-07-017; 0215-01-038): FM 3487 (Culebra Road) from IH 410 to FM 471, generally exists as a four lane roadway. Proposed improvements to this 3.23 mile segment would upgrade the roadway to a six lane section with a bicycle lane in each direction, maintaining the continuous, two-way left turn lane and storm drain system curbs and sidewalks within the existing right of way.

FM 2696 (Blanco Road) from Glade Crossing to West Oak Estates: “FM 2696 (Blanco Road) is situated between Glade Crossing and West Oak Estates. It currently exists as a two-lane road and the proposed improvements include upgrading this 4.22 segment of the roadway into a four lane divided section with bicycle lanes and sidewalks” (Pass-Through Toll Agreement).

Improvements on SH 46 from 0.25 miles west of Range Road to Kerlick Lane and expansion of 2 lanes to 6 lanes with a raised median.

Partners:

- Bexar County and the TxDOT San Antonio District (for the FM 3487 and FM 2696 projects)
- Comal County and the TxDOT San Antonio District (SH 46 project)

Benefits: None indicated except an improved transportation system

Risks: There was some risk for the department in trying to get the county to fully understand the plans that were designed by TxDOT. Since the county did not design the facility, it was a challenge for the design team to make sure that the county was familiar with the TxDOT design standards (J. Castiglione, personal communication, 2008). Ms. Castiglione of TxDOT also mentioned that inflation, politics, and details that will arise during the plans, specifications, and estimate (PS & E) phase still leave partners at risk.

Financing Tool: Culebra and Blanco Roads are both funded by Category 12 (Commission Discretion) funds with local participation from Bexar County. Bexar County is using a revenue stream that it gets through an Advanced Transportation District fund from a quarter cent sales tax (J. Castiglione, personal communication, 2008).

Current and future traffic counts on the road ways were conducted for these projects as a way to help project its feasibility, along with projected growth for the area in relation to the proposed roadway. The estimated construction cost for the SH 46 project is around \$62.9 million paid for using Category 4 and Category 12 funds.

Lessons Learned:

- Have a very good understanding of what your estimates are for the projects when going into the PTA process
 - It is really hard to get a good estimate when you sign the agreement because, at that time, there are still many unknowns (J. Castiglione, personal communication, 2008).
- The further along in the project development process, the more accurate the cost estimate can be
 - The later in the project development process that the PTA is signed, the more accurate the estimate will be, for many reasons including the ability to capture the effect of inflation because generally over time, prices go up, gas prices increase, etc (J. Castiglione, personal communication, 2008)
- The PTA application can take a long time to put together
 - For the verbiage to be specific, the developer's lawyers can take a lot of time to ensure that everything is clear. When this happens, the time spent on the agreement adds to the process completion time.

5.1.8 Galveston County, FM 646

Status: PTA executed

Project Characteristics:

CSJ: 3049-01-013 & 0978-01-024: Reconstruction of FM 646 from 2 lane to 4 lane divided (approximately 5.119 mi.) from FM 1764 to FM 517 and from I-45 to FM 517.

Partners: Galveston County and the TxDOT Houston District

Benefits: None indicated except an improved transportation system

Risks: The partners indicated to me that they did not know of any risks to them with this project and both felt it was a pretty simple, smooth process.

Financing Tool: According to the contract, the total cost of the project is \$53,000,000; the Department will contribute \$4,500,000 and the county participation is \$48,500,000. Total cost for construction is about 40 million dollars, backed by Ad Valorem (property tax) bonds (M. Fitzgerald, personal communication, 2008).

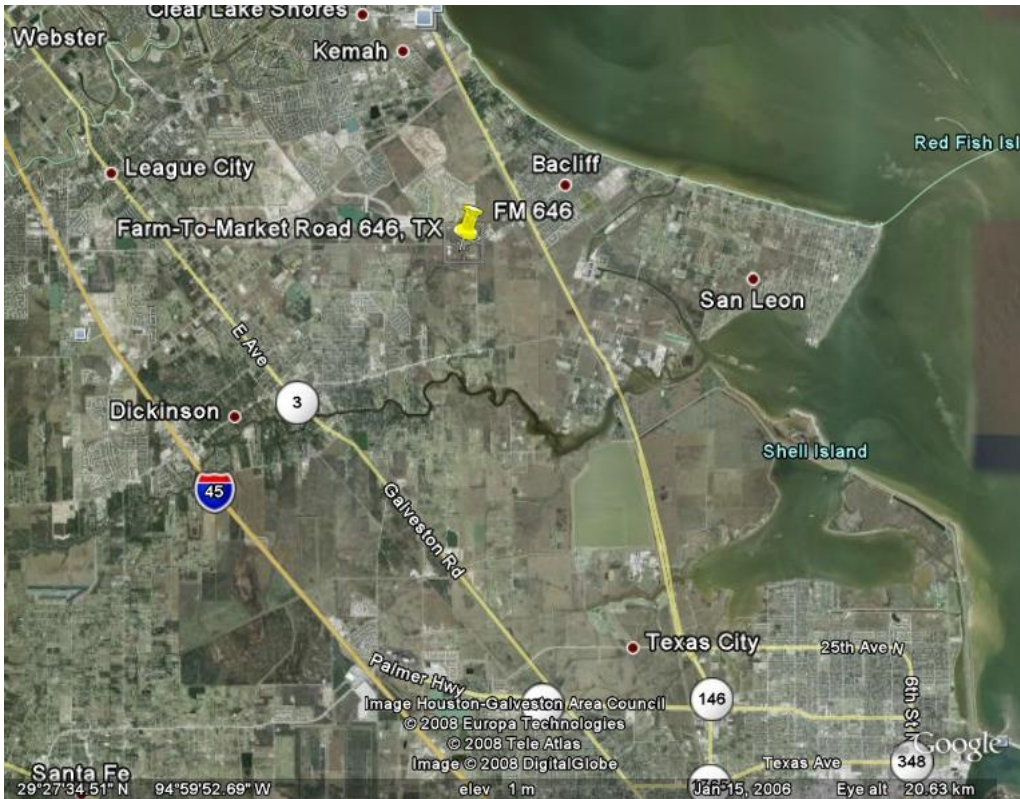


Figure 5.7: FM 646 Project Location

The details provided by the Houston District with regard to the FM 646 project and the FM 1484 were limited. Most of the information included here came from the County Engineer, Mr. Mike Fitzgerald.

No cost benefit analysis was conducted for the anticipated revenue stream that the county would use to upfront the property tax money (M. Fitzgerald, personal communication, 2008).

Lessons Learned:

- Hold meetings early on
 - Meetings held early on in the process can help with covering any items that are not specifically stated in the agreement (W. Nauman, personal communication, 2008).

5.1.9 El Paso County, State Spur 601

Status: PTA under negotiation

Project Characteristics:

Construction of State Spur 601, the Inner Loop from US 54 to Loop 375 in El Paso County. The project will provide a 7.4 mile mobility connection between US 54 to the west and Loop 375 to the east. The Spur will follow the existing Fred Wilson Avenue

from US 54 to the Airport Road/Sergeant Major Boulevard intersection. Then follow a route north of Founders/Walter Jones Boulevards and traverse the property lines between El Paso International Airport, Biggs Army Airfield and Fort Bliss Military Reservation, and terminate at Loop 375 (M.A. Boyd, personal communication, 2008).



Figure 5.8: State Spur 601 Project Location

Partners:

- Jon F. Abrams, President/CEO (Developer “JDA”) and TxDOT El Paso District

Benefits: According to the El Paso District, this public-private agreement will serve to protect the public and national interests by opening to traffic Spur 601 much sooner than if this agreement were not used, thereby benefiting the citizens of El Paso, the military at Biggs Army Airfield and Fort Bliss Military Reservation, and the El Paso International Airport (M.A. Boyd, personal communication, summer 2008). In addition, “parts of the road will be elevated, allowing motorists to enter and leave Biggs without having to navigate the traffic lights at Fred Wilson and Airport Roads” (Keep Texas Moving Website).

Risks: No known risks were provided.

Financing Tool: The county is “contemplating financing the project through the issuance of tax-exempt bonds” (PTA Agreement). The total construction cost estimate was

\$184,000,000 and the total project cost estimate was \$229,850,000 with a capitalized interest of \$11,998,000. Sources of funding include \$151,450,000 (par value) of bonds, \$12,800,000 of SAFETEA-LU, \$10,000,000 from the city of El Paso, and \$53,800,000 of UTP funds. The total estimated cost to design and construct Spur 601, including right-of-way acquisition and utility accommodation, is \$268 million.

The project has two intermediate milestones:

- Segment A-1 will be open to traffic 425 days after issuance of NTP #1
- Segment A-2 will be open to traffic 638 days from issuance of NTP #1

The entire project will be substantially completed and open to traffic 1,247 days after issuance of NTP #1. If any of these milestones or the substantial completion date is not met liquidated damages of \$1,580 per working day will be deducted from the semiannual pass-through tolling payments (M.A. Boyd, personal communication). The loop is scheduled for completion in 2010 or 2011 and is expected to handle traffic from residential construction at Biggs Army Airfield, as well as the increasing Northeast El Paso traffic. The seven-mile project will also help the region manage the increase in vehicle and pedestrian traffic on local roadways and is considered crucial to a Pentagon plan to bring nearly 23,000 soldiers and thousands more family members to Fort Bliss and El Paso (Keep Texas Moving Website).

Direct payment by TxDOT to JDA will not exceed \$55 million. Payments for this amount will be made based on invoices submitted at negotiated periods (monthly) by JDA to TxDOT. Invoices will be sealed as accurate by JDA's Design and Independent Construction Quality Assurance managers. In addition to the direct payment, upon substantial completion of Segments A-1, A-2 and A-3 of the project anticipated in 2009, semi-annual payments will be made based on pass-through tolling. These payments will be based on vehicle miles traveled and classification of vehicles as either less than 20 feet or more than 20 feet in length. Prior to substantial completion of the entire project pass-through toll payments will be based on traffic using the partially completed project. Upon substantial completion of the entire project semi-annual payments will be based on traffic using Spur 601, will be no less than \$15,650,000 and will be no more than \$17,500,000. The total amount paid for the pass-through tolling payments over the term of the agreement anticipated to be complete in 2019 will not be more or less than \$312,450,000.

Lessons Learned:

- No lessons provided. The reimbursement amount appears to be greater than the estimated construction cost.

5.1.10 Val Verde County, US 277

Status: PTA executed

Project Characteristics:

CSJ: 0922-11-016. Construction of an approximately 12 mile 2 lane relief route to US 277, that extends from US 90 north of Del Rio southward to US 277 southeast of the city.



Figure 5.9: US 277 Project Location

Partners: Val Verde County and TxDOT Laredo District.

Benefits: TxDOT maintains that the project is good for the local economy and having this built sooner will promote economic development in the area (M. Montemayor, personal communication, 2008).

Risks: TxDOT expressed concern about the local entity's financial commitments and how they were to be met. There were also concerns voiced from citizens regarding environmental degradation and how it would affect wildlife habitat, and some trees. Some people were also concerned about the financial benefits from the project.

Financing Tool: The department and the county have agreed to a reimbursement through pass-through tolls of \$75 million for the construction of the project. The local entity was open to promoting this type of project financing as their bond rating was favorable and the project completion would be done sooner. Although there was not a formal cost benefit analysis for this project, the developer checked that development potential of the road would be enough to pay back the investment over the identified 20 year time frame.

Lessons Learned:

- Have only one design from inception (M. Montemayor, personal communication, 2008).

5.1.11 Lubbock District, North Loop 289 and Slide Road

Status: PTA failed

Project Characteristics:

The project is located near the intersection of Slide Road with North Loop 289. CSJ: None-this project was cancelled before one could be assigned.

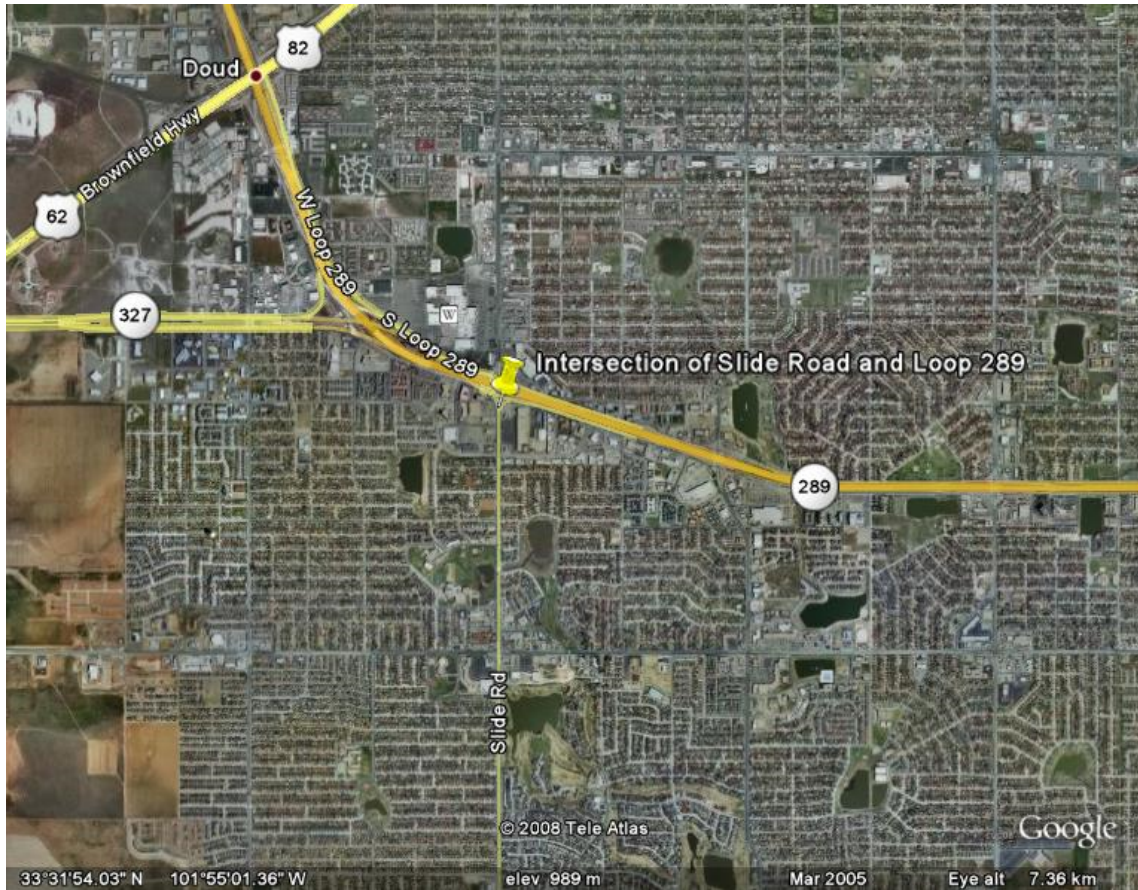


Figure 5.10: Lubbock District Project Location

Partners:

- PTA negotiations: City of Lubbock and TxDOT Lubbock District

Benefits: The city of Lubbock had a lot to gain in this deal. It needed infrastructure improvements and would basically have the benefit of being fully reimbursed for it (excluding the interest). TxDOT would also stand to gain from this deal with improvements to its overall transportation system, with 100% of the cost paid (S. Warren, personal communication, 2008).

Risks: No known risks indicated.

Financing Tool: The Lubbock School District is in a “land lock” situation; therefore, all new development is occurring around new school districts. However, there was one pocket of land in town that could increase the attendance in an existing school. This was a good opportunity for TxDOT to take advantage of improvements to this road in an area that would experience high growth, before there became a need for these improvements. (S. Warren, personal communication, 2008).

The city of Lubbock approached the department looking for what was available for them to help pay for the project. They were going to use franchise fees, The Gateway Streets Fund, to upfront the money since they had already increased the franchise fees to sell bonds and leveraged up to \$125 million (total cost of the project was estimated at \$73 million). In addition, the city claimed to have done some sort of analysis to see how long the bonds could be floated.

Lessons Learned:

- Act quickly
 - The city took too long submitting its application, and this allowed for other agencies to get ahead in line for PTA funds. Ultimately, this cost the city this project because, after funding the other agencies, TxDOT ran out of PTA money. The amount of franchise fees in combination with the TxDOT repayment amount was not reached and so the project was not successful. (S. Warren, personal communication, 2008).

5.1.12 San Angelo, 50th Street

Status: PTA failed

Project Characteristics:

The objective was to have a major arterial built in an event-driven traffic area. The project was cancelled so early in the process that there was never a CSJ number assigned.

Partners:

- City of San Angelo and the TxDOT San Angelo District

Benefits: The city wanted the PTA because they wanted to be reimbursed and TxDOT was interested in getting the community involved in funding local projects and also creating “seed” projects, to get local entities familiarized with partnering with TxDOT (J. Dewitt, personal communication, 2008).

The city, through a referendum, had prioritized a series of projects to extend the ½ cent sales tax. The 50th street project was identified because it would provide better access to a nearby coliseum and fair grounds out there that experienced a lot of traffic; the widening of the road would help the HW 208 interchange located just past the middle school. The city of San Angelo approached TxDOT and asked if there was a way to fund the project (which came through the MPO). TxDOT reviewed the project and encouraged them to extend it to a location where the project would connect to US 87 on the east. They accepted this and went forward with the plan to discuss with the TP&P Division in

Austin (which oversees PTA's). However, TP&P felt that the project still needed better connectivity for its viability as a PTA project.

