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FINANCING TOOLS AND PARTNERSHIPS FOR RURAL AND SEMI-URBAN TRANSPORTATION PROJECTS

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Abstract: In this research product, financing techniques and partnerships for rural and small urban area transportation projects are presented. This research examined alternative financing options, TxDOT experience with them, and lessons learned. The results will be of use to TxDOT district staff in developing partnerships with local and private entities to address local needs.

Keywords:
Rural transportation financing; transportation debt; transportation revenue options

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83

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Section 1: Introduction

This Product: In this research product, financing techniques and partnerships for rural and small urban area transportation projects are presented. With traditional transportation revenue sources lagging and maintenance demanding more attention, non-urban areas have less funding for new projects. This research examined alternative financing options, experience with them, and lessons learned. The results will be of use to TxDOT district staff in developing partnerships with local and private entities to address local needs.

Project Financing: Project financing involves two aspects: (1) funds for construction and operation (negative cash flow), and (2) revenue (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.

Financing versus Repayment: TxDOT experience with partnership projects has been limited, especially in rural districts, so concepts such as revenues and reimbursement are often misunderstood. 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. This product shows that there are multiple options for upfront funding and repayment, and each permutation is a potential financing technique.

Benefits and Risks: 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. TxDOT procedures for calculating project benefits are designed to weigh one in-house project against another in terms of safety, congestion mitigation, connectivity, etc. However, TxDOT specifically includes economic development as a project goal, yet there is no defined procedure for calculating such benefits. This product presents lessons learned from partnership projects.

Matching Projects to Financing Tools: 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.

Outline of Product: In the next section, sources for funding the construction of a project are presented. In Section 3, sources of revenues to repay project cost are discussed. Section 4 discusses benefits and risk-sharing in partnerships. Section 5 presents case studies on partnership projects. Section 6 discusses the lessons learned from the case studies. Section 7 presents conclusions.

Section 2: Construction Funding Sources

2.1 Primary Funding Sources

There are two main sources for funding the construction of a 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.

2.2 Grants

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.

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 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 1: TxDOT Funding Categories

Strategy	Funding Category	Starting Point	Selection Process	Usual Cost Split
Maintain It. These categories are part of the SPP – Statewide Preser-vation Program	**1 - Preventive Maintenance and Rehabilitation**	TxDOT District	Projects selected by districts.	Federal 90% State 10% *or* Federal 80% State 20% *or* 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% *or* Federal 80% State 10% Local 10% *or* 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% *or* State 100% *or* 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% *or* State 100%
	3 - Urban Area Corridor Projects	TxDOT District	Commission approves projects in corridors. Projects scheduled by consensus of districts.	Federal 80% State 20% *or* State 100%
	4 - Statewide Connectivity Corridor Projects	TxDOT District	Commission approves projects in corridors. Projects scheduled by consensus of districts.	Federal 80% State 20% *or* 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	Federal 80% State 20% *or* Federal 80% Local

Strategy	Funding Category	Starting Point	Selection Process	Usual Cost Split
			Quality and funded by districts. Commission allocates money based on population percentages within areas failing to meet air quality standards.	20%
	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% *or* Federal 80% Local 20% *or* 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% *or* 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 Depart-ment, Other (federal allo-cation)	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% *or* Federal 80% State 20% *or* Federal 80% Local 20% *or* Federal 100%
	11 - District Discretionary	TxDOT District	Projects selected by districts. Commission allocates money through Allocation Program.	Federal 80% State 20% *or* Federal 80% Local 20% *or* State 100%
	12 - Strategic Priority	Com-mission	Commission selects these projects on a project-specific basis.	Federal 80% State 20% *or* 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.

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 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.

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.

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 the tax benefits. That restriction was relaxed under SAFETEA-LU to allow up to $15 billion in PABs to have tax-exempt

status. The U.S. Secretary of Transportation allocates that 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).

Section 3: Debt Repayment Sources

3.1 Primary Revenue Sources

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.

3.2 Reimbursements

Pass-through Toll Agreements: 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" (TxDOT, 2007a).

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 is paid by TxDOT" (TxDOT, 2007b). PTAs will be discussed further in the case studies in Section 5.

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

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.

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

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: The City of Lubbock has proposed imposing a $70 fee on all new utility installations. In effect, this is similar to a property development fee. The revenue is dedicated to repaying a loan from the Texas Mobility Fund for expansion of the Lubbock Outer Loop.
- 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.

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.

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.

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 18.4 cents per gallon tax on the purchase of gasoline, 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 26 cents a gallon on 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 a more 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.

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.

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.

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.

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.

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.

