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16. Abstract This report is the final in a series of reports prepared as a case study analysis of a mid-size urban/rural toll road implementation in the Tyler, Texas, area. The case study focuses on a proposed outer loop, Loop 49, which is a new regional highway that will eventually connect Lindale and US 69 with I-20 northwest of the city, looping to the south and east and terminating at I-20 on the east side of Tyler. Originally planned as a non-tolled highway with initial segments funded through conventional sources, the first segment of Loop 49 will be opened in late 2006 as a toll facility.  The case study documents the development of Loop 49 as a toll facility, including the tolling concept, design, public acceptability, and environmental aspects of the project. This final report is a summary of the lessons learned over the past three years as the Loop 49 project has moved through the project development process as a two-lane, all-electronic tolled highway. The findings cover a number of different aspects of tolling implementation, including public support, design flexibility, environmental re-evaluation, financial planning, and formation of the regional mobility authority (RMA). The lessons are offered from the perspective of a state department of transportation pursuing tolling in a small urban or rural setting, yet many of the lessons have broader application in the development of toll projects, particularly in communities new to tolling.			
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# Lessons Learned from Loop 49:

## Implementation of a New Toll Road in Tyler, Texas

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Technical Report - Loop 49

Tyler District

Texas Department of Transportation

Research Implementation Project 5-4055-01:

Case Study Analysis of Urban/Rural Area Toll Road Options

Report 5-4055-01-6

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# Disclaimer

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The contents of this report reflect the views of the authors, who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the official views or policies of the Texas Department of Transportation (TxDOT) or the Federal Highway Administration (FHWA). This report does not constitute a standard, specification, or regulation, nor is it intended for construction, bidding, or permit purposes. The engineer in charge of the project was Ginger Goodin, P.E. (TX-64560).

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# Introduction

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This report documents the third and final year of the research implementation project 5-4055-01 *Case Study Analysis of Urban/Rural Toll Road Options*. The purpose of the research implementation project was to:

- transfer research findings and best practices to the toll development process for Tyler Loop 49, given the unique nature of the project as a rural, two-lane, low-volume toll facility; and
- document the processes used in evaluating and developing Loop 49 as a toll project so that other TxDOT districts can draw from lessons learned from Tyler's experiences.

During the third year of the implementation project, the research team focused on technology transfer associated with Loop 49 public outreach. In addition, the team finalized the one-day Loop 49 workshop, which was developed from lessons learned from the Loop 49 experience for the purpose of sharing information with other TxDOT district offices. This report documents the lessons learned that were presented in the workshop.

## *Loop 49 Research Implementation Project*

The Texas Department of Transportation's research implementation program supports the incorporation of TxDOT's research products and other innovations into department operations with the direct involvement of university researchers. Research Project 0-4055, "Guidelines for TxDOT - Regional Tollway Authority Cooperation," produced a set of guidelines that provide TxDOT, regional tollway authorities (RTAs), and regional mobility authorities (RMAs) with techniques to enhance planning, financing, designing, constructing, and operating toll facilities in Texas. The Loop 49 research implementation project was initiated to apply the findings from Project 0-4055 to develop a tolling pilot project on Loop 49 in the Tyler District as a showcase to other districts.

This summary report describes the implementation issues addressed during Year 3 of the study.

## *Scope and Purpose of Implementation Project*

The objectives of the Loop 49 implementation project are (1) to pilot test tolling applications in a mid-size urban/rural area, specifically on the south segment of Loop 49, and (2) to develop a toll history for Loop 49. The four tolling elements examined during the research implementation effort were the following:

- conceptual tolling plan and tolling features,
- baseline public perception,
- comprehensive public education and marketing strategy, and
- financial considerations and partnering opportunities.

## Background and Status of Loop 49

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The Texas Department of Transportation is constructing a new regional highway, Loop 49, around the city of Tyler, Texas. The ultimate facility will be an approximately 26-mile, circumferential, controlled-access 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 1](#)).

To complete the loop in a compressed timeframe, the Tyler District and its partnering agencies evaluated Loop 49 for tolling, including application of tolling to the initial 5-mile segment under construction and funded through gas tax revenues. It is expected that by tolling Loop 49, the opening of the fully completed loop project can be accelerated by as much as 20 years.