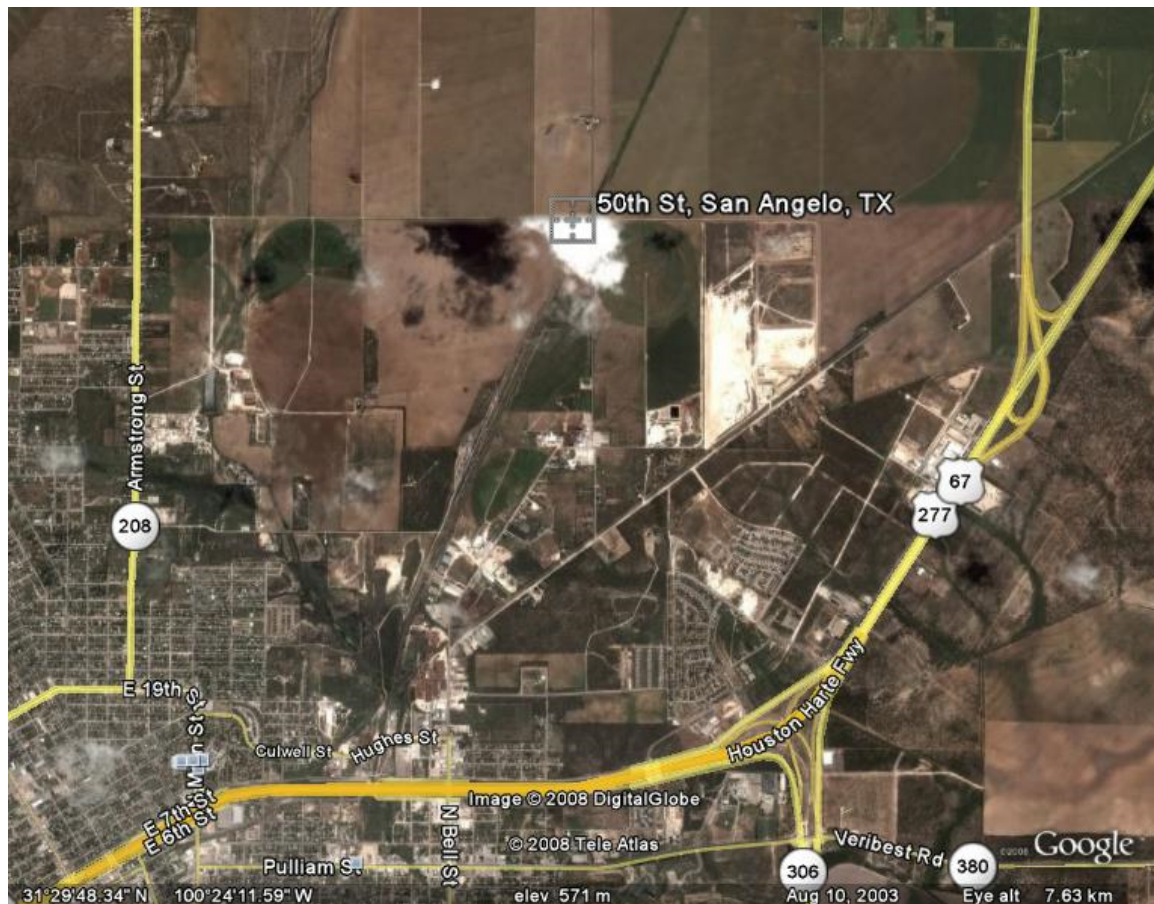


Figure 5.11: 50th Street Project Location

The recommended extension from the district added cost to the project. Since the project was somewhat of a marginal candidate to begin with (it barely reached the level of regional significance), it ended up falling through.

Risks: The allocated money for PTAs was shrinking at the time this project was in the process and many other projects were already in line ahead of it. This may have put a squeeze on things and less money was available to deal with. As a result, it might have put more of a focus on the level of regional significance that each project needed (J. Dewitt, personal communication, 2008).

Financing Tool: The city collects a ½ cent sales tax and saves this money strictly for economic development projects that the city wants. The fund is governed by the City of San Angelo Economic Development Group; the group is appointed by the City Council. “Financial support for economic development promotion is a joint effort in San Angelo between the City Council, City of San Angelo Development Corporation, Tom Green

County Commissioners, and the Chamber's Cornerstone Investors” (San Angelo: Business and Economic Development website, 2008).

The construction cost that the city initially had estimated was around \$2.4 million. After discussions with TxDOT along with different scenarios proposed, TxDOT estimated that the project cost would be more in the realm of \$5 million (inclusive of ROW acquisition and utilities) (J. Dewitt, personal communication, 2008).

Lessons Learned:

- Environment and political climate can kill a project, especially if it is a marginal candidate
 - The Department gave as much as it could to meet the city’s requests and given the environment and political climate it was not sure that there could have been much more done (J. Dewitt, personal communication, 2008).

5.1.13 City of Harker Heights and city of Killeen, US 190

Status: State-Local partnership succeeded.

Project Characteristics:

CSJ: 0231-03-114. The relocation of an off-ramp to increase the sight distance associated with the intersection of US 190 and Modoc Street, and to decrease conflicts with access points along the project limits.

Partners:

- City of Harker Heights, City of Killeen, and TxDOT Waco District

Benefits:

All the benefits were positive for both TxDOT and the city. The city would be receiving benefits from the stimulated economic activity in the area and the department would receive smoother traffic operations from the improved accessibility of the ramp.

Risks:

The only known TxDOT concerns were in relation to the safety and congestion in the areas to be developed and the location of the site chosen by the city to promote commercial and retail development.

Financing Tool:

The Texas Department of Transportation covered all construction costs for the project, a total of \$1,160,400 (R. Richardson, personal communication, 2008). Other partner amounts that were contributed to the project include the following:

- \$350,000 Walmart Stores, Texas
- \$150,000 Private Developers
- \$100,000 City of Killeen
- \$100,000 City of Harker Heights

With Walmart Stores Texas accelerating the construction of a new store at this intersection, this project was a means to secure highway construction financing for a project with no short term funding allocations through the Texas Department of Transportation. In addition, there was no cost benefit analysis conducted, as this project was already an approved process (R. Richardson, personal communication, 2008).

Lessons Learned:

- Centralize all discussions with one primary local governmental entity
 - This would allow any additional discussions to take place between all stakeholders
 - Would have helped with the collection of the various participation amounts
 - Would have expedited the decision making process
 - Would have allowed TxDOT to work more efficiently with one source who could take full responsibility for the outcome

5.1.14 City of Forney, US 280 Interchange

Status: PTA pending

Project Characteristics:

Upgrading the US 280 Interchange to relieve some capacity issues that were going due to the development occurring within the area (from residential growth)

Partners:

- City of Forney and TxDOT Dallas District.

Benefits: From this project, the city will benefit primarily by getting some much needed transportation improvements, which they in the end would not need to fund (B. Barth, personal communication, June 11, 2008).

Risks: TxDOT had concerns about the aggressive schedule that the city made but the city's engineer will hold them (the city) accountable for it, so this eliminated the risk to TxDOT.

Financing Tool: The project construction cost is estimated at \$47,000,000, which the city will pay for using a bond program derived from the general revenue (sales tax revenue). The city and county wanted to move the project forward in a shorter time frame and so they saw that they would be able to do so using the PTA financing method. The partnership was only between the department and the city but on the city's end, they partnered with the county independent of the PTA agreement.

The project's final PTA has not yet been finalized but the design is well under way and monthly meetings with the county engineer are ongoing (B. Barth, personal communication, 2008).

Lessons Learned:

- Be as far along in the process as possible, before making the agreement
 - It would be a benefit to be further along in the process before making the agreement, because then you have a more accurate estimation of costs
 - Be further along in the Design Phase before approaching the Commission for the local entity to feel confident on an agreement

5.1.15 Taylor County, Abilene, BI 20-R

Status: State-Local partnership succeeded

Project Characteristics:

CSJ: 0006-18-041: The project work consists of construction of a crossover and acceleration and deceleration lanes. Project length is approximately 0.263 miles in length and located on South 1st Street, near US 83 Winters Fwy and terminates near the vicinity of Pioneer St., Abilene, Texas, Taylor County (B. W. Haynie, P.E., personal communication, 2008).

Partners:

- City of Abilene and the TxDOT Abilene District

Benefits: Upon construction the city reimbursed TxDOT for construction costs. The benefit to the local developer is better access to the property; the benefit to the state is a safer access point. In addition, hydraulics was improved through the area (B. W. Haynie, personal communication, 2008).

Risks: No known risks were indicated.

Financing Tool: The total cost of construction for this project was \$170,684, paid for 100% by the city, and which was reimbursed by a local developer through an agreement made between the city and developer (B. W. Haynie, P.E., personal communication, 2008). According to the Transportation Planning and Development Director, this particular project was not originally in their plans, however, due to recent changes in traffic patterns from a local parking lot reconfiguration, it was deemed necessary. The project will not have any return other than better access.

Lessons Learned:

- The District said there were no lessons learned, but also indicated that there were some project issues with the consultant that the developer hired.

5.1.16 Taylor County, Abilene, City Street

Status: State-Local partnership succeeded.

Project Characteristics:

City Street, CSJ: 0908-33-066: The project is for the reconstruction of an approximately 2.4 mile segment of City Street to provide better access for commercial traffic as well as strategic traffic for the north gate of Dyess AFB. Project limits are from the north entrance of Dyess AFB to FM 3438 to the north Entrance of Dyess AFB. (B. W. Haynie, personal communication, 2008).

Partners:

- The city of Abilene and the Texas Department of Transportation

The project has strong support from community leaders as they have continued to express their “strong support for the proposed Dyess AFB access corridor improvements” (Statewide Transportation Improvement Program FY 2008-2011: Abilene District, 2007). Although the military was identified as a major part of the local economy, it wasn’t part of the financing for this project.

Benefits: The Abilene community supports the Dyess AFB mission as the base is a major benefit for the Abilene economy (B. W. Haynie, personal communication, 2008).

Risks: No known risks were indicated.

Financing Tool: According to the Transportation Planning and Development Director, this particular project will be funded with a combination of Category 3 Funds, Federal Demonstration Funds and Public Lands Highway Discretionary Funds. Consistent with the Texas Administrative Code, the project required and was partially funded by local dollars and it was the required match that could have delayed the project; therefore, the city of Abilene lobbied the Congressman for additional funding. No cost benefit analysis was formally conducted for this project.

Lessons Learned:

- None provided.

5.1.17 Tyler, Loop 49

Status: TxDOT toll financing succeeded.

Project Characteristics:

Loop 49, located in the rural outskirts of the city: The Loop 49 project consists of a new regional highway around the city of Tyler, Texas. The ultimate facility will be an approximately 26-mile, circumferential, controlled-access two lane (originally four lane) highway. The southern section of Loop 49 extends from State Highway (SH) 155 to SH 110, a length of 9.62 miles. A 5-mile segment (south segment) of this section from SH 155 to US 69 opened August 22, 2006.

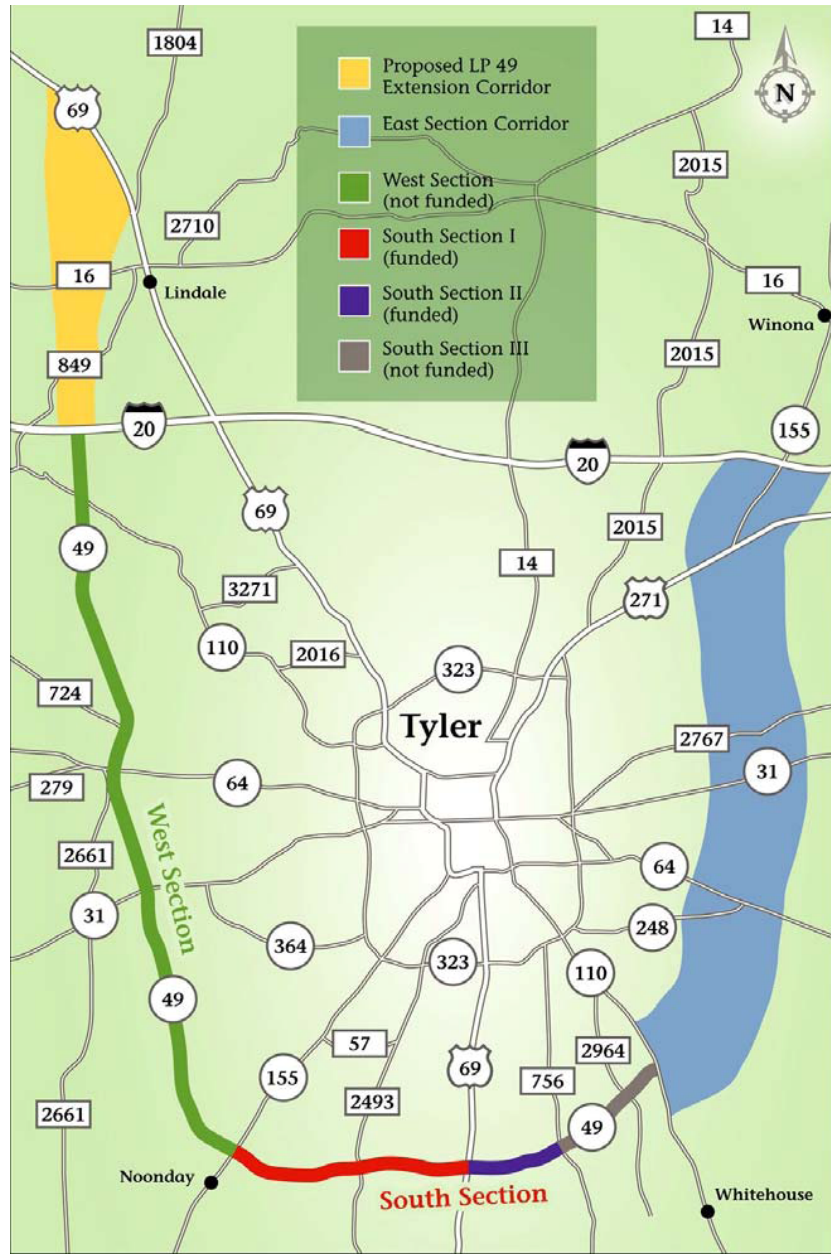


Figure 5.12: Tyler Loop Toll Road Planning

Source: Texas Transportation Institute, 2007

Partners:

- Local agencies and the Texas Department of Transportation. When contacted about this project, the district did not select it as an example of a partnership. The information presented is taken from an Implementation Project Report by the Texas Transportation Institute.

Benefits: None identified, except that the citizens supported the project

Risks: This project was a risk to TxDOT because it was a two-lane road being constructed on the rural outskirts of a small urban area, where the traffic demands to repay the cost was not likely. Additionally, the area had no history of toll roads in the region, which raised the likelihood for public opposition (Texas Transportation Institute, 2007).

Financing Tool: The project was evaluated by the TxDOT Tyler District for toll viability as a way to compress the project construction timeframe. With tolling, it is expected that the opening of the fully completed loop project could be accelerated by as much as 20 years.

A toll public hearing was held on October 25, 2005, to solicit public comment. Environmental documents for the tolling of Loop 49 south and west segments re-evaluation documents were approved by the FHWA on December 16, 2005. The Texas Transportation Commission approved toll financing for Loop 49 on January 27, 2006 and the first segment opened as a tolled facility on August 22, 2006. All future segments will open as a tolled facility.

Lessons Learned (Texas Transportation Institute, 2007):

- Separate tolling from traditional highway project development issues
 - The project originally started out as a non-tolled facility, but over time (20 years) the full funding was not made available due to competing projects; therefore toll financing was chosen. To counter public opposition, tolling was presented as simply needed to facilitate the process with funding.
- Build sustainable stakeholder support
 - The key relationships that TxDOT had already established afforded the department with strong support, especially when spokespersons were needed.
- Be flexible as project design elements evolve
 - Due to funding constraints, community concerns, and departmental policies that changed, the design of the Loop 49 project had to be modified accordingly to allow for tolling, particularly the location of access points.
- Listen to the public and gauge public perception
 - This was extremely helpful for two reasons: tolling was new to the region, and the project's unique toll application due to its rural location
- Develop a public outreach plan using perception data
 - This is important for monitoring the public's acceptance of the project
- Clearly explain the benefits of tolling at the project level

- Once the benefits of the project were clearly explained, tolling was broadly accepted
- Link environmental review to public outreach, and coordinate closely with all players
 - Linking the tolling evaluation and the environmental re-evaluation was very useful as it allowed for public education while meeting the requirements of the National Environmental Policy Act (NEPA).
- Build an incremental financial plan
 - Refine the financial plan as you go along in the process; this allows for a greater level of certainty in each step
- Enlist key stakeholders in creating a Regional Mobility Authority (RMA)
 - Regional cooperation, facilitated by TxDOT, was key to the formation of the North East Texas RMA (NETRMA) and the working relationship between the two entities.

5.2 Chapter Summary

In this chapter, 17 case studies of financing tools used by TxDOT districts to advance locally important projects were presented. The following table summarizes the case studies for easy reference. Additional details are provided in Appendix D. The next chapter will provide an analysis of the lessons learned from these case studies.

Table 5.2: Summary of Texas Case Studies

Project Characteristics/Scope	Stated Benefits	Identified Risks	Financing
1. Jefferson County: Widen FM 365, a road located within an area of high commercial development.	Will help facilitate economic development in the area	Details within the agreement were not clearly stated and caused miscommunication between the partners. Also, the city wanted to be reimbursed for too much	Not financed. PTA agreement failed.
2. Montgomery County: Widen FM 1488 between FM 2978 and Texas 242; improvements to FM 1484, FM 1485, FM 1488, and FM 1314.	Getting the project done sooner and in a shorter amount of time will save on costs, specifically construction. A conceptual toll feasibility analysis was conducted.	The schedule is extremely aggressive and there is doubt from the Commission that it can be met. Also concerns about whether the county will be able to develop all three projects within its budget	PTA. Local contribution \$186,323,000 in bond money, plus \$33,080,000 in TxDOT funds. Max. TxDOT PTA payment \$174,473,000.
3. Weatherford: Widen FM 51/SH 171 from Interstate Highway 20 south to Causble Road and add eastbound frontage road on Interstate 20 between FM 51/SH 171 and FM 2552	Anticipated economic activity stimulated by the project's added capacity in an area that was developing primarily as commercial/retail	Lack of experience and difficulty in the construction of this project since the city had never done a TxDOT project before.	PTA. Local upfront funding of \$54,413,921 in certificate of obligation bonds. Max. TxDOT PTA payment \$52,443,517.
4. Titus County: Construction of three (3) new Highway Improvements: US 271 (West Loop) from FM 3417 to US 67, FM 1000 (East Loop) from US 271 (new) to FM 1735, and FM 2348 (East Loop) from US 67 to SH 49.	Greater mobility, increased efficiency and safety for the movement of people and goods throughout the region as well as enhanced economic opportunities. A conceptual toll feasibility analysis and a value engineering study were conducted.	Ability to complete plan development, environmental clearance, ROW purchase, and construction within the estimated project budget. No formal cost-benefit analysis.	PTA. Construction cost estimate \$116.7 million. Local upfront funding plus \$13.3 TxDOT funds. Max. TxDOT PTA payment \$181,920,000.