Section 4: Partnerships

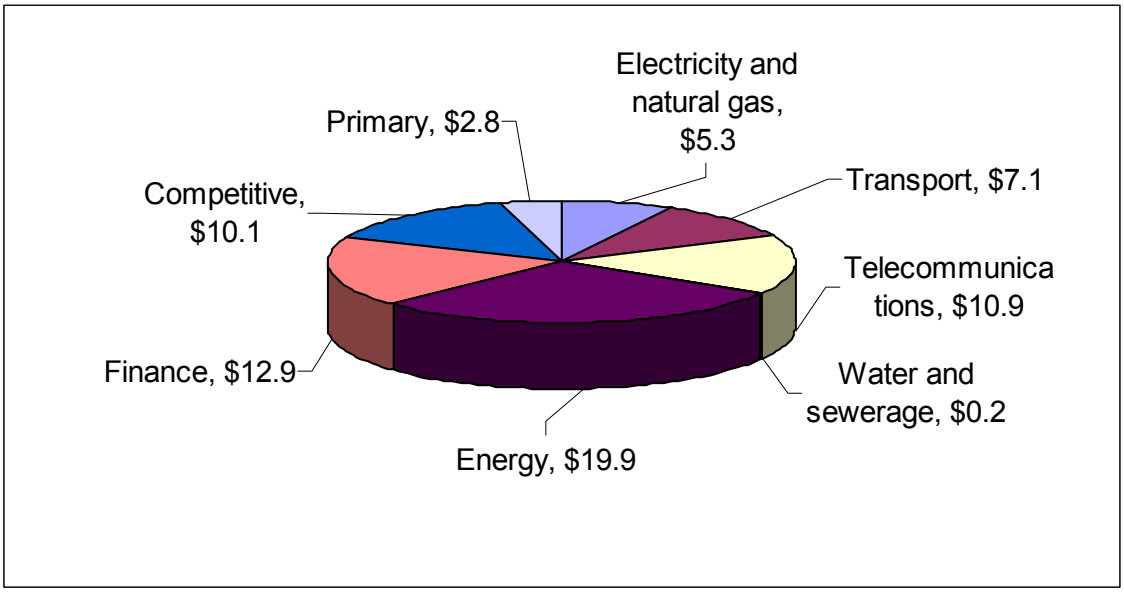
4.1 Worldwide Trends

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 transport 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).

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 1) (Kikeri & Phipps, 2007). Demand for partnerships between the public and private sectors is particularly high in areas with substantial economic and population growth.

Figure 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. 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). 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 that exists on the use of private finance for roads. Shaoul et al. claim that this may largely be in part because a road, 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 losses 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.

Estimating project benefits: Table 2 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 2: Benefits of Transportation Improvements
(Adapted from Persad et al, 2005)

	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

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.

Estimating revenues: Each of the effects listed in Table 2 is a potential source of revenue to pay for a transportation improvement. However, in Section 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.

Even the estimation of toll revenues is uncertain. For example, a 2004 Standard & Poors report evaluated the accuracy of year-one traffic projections on 87 toll projects and found that, on average, traffic forecasts were overestimated by 20–30% (Bain, 2004). There is a need for better understanding of traffic distribution between tolled and non-tolled roads. In addition, urban and rural populations tend to have different values of time and willingness to pay.

To develop the traffic and revenue forecasts necessary to determine the financial feasibility of the SH 130 project in Austin, two independent traffic consultants (Vollmer Associates LLP, and URS Corporation) were used. The traffic engineers 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 following assumptions were made:

- 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.

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.

4.3 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.

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 3), 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.

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 more of 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).

Table 3: 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.
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	

Type of risk	Public sector	Private sector	Shared
		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.	

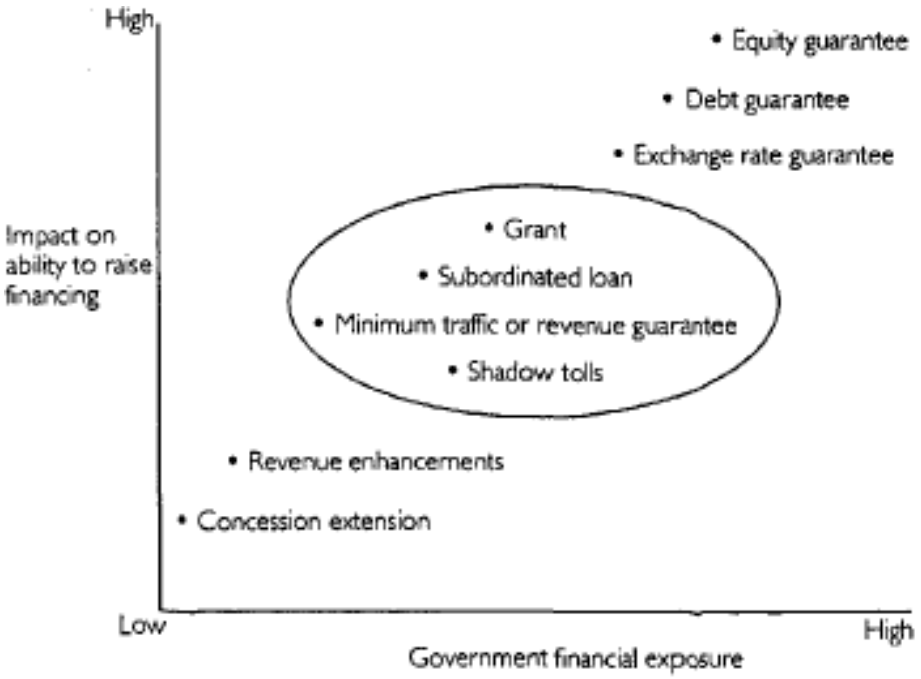
(Source: Haynes & Roden, 1999)

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 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 3). 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 2: Range of Options for Government Support



(Source: Fishbein & Babbar, 1999)

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 infrastructures 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. A slightly modified form known as "Pass-Through Tolling" has been started in Texas.

Section 5: Case Studies

5.1 Shadow Tolling- The British Experience

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):

- the widening of a road near Leeds (estimated capital value: £214 million);
- the 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)
- and 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.).

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).

The following figures illustrate the operation of the shadow toll mechanism. The hypothetical road in this example assumes a 100 km length of road with no differentiation in the shadow toll rates between heavy goods vehicles and other vehicles. It also uses three scenarios to project future traffic growth (Table 4). Using the four shadow toll bands bid by the DBFO Company (Figure 4) produces different estimates of shadow toll payments for a future year (Table 5) (Haynes & Roden, 1999).