A toll public hearing was held on October 25, 2005, to solicit public comment. FHWA approved the environmental re-evaluation documents for the tolling of Loop 49 south and west segments on December 16, 2005. The Texas Transportation Commission approved toll financing for Loop 49 January 27, 2006. The first segment opened as a tolled facility August 22, 2006 with a “drive for free” period of three months to complete toll technology testing and allow saturation of the electronic transponder, TxTag, in the Tyler area. All future segments will open as a tolled facility.

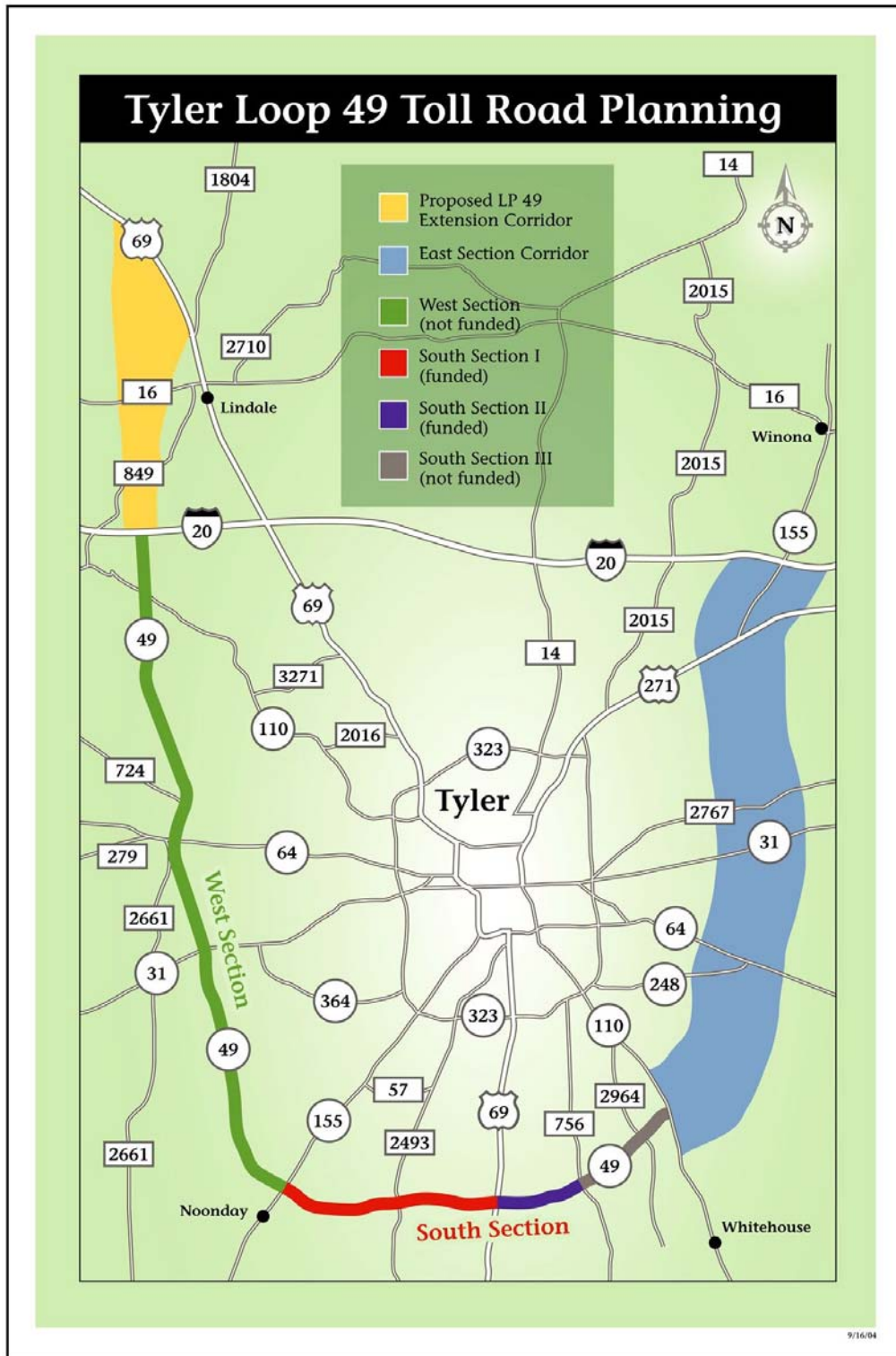


Figure 1. Loop 49 Map.