Project Characteristics/Scope	Stated Benefits	Identified Risks	Financing
5. Grayson County: Improvements to SH 289 from SH 56 to FM 120, provide north south access and relieve congestion on US 75, construct two lane highway with shoulders on new location with ROW purchase enabling future toll road with frontage roads, approx 10 miles.	Lower road user costs (sic) since it is cheaper to build the facility now, rather than in the future. The project will also decrease congestion and increase the life of pavement, reducing maintenance costs and saving money for the citizens	No known risks. The future construction cost for the project was compared to current cost estimates but no formal cost-benefit analysis was performed.	PTA. Construction cost was \$42.5 million. Local upfront funding. Max. TxDOT PTA payment \$84,506,000.
6. Hays County: Extension and widening of FM 3407 from its intersection at FM 2439 westward to intersect with RM 12. Improvements to FM 110, RR 12 and FM 1626	None indicated	Aside from the environmental clearance, design and standard construction, TxDOT did not have any concerns for this project yet and indicated that it won't have or know of any until the work starts. Neither project had a formal cost benefit analysis conducted.	PTA. FM 3407: Construction estimate is \$73,747,367. Local upfront funding. Max. TxDOT PTA payment \$60,600,000. Others: Construction estimate is \$32,850,000. Local upfront funding \$24,840,000 plus TxDOT \$8,010,000. Max. TxDOT PTA payment \$133,170,000 (sic).
7. Comal and Bejar Counties: FM 3487 (Culebra Road) upgrade and FM 2696 (Blanco Road) improvements. SH 46 and US 281 improvements.	None identified. There were current and future traffic counts on the roadways conducted for these projects as a way to help project its feasibility, along with projected growth for the area in relation to the proposed roadway.	Since the county did not design the facility, it was a challenge for the design team to make sure that the county was familiar with the TxDOT design standards. Inflation, politics, and details that will arise during the PS & E can still leave partners at risk. No formal cost-benefit analysis was conducted.	PTA. Culebra/Blanco: Max. TxDOT PTA payment 88% of cost, at <\$7,505,520 per year. SH46: Construction estimate is \$44 m. Local upfront \$16 m. plus TxDOT \$28 m. Max. TxDOT PTA payment \$16 m. US 281: Construction estimate is \$35 m. Local upfront \$16 m. plus TxDOT \$19 m. Max. TxDOT PTA payment \$16 m.

Project Characteristics/Scope	Stated Benefits	Identified Risks	Financing
8. Galveston County: Reconstruction of FM 646 from 2 lane to 4 lane divided (approximately 5.119 mi.) from FM 1764 to FM 517 and from I-45 to FM 517	None identified	The partners indicated to that they did know of any risks to them with this project and both felt it was pretty simple, smooth process. No cost benefit analysis was conducted for the anticipated revenue stream that the county would use to upfront using property tax money.	PTA. Construction estimate is \$53 m. Local upfront \$48.5 m. plus TxDOT \$4.5 m. Max. TxDOT PTA payment \$17.7 m.
9. El Paso County: Construction of State Spur 601, the Inner Loop from US 54 to Loop 375 in El Paso County. The project will provide a 7.4 mile mobility connection between US 54 to the west and Loop 375 to the east.	Will help the region manage the increase in vehicle and pedestrian traffic on local roadways and is considered crucial to a Pentagon plan to bring nearly 23,000 soldiers and thousands more family members to Fort Bliss and El Paso	No risks indicated. No formal cost-benefit analysis conducted.	PTA. Cost estimate \$268 m. County tax-exempt bonds of \$151 m, plus \$66.6 m. TxDOT funds plus \$10 m. city funds, plus \$55 m. private developer. Max. TxDOT PTA payment \$312.5 m. at <\$17.5 m. per year.
10. Val Verde County: Construct 12 miles of 2 lane relief route to US 277, from US 90 north of Del Rio to US 277 south of Del Rio	The project is good for the local economy, and having it built sooner will promote economic development.	Concern from TxDOT over the county's ability to meet its financial commitment. Public concern over environmental degradation and the financial benefits of the project.	PTA. No cost estimate. TxDOT upfront of \$53 m. Max. TxDOT PTA payment \$75 m.
11. Lubbock: Unsuccessful PTA application for a project located near the intersection of Slide Road with North Loop 289.	Good opportunity for TxDOT to make improvements to a road in an area that would experience high growth, before the need arose.	No risks indicated. The partnering entity claimed to have conducted an analysis that showed how long the bonds could be floated but there was not a formal cost-benefit analysis conducted by TxDOT.	PTA failed. Cost estimate \$73 m. City planned to sell bonds up to \$125 m., backed by utility fees. TxDOT PTA fund ran out before paperwork submitted.

Project Characteristics/Scope	Stated Benefits	Identified Risks	Financing
12. San Angelo: Unsuccessful PTA application for 50th Street	TxDOT was interested in getting the community involved in funding local projects and also creating “seed” projects, to get local entities familiarized with partnering with TxDOT	No risks indicated. Project is of marginal regional significance. No formal cost-benefit analysis was conducted-only the discussion of different scenarios.	PTA failed. Cost estimate between \$2.4-\$5 m. City has a fund from its 0.5 c sales tax for economic development but wanted PTA funds.
13. Cities of Harker Heights and Killeen: The relocation of an off-ramp to increase the sight distance associated with the intersection of US190 and Modoc Street, and to decrease conflicts with access points along the project limits.	Project had a direct impact on Regional and Community wide Commercial and Retail Development	Safety and congestion in the areas to be developed were the primary concerns related to the location chosen by the city to promote commercial and retail development. No formal cost-benefit analysis was conducted.	State-local partnership: TxDOT: \$1,160,000 Walmart: \$350,000 Private developers: \$150,000 City of Killeen: \$100,000 City of Harker Heights: \$100,000.
14. City of Forney: Upgrading the US 280 Interchange to relieve some capacity issues that were going due to the development occurring within the area (from residential growth)	Getting some much needed transportation improvements	TxDOT had concerns about the aggressive schedule that the city made but the city’s engineer will hold them (the city) accountable for it, so this eliminated the risk to TxDOT. No formal cost-benefit analysis conducted.	PTA possible. Cost estimate of \$47 m. City will pay upfront costs with bonds backed by local sales tax. Will seek TxDOT PTA payments.

Project Characteristics/Scope	Stated Benefits	Identified Risks	Financing
<p>15. Taylor County, Abilene: Construction of a crossover and acceleration and deceleration lanes. Project length is approximately 0.263 miles in length and located on South 1st Street, near US 83 Winters Fwy and terminates near the vicinity of Pioneer St., Abilene, Texas, Taylor County</p>	<p>Better and safer access</p>	<p>None identified. No formal cost-benefit analysis conducted.</p>	<p>State-local partnership. Total cost \$170,684. Paid upfront by the city of Abilene. Will be reimbursed by a local developer.</p>
<p>16. Taylor County, Abilene (2): Reconstruction of an approximately 2.4 mile segment of City Street to provide better access for commercial traffic as well as strategic traffic for the north gate of Dyess AFB.</p>	<p>Abilene Community supports the Dyess AFB mission as the base is a major benefit for the Abilene economy</p>	<p>None identified. No cost benefit analysis was formally conducted for this project.</p>	<p>State-local partnership. Funded 80% by TxDOT. Remaining 20% should have been local contribution, but the city lobbied the Congressman for that amount.</p>
<p>17: Tyler: Loop 49 project- a new regional highway around the city of Tyler, Texas. The ultimate facility will be an approximately 26-mile, circumferential, controlled-access two lane (originally four lane) highway.</p>	<p>None identified. A toll feasibility analysis was done.</p>	<p>This project was a risk to TxDOT because it was a two-lane road being constructed on the rural outskirts of a small urban area, where the traffic demands to repay the cost was not likely. Additionally, the area had no history of toll roads in the region, which raised the likelihood for public opposition.</p>	<p>TxDOT toll financing. First segment of 5 miles opened in August 2006. \$12.25 m. Toll Equity grant by TxDOT.</p>

Chapter 6. Lessons Learned

6.1 Chapter Introduction

In-depth review of the case studies presented in Chapter 5 shows that TxDOT is still in the learning phase of partnering, especially on rural and small urban area projects. However, six lessons can be drawn from the case studies. These lessons are elaborated in this chapter.

6.2 Explain the process

The districts found that it would benefit all the parties involved in partnership projects to have as much knowledge of the transportation project development process as possible. Because not everyone understood the process, some non-TxDOT partners had the idea that construction could start as soon as financing was available. It is necessary for all entities to understand what steps must be followed in order to develop a project and the associated effects on the timeline and cost. This educational effort at the earliest stage possible would provide all parties with an awareness of the logistics and a more realistic perspective of timeframes, especially for preliminary design.

An understanding of environmental constraints, rules and regulations is particularly necessary, as these are a very important component of project development. Many districts mentioned that it was difficult for new partners to understand the particulars that must be followed in complying with the NEPA requirements. When environmental elements are present in a project, intense coordination among partners is needed. Moreover, environmental permitting can often complicate other aspects of project development, and should be included in the discussions/negotiations.

6.3 Develop and maintain relationships

Several districts mentioned that a good working relationship with the local government was important when considering a partnership for a project. Some districts reported that when the local agency had previously cooperated on TxDOT projects, the environmental and construction phases on new projects went more smoothly. On the other hand, lack of communication between the local entity and the district can be an obstacle to developing partnerships. Relationships with chambers of commerce and political leaders are also important, because they have an influence on public support or opposition to a project. Moreover, they can leverage funding from private or federal sources.

6.4 Designate a leader and meet regularly

Several districts said that their experience would have been smoother if the roles and responsibilities of each entity were clearly defined early on. Clarification of responsibilities can help eliminate duplication of work as well as provide better organization. In some cases, there was no single agency designated as responsible for coordinating among the parties, and this caused miscommunication or disagreements. This finding suggests that there is a need to designate one of the partners as the lead agency/coordinator. When responsibility is given to one agency for leading and coordination, that agency can ensure that project information reaches all parties involved, and can provide a more efficient way of reporting critical issue updates.

One district found that monthly meetings allowed for the project team to discuss the status, resolve conflicts, and create needed action items for the project. These meetings were particularly valuable during early discussions of interim submittal of items, and later on to resolve issues not detailed in the agreement.

6.5 Set realistic schedules

More than one district mentioned that “aggressive” schedules were set forth in partnership projects. Although a key benefit to debt financing is the ability to get the project done much sooner than traditional funding can achieve, it can also create haste and strain on working relationships. The districts felt that the scheduling was unrealistic and often imposed a hardship on TxDOT personnel in meeting the tight deadlines. In order to establish long term working relationships and avoid misunderstandings, TxDOT must first lay out a realistic schedule for its work considering other district commitments, and share it with all partners.

Some partners fail to take into account the time required for paperwork and negotiating an agreement. One district reported that a PTA negotiation was unsuccessful due in part to the local entity getting its application paperwork finalized late. Agreements with private entities typically require more time. These considerations must be factored into the project schedule before promises are made to the public.

6.6 Negotiate the details

In negotiating an agreement, it is important that all the details are clearly presented, to avoid disputes that could occur, and to ensure a good working relationship. For this reason the San Antonio District felt that it would be a benefit to be further along in the process before making an agreement. Thus, if the majority of the environmental studies have been completed and the schematics prepared, the estimation of costs will be more accurate. The district also felt that the closer you are to the construction date when finalizing an agreement, the less likely it is that inflation will affect the cost.

As soon as possible after potential partners enter discussions with TxDOT, the department should share with them details of various partnering arrangements. For PTAs, reimbursement amounts agreed upon in the negotiation process should be clearly spelled out in the final agreement. TxDOT may reimburse the full amount paid upfront by another party, but in general will not reimburse interest costs. One district claimed that the city was requesting to be reimbursed for everything, including the interest incurred from their loan amount; however, it is not TxDOT policy to cover all costs. Tensions between the parties developed and the project negotiations were unsuccessful.

6.7 Be flexible

The Tyler district’s experience on the Loop 49 project showed that it was important to be flexible as a project develops. Unforeseen circumstances such as funding constraints, community concerns, and policies that change over the course of the project could force changes in the design of the facility. That project also showed that the possibility of design and scope changes call for a flexible financial plan.

Chapter 7. Conclusions and Recommendations

7.1 Chapter Introduction

The focus of this research was on financing tools and partnerships between TxDOT and local agencies to advance rural and small urban area projects. It was seen that there are a variety of options for upfront financing of local projects, and alternative ways to pay for those projects.

In partnerships, each party expects to gain specific benefits, and an explicit estimate of these benefits is necessary in order to have an equitable contract. Similarly, each project has risks, and these need to be evaluated and equitably shared. In this research, case studies of partnerships between TxDOT and other entities, especially Pass-Through Toll Agreements, were conducted. From these case studies, several key lessons were learned. Four significant conclusions and recommendations can be drawn from this research, and these are discussed in this chapter.

7.2 Understand project financing and revenue issues

The interviews with the districts reveal that there is considerable misunderstanding of project financing, mainly because of the historical model of collecting revenue before funding projects. Project financing involves two aspects: (1) funds for construction and operation (negative cash flow), and (2) revenue (positive cash flow). The main sources for funding construction are grants and/or debt (bonds or loans). To pay for the debt, the borrower must identify revenue streams, preferably directly attributable to the project benefits. If upfront financing is treated as a distinct issue from repayment, it is easier to see that each project must generate sufficient revenue to repay its costs, and that the funds expended by TxDOT must be replenished.

There is no defined procedure for sharing project costs other than the traditional TxDOT:local split of 80:20 or 90:10. Many district staff had the impression that it was the responsibility of TxDOT to pay all costs for a project, and that any benefits or revenue that accrued were not TxDOT's concern. In most of the cases TxDOT "donates" project planning, design, and construction management without counting those costs in the overall project budget. On the other hand, in one partnership a private developer who is providing those services will be reimbursed for them. Equitable cost and revenue sharing are necessary in partnerships. The contributions of each party should be properly accounted in negotiating the sharing of costs and allocation of future revenues.

7.3 Select the right projects for partnerships

This research sought to find a way to match projects with appropriate financing tools. It was thought that a project's characteristics and revenue potential would determine its fitness for a particular financing option. However, no clear decision process was found, largely because project benefits are not adequately assessed before the financing decision. It appears that, because of limited financing sources, every project competes against all others, and multiple factors determine which projects get funded.

One district mentioned that TxDOT was interested in getting the community involved in funding local projects and also creating "seed" projects, to get local entities familiarized with partnering with TxDOT. While this strategy is desirable over the long term, districts should be

careful to select projects that meet the department's goals and would deliver benefits to the public. Otherwise the impression could be created that TxDOT is over-eager for partnerships, or that anyone willing to put up some money can get TxDOT to accelerate a project. A more rigorous set of qualifications for partnership projects is desirable.

It was found that TxDOT criteria for PTA projects are too vague. The criteria do not address the technical characteristics of the project nor its revenue potential. Benefits such as congestion relief, air quality improvements, and financial benefits to the state are not quantified. Potentially, any project can qualify if it is on the Unified Transportation Plan and public support can be demonstrated. The financing arrangements for most of the PTAs are such that the financiers are essentially guaranteed to get back from the state most of the money they spend, plus any local tax revenue generated. As a result of this essentially risk-free arrangement, the demand for PTA funding has outpaced its availability.

7.4 Select appropriate financing tools

It was found that the financing tool used on any given project bears no relationship to the characteristics, scope or benefits of the project. Thus, there is no pattern or consistency for selection of financing tools. It appears that in each case, whatever method of financing was available or could be gathered was used. District interviews also revealed that no planning tools were used in targeting the most financially suitable repayment mechanism. With the growing use of alternative financing on TxDOT projects, there must be stronger evaluation of project suitability for a particular form of financing, similar to how a traffic and revenue analysis is conducted for toll projects.

The Tyler District experience with the Loop 49 project indicated that market research is essential when tolling is new to a region. Toll financing is appropriate only in cases where the traffic and revenue studies indicate that the tolls will be sufficient to pay project costs. Customers must experience real time savings to be willing to pay, and the cost must be compatible with users' value of time. Generally, neither condition obtains in rural and small urban areas. Therefore tolling is more applicable in highly congested and high income urban areas.

7.5 Conduct a formal analysis of project benefits

In most of the cases identified, there was no formal analysis of project benefits, with only a couple having a toll feasibility analysis. In fact, very little effort, if any, was made during project development to determine the benefits other than a qualitative review, e.g., "it will benefit the local economy." On several occasions, the district was not even concerned about what was 'on the other end,' and did not view the lack of financial analysis as a risk.

Transportation projects improve mobility, accessibility and trip reliability. The public enjoys greater access to services and lower transportation costs. These benefits stimulate development and generate economic activity. The difficult part of assessing project benefits is translating each of them into dollars, and determining which ones should be counted and which are spin-offs of others. However, when costs are to be shared, it is important that project benefits are quantified. Estimation and categorization of benefits are even more necessary when each party supports a project for different specific benefits. Estimation is critical when revenue will be derived from the project.

There is a strong need for a tool to assist the districts in project benefit and/or revenue analysis. In some cases the city or county was borrowing the money through bonds, and should

have conducted some kind of revenue estimate or analysis (from taxes, etc.). However, such assessments were not shared with TxDOT.

7.6 Summary

The focus of this research was on financing tools and partnerships between TxDOT and local agencies to advance rural and small urban area projects. It was seen that there are a variety of options for upfront financing of local projects, and alternative ways to pay for those projects. These were presented in detail in Chapters 2 and 3 and Appendices B and C.

In partnerships, each party expects to gain specific benefits, and an explicit estimate of these benefits is necessary in order to have an equitable contract. Similarly, each project has risks, and these need to be evaluated and equitably shared. These issues were addressed in Chapter 4. Case studies of partnerships between TxDOT and other entities, especially Pass-Through Toll Agreements, were presented in Chapter 5. Lessons learned from the case studies were presented in Chapter 6.

It was found that TxDOT procedures for calculating project benefits are insufficient for partnership projects. Historically, those procedures were designed to weigh one in-house project against another in terms of safety, congestion mitigation, connectivity, etc. However, TxDOT now specifically includes economic development as a project goal, yet there is no defined procedure for calculating such benefits.

Decisive measures to ensure a reliable return on the investment of public funds should be emphasized. Public funding of new infrastructure from money raised through taxes or borrowing has been a growing trend globally (Haynes & Roden, 1999) and as TxDOT moves into an era of partnering to finance projects, formal project benefit analyses are essential.

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Appendix A: Interview Questions

District Experience with Cooperative Projects

District Contact (District Name _____)
1. Name and Position: {Writing Space}
2. Date of interview: {Writing Space}

Project Characteristics
3. Please provide the following information on the project: Highway #, CSJ, Location/City, Transportation objective, Description of Work, Length... {Writing Space}

Financial Feasibility
4. What was the construction cost of the project? {Writing Space}
5. What were the sources of the project financing (to pay for construction)? {Writing Space}
6. Why was this project a good fit for this method of financing? {Writing Space}
7. How will the project repay that upfront financing, i.e., what were the identified future benefits and/or revenues? {Writing Space}
8. What details of the cost/benefit analysis can you share with us (What was your estimate of your revenue stream or revenue that you were going to collect)? {Writing Space}

Public Involvement
9. Who initially presented this project to TxDOT? {Writing Space}
10. Which parties (persons or organizations) moved the project forward? {Writing Space}
11. Can you provide contact information? {Writing Space}
12. What kind of support or constituency did they claim for the project? {Writing Space}

13. What were the social concerns or unequal impacts (if any) associated with the project?

{Writing Space}

14. What were the constraints or opposition to the project

{Writing Space}

Project Risks

15. What were the legal risks and how were they addressed?

{Writing Space}

16. What were TxDOT's concerns regarding the project?

{Writing Space}

Partnership/Contract Details

17. Who or what factors played key roles in creating the partnership for this project, and how were the partners brought into the process?