Table 4: 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	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 3: Typical Banding Structure Proposed by Bidders

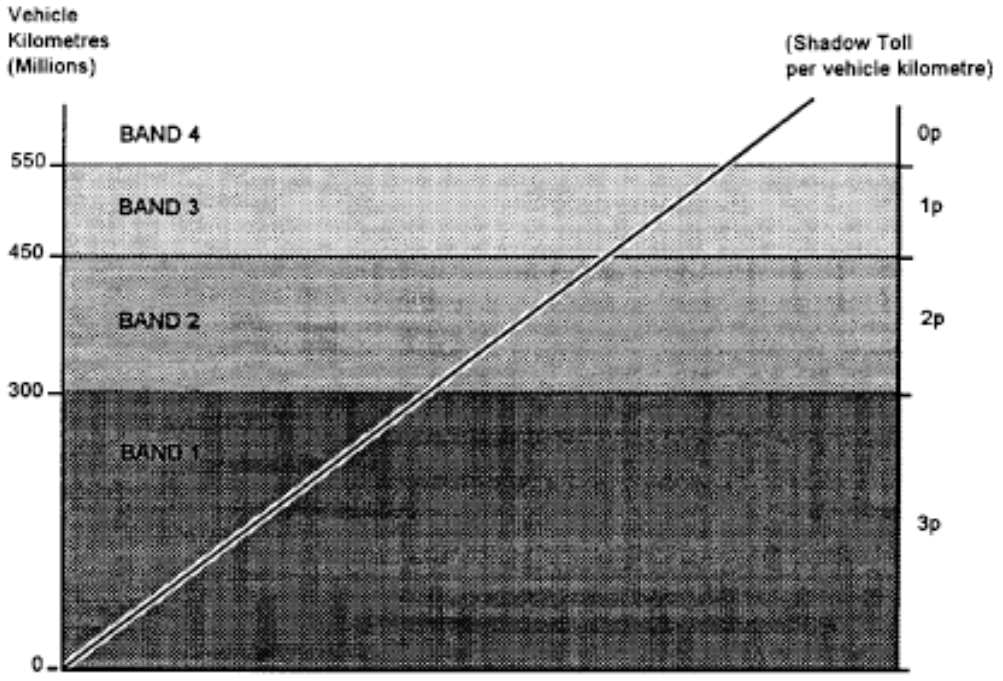


Table 5: Annual Traffic Flow and Shadow Toll Payments Under the Three Traffic Growth Scenarios

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).

5.2 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. In this part of the report, recent TxDOT experience in using PTAs and other innovative financing in rural and small urban areas is documented. The information was derived through a questionnaire, interviews and in-depth discussions with 23 TxDOT districts and local governments.

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 6).

Table 6: 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.

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).

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).

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 7). Note that 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 7: 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.

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.

5.3 Texas Case Studies

Recent TxDOT experience in using innovative financing in rural and small urban areas is presented next. The information was derived through a questionnaire, interviews and in-depth discussions with 23 TxDOT districts and local governments.

5.3.1 Jefferson County, Port Arthur, FM 365

Status: 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 4: 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.

5.3.2 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.

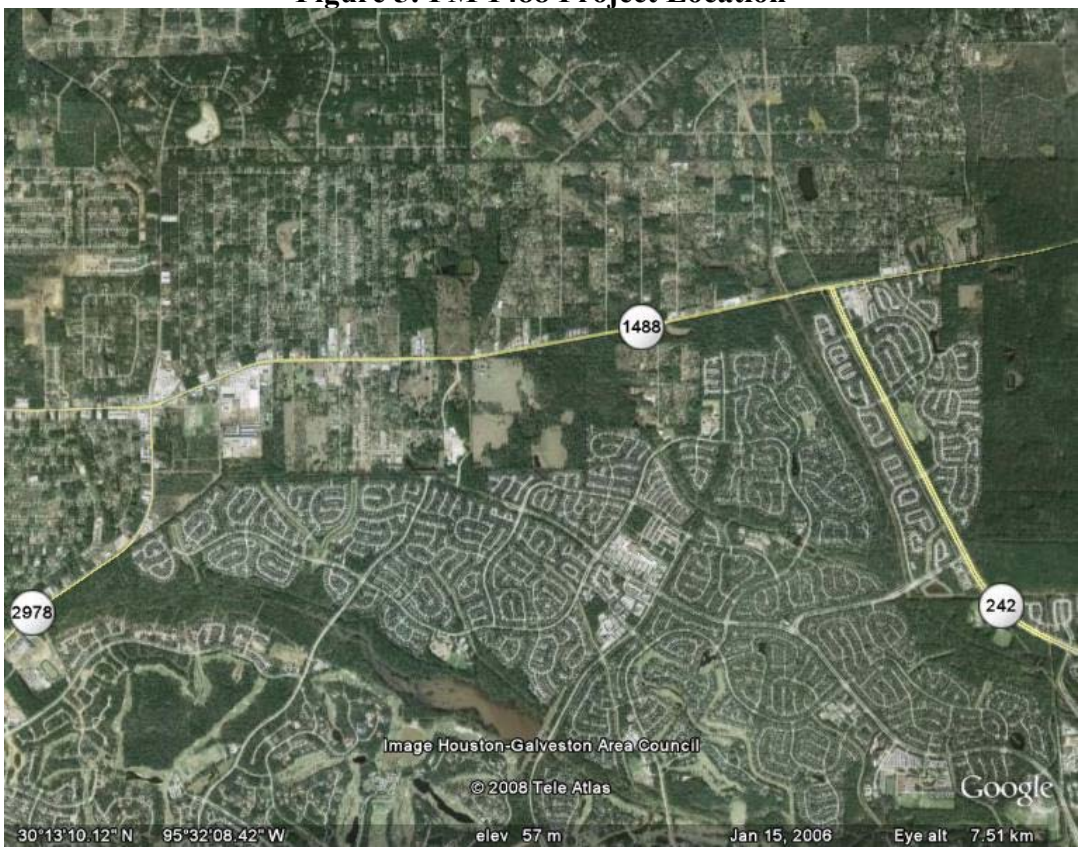
Partners: Montgomery County and the TxDOT Houston District

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: 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.