# Lessons Learned from Loop 49

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Development of the Loop 49 project as a toll facility occurred during a time of unprecedented change within the TxDOT organization. Since the passage of House Bill (HB) 3588 in 2003, the approach TxDOT has used to evaluate and implement highway projects has rapidly evolved. The sweeping legislation that offered new financing tools for TxDOT set in motion a number of policies related to the way in which added-capacity projects are viewed. In essence, all new highway capacity is now reviewed for tolling possibilities.

Loop 49 had a long history as a planned non-toll project before the Tyler District began exploring tolling in early 2003, several months before the landmark legislation passed. The fact that there was no formal guidance on how to proceed with re-evaluating Loop 49 as a toll project can be attributed to:

- the unique nature of the project as a predominately rural alignment on the outskirts of a mid-sized urban area; and
- the speed at which policy changes were being implemented within the Department.

The lessons outlined in the following pages originated from three years of documentation of Loop 49 as a case study. The experience in Tyler has been instrumental in formulating guidance at the state level in the areas of public support, design, operations, and environmental evaluation, and, through the Loop 49 workshop, has offered valuable assistance to other district offices. The lessons are offered from the perspective of a state department of transportation pursuing tolling in a small urban or rural setting, yet many of the lessons have broader application in the development of toll projects, particularly in communities new to tolling.

## *Lesson 1: Separate tolling from traditional highway project development issues*

Loop 49 had a long history as a non-toll project before tolling became a consideration. At the time tolling was introduced, the project enjoyed broad public support but had been repeatedly denied full funding due to competition with other projects across the state, including those in major metropolitan areas.

The Tyler District of TxDOT had been working on public support, design, and property acquisition details for Loop 49 for more than two decades before tolling was introduced as a funding method to speed up completion of the full loop. Simply moving the project through the development process as a non-toll facility was not without controversy, but the hard work had been largely done before tolling was introduced as the method to accelerate implementation. As a result, it was relatively

straightforward to separate the issue of tolling (and its potential volatility) from the basics of the project by suggesting that it serve as the financing mechanism to move the full project forward more quickly.

### *Lesson 2: Build sustainable stakeholder support*

Stakeholder support has been the backdrop to all other elements of toll project development. Strong project champions in both the public and private sector have enabled TxDOT staff to effectively advance Loop 49 as a *community* project, not just a TxDOT project.

Early stakeholder support involved three primary players — Smith County, City of Tyler, and Tyler Chamber of Commerce — and all three stakeholders have been the foundation of community support for the project. These entities have supported Loop 49 as an important project for the region. As the proposal for tolling gained momentum during 2003, these three critical stakeholders realized potential benefits to the community by speeding up completion of the full loop through tolling and openly expressed support for adapting the project for toll operation.

The Chamber of Commerce in particular has a large, active transportation committee with members who have been involved in the Loop 49 project since its inception. They have provided a high degree of sustainable support, particularly given changes in local elected leadership over time. The Tyler Metropolitan Planning Organization (MPO), led by city, county and TxDOT representatives, has been intimately involved in Loop 49 and has expeditiously advanced modifications to the Metropolitan Transportation Plan (MTP).

Success of the Loop 49 project is also the result of the staff and leadership of the TxDOT Tyler District, who have an organizational culture that emphasizes developing and nurturing relationships with stakeholders, the public, and the media. In response to project opponents, the Tyler District staff prefers to engage in direct communication with naysayers in pursuit of common ground and is inclined to offer opponents an invitation to become involved in the process. Early and ongoing media coverage of tolling Loop 49 was positive due to the constructive relationships TxDOT has developed with the media and the strong support of key project champions who served as spokespersons.

### *Lesson 3: Be flexible as project design elements evolve*

The design of Loop 49 has evolved over time as funding constraints, community concerns, and departmental policies have changed. These changes have necessitated an attitude of flexibility since some design aspects of the project had to be modified to accommodate tolling, particularly the location of access points. Experience from

the project also highlighted the importance of educating the public of changes as they occur.