{Writing Space}

18. What barriers had to be overcome?

{Writing Space}

19. What did each entity expect to gain from this project?

{Writing Space}

20. What kind of agreement was executed and can you share a copy with us?

{Writing Space}

21. What later modifications were made to the agreement and for what reason?

{Writing Space}

22. What tools/techniques were developed/used in order to facilitate the process?

{Writing Space}

Lessons Learned

23. If you had to go through this process again, what would you do differently?

{Writing Space}

24. What aspects of the project still leave one or more of the partners at risk?

{Writing Space}

25. What planning tools were/are being used to assess project feasibility and risks?

{Writing Space}

26. What shortcomings were identified with those tools?

{Writing Space}

Appendix B: Funding Options

Grants

Grants- Federal	Community Development Block Grant Program - CDBG
Reference	Advanced Public Transportation Systems for Rural Areas: Where Do We Start? How Far Should We Go? Prepared for: Transit Cooperative Research Program Transportation Research Board National Research Council Submitted By: Institute for Transportation Research and Education North Carolina State University Raleigh, North Carolina In association with KFH Group TransCore June 2001

Grants- Federal	Rural Road Safety Program (RRSP)
Description	This program would allow federal funds to be set aside strictly for use on rural roads, specifically to make "safety improvements." This financing mechanism would ensure that the DOT could not use "the money for any other purpose than for those roads." The American Traffic Safety Services Association (ATSSA) is supportive of this financing option and suggests that the "program be funded through a 10 percent safety set-aside - which could equal approximately \$730 million - in the STP. According to ATSSA, the money could be used to make low-cost safety improvements such as improving signage, marking pavement, and installing guardrails and traffic lights on rural roads. ATSSA also proposes an additional \$3 billion in new funding to enhance overall safety for all of the nation's roadways."
	"Publicly-owned and publicly-operated project Design-Build turnkey contract to guarantee maximum price and completion date"
Partnering Entities/Potential Partners	Rural officials (local representation), National Association of Regional Councils, the National Association of Towns and Townships, and the U.S. Conference of Mayor
Primary Benefits to Partners	Local governments will improve safety on the nation's most deadly roads, the funds will be federal funds dedicated strictly for the use on rural roads.
Modifications Required	"While some states have a process in place and the Federal Highway Administration did issue guidance on [inclusion] to its field offices, the U.S. Department of Transportation has yet to issue final regulations on rural planning requirements. We very much hope this issue can be resolved so that it does not carry over to the reauthorization."
Reference	Reagin, Misty. "Rural roads: Where finance and safety collide." American City & County. (May 1, 2002): NA. Academic OneFile. Gale. University of Texas at Austin. 19 Oct. 2007 < http://find.galegroup.com/itx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T003&prodId=AONE&docId=A87378964&source=gale&userGroupName=txshracd2598&version=1.0 >.

Grants- Federal	Regional ITS Program
Description	The Regional ITS Program sets aside funds from larger STP-MM & CMAQ Funding Programs and allows for the Implementation of Regional ITS Initiatives.
Primary Benefits	Primary benefits to partners include funding for new or immediate needs as they arise, regional level initiative and the ability to allow for implementation of Regional ITS Initiatives
Potential Pitfalls	Limited funding and duration
Contact	Contact: Christine Jestis, Program Manager Transportation Project Programming, North Central Texas Council of Governments, Email: cjestis@nctcog.org , phone: 817/608-2338

Contributions

Contributions- Investors	Cost Sharing (Bond and Private Investment)
Description	The construction of three new roads in Travis County were approved to be financed 50% by land use owners and developers and 50% through the County's bond money, to be paid by property taxes [probably a municipal utility / road district].
Partnering Structure	The County and private investors (developers and land owners)
Partnering Entities/Potential Partners	The local government (city, county, or RMA) and private investors (developers and land owners)
Primary Benefits to Partners	This financing tool is a mechanism to help save tax payer money. The cost was supposed to be split about 50-50 between the county and private interests.
Potential Pitfalls	One potential pitfall for this type of financing tool is the risk of the private investor backing out. Recently a project located in northeastern Travis County has been stalled due to the fact that the private investor that initially opted to pay for half of the project cost "never came through" (Austin American Statesman, 11-3-2007). As a result, the 7.4 million dollars approved for the project's construction has since been "diverted to another project" (Austin American Statesman, 11-3-2007). If the project falls through as it did in this case, voters will be likely not to trust subsequent bond projects "because of this kind of bait and switch" (Sal Costello, Central Texas road planning critic).
Modifications Required	If the project is delayed due to the withdrawal of an investor's money, the project would be stalled and have three narrow options: (1) wait until the next bond referendum; (2) set aside more money to use on other projects (3) the county would have to pay their share.
Reference	Austin American Statesman article dated Saturday, November , 2007 pgs. A1 and A15.

Case Studies	Wells Branch Parkway extension (near Pflugerville and Howard Lane) located in northeastern Travis County
Contact	County Commissioner Sarah Eckhardt (She made some comments in the newspaper article) or County Commissioner Margaret Gomez.

Contributions-Private	Cost Sharing
Description	This project involved the relocation of a roadway paid for by a private owner (The Alcoa Company). The new alignment is thought to be better than the original and was constructed to a higher standard.
Partnering Structure	Cost Sharing-a private company, TxDOT, and Denton County
Partnering Entities/Potential Partners	A private company and TxDOT
Primary Benefits to Partners	The primary benefits that that the partners experienced were economic development and the new structure built to a higher standard (at no cost to TxDOT).
Reference	Promoting Local Participation on Transportation Improvement Projects August 2006 p.15
Case Studies	FM 2116 and FM 112 relocation Lee County, Texas
Lessons Learned	Comment: This may have possibilities where a private company is asking for a road or the road only serves a private company.

Contributions-Local	Local General Funds
Description	"Sections 33.1-75.1, 75.2, and 75.3 of the Texas Transportation Code indicate that counties have the ability to use their own general funds to contribute to transportation improvements. Section 75.2 specifically points out that counties may make contributions to facilitate primary and secondary road construction, whereas Section 75.3 notes that counties may use these general funds for other activities related to the primary and secondary system, such as "curbs, gutters, drainage ways, sound barriers, sidewalks, and all other features or appurtenances conducive to the public safety and convenience" (§ 15.2-2404 of the Code)."
Reference	Alternative Transportation Funding Sources Available to Virginia Localities p.

Contributions-Local	Flexible Match- Non-state sources
Description	"Flexible Match allows the non-Federal project costs to be a variety of public and private contributions" and gives the opportunity "to match Federal highway funds with certain other types of state, local or other Federal funds or donations." In addition, "this tool may be very useful

	in a managed lanes project that is depending on private equity for financing" (Source: < http://www.fhwa.dot.gov/innovativeFinance/ifp/innoman.htm >).
Reference	THE FUNDING AND FINANCING OF MANAGED LANES PROJECTS p.9
Case Studies	Pennsylvania: The state's DOT used the flexible match for the accelerated construction of project and the "ability to substitute private funds for public matching funds offered PennDOT a means to expedite construction of these projects that lacked the required public match" (source: http://www.fhwa.dot.gov/innovativeFinance/ifp/innoman.htm).

Contributions- local or state match	Transportation Development Credits: Current or future toll revenues
Description	Transportation Development Credits are a financing tool that allows states to use their federal obligation authority without the requirement of non-federal matching dollars. Transportation Development Credits (TDCs) -formally known as toll credits- are a unique tool that allow transit providers to procure new equipment. TDCs can be earned when a local, state or private entity uses funds earned on existing toll facilities for capital transportation investment. The Federal government then gives 'credit' to the states for these investments.
Primary Benefits to Partners	States can apply toll revenues used for capital expenditures to build or improve public highway facilities as a credit toward the non-Federal share of certain transportation projects. Transportation development credits are earned when a state, a toll authority, or a private entity funds a capital highway investment with toll revenues from existing facilities. The amount of toll revenues spent on non-Federal highway capital improvement projects earns the state an equivalent dollar amount of credits to apply to the non-Federal share of a Federal-aid project.
Legislative Restrictions	The passage of SAFETEA-LU in 2005 however, now allows these credits to now be used on a pro rata basis. In light of this change the Commission adopted new rules in February 2006 allowing these credits to be applied as the local match for federally funded transit and rail projects. 75% of the state's locally earned credits will be awarded by the Commission. These will be granted to projects within the region in which they were earned under a competitive process.

Contributions- state match	Tapered Match- Delay state match as long as possible
Description	"Permits the Federal/non-Federal share of payments to vary over the life of a project, as long as the appropriate matching ratio is achieved by the end of the project"(FHWA Innovative Finance), thus allowing 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. 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" (FHWA Innovative Finance).
Primary Benefits to Partners	With this allowance, a project can then move forward even if the "state does not have the required local match at the present time." This financing technique is especially useful "for projects that will produce a revenue stream either through tolls or special taxes but need time for those revenues to accumulate."
Reference	THE FUNDING AND FINANCING OF MANAGED LANES PROJECTS p.9 and the FHWA Innovative Finance website:< http://www.fhwa.dot.gov/innovativefinance/tapered.htm >
Case Studies	"In Washington State, limits on state expenditures threatened to delay by a year or more a \$35.9 million project to construct high-occupancy vehicle lanes and make related road improvements for State Route 520, near the high-tech cities of Bellevue and Redmond. By using tapered match, the Washington State DOT was able to obtain Federal reimbursement of 100 percent of its expenditures on the project until the maximum Federal contribution had been reached. By that time a new state budget cycle had begun, providing the state DOT with the spending authority for completion of the project with 100 percent state funds" (Source: < http://www.fhwa.dot.gov/innovativeFinance/ifp/innoman.htm >).

Contributions-Local/state	Advance Construction: Start project with Local/state match
Description	This technique enables the state to start a project without having all of the needed Federal Funds. Using this approach can allow a state to begin projects and then at a later time convert the project to a Federal aid project-when federal funds are available. Advanced Construction is now being used on all TxDOT right of way purchases. The FHWA Innovative Finance states that "Advance construction is a technique which allows a State to initiate a project using non- federal funds while preserving eligibility for future Federal-aid funds. Eligibility means that FHWA has determined that the project technically qualifies for Federal-aid; however, no present or future Federal funds are committed to the project. After an advance construction project is authorized, the State may convert the project to regular Federal- aid funding provided Federal funds are made available for the project."
Partnering Structure	Federal, State and a local government
Primary Benefits to Partners	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. 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 9 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."
Potential Pitfalls	(1) Allows the investor to get an early start on the project however, the investor/developer must be able to pay for the initial lump sum of costs such as utility relocation fees, etc. (2) if Federal Transit Act funds are discontinued, Transportation Authority will be responsible for all project expenses. (3) With regard to the sited case study, "a portion of future capital grants is dedicated to paying off the interest for the project" and "Between FY 2000 and 2013, MBTA must use \$16 million in federal capital grants and \$4 million of its own revenues to pay the principal and interest on bonds for the Boston Engine Terminal project."
Legislative Restrictions	Projects excluded from this financing tool include the projects that are using the "National Highway System, Interstate Construction, or Interstate Maintenance funds, one of the following conditions must be met to qualify for advance construction: the State has obligated all the funds apportioned or allocated for the specific program, the State has used its obligation authority, or the State can demonstrate it will use its obligation authority before the end of the fiscal year." This option may allow the developer to get an early start on a project but to do so the entity must have all of the money (own) up front for the work. This financing tool may only work for ROW acquisition and utilities.
Modifications Required	To qualify for this financing tool option, one of the following conditions must be met: the State has obligated all the funds apportioned or allocated for the specific program, the State has used its obligation authority, or the State can demonstrate it will use its obligation authority before the end of the fiscal year. "
Reference	The Funding and Financing of Managed Lanes Projects Sept 2002 p.8, THE FUNDING AND FINANCING OF MANAGED LANES PROJECTS p.8-9 and the FHWA website: < http://www.fhwa.dot.gov/innovativefinance/sc308510.htm >
Case Studies	The Massachusetts Bay Transportation Authority (MBTA) used the Advance Construction Authority to finance the rebuilding of its main commuter rail maintenance facility. Source: < http://www.innovativefinance.org/topics/finance_mechanisms/pdfs/tcr_p_31_mbta.pdf >
Contact	FHWA Website: Questions relating to this guidance should be directed to Max Inman, Office of Fiscal Services, at 202-366-2853. For the Massachusetts Case Study, the Contact would be: Peter Butler Massachusetts Bay Transportation Authority 617-222-3365

Lessons Learned	<p>MBTA notes several key advantages to Advance Construction Authority over traditional funding methods for large, expensive projects:</p> <ul style="list-style-type: none"> • expenses can be incurred immediately, • construction can be consolidated into one contract, and • 80% of the bond interest for all expenses incurred above the FTA allocation are reimbursable by FTA. With Advance Construction Authority, a transit agency can spend the money necessary for a major contract immediately. Thus for projects that exceed an agency's annual FTA capital allocation, a transit agency can build them immediately without having to wait to collect multiple years of allocations and realize the benefits of the project sooner. If MBTA had to wait until it had cash on hand for the \$235 million Boston Engine Terminal renovation, the facility would have been out of service for 19 years. Under Advance Construction Authority, the Boston Engine Terminal is being rebuilt in 6 years, but the financing is accomplished through 19 years of debt service repayment.
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Contributions- local/state	Partial Conversion of Advance Construction: Local/state share to start project
Description	(Similar to Advance Construction). "Process allowing states to begin a project with their own source of funding, and then incrementally obligate Federal funds" (FHWA Innovative Finance Website). This technique is similar to the advance construction technique in that it allows a project to be advanced without non-federal money and then convert at a subsequent time; however, the difference is that the project can be transferred to federal aid in phases.
Potential Pitfalls	This tool has been used in the past (prior to 2000) approximately 25% of the time and was generally done at the end of the fiscal year. The primary benefit of the advance construction tool is that it can be very useful for the advancement of TxDOT projects when the department's budget is largely consumed by other large projects.
Reference	The Funding and Financing of Managed Lanes Projects Sept 2002 p.8
Case Studies	"The Connecticut State DOT advanced a major bridge project with a total construction cost of \$55.4 million through partial conversion of a \$35.7 million component. Connecticut spread its Federal-aid obligations for the I-95 bridge project over two years, enabling it to redirect some funds to other smaller bridge projects" (Source: < http://www.fhwa.dot.gov/innovativeFinance/ifp/innoman.htm >).

Bonds

Bonds- backed by State	Proposition 12 Bonding Authority
Description	"In November 2007, Texas voters approved Proposition 12, which authorized the Texas Transportation Commission to issue up to \$5

	<p>billion in general obligation bonds to fund highway improvements. Once approved, bonds authorized under Proposition 12 are general obligations of the state, and the state is required to repay the debt. TxDOT currently uses bonding as an innovative financing tool."</p>
Efficiency	<p>"Limited efficiency</p> <ul style="list-style-type: none"> • General obligation bonds are not new revenues to the State; however, they would be new revenues to TxDOT. • Applicable to projects funded through the State Highway Fund, pending enabling legislation. • Cannot be used to secure additional debt."
Equity	<p>"Equitable</p> <ul style="list-style-type: none"> • Costs are spread over time. • If repaid by the state's general fund, not linked to transportation uses. • Not equitable across the system, as costs are equal system-wide but benefits may not be."
Simplicity	<p>"Simple</p> <ul style="list-style-type: none"> • Enabling legislation necessary to approve bond issuance. • General obligation bonds for infrastructure are understood by the public."
Reference	<p>Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i>, 2008</p>

Bonds- Backed by fees	Texas Mobility Fund
Legislative Restrictions	<p>"State DOTs are not always willing to use federal innovative financing tools, nor do they always see advantages to using them. For example, officials in two states indicated that they had a philosophy against committing their federal aid funding to debt service. Moreover, not all states see advantages to using FHWA innovative financing tools. For example, one official indicated that his state did not have a need to accelerate projects because the state has only a few relatively small urban areas and thus does not face the congestion problems that would warrant using innovative financing tools more often. Officials in another state noted that because their DOT has the authority to issue tax-exempt bonds as long as the state has a revenue stream to repay the debt, they could obtain financing on their own and at lower cost"</p>
Reference	<p>TRANSPORTATION INFRASTRUCTURE Alternative Financing Mechanisms for Surface Transportation" testimony Before the Committee on Finance and Committee on Environment and Public Works U.S. Senate. September 2002.</p>

Bonds- backed by future Federal funds	Grant anticipation notes (GAN)
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Description	(Similar to GARVEE next). Grant Anticipation Notes are Federal bonds that the federal government allows states to borrow against anticipated future Federal grants.
Primary Benefits to Partners	This financing method allows for an entity to borrow money for a project without having a steady source of revenue to repay it. Instead this kind of tool allows the entity to borrow the money to start the project against anticipation of the revenue that will be realized once the project is completed.
Potential Pitfalls	There are "two primary concerns with this contract assistance agreement. (1) the operating and maintenance cost reimbursement from the state is legislatively capped at \$25 million per year – although the projected cost to operate and maintain the Central Artery and CANA is expected to far exceed this amount over time." (2) "because the contract assistance payments are used to pay debt service on prior borrowings for the project, tolls are effectively paying for all operating and maintenance costs associated with the nontolled Central Artery. "
Legislative Restrictions	The state can cap the amount of money borrowed.
Reference	< http://www.eot.state.ma.us/downloads/tfc/TFC_Findings.pdf >
Case Studies	"In the late 1990s Massachusetts issued \$1.5 billion of Grant Anticipation Notes (GANs) to pay for the Central Artery. The current outstanding balance of these GANs is \$1.2 billion. MassHighway's spending plan provided to the Commission shows that one quarter of the state's obligation authority between FY 2007 and 2009 (i.e., the amount of money that is expected to actually be received from the Federal government for highway spending) will go toward repaying the GANs. The GANs extend to 2014, and the amount of the GAN repayments increases steadily by about 8 percent per year from 2009 to 2014. <ul style="list-style-type: none"> • The state has an outstanding balance of \$279 million in advance construction dollars, which has allowed Massachusetts to start working on projects with its own funds before all the Federal funds become available."