5.3.3 Weatherford, FM 51/SH 171

Status: PTA executed

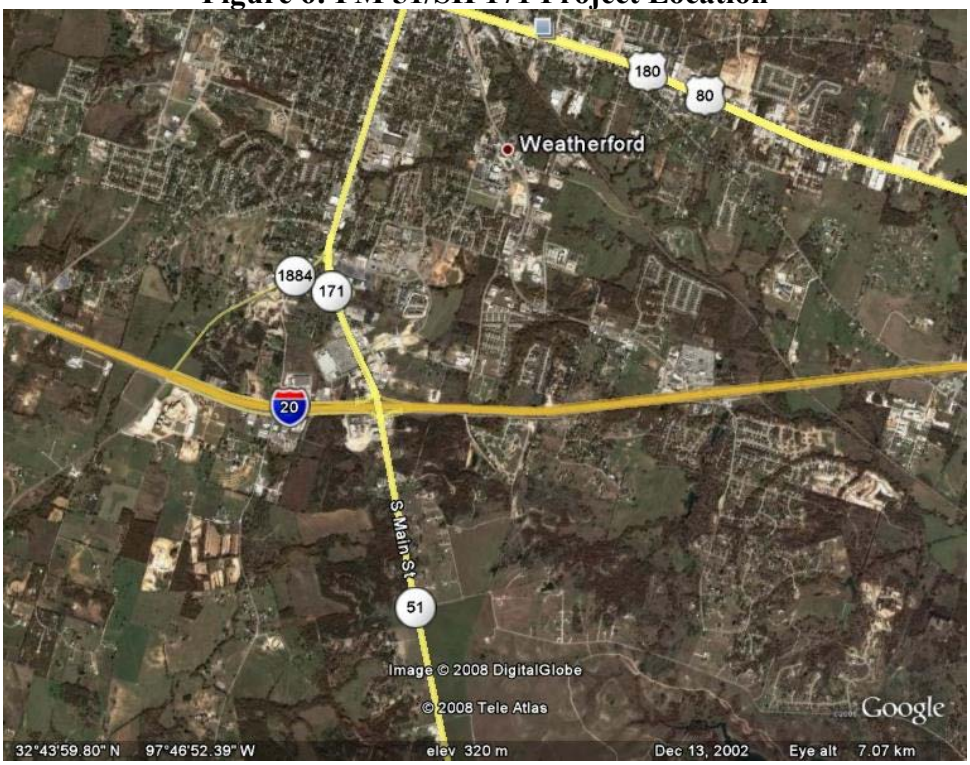
Project Characteristics:

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 6: 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 amounts to $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 the TxDOT 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 what is all 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).

5.3.4 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.

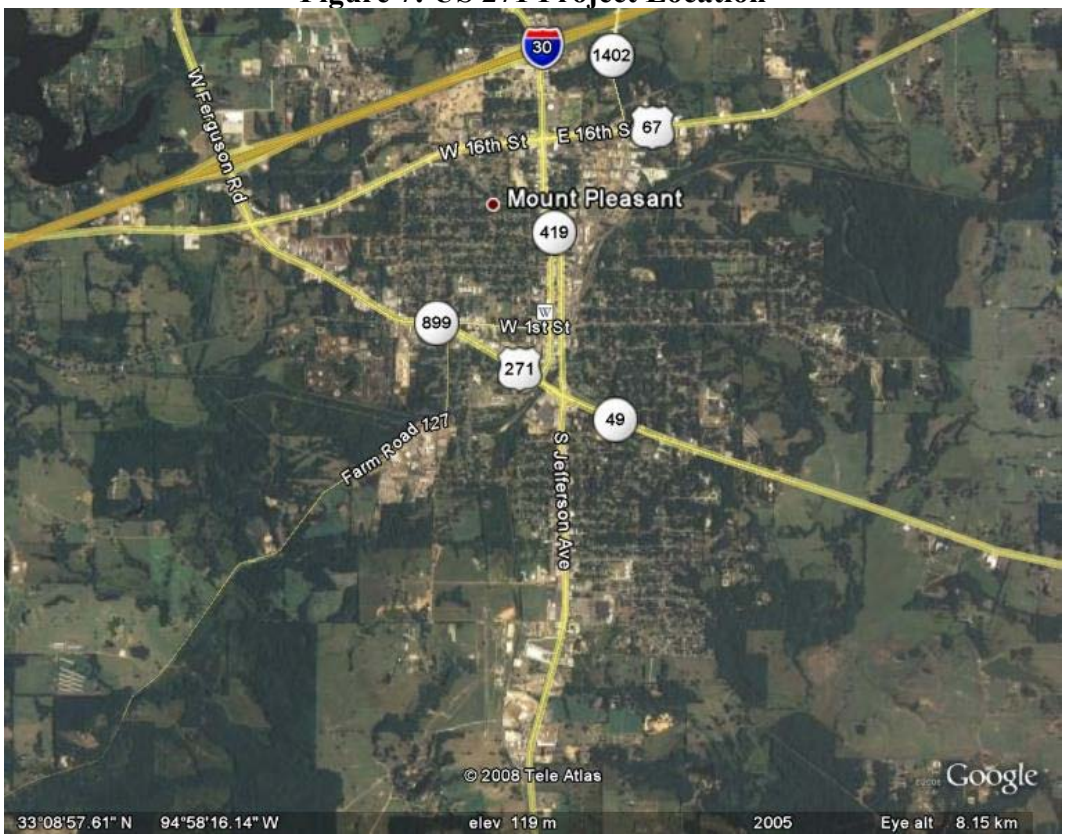
Partners:

- 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 project risk, they believe the project benefits outweigh the assumed risk (D. Simmons, personal communication, 2008).

Figure 7: US 271 Project Location



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).