To secure initial construction funding using conventional sources, the cross section was dropped from four lanes to two lanes. During focus groups with the public, researchers found that the public was not aware of this change and were highly concerned with the prospect of a two-lane highway, more so than with the proposal to add tolling. One of the lessons learned through this was the importance of communicating design changes to the public.

With tolling as a consideration, the two-lane section was initially upgraded to a Super2 design; access points were reduced, and some diamond interchanges were converted to overpasses. These modifications were made to support toll operations and address funding shortfalls. The Super2 design was eventually dropped.

For toll operations, the evolution was more dramatic. Coincidentally, TxDOT's approach to toll operations evolved dramatically during the period in which Loop 49 was evaluated for tolling, with statewide models ranging from cash options to open road tolling (ORT). The toll operations plan for Loop 49 was modified over time as various technology and toll operations alternatives were explored, and as designers sought to offer greater functionality and reduced costs. Among the technology options considered were automated coin machines, ramp versus mainline plazas, ORT, on-road and off-site kiosks, privatized transaction processing, and operations by the North Texas Tollway Authority (NTTA).

The initial preferred option consisted of a combination of electronic toll collection and automated coin machines. As TxDOT's statewide toll operating approach was formulated during the course of the project, the automatic coin machine option was replaced with a kiosk where motorists could purchase sticker transponder tags using various payment methods. Ultimately the kiosk option proved too costly, and video tolling was incorporated late in the project implementation to address users without transponders, such as out-of-town motorists.

Artistic renderings of the tolling concept, such as [Figure 2](#), were developed early (and revised as the concept evolved) for the purpose of communicating with the public. These renderings were found to be an important element in conveying the concept of electronic toll collection to the general public, particularly since a large percentage of the population was unfamiliar with modern toll roads and electronic toll collection.





Figure 2. Mainline Plaza Design.

#### *Lesson 4: Listen to the public and gauge public perception*

Market research has been important for Loop 49 for two reasons:

- tolling is new to the region; and
- the project itself is a unique toll application because of its rural nature.

The information gathered early in the process was one of the most important steps in building a public education program. The market research identified issues the public had both with the project itself and the proposal to toll Loop 49. TxDOT staff felt this research was extremely valuable to the development process since some of the issues raised were not anticipated.

A variety of research techniques were used to listen and gauge public attitudes, techniques that are not typically utilized in traditional TxDOT highway project development: stakeholder and community leader interviews, trucker interviews, focus groups, and public opinion polls. Renderings of proposed tolling features were essential in eliciting feedback. Results were used to make adjustments to the project and to formulate a public education and outreach plan for tolling. Without this information, TxDOT would not have been as effective in directly and expeditiously answering questions from the public and dispelling misconceptions about tolling.

### *Lesson 5: Develop a public outreach plan using perception data*

Public outreach for Loop 49 has required answering both “big picture” questions and project-specific questions by the public. The big picture questions are those that are universal to all toll projects in the state: Why is tolling being considered? Why aren’t current gas tax revenues enough? The public also expects answers to specific questions that are more local in nature: Why is Loop 49 a good project for tolling? What benefits do we get from tolling Loop 49? How does tolling Loop 49 affect me? TxDOT was effective in answering the public’s questions at both levels and used a “top ten” question-and-answer format for the toll public hearing on the project.

Those “top ten questions” were identified largely through the public listening process. Market research data identified gaps in understanding that were directly addressed in the public outreach program. Market research data also highlighted the positive selling points that should be emphasized in the outreach program.

Public outreach and marketing was accomplished in two stages – Awareness Stage and Operational Stage. Public outreach was initiated in the Awareness Stage, which began early in the process to inform the public about the plans and progress of the project. The objective was to transmit accurate information to minimize misinformation. The messages used during this initial stage were derived from public perception to address concerns raised. This stage coincided with the environmental re-evaluation process and can be characterized as public education. The concerns raised during the listening phase were addressed very directly in public presentations. A variety of communication tools were used to deliver the messages.

The “Operational Stage” is the marketing component, addressing the consumer aspects of the toll road. It involves explaining the operation of the facility as an all-electronic toll road, how to obtain a TxTag, and how video billing works. Sustaining public support for the project is still critical given that additional sections are proposed, and ongoing public education using messages that focus on community-wide support and innovation are important to maintaining public acceptance of the project.