Bonds- backed by future Federal funds	GARVEE bonds
Description	(Using future federal grants for debt service of bonds). The Grant Anticipation Revenue Vehicle (GARVEE) is essentially a "debt financing instrument that has the pledge of future Federal-aid for debt service and is authorized for federal reimbursement of debt service and related financing costs."
Partnering Entities/Potential	Federal, State, local and private.

Partners	
Primary Benefits to Partners	The primary benefits that a partner would have would be the acceleration of project completion, lower costs due to the inflation savings and additional funds for transportation projects. In addition, the project could experience performance standards at a reduced cost for TxDOT.
Legislative Restrictions	"Not all state DOTs have the authority to use certain financing mechanisms, and others have limitations on the extent to which they can issue debt. For example, California requires voter approval in order to use its allocations from the Highway Trust Fund to pay for debt servicing costs. In Texas, the state constitution prohibits using highway funds to pay the state's debt service. Other states limit the amount of debt that can be incurred. For example, Montana has a debt ceiling of \$150 million and is now paying off bonds issued in the late 1970s and early 1980s and plans to issue a GARVEE bond in the next few years.
Reference	Promoting Local Participation on Transportation Improvement Projects August 2006 Transportation Infrastructure: Alternative Financing Mechanisms for Surface Transportation p.21 and http://www.innovativefinance.org/projects/highways/butler.asp ; TRANSPORTATION INFRASTRUCTURE Alternative Financing Mechanisms for Surface Transportation" testimony Before the Committee on Finance and Committee on Environment and Public Works U.S. Senate. September 2002.
Case Studies	Corridor 44 located in Santa Fe, New Mexico:"The first ever long term highway warranty was introduced by the State of New Mexico when its DOT partnered with Mesa Development Corporation for a 20 year highway warranty in the United States. The warranty was secured with a private sector company assets that are pledged to the state, guaranteeing a public road of superior quality that could not be achieved using the traditional means of financing." BUTLER REGIONAL HIGHWAY- BUTLER COUNTY, OHIO or another example would be " the challenge of Interstate highway needs of over \$1.0 billion, the state of Arkansas determined that GARVEE bonds would make up for the lack of available funding. In June 1999, Arkansas voters approved the issuance of \$575 million in GARVEE bonds to help finance this reconstruction on an accelerated schedule. The state will use future federal funds, together with the required state matching funds and the proceeds from a diesel fuel tax increase, to retire the bonds.
Contact	Rhonda G. Faught, P.E. Cabinet Secretary New Mexico Department of Transportation Tel. (505) 827-5110 rhonda.faught@nmshtd.state.nm.us Tisha Jones Mesa PDC, LLC

	4111 E. 37th St. North Wichita, KS 67226 jonest@nm44.com Tel. (316) 828-6688
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Bonds- backed by local general funds	Municipal Bonds
Description	Municipal Bonds represent borrowing by state or local governments to pay for, for example, highways. The interest income earned is exempt from Federal tax and state and local taxes if issued in the investor's state of residence. There are several types of municipal bonds, among others general obligation bonds. General obligation bonds are voter-approved bonds to finance specific capitol improvements, such as highways. These bonds are not tied to a particular revenue stream. Rather they are backed by the full faith and credit of the state or local agency. City bonds, for example pledge the city's general fund income, including taxes on real and personal property, for the payment of the principal and interest of the bonds. The issuer can thus raise taxes as high as needed to pay the bonds.

Bonds- backed by a tax	Limited Obligation and special tax bonds
Description	These bonds are payable from a pledge of the proceeds against a special tax, such as a gasoline tax. Unlike general obligation bonds, the issuer is limited as to the source for the revenue to pay the bonds.
Reference	www.e-analytics.com/bonds/bond14.htm

Bonds- backed by asset leases	Certificates of Participations (COPs)
Description	COPs are tax-exempt bonds issued to finance the purchase of assets that are usually secured with revenue from a specified source such as an equipment or facilities lease.
Case Studies	The California Transit Finance Corporation (CTFC), for example, provided funding to purchase buses for several California transit operators, including the Sunline Transit Commission. The CTFC issued COP's, secured by a lease on the buses that were purchased (Federal Transit Administration, 1995). Significant economies of scale are realized, because the CTFC permits transit operators to combine what would otherwise be individual financial transactions for equipment leases or vehicle purchases, thereby achieving cost savings.

Bonds- backed by local revenues	Local Bonding (Revenues pledged)
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Description	"Local governments are authorized to issue bonds to fund the costs of state highways within the county and extensions into adjacent counties, and to pledge for the payment of the bonds: (1) revenues from any source; (2) taxes (subject to any applicable constitutional limitation), or (3) a combination of revenue and taxes."
Partnering Structure	Local government, county, and state.
Primary Benefits to Partners	This financing tool is "particularly suited to rural project financing" for the reason that it has (1) local benefits to the economy and "can only be recaptured through local revenue measures." Furthermore, "a district in which bonds are issued for transportation (2) projects will not lose any of its previous share of the gas taxes (since funding allocation formulas are prohibited from being revised)." Thus, this financing tool, local bonding, can be an effective way of leveraging state and federal funds.
Reference	< http://www.innovativefinance.org/projects/highways/cross.asp >
Case Studies	CROSS ISLAND PARKWAY- HILTON HEAD, SOUTH CAROLINA
Contact	Anna Salvagin South Carolina DOT (803) 737-1277

Bonds- backed by specific revenues	Revenue Debt
Description	Revenue debt can be issued by the state, an authority, or even the private sector and are guaranteed by specific new and or existing revenue streams. These include tolls, cargo fees, dedicated sales or other taxes, etc. (Transportation Research Board, 1998).

Bonds- interest-free/ tax credit	Tax Credit Bonds
Description	Tax credit bonds are a form of interest free financing in that the issuer is only responsible for repaying the principal. The federal government provides tax credits to bondholders instead of interest payments. These bonds provide a more substantial benefit to the issuer than tax-exempt bonds (Transportation Research Board, 1998).
Contact	JayEtta Z. Hecker (heckerj@gao.gov) or Steve Cohen (cohens@gao.gov) (202) 512-2834. Individuals making key contributions to this testimony include Lynn Filla-Clark, Jennifer Gravelle, Gail Marnik, Jose Oyola, Eric Tempelis, Stacey Thompson, and Jim Wozny.
Lessons Learned	"In the case of a tax credit bond where project revenues would be the only source of financing to redeem the bonds and the federal government would be committed to paying whatever rate of credit investors would demand to purchase bonds at par value, the federal

	<p>government would bear all of the cost of compensating the investors for risk.¹⁰ States would no longer have a financial incentive to balance higher project risks with higher expected project benefits. Alternatively, the credit rate could be set equal to the interest rate that would be required to sell the average state bonds (issued within the same timeframe) at par value. In that case, states would bear the additional cost of selling bonds for projects with above average risks".</p>
Reference	<p>TRANSPORTATION INFRASTRUCTURE Alternative Financing Mechanisms for Surface Transportation" testimony Before the Committee on Finance and Committee on Environment and Public Works U.S. Senate, September 2002, p.11.</p>

Bonds- private sector	Private Activity Bonds (PABs)
Description	<p>Private Activity Bonds (PABs) are tax-exempt bonds issued by private entities to provide special financing for infrastructure projects. They reduce the costs of financing because they are exempt from federal tax. Federal legislation limits the amount of PABs that may be issued.</p>

Loans

Loans- Federal to be repaid by dedicated revenue	Section 129 loans
Description	<p>This is a good financing tool because it provides many options for local agencies to dedicate future revenues. "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. Section 129 loans are essentially loans that any project can qualify for as long as it has a dedicated source of revenue. Typical project revenue streams include:</p> <ul style="list-style-type: none"> • Tolls on road and bridge projects • Pledges of
Partnering Structure	Local Government and a private developer
Primary Benefits to Partners	<p>(1) "Attract private or local funding by providing easy financing (2) Accelerate projects slated for grants in later years of a STIP (3) Provide "gap" funding or initial "seed" funding for difficult to finance projects (4) Assistance, short of grants, to eligible private sector projects, with a public purpose:</p> <ul style="list-style-type: none"> • Intermodal freight transfer • Truck stop electrification • Car sharing • Rail-highway crossing elimination"

	The primary benefits to the loan borrowers include: "Low interest rate (below market), Long terms (max loan term 30 years), Seed funding -- repayments don't have to begin until 5 years after construction and the possibly more lenient underwriting (for public purpose projects)"
Legislative Restrictions	"• No grants allowed • Investment income has to be credited to revolving fund • Annual reports to Secretary required • 2% limit on fraction of funds used for administration. • Guidelines on investment of SIB funds" Also, Federal Funds CANNOT be used to repay Section 129
Reference	THE FUNDING AND FINANCING OF MANAGED LANES PROJECTS p.13; < http://innovativefinance.org/events/pdfs/freight06_mayer.pdf >
Case Studies	There are only 3 Section 129 Loans to date (George Bush Turnpike in TX, Butler Regional Highway & Stark County Intermodal Facility in OH). 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.
Contact	Jennifer Mayer (415)744-2634 Jennifer.mayer@fhwa.dot.gov

Loans- Federal	TIFIA
Description	"The TIFIA program—can leverage federal funds by attracting additional nonfederal investments in infrastructure projects. For example, the TIFIA program funds a lower share of eligible project costs than traditional federal-aid programs, thus requiring a larger investment by other, non-federal funding sources. It also attracts private creditors by assuming a lower priority on revenues pledged to repay debt. Bond rating companies told us they view TIFIA as “quasi-equity” because the federal loan is subordinate to all other debt in terms of repayments and offers debt service grace periods, low interest costs, and flexible repayment terms".
Primary Benefits to Partners	"However, TIFIA's features, taken together, can enhance senior project debt ratings and thus make the project more attractive to investors. For example, the \$3.2 billion Central Texas Turnpike project—a toll road to serve the Austin–San Antonio corridor—received a \$917 million TIFIA loan and will use future toll revenues to repay debt on the project, including revenue bonds issued by the Texas Transportation Commission and the TIFIA loan. According to public finance analysts from two ratings firms, the project leaders were able to offset potential concerns about the uncertain toll road revenue stream by bringing the TIFIA loan to the project's financing"
Potential Pitfalls	"It is often difficult to measure precisely the leveraging effect of the federal investment. As a recent FHWA evaluation report noted, just

	comparing the cost of the federal subsidy with the size of the overall investment can overstate the federal influence—the key issue being whether the projects assisted were sufficiently credit-worthy even without federal assistance and the federal impact was to primarily lower the cost of the capital for the project sponsor".
Legislative Restrictions	"Some financing tools have limitations set in law. For example, five states are currently authorized to use TEA-21 federal-aid funding to capitalize their SIBs. Although other states have created SIBs and use them, they could not use their TEA-21 federal-aid funding to capitalize them. Similarly, TIFIA credit assistance can be used only for certain projects. TIFIA's requirement that, in general, projects cost at least \$100 million restricts its use to large projects".
Reference	http://www.innovativefinance.org/topics/finance_mechanisms/federal_loans/tifia.asp ; TRANSPORTATION INFRASTRUCTURE Alternative Financing Mechanisms for Surface Transportation" testimony Before the Committee on Finance and Committee on Environment and Public Works U.S. Senate. September 2002 (Statement of JayEtta Z. Hecker, Director, Physical Infrastructure Issues of the GAO, p.5).
Contact	JayEtta Z. Hecker (heckerj@gao.gov) or Steve Cohen (cohens@gao.gov). (202) 512-2834. Individuals making key contributions to this testimony include Lynn Filla-Clark, Jennifer Gravelle, Gail Marnik, Jose Oyola, Eric Tempelis, Stacey Thompson, and Jim Wozny.
Lessons Learned	"In some cases private investors participate in highway projects, either by purchasing "nonrecourse" state bonds that will be repaid out of project revenues (such as tolls) or by making equity investments in exchange for a share of future toll revenues. By making these investments the investors are taking the risk that project revenues will be sufficient to pay back their principal, plus an adequate return on their investment. In the case where the nonrecourse bond is a tax-exempt bond, the state must pay an interest rate that provides an adequate after-tax rate of return, including compensation for the risk assumed by the investors. By exempting this interest payment from income tax, the federal government is effectively sharing the cost of compensating investors for risk. Nevertheless, the state still bears some of the risk-related cost and, therefore has an incentive to either select investment projects that have lower risks, or select riskier projects only if the expected benefits from those projects are greater.

Loans- from state to be repaid from local reveunes	State Infrastructure Bank (SIB) Program
Description	The State Infrastructure Bank (SIB) Program gives states flexibility to offer a range of loans and credit assistance to meet the specific highway construction and transit capitol needs of individual states. Most states

	are providing SIB assistance in the form of direct loans (at or below market rates) but in the case of Puerto Rico SIB funding is used to support the issuance of highway bonds. The SIB gives "states flexibility to offer a range of loans and credit assistance to meet the specific highway construction and transit capitol needs of individual states." Under SIB, all States (Puerto Rico, the District of Columbia, American Samoa, Guam, the Virgin Islands, and the Commonwealth of the Northern Mariana Islands) are "authorized to enter into cooperative agreements with the Secretary to establish infrastructure revolving funds eligible to be capitalized with Federal transportation funds authorized for fiscal years 2005-2009."
Partnering Structure	The partnering structure was a cost sharing one where the DOT's highway bonds, SIB loans and County hospitality fees paid for the project. In addition, the "MPO/COG committed anticipated federal funds against SIB debt."
Partnering Entities/Potential Partners	DOT, SIB, County and MPO/COG
Primary Benefits to Partners	Acceleration of project completion, funding sources from outside of the DOT, project cost reduction, and increased funding available for transportation financing. "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 legally permissible; and provide credit enhancements, all in an effort to bolster a project's attractiveness to the private capital markets."
Legislative Restrictions	<p>Limitations on the way the money of the SIB account is spent are limited as follows:</p> <p>"Highway account – up to 10 percent of the funds apportioned to the State for the National Highway System Program, the Surface Transportation Program, the Highway Bridge Program and the Equity Bonus.</p> <p>Transit account – up to 10 percent of funds made available for capital projects under Urbanized Area Formula Grants, Capital Investment Grants, and Formula Grants for other Than Urbanized Areas</p> <p>Rail account – funds made available for capital projects under subtitle V (Rail Programs) of Title 49, United States Code.</p> <p>The State must match the Federal funds used to capitalize the SIB on an 80-20 Federal/non-Federal basis, except that for the highway account, the sliding scale provisions apply."</p>
References	<p>Promoting Local Participation on Transportation Improvement Projects August 2006 p.32;</p> <p>THE FUNDING AND FINANCING OF MANAGED LANES PROJECTS p.13;</p> <p>FHWA's Innovative Finance, 2001;</p> <p>"TRANSPORTATION INFRASTRUCTURE Alternative Financing</p>

	Mechanisms for Surface Transportation" testimony Before the Committee on Finance and Committee on Environment and Public Works U.S. Senate, September 25, 2002.
Case Studies	The Veterans Highway of South Carolina (SC 22): Joint financing through the state's DOT using the State Infrastructure Bank (SIB) and the County. This particular project cost \$386 million: \$95 million was paid by the DOT using the SIB and the remaining balance was paid for by hospitality fees (fees from hotel rooms, green fees, restaurant meals). Some of the SIB assisted projects in Texas include: State Highway 121, State Highway 45, the World Trade Bridge, the El Paso International Bridges, the Joe Fulton International Trade corridor, and the John F. Kennedy causeway. Moreover, using a \$25 million SIB loan for land acquisition in the initial phase of the Miami Intermodal Center, Florida accelerated the project by 2 years, according to FHWA.
Contact	Deborah Roundtree, South Carolina DOT (803) 737-1243

Appendix C: Revenue Options

Reimbursements

Reimbursements-paid according to actual usage	Pass-through agreements (PTA)
Description	PTAs are a "per vehicle fee or a per vehicle-mile fee that is determined by the number of vehicles using a toll or non-toll facility on the state highway system, that will be paid to the entity that financed the construction of the facility". Essentially, "in a pass-through financing agreement: The developer agrees to finance, construct, maintain and/or operate a project on the state highway system. TxDOT reimburses the developer the cost of the project rather than assessing a toll directly on users via a toll. TxDOT makes periodic payments based on the number and types of vehicles using the facility." Furthermore, "Pass-through financing projects do not require toll plazas or toll collection equipment. In fact, they look like typical non-tolled facilities. The difference is that the monies typically paid by the motorist in conventional tolling is paid by TxDOT".
Partnering Structure	Potential partnering structures include: Regional Tollway Authority, Regional Mobility Authority, TxDOT, Private Entity and the Local or County Government
Partnering Entities/Potential Partners	A Developer and The Department of Transportation
Primary Benefits to Partners	As a benefit to the local government, this financing mechanism allows for "local, up front financing of the project, rather than reliance on TxDOT funding".
Legislative Restrictions	In order for a project to qualify for this financing option, it must be on the state highway system. TxDOT has currently put a moratorium to evaluate current projects.
Case Studies	See Case Studies section of this report
Contact	James M. Bass Chief Financial Officer Finance Division (512) 463-8684 www.dot.state.tx.us; Doug Woodall, P.E. Director of Transportation Planning & Development Texas Turnpike Authority Division (512) 936-0908
References	http://www.dot.state.tx.us/publications/design/ptf_guidelines.pdf ; http://www.dot.state.tx.us/publications/ta/pass_through.pdf ; http://corridornews.blogspot.com/2005/10/txdot-pushes-for-rma-and-

	pass-through.html
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Reimbursement based on availability	Availability Payments
Description	An entity finances, designs, constructs, operates, and maintains the facility. The state or a contracted separate entity collects tolls from users, and reimburses the owner based on availability of the facility, e.g., how many lane-mile-days it is open for use, condition, etc. Variations include the owner getting a share of the available revenue, but it is not clear why this would be preferred to private tolling.
Partnering Structure	The owner entity could be a private company or other non-state entity (city, county, RMA, toll authority, etc.). The state would sign an agreement with them on a reimbursement plan. The toll collector is not part of the partnership necessarily, but merely an agent for the state.
Primary Benefits to Partners	The main benefit for the state is that additional transportation facilities are made available to the public. The investor has a guaranteed stream of revenue which hopefully is sufficient to cover expenses and return a profit. In the case of local government investors, they may be satisfied with lower reimbursement, because they get the transportation facility they want, and may be able to tax the economic benefits.
Potential Pitfalls	The risk to investors is that expenses exceed the availability payments, e.g, high maintenance costs, or accidents or frequent maintenance reducing lane availability. The main risk to the state is that toll revenue may not be sufficient to cover agreed payments.
Legislative Restrictions	This mechanism gets around the 2007 Legislature's 2-year moratorium on new toll projects, in that the state will do the tolling.
Case Studies	Possible on SH281 in San Antonio.
Reference	Doug Woodall, TxDOT.