Table 8. Estimated Construction Costs

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

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:

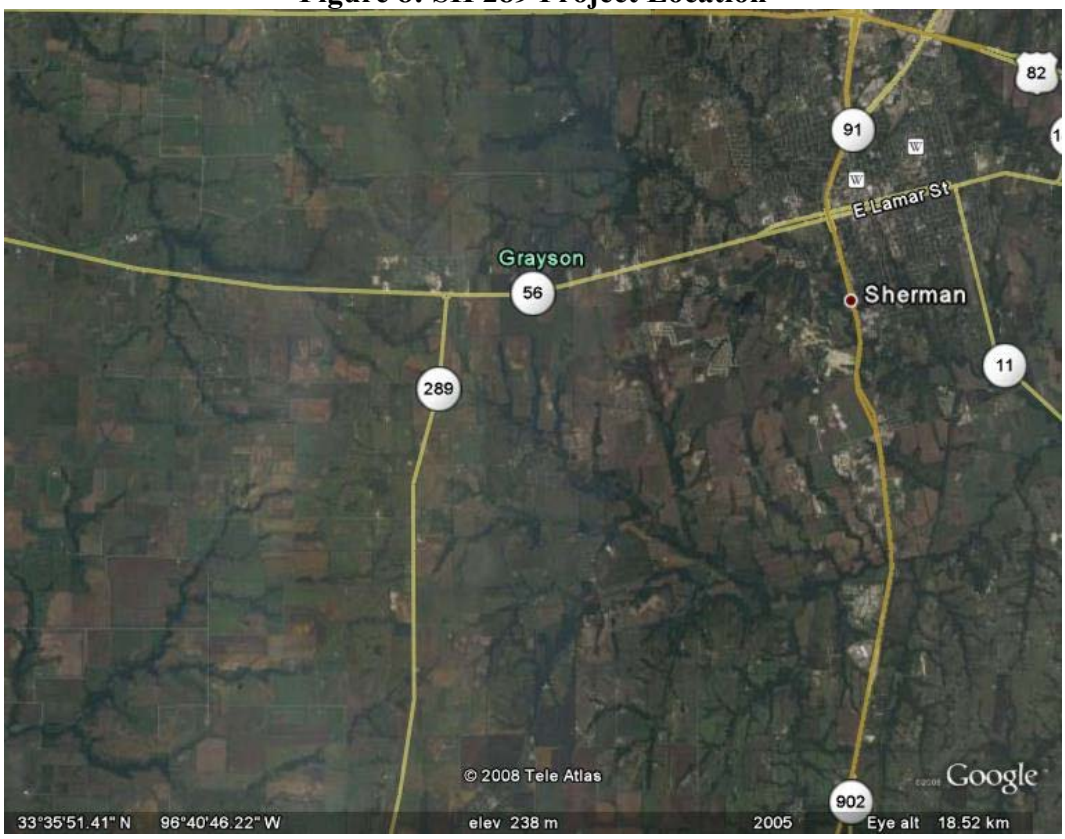
- No lessons provided. There is concern about the cost estimate.

5.3.5 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 8: 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.

5.3.6 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

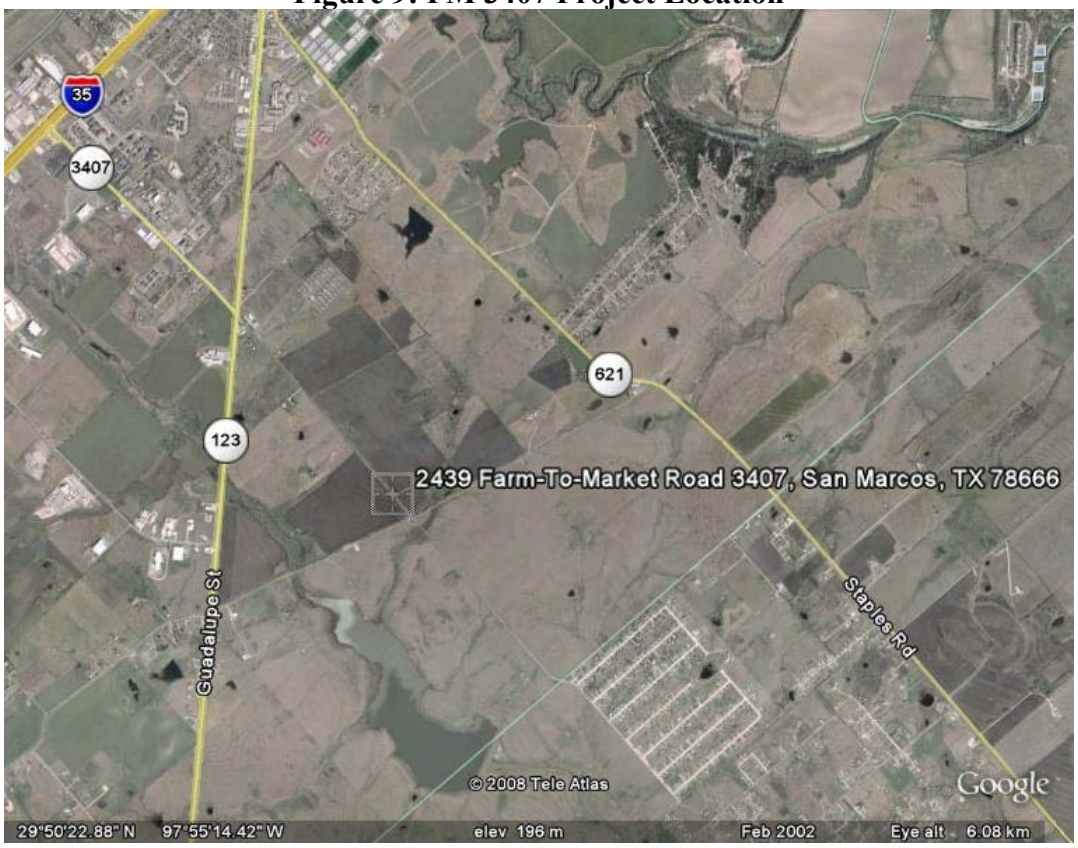
Benefits:
None indicated except an improved transportation system

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 9: 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).