### *Lesson 6: Clearly explain the benefits of tolling at the project level*

Loop 49 is a project that has been planned for decades but was unable to advance when competing for funding with other projects across the state. Nevertheless, the community viewed it as a critical facility to help address future growth in the region and relieve congestion on the inner loop. The primary benefit of tolling Loop 49 was the ability to put the project on the ground sooner than would have been possible with traditional funding. When this benefit was clearly explained, tolling found broad acceptance with the public.



One of the most effective tools used by the TxDOT Tyler staff to communicate the benefits of tolling Loop 49 was a simple graphic (Figure 3) showing how much more quickly the project schedule could be advanced by applying tolling to Loop 49. Project acceleration is a benefit of tolling that can be readily understood by the public and, with the right communication tool, can be depicted in a way that makes the argument implicit.

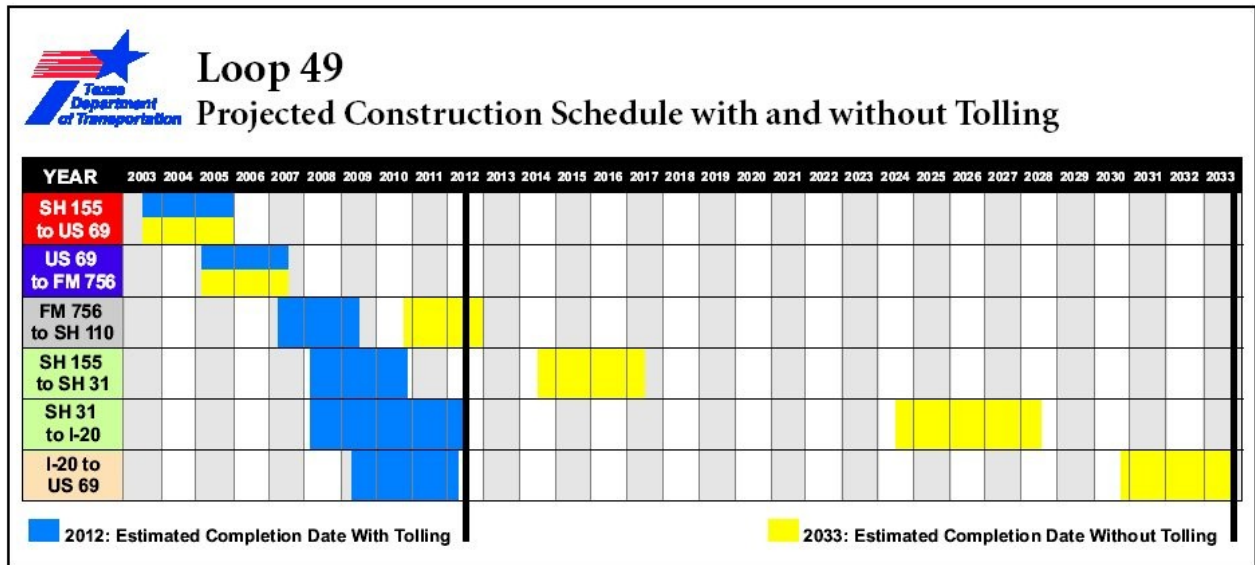


Figure 3. Timeline - with and without Tolling.

*Lesson 7: Link environmental review to public outreach, and coordinate closely with all players*

The Loop 49 project required a re-evaluation for tolling for both the south and west segments since two records of decision (RODs) had previously been issued by the Federal Highway Administration. Because Loop 49 was the first project to be re-evaluated for tolling, early coordination with FHWA and the Environmental Affairs (ENV) division was needed to ensure the project progressed on schedule. Many new departmental policies were being implemented during the re-evaluation process.

The Loop 49 project represented a unique case study because it has three distinct planning and construction scenarios that were addressed differently in the environmental review process. The re-evaluation experience from Loop 49 helped TxDOT formulate new policies at ENV, which have led to guidelines for toll projects that help planners determine which review process best addresses the needs of the project at various stages of planning and/or construction.