Sales

Sales- of assets	Land sales proceeds
Description	Asset sales used to finance roads. A project will be paid for through real estate sales (51%), metro operating profits (30%), government loans (10%), and taxes (9%) (Option for flexible match or small urban/rural financing).
Reference	Research Results Digest 77 May 2006 p. 13-14

Leases

Leases- concessions	Toll concessions
Description	"Toll equity helps stretch limited state tax dollars by allowing state highway funds to be combined with other funds to build toll roads,

	<p>without requiring repayment of state highway funds. This combination of funds makes toll roads more feasible since the entire cost of the project does not have to be repaid with tolls. Current law limits TxDOT's annual financial participation in toll facilities to \$800 million each fiscal year. Section 222.103, Transportation Code establishes the \$800 million toll equity cap and does not apply to money required to be repaid (loans). There are concerns that the existing cap on toll equity will severely limit the department's ability to leverage limited state highway funding by financing toll projects". "In Texas and in most other jurisdictions, tolls are pay-per-use fees that are levied on users of a preferred route in addition to what system-wide user fees they may pay through motor fuel taxes or other charges."</p>
Primary Benefits to Partners	<p>"In the case of highway sector investments, it seems fair to say that the cost-benefit trade-off is typically in favor of PPPs. But whether the net benefits of PPPs materialize in practice depends very much on the institutional framework for PPPs and highway sector policies"</p>
Potential Pitfalls	<p>Traffic and Revenue Risks include: "Miscalculation of road user willingness-to-pay (WTP) especially for frequent users/commuters, and trucks. Recession/economic downturn. Future-year land use scenarios that never transpired. Inaccurate estimate of Value of Time. Time savings less than expected." Also, there are potential Engineering Risks that include: "Design, construction and maintenance should be with concessionaire who will pass it on, or share it with, his contractors. Ground conditions: bidders should share costs of ground investigations until concession award, then paid by successful concessionaire."</p>
Modifications Required	<p>Using a Private Party Partnership can mean: "Bidding for private sector schemes costs much more than for public sector schemes (design, legal, financing costs). Preparing concessions for PPP projects cost much more than public sector projects (legal and financial advice costs). The cost of money for the private sector is higher than for the public sector especially for "one-off" private projects. The whole process can be time consuming. Total cost of private financing may be more than equivalent public sector schemes."</p>
Case Study Examples	<p>"Hungary is a particularly interesting case of PPP and concession models for highways, although not a very successful one. In fact, Hungary was the first CEE country that decided, in 1991, to rely almost entirely on private concessions for its highway development. The required investments for highway construction alone were estimated at around EUR 3 billion, to be raised through concessions to domestic and foreign private investors. Initially, concessions were planned for Hungary's major motorway stretches M1, M15, M3, M5, M7, and two</p>

	bridges over the river Danube. The introduction of cost-covering tolls was a necessary condition for the success of this type of PPP".
Case Studies	Concessions that were planned for Hungary's major motorway stretches M1, M15, M3, M5, M7, and two bridges over the river Danube were not successful.
Lessons Learned	According to Henry Kerali of the World Bank, the main elements for success are: "A well defined legal framework with well developed model concession contract. Simple and transparent procurement. Shared risk-reward concession structure. Appropriate Gov't revenue support system. Projects should have social benefits as well as commercial viability. Particular attention to traffic forecasting and public willingness-to-pay. Public sector comparator is a must. Need for institutional capacity to manage PPP projects (PPP unit) with external expert advice."
Efficiency	"Somewhat efficient: <ul style="list-style-type: none"> • Increasing tolls by 10¢/transaction on all currently tolled facilities would approximately yield an additional \$50 million per year, considering price sensitivity. • Not indexed to costs, but initial toll rate schedules must account for full life cycle costs. • Stable but sensitive to price, since drivers usually have an alternative untolled route. • Often collected by local toll authorities. • Most toll revenues are spent only on the system on which they are collected and there is resistance to spending toll revenues on other systems."
Equity	"• Equitable across locations, generations, users, and income groups as long as drivers have an alternative untolled route. • Low chance of diversion to non-transportation uses."
Simplicity	"• Well understood user fee in practice across Texas. • Tools for administration, compliance, and collection in place."
References	Henry Kerali, World Bank. Powerpoint without a date; Brenck, Beckers, Heinrich, and Hirschhausen, 2005, p.89; Texas Transportation Commission "Mobility Challenges & Solutions 79th Legislative Session" December 16, 2004; Reprint from EIB Papers, Vol. 10, No. 2 (2005), 82-112 "Public-Private Partnerships in New EU Member Countries of Central and Eastern Europe: An Economic Analysis with Case Studies from the Highway Sector"; Texas Department of Transportation Funding Challenge Findings and Analysis, 2008.

Leases- ROW	Right of Way (ROW) leases
Description	A way for the Department of Transportation to extract money from existing assets. Examples include leases for utility corridors and cell phone towers.
Case Studies	E- 470 PUBLIC HIGHWAY AUTHORITY- DENVER, COLORADO
Contact	<p>Finance information: John D. McCuskey Director of Finance jmccuskey@e-470.com</p> <p>Operational information: Dave Kristick Director of Operations dkristick@e-470.com</p> <p>E-470 Public Highway Authority 22470 E. 6th Parkway Suite 100 Aurora, CO 80018 Tel. (303) 537-3470</p>
Reference	http://www.innovativefinance.org/projects/highways/e470.asp

Fees

Fees- vehicle registration- from owners	Road Tariffs (Annual road access fee)
Description	The identified road tariff could be charged through "an annual vehicle license fee that charges for access to the road network (sometimes supplemented by a heavy-vehicle license fee), a road maintenance levy added to the price of fuel that charges for use of the road network, and, where feasible, or a congestion charge to manage congestion."
Potential Pitfalls	Rising costs make it hard to keep up
Reference	Commercial Road Management and Financing of Roads

Fees- vehicle registration fees	Vehicle Registration Fees
Description	"Texas charges a fee on all vehicle registrations that varies according to the class of vehicle being registered. In addition, counties in Texas levy vehicle registration fees to pay for improvements to their road systems. Texas vehicle registration fees remitted to the State Highway Fund average about \$62 per vehicle registration, lower than the U.S. average of about \$67 per vehicle registration."
Efficiency	<p>"Very Efficient</p> <ul style="list-style-type: none"> • Each \$10 increase in motor vehicle registration fees should yield about \$200 million per year in additional revenues

	<ul style="list-style-type: none"> • Revenues should grow in proportion to vehicle registrations which, in times of high fuel prices, may exceed the growth rate of motor fuel taxes as the average mileage driven with Texas-registered vehicles declines • The purchasing power of vehicle registration fees will erode with continuing inflation”.
Equity	<p>"Somewhat Equitable</p> <ul style="list-style-type: none"> • Equitable across generations but fees are the same regardless of distances traveled and type of fuel used • Not equitable across locations, as collection is statewide but projects are local • Somewhat regressive, as lower income groups pay a higher proportion of their incomes. • Low chance of diversion to non-transportation uses"
Simplicity	<p>"Simple</p> <ul style="list-style-type: none"> • All necessary administrative and compliance tools exist • No new technology or increased costs of compliance to users • Subchapter D (Registration Procedures and Fees), Section 502 (Registration of Vehicles), Title 7 (Transportation) would have to be amended."
Reference	Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008

Fees- Road user charges	Usage-Based Vehicle Charges
Description	Usage Based Vehicle Charges include: mileage based charges for insurance, taxes, or the lease fees. Car Sharing and the Pay-As-You-Drive (PAYD) Automotive Insurance can also be a usage based charge. PAYD Auto Insurance is a charge associated with a driver's usage that converts the traditional fixed rate of Auto Insurance into a variable. This gives the driver an incentive to use his/her car less as the rate is directly related to the amount of miles traveled.
Case Studies	Indiana-results of highway financing needs study carried out for Indiana, and results of analyses using the Indiana Statewide Travel Demand Model (ISTDM); California: Car Sharing in the City of San Francisco; Georgia: Simulation of Pricing on Atlanta's Interstate System; Minnesota: Mileage-Based User Fee Regional Outreach Statewide
References	www.ops.fhwa.dot.gov/tolling_pricing/projtypes/usagebasedvehchgs Implementation and Evaluation of Self-Financing Highway Pricing Schemes - A Case Study - p.11

Fees- traffic impact- from developer	Pro-Rata Reimbursement
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Description	Pro-Rata Reimbursement requires that the developer pay for the cost of providing roads. "Any such provision must provide for the adoption of a pro-rata reimbursement plan to include reasonable standards to identify the area having related traffic needs, to determine the total estimated or actual cost of road improvements required to serve the area adequately when fully developed in accordance with the comprehensive plan or as required by proffered conditions, and to determine the proportionate share of such costs to be reimbursed by each subsequent subdivider or developer within the area, with interest at the legal rate or at an inflation rate prescribed by a generally accepted index of road construction costs, whichever is less (§ 15.2-2242 of the Code)."
Reference	Alternative Transportation Funding Sources Available to Virginia Localities p.12

Fees- on new utility installations	Utility fees
Description	Utility franchise fees, in this case, are used to leverage Texas Mobility Fund (TMF) money. The utility fee would be charged on all new utility installations, and would raise an anticipated amount of about \$70 million over time. Essentially, this financing mechanism is a way for locals to raise money.
Case Studies	Lubbock, Texas: Lubbock Outer Loop "The leveraged TMF money is pledged for transportation purposes, including development of the Lubbock outer loop. Recently, in the current legislature session, SB 683 was filed to permit Fort Bend County Municipal Utility District to issue bonds to construct road facilities including state highways and turnpikes, and to impose a property tax to repay those bonds. Other leveraging mechanisms include contribution of right-of-way, drainage and utilities, materials, and inspection staff."
Reference	See Case Studies section of this report

Fees- road utility -from developers or property owners	Road Utility Fee, Impact Fees, or Traffic Impact Fee
Description	(Very similar to Pro-rata reimbursement). "The Road Utility Fee is based on the amount of traffic generated by a piece of property, looking at the type of use and size of the building". There are nine proposed categories of this type of fee, of which two are residential. "The fee is billed monthly on the regular city utility bill" and is divided accordingly: 1/7 for street lighting, 6/7 for the Pavement Management Program." In total, approximately 3/4 of the money will come from nonresidential customers.

	"Impact fees are fees paid as part of a permitting approval process to offset, partially or entirely, the costs of traffic capacity and safety improvements that the developed land will require. Many county and municipal governments throughout the United States impose them under different names, such as Traffic Impact Fees or Transportation Improvement fees.
Primary Benefits to Partners	The fee is equitable, reasonable and can be easy to manage. The funds can be used to "maintain almost every street in the city."
Potential Pitfalls	How to keep up with rising costs. "The implementation of a corridor wide land development charge would require municipalities to agree to a common fee structure in order to avoid competition".
Case Studies	City of Tualatin, Oregon
Contact	Steve Wheeler, City Manager or Daniel J. Boss, Operations Director
Efficiency	"Land development charges are not efficient. The revenue yielded by land development charges can be significant on a per-project basis but is unlikely to meet major project or program needs; they are not efficient due to the small number of developments to which they can be applied. Impact fees, if related to real estate values, would be well-insulated from loss of purchasing power due to cost increases but would vary significantly due to changes in the health of the economy. As a result, they would not be a good source of debt security. They are almost always leveraged at the local level. To illustrate the potential yield of an impact fee in Texas, where the value of non-residential building permits averages about \$7 billion per year, land development charges would yield revenues of about \$75 million per year".
Equity	"Land development charges are equitable, since the developers who pay them pass the charges on to the consumers who benefit from the developed sites. Land development revenues go into the developing infrastructure that these consumers will require for access to the sites. There is no cost disadvantage to localities charging land development fees; however, they are a form of real estate tax that can divert funds from other local priorities".
Simplicity	"These fees are simple to understand and administer. Twenty-seven states currently have land development charge-enabling legislation. Systems, such as permitting, are already in place at the local level to administer land development charges, although implementation would require more legal involvement. The implementation of a corridor-wide land development charge would require municipalities to agree to a common fee structure in order to avoid competition".
References	League of Oregon Cities Conference (Power Point) November 9, 2002; http://www.orcities.org/portals/17/A-Z/handout16.pdf ; TxDOT Funding Challenge Findings and Analysis, 2008 (DYE Report)

Fees- road utility -from property	Transportation Utility Fee (TUF)
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owners	
Description	(Same as Road Utility Fee). This financing tool treats transportation like a public utility and therefore requires the users to pay a "user fee." Using this method of finance, the local government would assign a fee based on the estimated road usage for a property and the generated trip rates associated with that property. "All TUF alternatives are similar and slightly regressive."
Partnering Structure	Local government, developers, residents and the DOT
Primary Benefits to Partners	The revenue generated from the TUF would be adequate and stable. This method of finance would also allow for a diversification of the revenue sources for transportation and would have the least legal challenges when compared to other innovative financial mechanisms for municipalities.
Potential Pitfalls	Possible project delays due to "pandemonium created by the land users and the difficulties in shifting [utility] lines." Hence, the Public Works Department of some local departments are "seriously thinking of sending a proposal to the government to introduce Land users fees, which has the potential to regulate the land use." .
Case Studies	City of Milwaukee and the National Highway Authority of India (NHAI)
Contact	Contact information: Deven Carlson: decarlson@wisc.edu Bill Duckwitz: wpduckwitz@wisc.edu Karen Kurowski: kakurowski@wisc.edu Lamont Smith: lsmith3@wisc.edu
References	Possibilities for the City of Milwaukee, May 11, 2007; www.lafollette.wisc.edu/publications/workshops/2007/tuf.ppt ; < http://www.deccanherald.com/Content/Oct202007/district2007101931559.asp >

Fees- from riders of public transit	Public Transportation Ridership Fees
Description	(Similar to tolling). In order to support the operating costs of Barcelona, Spain's public transportation system, the Spanish Government relies on the ridership fees generated from the people that use the metro system. In an effort to maximize the fare-based revenues generated, the Spanish government has devised a plan to implement an integrated fare based plan that would cross all transportation modes. With this method implemented in 2001, the prices are fixed and correspond to the number of zones crossed each time a traveler makes a trip.
Primary Benefits	The operators are compensated monthly based on their concession

to Partners	contracts.
Case Study Examples	The City Ring in Copenhagen
Reference	Research Results Digest 77 May 2006 p. 12

Taxes

Taxes- sales tax to local govt	Local sales tax
Description	"Sales taxes dedicated to transportation are well-established in Texas as local option taxes and have historically been focused on transit. An increase in the state sales tax for transportation purposes would provide net new revenues. Local option sales taxes to fund transit authorities are in place in the Austin, Corpus Christi, Dallas-Fort Worth, El Paso, Houston, Laredo, and San Antonio metropolitan areas." For example, in San Antonio there is a special "1/4 cent sales tax to transportation projects based on the following statutory formula: 25% to leverage state funds (TxDOT Highway Funds), 25% for city street construction, maintenance and operations, and the remaining 50% of the funds for transit services and, depending on the level of the sales tax, the development of High Occupancy Vehicle (HOV) lanes."
Partnering Structure	Local transportation district (Advanced Transportation District), city government, and the city's Public Transportation Entity.
Primary Benefits to Partners	This is an effective way to let economic activity pay for transportation.
Efficiency	"Very efficient <ul style="list-style-type: none"> • Yield will vary based on dollar value of sales tax collected in jurisdiction • Stable, but will grow less than VMT and is sensitive to the amount of consumer goods sold • Well-established in Texas as local option taxes, typically focused on transit"
Equity	"Not equitable <ul style="list-style-type: none"> • Revenue collection not linked to transportation uses • Revenue dedicated to transportation will be lost to other programs • Possible negative impacts on retailers in border regions • Not equitable across users, income groups, locations, or generations"
Simplicity	"Very simple <ul style="list-style-type: none"> • Effective administration, compliance, and enforcement systems exist • Local governments are empowered to fund transportation projects in Texas • Section 151 (Limited Sale, Excise and Use Tax), Title 2 (State Taxation) amendment required
Case Study	The Alameda Corridor located in Los Angeles California: The Bay Area counties surrounded by the Metropolitan Transportation Commission (MTC) were allowed "to request voters to support the

	levying of a sales tax of up to one percent to fund transportation projects. Voters (56.9 percent) approved the half-cent sales tax (Measure B) in November 1986 to fund a \$990 million Transportation Expenditure Plan in Alameda County. The Expenditure Plan required an increase in the County sales tax from 6.5 to 7 per cent for a period of 15 years". For Alameda Corridor project, the partnering entities were the Caltrans, ACTA (Alameda Corridor Transportation Authority), Ports of Long Beach and Los Angeles, Southern Pacific Rail Road, and the Burlington Northern Santa Fe Rail Road. The primary benefits to partners include: the reduction of congested highways and traffic delays; the realization of economic and environmental benefits; elimination of at-grade conflicts (nearly 200 for the Alameda Corridor Project); and the increased operating speed of the railroads.
References	CTR Innovative Transportation Financing for the Future 0-4567; www.acta2002.com ; Promoting Local Participation on Transportation Improvement Projects August 2006 p.22 Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008

Taxes- Local option taxes	Local Option Taxes
Description	Essentially, this financing mechanism requires "voter approval" for projects, with debt to be repaid through a dedicated special tax, e.g., a car rental or hotel stay tax. Other possibilities include special taxes on automotive services, automotive-related purchases, or businesses servicing travelers. The tax dies when the debt is repaid.
Primary Benefits to Partners	"Each county that collects and administers a transportation sales tax has a designated transportation authority to oversee use of the funds. Thus, the creation of county transportation authorities has significantly expanded the planning and delivery of transportation improvements at the county level."
Potential Pitfalls	Projects may be susceptible to political winds. The revenue source is not predictable, and may not be sufficient to cover debt.
Reference	A Quiet Crisis in Transportation Finance: Options for Texas. Martin Wachs. April 2006

Taxes- State sales tax	Statewide Sales Tax
Description	"Sales tax revenues merit attention as a potential source of transportation infrastructure funding because of their size. In many states, retail sales taxes are the largest established tax base in the state. In Texas, collections on the state sales tax of 6 1/4% in 2006 were \$18.3 billion, over half of the state's total tax collections of \$33.5 billion."