5.3.7 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 since 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.

5.3.8 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.

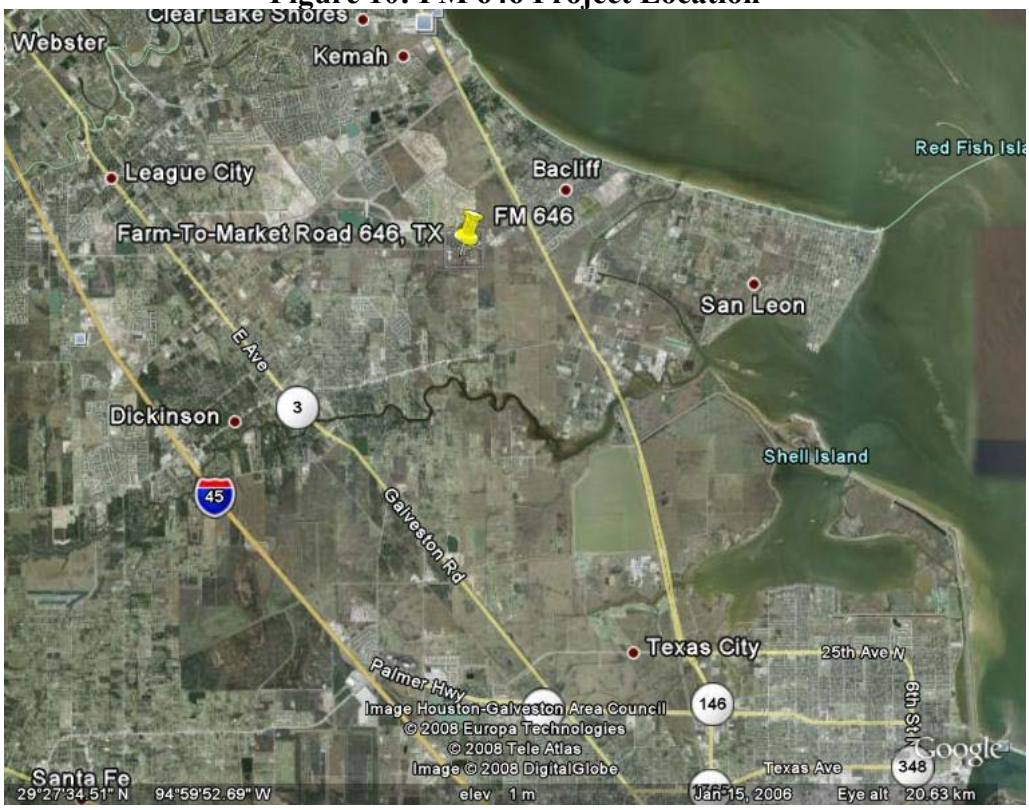
Partners: Galveston County and the TxDOT Houston District

Benefits:
None indicated except an improved transportation system

Risks:
The partners indicated to me that they did 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 10: 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).

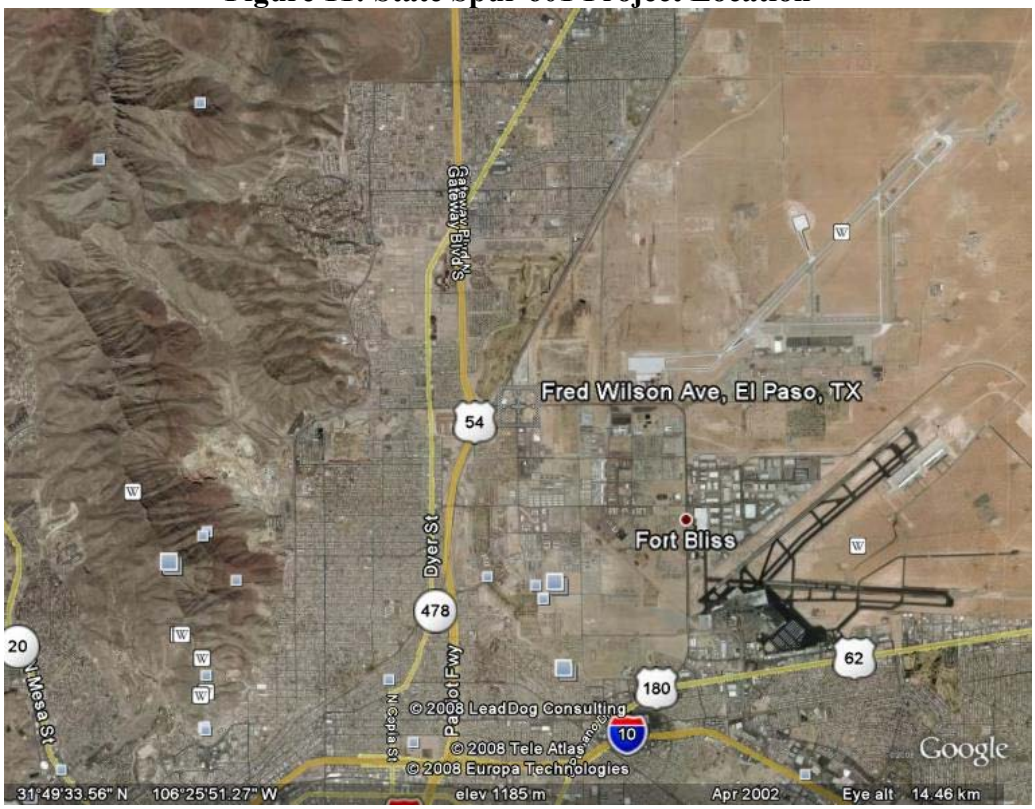
5.3.9 El Paso County, State Spur 601

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 11: 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:

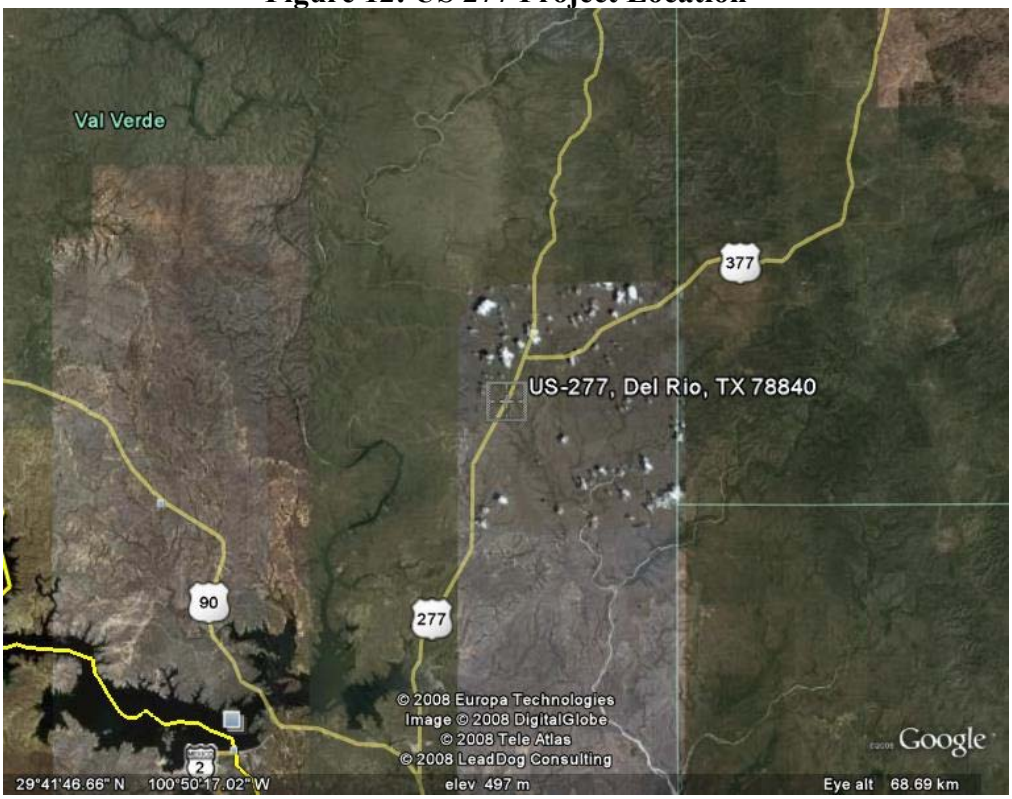
- No lessons provided. The reimbursement amount appears to be greater than the estimated construction cost.

5.3.10 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 12: 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).

5.3.11 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.

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).

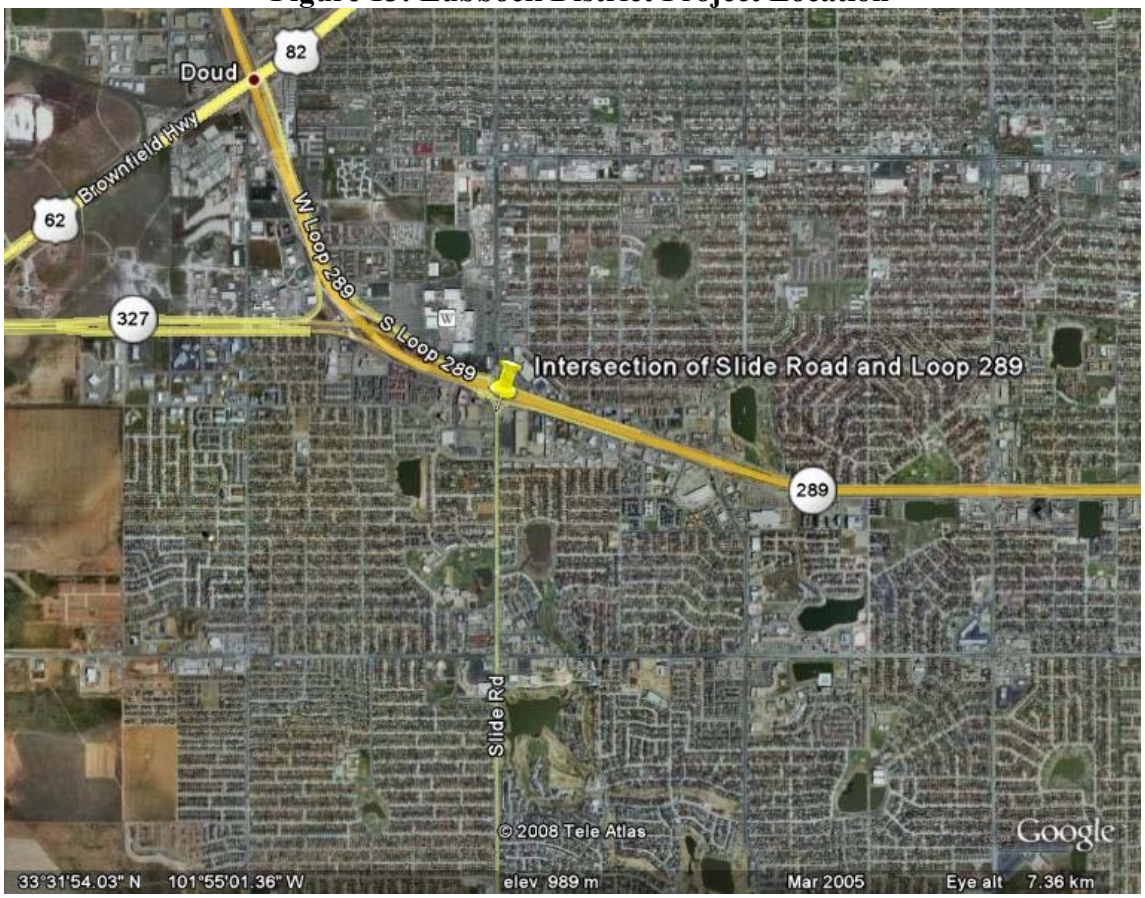
Risks:
No known risks indicated.