The environmental documentation for the Loop 49 re-evaluation incorporated the products of the tolling evaluation process: the conceptual tolling plan, toll technology

alternatives analysis, and the operational alternatives analysis. The environmental documentation also recounts the numerous public meetings, focus groups, interviews, and general public outreach as effective mechanisms to encourage public input during the tolling evaluation process.

In addition to addressing the issues related to tolling the project, the documents detail the public meetings and hearings held prior to the issuance of the RODs. The extensive public outreach efforts performed throughout the history of the Loop 49 project simplified the environmental re-evaluation for tolling. The previous public outreach was an important contribution to the re-evaluation because much of the relationship-building was accomplished when the project was in advance planning. These relationships identified project champions who were then instrumental in communicating the need for tolling. The project itself had already been through a rigorous course of environmental documentation and public acceptance. Moreover, the project champions were instrumental in communicating to a larger public audience the messages regarding tolling Loop 49 and gaining subsequent public acceptance. Building on those previous efforts, the re-evaluation was able to focus on the tolling aspect of the project.

The environmental re-evaluation process was enhanced by the ongoing outreach efforts used during evaluation of Loop 49 for tolling. Linking the two processes - the tolling evaluation and the environmental re-evaluation - proved useful in that public education could occur in conjunction with the necessary regulatory and legal requirements of the National Environmental Policy Act (NEPA) documentation. This also minimized the risk that the public could become confused about the project. Public outreach is a component of the NEPA process, but the overwhelming support of the project by the public as assessed through tolling evaluation and documented in the re-evaluations demonstrates the benefit of linking the two processes.

As noted previously, the Loop 49 re-evaluation for tolling embarked on new territory for the district and the department. By involving all the parties from the beginning and determining a common direction agreeable to all, the project proceeded on schedule. Clearly, this early coordination facilitated a smooth process for this project and served as a model in setting new departmental policies.

### ***Lesson 8: Build an incremental financial plan***

The Loop 49 financial plan is unique to Tyler and to the project itself. Over the course of the tolling evaluation, three toll feasibility studies were performed for Loop 49 to evaluate financial viability: a conceptual study, a Level 1 or Project Specific Study, and a Level 2 or Pre-Investment Grade Study. Project assumptions, including cross section, traffic volumes, and project development costs, were progressively refined during the process, representing a greater level of certainty with each step. The percentage of project costs for construction of the full loop that is expected to

be covered by tolling is expected to be approximately 40 percent, with the remaining costs paid for through other sources.

The preliminary financial plan was constructed using a practical tool created by the Tyler District called a "Source/Use Table." The Source/Use Table is essentially a balance sheet showing sources of funding on one side and project costs on the opposite side. The objective is to make the bottom line totals coincide, which for Loop 49 required a variety of funding sources such as bonding, advancing certain categories of MPO funds, and local agency contributions. This financial plan was viewed as a fluid document throughout the toll project development, with revisions occurring as more detailed traffic and revenue studies were performed and more information was available regarding project design and costs.

### *Lesson 9: Enlist key stakeholders in creating a Regional Mobility Authority*

The Northeast Texas Regional Mobility Authority (NET RMA) is an agency that offers flexibility and local control over regional transportation projects such as Loop 49. The formation of this body came directly from the involvement of the key stakeholders mentioned earlier. The NET RMA is widely supported, with several additional counties considering participation. Regional cooperation, facilitated by TxDOT, has been the key to the formation of the NET RMA. The NET RMA continues to work with TxDOT on short-term and long-term projects, including the implementation of the full Loop 49 project.

## Summary

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The Loop 49 project has a number of unique aspects that have been described in this case study:

- a two-lane toll road on the rural outskirts of a small urban area;
- no history of tolling in the region, and only limited familiarity by the public to electronic tolling through experiences in Dallas, 90 miles to the west;
- TxDOT's first all-electronic toll facility; and
- the first project in Texas to use video billing.

Despite these unique aspects of the project, TxDOT has been able to capture the collaborative spirit of its partners in Tyler to gain widespread public support for the project, obtain environmental clearance, and proceed with implementation of Loop 49 as a tolled facility. The first segment of Loop 49, built with conventional funding, opened August 22, 2006, with actual tolling to begin in mid-November 2006. Further evaluation of the project will be important in assessing its long-term success, both in terms of the state-of-the-art technical aspects as well as the ability to sustain public support.