Efficiency	"Very efficient <ul style="list-style-type: none"> • Each 1% increase would yield about \$1.3 billion per year, considering price sensitivity • Stable, but will grow less than VMT and is sensitive to the amount of consumer goods sold • Well-established in Texas as local option taxes, typically focused on transit"
Equity	"Not equitable <ul style="list-style-type: none"> • Revenue collection not linked to transportation uses • Revenue dedicated to transportation might be lost to other programs • Possible negative impacts on retailers in border regions • Not equitable across users, income groups, locations, or generations"
Simplicity	"Very simple <ul style="list-style-type: none"> • Effective administration, compliance, and enforcement systems exist • Local governments are empowered to fund transportation projects in Texas • Section 151 (Limited Sale, Excise and Use Tax), Title 2 (State Taxation) amendment required".
Reference	Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008

Taxes- State motor fuel tax	Motor Fuel Tax
Description	"The Texas state tax on motor fuel, at 20¢ per gallon, is near the national average state motor fuel tax. Combined with the US federal fuel excise tax of 18.4¢ per gallon, there is a motor fuel tax load on gasoline and gasohol in highway use in Texas of 38.4¢ per gallon. Converted into US measures, comparable fuel taxes in other jurisdictions are, approximately: <ul style="list-style-type: none"> • Canada, about \$1.25 per gallon, including a recently-introduced 30¢ per gallon carbon surtax • United Kingdom, France and Germany, about \$4 per gallon • Japan, about \$3.50 per gallon By these comparators, motor fuel taxes paid by Texans are low".
Efficiency	"Increasing the motor fuel tax rate would be very efficient, providing immediate additional revenues for the State Highway Fund of about \$100 million per year for each one cent per gallon increase in the tax rate. Its effectiveness will diminish steadily, however, as: <ul style="list-style-type: none"> • Engine efficiency increases and vehicles travel more miles to the gallon • Growth in vehicle miles traveled is diminished by the higher costs of travel to which the increased taxes contribute • Use of alternative fuels increases • The costs of highway construction inflate over time".
Equity	"A higher motor fuel tax rate is somewhat equitable. Fuel taxes are user fees and match the costs of the state highway system to drivers who use

	it. A relatively high fuel tax may put Texas fuel retailers in border regions at a competitive disadvantage. They are not equitable across locales, however: drivers in all locales pay them, but some locales may benefit from them more than others. Nor are fuel taxes equitable across levels of income: since transportation is a basic need in Texas, lower income households would pay a higher proportion of their incomes into the motor fuel tax".
Simplicity	"An increased motor fuel tax rate is very simple to understand and administer. The motor fuel tax is generally understood to be a user fee that drivers are accustomed to paying. All necessary administrative and compliance tools exist for collection of the fuel tax. As the fuel tax is collected at the point of wholesale, it is not particularly viable as a local option".
Reference	Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008
Taxes-environmental impact taxes	Carbon Tax
Description	"Carbon taxes are environmental impact charges on the carbon dioxide (CO2) emitted from burning fossil fuels, and are user fees that would appear as an increase in the state motor fuel tax. Carbon taxes are typically part of environmental reforms packages, as they send a price signal to users directly related to their individual carbon emissions. Most currently levied carbon taxes are revenue-neutral; for example, the tax collected in British Columbia is returned to taxpayers through income and business tax cuts. Those that are revenue-generating, like in Sweden, use carbon tax revenues for environmental projects."
Efficiency	"Very efficient <ul style="list-style-type: none"> • Would approximately yield an additional \$1.7 billion a year if implemented at the level of British Columbia's carbon tax (27.5 cents per gallon of gas), considering long-run price sensitivity. • Stable to economic cycles, sensitive to decreases in VMT. • Effectiveness will diminish as highway construction costs inflate, vehicle efficiency increases, and alternative fuel use increases. • Somewhat complex to implement as a local option tax.
Equity	"Somewhat equitable <ul style="list-style-type: none"> • A large increase in the motor fuel tax will change Texas' competitive position with neighboring states. • Equitable across users and generations. • Somewhat regressive, as lower income groups pay a higher proportion of their incomes. • Some chance of diversion to environmental programs, as in other jurisdictions".
Simplicity	"Simple <ul style="list-style-type: none"> • Understood user fee. • All necessary administrative and compliance tools exist.

	<ul style="list-style-type: none"> • Few problems of documentation or measurement, as exact carbon outputs of fossil fuels are known.
Reference	Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008.

Taxes- property	Real Estate Taxes
Description	In the Barcelona region of Spain, real estate taxes from individuals and business along with parking fees (from street and underground) support public transportation services. Currently there is no fuel tax in Spain.
Partnering Structure	The federal government revenues are distributed to cities based on the size of their systems and the cost needs.
Partnering Entities/Potential Partners	Regional government, municipalities served by the system and the local municipality
Potential Pitfalls	Regressive
Reference	Research Results Digest 77 May 2006 p.11-12

Taxes- on property -on increased values	Tax increment financing (TIF)
Description	These are attempts to recover some of the increases in private land values resulting from transportation investments. TIF uses "future gains in taxes to finance development". Because transportation facilities increase the adjoining property values, the resulting increase in property taxes can be used to repay transportation debt.
Partnering Entities/Potential Partners	A local government and TxDOT
Primary Benefits to Partners	The local governments would see local transportation projects advanced that would otherwise be "unaffordable" without this funding.
Potential Pitfalls	The revenue can be effective on a "per-project basis but is unlikely to meet major project or program needs." This is because the TIFs can only be applied to small numbers of developments. "They are a form of real estate tax that can divert funds from other local priorities".
Legislative Restrictions	"In 2007, Texas lawmakers enacted legislation to create Transportation Reinvestment Zones. This legislation, S.B. 1266, enables local areas to use tax increment financing to fund a project or to repay TxDOT funds under pass-through toll agreements".
Modifications Required	Systems at the local level are already in place but actual implementation would require more legal work.
Efficiency	"Impact fees, if related to real estate values, would be well-insulated from loss of purchasing power due to cost increases but would vary

	significantly due to changes in the health of the economy. As a result, they would not be a good source of debt security. They are almost always leveraged at the local level".
Simplicity	Very simple to apply and administer. As of July 2008, there are a total of 27 states utilizing land development charge-enabling legislation.
References	Transportation Research Board, 1998; Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008.

Tolls

Tolls- local	Cordon toll
Description	Motorists are charged an access fee to drive into a congested central city or central business district (CBD).
Case Studies	These fees have been implemented successfully in Singapore and Europe to reduce congestion in downtown areas. A well-known example is the London Cordon toll.
Reference	www.innovativefinance.org

Tolls- congestion pricing	Congestion pricing
Description	(Charges for miles driven on specific facilities during specific times). "Congestion pricing involves increased tolling in a specific area and/or during peak hours. They are designed to reduce congestion, and not necessarily to produce additional revenues. These charges are urban center-specific and therefore viable chiefly as an option implemented by a toll authority. Congestion charges would provide net new revenues to fund new transportation projects; however, there may be resistance to spending toll revenues outside the tolled area. Congestion charges are in use in Europe, notably in London, where users are charged about \$8 per trip to enter the central city."
Efficiency	"Not efficient <ul style="list-style-type: none"> • Tends to undermine the basis for tolls by discouraging trips into tolled area • Stable but sensitive to price, since drivers usually have an alternative untolled route • Very effective price signal to users • Viable as a local option implemented by a toll authority"
Equity	"Somewhat equitable <ul style="list-style-type: none"> • Could be diverted to non-transportation uses • Not equitable across users or locations, as the charge is not tied to infrastructure costs and almost half of the trips in a metropolitan area are from one suburb to another • Regressive; lower income groups pay a higher proportion of their incomes"

Simplicity	"Complex: <ul style="list-style-type: none"> • May be less understandable in low-density Texas; the public may not view an urban-centered congestion charge as the solution to the statewide congestion problem • High costs of implementation of new technologies and administrative tools • New legislation would be required to enable congestion charges."
Reference	Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008

Tolls- trucks	Performance Based Standards (PBS)
Description	Under this financing mechanism, trucks would pay more for their use of roads due to greater consumption of infrastructure.

Tolls- trucks	Truck toll lanes
Description	A number of transportation stakeholders have been highlighting the benefits of separating truck and automobile traffic. Potential public sector benefits include improved safety, while significant improvements in delivery time and reliability will benefit shippers. An innovative option to finance truck-only lanes providing access to seaports and intermodal yards might be through truck toll lanes.
Case Studies	A number of countries in Europe-notably Germany and Switzerland-have implemented successful truck-only toll lanes.
Lessons Learned	Comment: This would probably have strong support from car drivers.

Tolls- trucks	Weight Distribution tolls
Description	Weight distance taxes on heavy commercial trucks.
Primary Benefits to Partners	The tax can replace the deteriorating fuel tax and produce a steady revenue stream.
Potential Pitfalls	The trucking industry is very opposed to this form of taxation.
Legislative Restrictions	Many states who tried this method have opted out.
Case Studies	In 1989, Oregon introduced a form of a ton-mile tax on trucks operating on its highways.

Tolls- trucks	Container Fees
Description	"Container fees are charges imposed on freight containers as they move through a transportation facility and are most often used to fund rail and road capacity improvements into container port terminals. Container fees would provide net new revenues to fund new transportation projects; however the competitive situation of ports would require most

	revenues to be dedicated to freight infrastructure in and around the port. They are best assessed and collected by ports and/or Regional Mobility Authorities."
Efficiency	"Somewhat efficient <ul style="list-style-type: none"> • A fee of \$30 per TEU on inbound containers through Houston and Galveston would yield about \$24 million per year • Very sensitive to economic cycles • The competitive situation of ports would require most revenues to be dedicated to freight infrastructure in and around the port"
Equity	"Equitable <ul style="list-style-type: none"> • If collected by a port authority, funds are unlikely to be diverted to non-transportation uses or uses outside of freight infrastructure in and around the port • The ports would be at a cost disadvantage to other ports that do not charge container fees • Equitable across users and locations • Mildly regressive; a container fee will slightly increase the cost of goods"
Simplicity	"Simple <ul style="list-style-type: none"> • Understood by the public if tied to relevant programs • Low cost of administration and compliance • Implementing container fees would not require new legislation if they are charged by Regional Mobility Authorities".
Reference	Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008

Tolls- road user VMT charge	Vehicle Miles Traveled (VMT) Charge
Description	"A Vehicle Miles Traveled (VMT) charge is a user fee paid by drivers for each mile that they drive. The charge can vary by time of day and by location. Many transportation-related organizations, including the Transportation Research Board (TRB), AASHTO, and the National Cooperative Highway Research Program (NCHRP), have concluded that a mileage-based user fee is a superior alternative to the fuel tax. VMT charges can be assessed through odometer readings, road-side scans of a device that is mounted on the vehicle or an on-board GPS that records vehicle movement." "This option is best implemented statewide, as part of a national movement toward a VMT charge as a replacement to the motor fuels tax. If GPS technology is used, local jurisdictions could collect the tax". Alternatively, passenger vehicle owners could be billed monthly based on the previous year's mileage accrual. During the annual inspection, billed and actual mileage would be reconciled based on the odometer reading. By the same token, freight vehicles can be billed on a ton-mile basis.
Primary Benefits	The revenue is steady and not dependent on vehicle fuel economy.

to Partners	Also, this option "offers the opportunity to charge for every mile driven by every vehicle on every road."
Potential Pitfalls	This financing option has not yet been implemented beyond the pilot program. If it is, there is a concern for consumer backlash due to people not wanting the government to track their routes or routines. Also, implementing this tool via GPS would require that all vehicles be fitted for the device.
Legislative Restrictions	"The level and type of charging is subject to many political considerations." Privacy concerns will also affect the decision.
Case Studies	<p>This tool has not been used yet. It is being tested in Indiana, Oregon and Washington (Seattle). "To date, there has been relatively little investigation of the optimal VMT fee structures. One of such studies was in Oregon where the VMT fee needed to approximately cover the revenue from the current state gas tax was determined as 1.2 cents".</p> <p>"It is found that efficient VMT fee needs to be set at 2.3 cents per mile to balance state-administered expenditure if none of the current revenue sources are maintained; and at 1.6 cents if revenues from vehicle registration fees are kept. In order for the current total state highway expenditure including spending through federal disbursement to be covered by VMT fees, the rates need to be set at 3.4 and 2.7 cents per mile without and with registration revenues, respectively.</p> <p>If the agency implements a uniform (across all functional classes) and efficient VMT rate that covers state expenditure, the urban highway system subsidizes the rural system, and if the agency implements a fee structure that covers expenditure from both state revenue sources and federal aid, the urban highway system subsidizes the rural system albeit to a smaller extent; the Interstate system subsidizes the non-Interstate system; and within the urban system, the Interstate system is subsidized by other freeways and arterials".</p>
Efficiency	"VMT charges are very efficient. In Texas, each additional 0.1 cent per mile would yield about \$200 million a year for the State Highway Fund. Revenues will vary directly with VMT which, in turn, are not volatile through economic cycles. A VMT charge is immune to erosions of revenue caused by increasing fuel efficiency; they are, however, vulnerable to cost inflation. VMT revenues would be attractive security for debt and, if Global Positioning System (GPS) units are used, VMT charges can be implemented as a local option".
Equity	"VMT charges are somewhat equitable. They comprise a source of revenue that is unlikely to be raised for purposes other than funding transportation; thus they have a low opportunity cost to other government programs. VMT charges would not significantly alter Texas' competitive position with neighboring states. A flat VMT rate would not match the impact of fuel taxes on vehicles with larger engines, which typically have a greater impact on roads and air quality,

	and are thus somewhat inequitable among different vehicle types. As with motor fuel taxes, those with lower incomes will pay a higher proportion of their incomes to VMT charges. VMT charges could be equitable across localities, as they could vary by location".
Simplicity	"While a VMT fee system is novel in the United States, it is likely to be understood as a substitute for motor fuel taxes. VMT charges are very complex to implement and administer. Implementing the system would take a significant investment in administrative systems, education, and new technologies. It would be difficult to enforce VMT charges in border areas. The most likely path of implementation is a 20-year effort towards nationwide implementation".
References	Beyond the Gas Tax: Alternatives for a Greener World Before the National Surface Transportation Policy and Revenue Study Commission. Martin Wachs. The RAND Corporation. Los Angeles Field Hearing. February 21, 2007. http://www.rand.org/ Distribution Services: Telephone: (310) 451-7002; Fax: (310) 451-6915; Email: order@rand.org ; Implementation and Evaluation of Self-Financing Highway Pricing Schemes:A Case Study. Jung Eun Oh, Samuel Labi, and Kumares C. Sinha. http://trb.metapress.com/content/e8mg457m42257276/fulltext.pdf Texas Department of Transportation <i>Funding Challenge Findings and Analysis</i> , 2008.

Tolls- road user fees	Transportation Public Utility
Description	"The highway sector is set up as a public utility. The board sets its own charges, submits them to the minister responsible for transport, and, provided they are consistent with the government's overall fiscal targets, publishes them in the government gazette. The road tariff is thus no longer collected under the government's tax making powers, and the revenues are no longer earmarked taxes. Instead, the revenues are collected under contract by the gas stations and government departments, and they are deposited directly into the road fund. Some of the strongest supporters of the above system are the ministries of finance. They see it as making road financing more transparent and as tightening financial discipline in the road sector. Ministries of works are less enthusiastic, since it imposes on them a large measure of (unwelcome) financial discipline."
Reference	Commercial Road Management and Financing of Roads

Appendix D: Additional Details of Case Studies

Case Study 1. Jefferson County, Port Arthur, FM 365 (Beaumont District)

Pass-through Toll Agreement (PTA) failed.

Case Study 2. Montgomery County, FM 1488 (Houston District)

PTA Approved: August 29, 2005

Work:

- Improvements to FM 1484, FM 1485, FM 1488, and FM 1314, and constructing and potentially operating direct connectors from SH 242 to I-45

Project Cost:

- \$219,403,000
- Department Participation is \$33,080,000. Developer Participation is \$186,323,000

Repayment:

- The Department shall reimburse the Developer by paying an annual amount equal to \$0.07 for each vehicle-mile traveled on the highway improvements that were substantially complete and open to the public at the highway improvements that were substantially complete and open to the public at any time during the previous year. The total cumulative reimbursement by the Department shall not exceed 93.7% of the Developer Participation.

*The annual reimbursement will be no less than \$10,500,000.00 and no more than \$17,447,300.00. Under no circumstances will the total payments under this article during the course of this agreement exceed \$174,473,000.00.

** This agreement terminates automatically when the Department has reimbursed the Developer fully

*** The Department shall be responsible for maintenance of the Project after completion of the work

Partners:

- Montgomery County and the Texas Department of Transportation

Case Study 3. Weatherford, FM 51/SH 171 (Fort Worth District)

PTA Approved: November 22, 2005

Work:

- Widen FM 51/SH 171 from Interstate Highway 20 south to Causble Road. Add eastbound frontage road on Interstate 20 between FM 51/SH 171 and FM 2552, and reconfigure on/off ramps. Add westbound frontage road between FM 2552 and improve and widen the FM 51/SH 171-bridge crossing of Interstate Highway 20. Add eastbound frontage road on Interstate Highway 20 from South Bowie Drive to FM 1884 and reconfigure on/off ramps. Add westbound frontage road from FM 1884 to South Bowie Drive and reconfigure on/off ramps. Add and overpass crossing of Interstate 20 at Holland Lake Road.

Project Cost:

- \$54,413,921.
- The total Department Participation is \$52,443,517. The total Developer Participation is \$1,970,404.

Repayment:

- The Department will reimburse the Developer by paying an annual amount equal to \$0.15 for each vehicle-mile traveled on the highway improvements that were substantially complete and open to the public at any time during the previous year. For each highway improvement that is opened after the first highway improvement, the number of vehicle-miles traveled on the Project the previous year shall include the vehicle miles traveled on the newly opened highway improvement beginning on the date the newly opened highway improvement is substantially complete and opened to the public.

*Under no circumstances will the Departments reimbursement payment be less than \$3,496,235 or more than \$5,244,352 and under no circumstances will the total payment under this article during the course of this agreement exceed a total reimbursement of \$52,443,517.00

** This agreement terminates automatically when the Department has reimbursed the Developer fully

*** The Department shall be responsible for maintenance of the Project after completion of the work

Partners:

- City of Weatherford and the Texas Department of Transportation

Case Study 4. Titus County, US 271, FM 2348, & FM 1000 (Atlanta District)

PTA Approved: November 22, 2005

CSJ: ?

Work:

- The scope of work consists of constructing the following three (3) new Highway Improvements: US 271 (West Loop) from FM 3417 to US 67, FM 1000 (East

Loop) from US 271 (new) to FM 1735, and FM 2348 (East Loop) from US 67 to SH 49.

Project Cost:

- Current estimated construction costs:
 - US 271 = \$93.2 million;
 - FM 2348 = \$11 million;
 - FM 1000 = \$12.5 million;
 - Total = \$116.7 million (information obtained from questionnaire filled out by Deanne Simmons, Advanced Planning Engineer)
- The total Department participation is \$13,300,000. The Maximum Pass-Through Reimbursement to Developer is \$168,620,000.