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.

Figure 13: Lubbock District Project Location



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).

5.3.12 San Angelo, 50th Street

Status: PTA failed

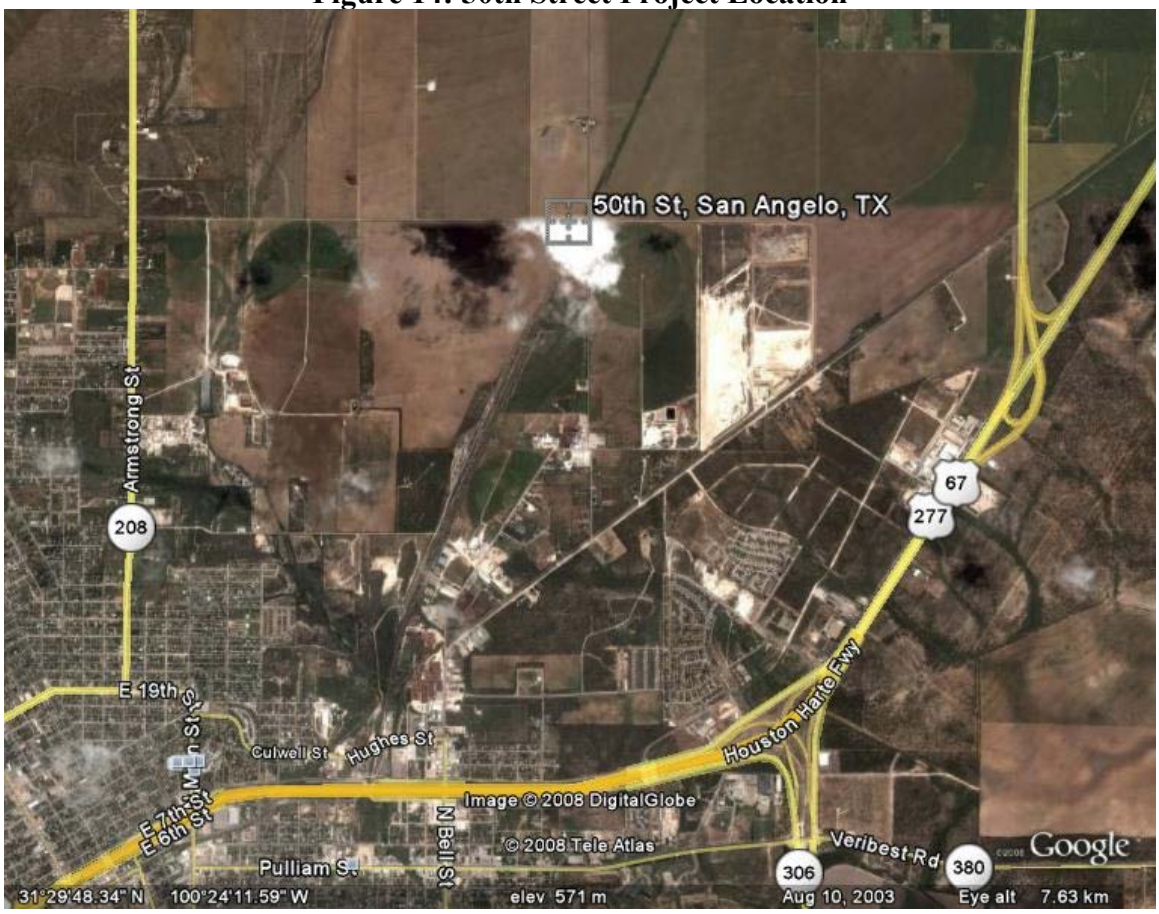
Project Characteristics:

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

Figure 14: 50th Street Project Location



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 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.

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).

5.3.13 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 Kileen
- $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

5.3.14 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

5.3.15 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.

5.3.16 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.

5.3.17 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 (see Figure 15).

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.

Figure 15: Tyler Loop Toll Road Planning

Source: Texas Transportation Institute, 2007

- 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.

Table 9: 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.
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.

Project Characteristics/Scope	Stated Benefits	Identified Risks	Financing
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.
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.

Project Characteristics/Scope	Stated Benefits	Identified Risks	Financing
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.
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.

Project Characteristics/Scope	Stated Benefits	Identified Risks	Financing
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.
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	Better and safer access	None identified. No formal cost-benefit analysis conducted.	State-local partnership. Total cost $170,684. Paid upfront by the city of Abilene. Will be reimbursed by a local developer.
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.	Abilene Community supports the Dyess AFB mission as the base is a major benefit for the Abilene economy	None identified. No cost benefit analysis was formally conducted for this project.	State-local partnership. Funded 80% by TxDOT. Remaining 20% should have been local contribution, but the city lobbied the Congressman for that amount.
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.	None identified. A toll feasibility analysis was done.	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.	TxDOT toll financing. First segment of 5 miles opened in August 2006. $12.25 m. Toll Equity grant by TxDOT.

Section 6: Lessons Learned

In-depth review of the case studies 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 section.

6.1 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.

6.2 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.

6.3 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.

6.4 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 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.

6.5 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.

6.6 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 changed 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.

Section 7: Conclusions

The focus of this product has been on partnering 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. Four significant conclusions can be drawn from the case studies, and these are discussed in this section.

7.1 Understand project financing and revenue issues

The interviews with the districts reveal that there is considerable misunderstanding of project financing and reimbursement. 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.

7.2 Select the right projects for partnerships

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.

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. A more rigorous set of qualifications for partnership projects is desirable.

7.3 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.

7.4 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. 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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