Project Feasibility and Risks:

- A Conceptual Toll Feasibility Analysis was developed for the US 271 Relief Route and Pass-Through tolling analyses were developed for both FM 1000 and FM 2348. In addition, Value Engineering Studies were conducted by TxDOT in 2000 and by Titus County in 2007.
- These tools showed these highway improvements would not be likely candidates for toll projects (with bonding). The Conceptual Toll Feasibility Analysis for US 271 found that tolling the project using ETC generates enough revenue to pay for operation for the entire 40 year period, but does not pay for combined operation and maintenance costs until the 21st (no frontage roads) or 31st year (discontinuous frontage roads). The negative net revenue indicates that funding the project through bonds may not be possible. Therefore, \$122.3 M (discontinuous frontage roads) or \$104.7 M (no frontage roads) of supplemental funding would be required to construct the project.
- For both the FM 1000 and FM 2348, the Pass-through Tolling Analyses showed that although these projects have good potential for net revenue after operations without bonding as tolled facilities, they both have low feasibility for bonding. The results indicated the simple repayment mechanism (pass-through tolling) without maintenance, represents the least total financial cost and initial cost outlay to TxDOT:
- FM 1000 - \$14.6 million in 2004 dollars (\$37.57 million with long-term maintenance included in the calculation).
- FM 2328 - \$9.83 million in 2004 dollars (\$21.12 million with long-term maintenance included in the calculation).

Financing:

- The development and construction of this project will be funded by a combination of Pass-Through, state, county, city, and local investor funds. According to the Pass-Through Toll Funding Agreement between Titus County and TxDOT, the

County will pay for the development and construction of the project and TxDOT will reimburse the County a maximum of \$168,620,000 out of Category 12 (Strategic Priority) for the development and construction of this project. TxDOT will also contribute an additional \$13.3 million (\$2,402,577 of Congressional High Priority Corridor/Category 10 funds and \$10,897,423 of District Discretionary/Category 11 funds). The County will be responsible for all additional costs. (The County has commitments from the City of Mt. Pleasant and other local entities to participate in some of the cost).

- With traditional financing, these facilities simply could not be constructed for at least 15 years. Titus County realized the importance of building these needed roadways sooner rather than later and had the support of the local citizens (evident by a bond initiative which passed by a 65% margin) to pay for the project costs up front as part of the pass-through toll funding process.

Repayment:

- The Department shall reimburse the Developer by paying a semi-annual amount equal to \$0.15 for each vehicle-mile traveled on any Highway Improvement that has been accepted by the Department and open to the public.

*The semi-annual reimbursement will be no more than \$8,431,000. Under no circumstances will the total payment for any Highway Improvement exceed the maximum reimbursement amount.

** This agreement terminates automatically when the Department has reimbursed the Developer fully

*** The Department shall be responsible for maintenance of the Project after completion of the work

Impacts:

- As a result of the project, some displacements of both businesses and residential locations will be necessary. With construction of the new project, the regional traffic currently using US 271 will be able to by-pass existing US 271 and the city center to get through Mt. Pleasant. This brought up concerns about the economic impact to the local downtown businesses. There are also some opponents who feel there is not a need for an east loop (i.e. traffic does not warrant the new roadways), but the majority of the people believe the project is needed to address current and future congestion, as well as safety, on existing US 271. As expected, there was also some opposition by those whose property will be directly impacted (i.e. right of way required, displacements) by the project location.

Constraints:

- One of the more critical environmental constraints for this project is the archeological issues. This area was largely inhabited by the Caddo Indians and there are many archeologically sensitive areas throughout Titus County. Efforts were made to locate archeological sites early on in the route selection of the US

271 Relief Route to avoid and minimize the impacts to such areas. Archeological investigations are underway to determine the impacts and necessary mitigation for the impacted areas.

Risks:

- The development of the schematics for the US 271 Relief Route, FM 1000 and FM 2348 were underway by TxDOT consultants during the pass-through negotiations, but were not completed. Titus County has taken over responsibility for completing the schematics. The inherent risk in this pass-through project is the ability for plan development, environmental clearance, ROW purchase, and construction to be completed within the estimated project budget. The County currently has the project scheduled to let in March 2009. In addition, the rate of reimbursement to the County depends on traffic volumes. The semi-annual reimbursement amounts from TxDOT are based on the traffic volume utilizing the new roadways. The more traffic that uses the new roadways, the sooner the County will receive the full reimbursement amount; less traffic means a longer payback period.

Partners:

- Titus County and the Texas Department of Transportation: TxDOT had good working relationships with both the County and the City. Pate Transportation Partners (PTP) had met with the County and City about possible projects that they might be able to assist in developing. PTP provided the technical expertise to assist the County in securing the funding and providing project management. TxDOT's District Office Staff and the Administration worked cooperatively with the County to determine roles and responsibilities and negotiate favorable terms.
- Multiple meetings were held between County, City, and TxDOT (District Office and Administration) throughout the process. A Conceptual Toll Feasibility Analysis was developed for the US 271 Relief Route and Pass-Through Tolling Analyses were developed for both FM 1000 and FM 2348.
- All three projects are currently in the schematic development phase and have not yet been finalized. Changes to the design are still being considered which leaves the final cost estimate somewhat uncertain. **There are still major phases to be completed (i.e. environmental clearance, right of way purchase), each of which entail some risk for the County.** The longer the project takes to get to construction, the more it will cost.

Case Study 5. Grayson County, SH 289 (Paris District)

PTA Approved: March 3, 2006

Work:

- Improvements to SH 289 from SH 56 to FM 120 in Grayson County, provide north south access and relieve congestion on US 75, construct two lane highway with shoulders on new location with ROW purchase enabling future toll road with frontage roads, approx 10 miles.

Financing:

Waiting for conventional funding would place this project in the year 2017 or later. By allowing a local entity to finance the project and build it now will provide much needed relief to US 75. Road user costs saved along with much higher construction price in the future made this a good candidate.

Project Cost:

- \$84,506,000
- The Department Participation is \$0. The Developer Participation is \$84,506,000.
- “The construction cost of the project was 42.5 Million.” –Kevin Harris (information obtained from questionnaire.)

Repayment:

- The annual payment shall be made within 45 days after the first anniversary of the date on which the highway improvements are substantially complete and opened to the public. Subsequent payments shall be made on or before each succeeding anniversary of the first annual payment.
- The Department shall reimburse the Developer by paying an amount equal to \$0.15 for each vehicle-mile traveled on the Project during the previous year. The annual payment shall be made within 45 days after the first anniversary of the date on which the highway improvements are substantially complete and opened to the public.
- Benefits for the local entity: Increased growth along this corridor would result in economic growth. As population is rapidly growing in this county, this roadway could be converted to a toll road with free frontage roads in the future as a Regional Mobility Authority (RMA) project. For TxDOT: Relieve of congestion on US 75 would increase life of pavement and reduce maintenance costs. This applies to US 82 and SH 56 that this proposed road crosses. A comparison of future construction cost to today’s cost also showed that this project was a good candidate for upfront financing.

*The annual reimbursement will be no less than \$5,281,625.00 and no more than \$7,042,167.00

** This agreement terminates automatically when the Department has reimbursed the Developer fully

*** The Department shall be responsible for maintenance of the Project after completion of the work

Partners:

- Grayson County and the Texas Department of Transportation-TxDOT administration and local elected leaders created this partnership with the TxDOT area office and district personnel bringing the partners into the process

Case Study 6. Hays County, San Marcos, FM 3407 (Austin District)

PTA Approved: June 20, 2006

CSJ: 2104-02-023

Work:

- Extension and widening of FM 3407 from its intersection at FM 2439 westward to intersect with RM 12.

Project Cost:

- Information not available

Repayment:

- The Development shall reimburse the Developer by paying an annual amount equal to \$0.15 for each vehicle-mile traveled on the Project during the previous year.

*The annual reimbursement will be no less than \$3,030,000.00 and no more than \$6,060,000.00. Under no circumstances will the total payments under this article during the course of this agreement exceed \$60,600,000.00 unless this agreement is amended.

- 2004 Traffic 12,000; Project Traffic at Opening Day 2008 14,400; 2024 Traffic =23,800; Traffic Increase Rate: ~600 increase/year; The total pass through toll request cost is \$73,747,367; The PTT request is \$55,283,002; and the total PTT Allowable is \$50,500,000.00. Project Adjustment for Inflation = 5 years @ 4% ~ 20% (about \$10,100,000); Therefore the total reimbursement through PTT is \$60,600,000. PPT Rate-0.15/VMT with a Minimum payout of 10 years-Maximum Annual Payment-\$6,060,000; Maximum Payout-20 years-Minimum Annual Payment-\$3,030,000. Estimated Payback-17.3 years. (information from interview)

** This agreement terminates automatically when the Department has reimbursed the Developer fully

*** The Department shall be responsible for maintenance of the Project after completion of the work

Partners:

- City of San Marcos and the Texas Department of Transportation

PTA #2: Austin District

Approved: December 12, 2006

Work:

- Improvements to FM 110 (San Marcos Loop), RR 12, and FM 1626.

Project Cost:

- \$32,850,000
- State participation is \$8,010,000. County participation is \$24,840,000

Repayment:

- The Department shall reimburse the Developer by paying a quarterly amount equal to \$0.14 for each vehicle-mile traveled on the highway improvements that were substantially complete and open to the public at any time during the previous year. The total cumulative reimbursement by the Department shall not exceed 88% of the Developer Participation.

* The annual reimbursement will be no less than \$13,317,000.00. Under no circumstances will be the total payments under this article during the course of this agreement exceed \$133,170,000.00 unless this agreement is amended.

** This agreement terminates automatically when the Department has reimbursed the Developer fully

*** The Department shall be responsible for maintenance of the Project after completion of the work

Partners:

- Hays County and the Texas Department of Transportation

PTA #3 Austin District

Approved: October 23, 2007

Work:

- Improvements to US 79, FM 1660, IH 35/SH 29, US 183, and FM 2338

Project Cost:

- Information not available

Repayment:

- The Department shall reimburse the Developer by paying semi-annual amount equal to \$0.10 for each vehicle-mile traveled on the highway improvements that were substantially complete and open to the public at any time during the previous year. The total cumulative reimbursement by the Department shall not exceed 88% of the Developer Participation.

* The annual reimbursement will be no less than \$7,597,100 and no more than \$15,194,200. Under no circumstances will the total payments under this article during the course of this agreement exceed \$131,942,000 unless this agreement is amended.

** This agreement terminates automatically when the Department has reimbursed the Developer fully

*** The Department shall be responsible for maintenance of the Project after completion of the work

Partners:

- Williamson County and the Texas Department of Transportation

Case Study 7. Comal and Bejar Counties, San Antonio, FM 3487 & 2696, and SH 46 (San Antonio District)

PTA Approved: September 5, 2006

CSJ: 2104-02-023

Work:

- Improvements to FM 3487 (Culebra Road) and FM 2696 (Blanco Road)

Repayment:

- The Department shall reimburse the Developer by paying an annual amount equal to \$0.10 for each vehicle-mile traveled on the highway improvements that were substantially complete and open to the public at any time during the previous year.
- The total cumulative reimbursement by the Department shall not exceed 88% of the Developer Participation.

*The annual reimbursement will be no less than \$3,752,760 and no more than \$7,505,520.

- The annual payment shall be made within 60 days after the first year of the date on which the first highway improvement is substantially complete and opened to the public. Subsequent annual payments shall be made on or before each succeeding yearly anniversary of the first annual payment.

**Agreement terminates automatically when the Department has reimbursed the Developer fully

Responsibilities:

- Developer is responsible for the provision and acquisition of all real property needed for the Project, including easements.
- If the req'd right of way encroaches on existing utilities and the Project requires their adjustment, removal, or relocation, the Developer shall be responsible for determining the scope of utility work and notifying the appropriate utility company to schedule adjustments.

***The Department shall be responsible for maintenance of the Project after completion of the work.

Partners:

- Bexar County Infrastructure Services and the Texas Department of Transportation

PTA#2 San Antonio District

Approved: April 4, 2007

CSJ: 0215-02-029; 0215-01-036;0215-02-046;0215-02-048;0215-07-017;0215-01-038

Work:

- Improvements on SH 46 from 0.25 mi. West of Range Road to Kerlick Lane.

Project Cost:

- \$44,000,000
- The Department Participation is \$28,000,000 and the County participation is \$16,000,000.

Repayment:

- The department will reimburse the County by paying an annual amount equal to \$0.10 for each vehicle-mile traveled on the Project during the previous year.
- The annual payment shall be made within 60 days after the first anniversary of the Project's completion. Payment under this contract beyond the end of the current fiscal biennium is subject to availability of appropriated funds.
- The Department will reimburse the County by paying an annual amount equal to \$0.10 for each vehicle-mile traveled on the Project during the previous year.

*Under no circumstances will the total payment under this article during the course of this agreement exceed \$16,000,000. The number of vehicle-miles traveled on the Project (SH 46 from 0.25 mi. West of Range Road to Kerlick Lane) during a year will be based on the Department's traffic estimates, which shall be performed in good faith and shall be made within 60 days after the first anniversary of the Project's completion and within 60 days after each succeeding anniversary of the Project's completion.

**Agreement terminates automatically when the Department has reimbursed the County fully

Responsibilities:

- The Department is responsible for determining the scope of utility work if the required right of way encroaches on existing utilities and the Project requires their adjustment, removal, or relocation. Utilities will not be adjusted, removed, or relocated before environmental approval is secured. The Department is responsible for notifying the appropriate utility company to schedule adjustments.

***The Department shall be responsible for maintenance of the Project after completion of the work.

Partners:

- Comal County and the Texas Department of Transportation

PTA #3 San Antonio District

Adopted: May 10, 2007

CSJ: 0253-03-043

Work:

- Constructing the improvements on US 281 from 0.2 miles north of the Guadalupe River to the Blanco County Line.

Project Cost:

- Total Project Cost is \$35,000,000.
- The Department Participation is \$19,000,000 and the County Participation is \$16,000,000

Repayment:

- The Department shall reimburse the Developer by paying an annual amount equal to \$0.10 for each vehicle-mile traveled on the highway improvements that were substantially complete and open to the public at any time during the previous year.

* Under no circumstances will the annual payment be less than \$2,666, 667 or more than \$4,000,000 and under no circumstances will the total payment under this article during the course of this agreement exceed \$16, 000,000. The number of vehicle-miles traveled on the Project during a year will be based on the Department's traffic estimates, which shall be performed in good faith and shall be conclusive and not subject to litigation in any forum. The annual payment shall be made within 60 days after the first anniversary of the Project's completion and within 60 days after each succeeding anniversary of the Project's completion.

**Agreement terminates automatically when the Department has reimbursed the County fully

Responsibilities:

***The Department shall be responsible for maintenance of the Project after completion of the work.

Partners:

- Comal County and the Texas Department of Transportation

Case Study 8. Galveston County, FM 646 (Houston District)

Approved: April 4, 2007

Work:

- Improvements to FM 646 from FM 1764 to FM 517 and on FM 646 from I-45 to FM 517.

Project Cost:

- \$53,000,000
- The Department will contribute \$4,500,000. Developer Participation is \$48,500,000.

Repayment:

- The Department shall reimburse the Developer by paying an annual amount equal to \$0.15 for each vehicle-mile traveled on the highway improvements that were substantially complete and open to the public at any time during the previous year. The annual reimbursement will be no more than \$5,365,200. The total cumulative reimbursement by the Department shall not exceed \$17,700,000.00 for

FM 646 from IH 45 to FM 517 when substantially complete and open to the public.

** This agreement terminates automatically when the Department has reimbursed the Developer fully

- The Developer is responsible for the provision and acquisition of all real property needed for the Project, including easements.

*** The Department shall be responsible for maintenance of the Project after completion of the work

Partners:

- Galveston County and the Galveston District, Texas Department of Transportation

Case Study 9. El Paso County, State Spur 601 (El Paso District)

Approved: August 30, 2007

Work:

- Construction of State Spur 601, the Inner Loop from US 54 to Loop 375 in El Paso County

Project Cost:

- Information not available

Financing:

- The Department understands that the Developer contemplates financing the Project through the issuance of tax-exempt bonds. If the Developer is unable to finance the Project such that the annual debt service requirements on the bonds are less than or equal to \$31,300,000, Developer shall have the right to terminate this agreement by giving written notice to the Department. In the event of such termination by the Developer, Developer agrees that it will sell all or any part of its design work product relating to Segment B to the Department at the Department's election, at a reasonable price to be agreed upon between the parties.

Repayment:

- After substantial completion of the entire Project, under no circumstances will the semi-annual payment be less than \$15,650,000.00 or more than \$17,500,000.00 but under no circumstances will the total payment under this article during the course of this agreement be more or less than \$312,450,000.00 (except for the payment provided above for the Direct Pay Scope of Work), provided, however, if the first Payment Date, after completion of the entire Project, occurs less than six months after completion of the entire Project, then the minimum and maximum payments due on such Payment Date shall be an amount based on the

prorated number of days from the date of completion until such Payment Date as compared to 180 days.

** This agreement terminates automatically when the Department has paid Developer all sums required to be paid the Department to Developer under this agreement, but not prior to Final Acceptance of the Project by the Department and FHWA. Responsibilities

- The Developer is responsible for the provision and acquisition of all real property needed for the Project, including easements.

*** After final acceptance of the Project, the Department shall be responsible for maintenance of the Project, including the equipment installed for counting vehicle miles, after completion and opening of various segments of the work.

Partners:

- Jon F. Abrams, President/CEO (Developer) and the El Paso District Texas Department of Transportation

Case Study 10. Val Verde County, US 277 (Laredo District)

Approved: February 12, 2007

CSJ: 0922-11-016

Work:

- Construction of a relief route to US 277 that extends from US 90 north of Del Rio southward to US 277 southeast of the city.

Project Cost:

- Information not available

Repayment:

- The Department shall reimburse the Developer by paying an annual amount equal to \$0.15 for each vehicle-mile traveled on the Project during the previous year.

*The annual reimbursement will be no less than \$3,750,000.00 and no more than \$7,500,000.00. Under no circumstances will the total payments under this article during the course of this agreement exceed \$75,000,000.00.

- The total Department participation is \$53,000,000.00. The Maximum Pass-Through Reimbursement to Developer is \$75,000,000.00.

** This agreement terminates automatically when the Department has reimbursed the Developer fully

*** The Department shall be responsible for maintenance of the Project after completion of the work

Partners:

- Val Verde County and the Texas Department of Transportation

Case Study 11. Lubbock District, North Loop 289 and Slide Road (Lubbock District)

PTA failed.

Case Study 12. through 17: No additional details.