



U.S. Department
of Transportation

**Federal Highway
Administration**

***Case Studies of
Transportation
Public-Private
Partnerships in the
United States***

**Final Report
Work Order 05-002**

Prepared for:

**Office of Policy and
Governmental Affairs**

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July 7, 2007

July 7, 2007

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Case Studies of Public-Private Partnerships for Transportation Projects in the United States - Task Order 05-002

Dear Mr. March,

AECOM Consult, in association with DMJM Harris, FaberMaunsell, Maunsell of Australia, the National Council of Public-Private Partnerships, and the Ybarra Group, is pleased to provide the final report of *Case Studies of Public-Private Partnerships for Transportation Projects in the United States*.

This report provides a fundamental understanding of PPP approaches and their potential consequences on project time, cost, and quality, and presents the results of actual PPP projects performed in the United States through a series of case studies and cameo descriptions. The projects selected for case study vary in type and maturity, and cover the range of private sector involvement associated with different PPP approaches. Each case study explores the reasons why the sponsoring agency elected to pursue the project as a PPP, the structure of the partnership, the nature of project financial and delivery responsibilities, and the issues and impediments that confronted members of the PPP team and how they addressed them to move the project forward. Each case study also presents the results of using the PPP approach applied to the project, lessons learned from performing the project as a PPP, and conclusions about the project to inform the reader about challenges and opportunities encountered by practitioners of PPP approaches to project financing and delivery.

This report focuses on PPP applications to transportation projects in the United States. A companion report focuses on PPP application in other countries, which began experimenting and refining PPP approaches for up to twenty-five years, where the vast majority of PPP projects overseas have occurred over the past fifteen years. This companion report describes how the forms of PPPs is continuing to evolve and expand to more countries as they struggle with the burden of funding their growing transportation infrastructure needs in this global economy. A third report provides a guidebook on developing and implementing a transportation project as a PPP and its aimed at both the early practitioners of PPP projects as well as those agencies just beginning to consider the possibility instituting some form of PPP arrangement for a particular project currently stalled for lack of available resources.

We appreciate the opportunity to perform this study of PPP transportation projects in the United States. We acknowledge the support and assistance provided to the study team by members of the FHWA Office of Policy and Governmental Affairs, FHWA Office of the Administrator – PPP Unit, and FHWA Resource Center in San Francisco. We are especially grateful for your guidance and suggestions throughout this study effort.

Very truly yours,



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CASE STUDIES OF TRANSPORTATION PUBLIC-PRIVATE PARTNERSHIPS IN THE UNITED STATES

ABSTRACT

Highway transportation agencies across the United States are facing a fiscal challenge caused by the growing gap between the costs of providing and preserving the highway infrastructure and available highway program funding. The inability of motor fuel taxes to provide adequate funding has prompted transportation policymakers to consider alternative ways to finance and deliver needed transportation infrastructure. Public-Private Partnerships (PPPs) represent a wide variety of project financing and delivery approaches which offer the potential to expedite project delivery, operations, and maintenance in a more cost-effective manner, enabling transportation agencies to effectively “do more with less.” The common element of a PPP is that the public sector sponsor of infrastructure projects engages the private sector to a greater degree in the performance of certain functions previously handled by the public sector. This can range from contracted maintenance services to full financing, development, operations, and preservation.

With the U.S. Department of Transportation and its surface transportation administrations encouraging their counterparts at the state and local government levels to consider the selective use of PPP approaches to expedite urgent transportation projects, there is significant opportunity for state and local transportation agencies to add PPP approaches to their means of accomplishing their missions. One way to present the implications and potential applicability of various types of PPP approaches is through the experience gained by early users of these alternative delivery approaches. This report does so through a series of case studies and cameos of actual PPP projects which have used various degrees of private sector involvement.

The projects selected for case study or cameo discussion represent a broad spectrum of highway projects varying types and maturity. Each case study explores the reasons why the sponsoring agency elected to pursue the project as a PPP, the structure of the partnership arrangement, the nature of project financial and delivery responsibilities, and the issues and impediments that confronted members of the PPP teams and how they addressed them to move the projects forward. Each case study also presents the results of using a particular PPP approach, lessons learned from performing the project as a PPP, and conclusions about the project. This information is intended to inform those considering the use of PPP approaches or are interested in learning more about what others are doing to develop and implement PPP project, noting both the challenges and opportunities encountered by practitioners of PPP approaches to project financing and delivery.

This report focuses on PPP applications to transportation projects in the United States. A companion report focuses on PPP application in other countries, which began experimenting and refining PPP approaches for up to twenty-five years, where the vast majority of PPP projects overseas have occurred over the past fifteen years. This companion report describes how the forms of PPPs is continuing to evolve and expand to more countries as they struggle with the burden of funding their growing transportation infrastructure needs in this global economy. A third report provides a guidebook on developing and implementing a transportation project as a PPP and its aimed at both the early practitioners of PPP projects as well as those agencies just beginning to consider the possibility instituting some form of PPP arrangement for a particular project currently stalled for lack of available resources.

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1. INTRODUCTION

Since the late 1980s, public-private partnerships (PPP) have come to the fore in various countries around the world in the provision of infrastructure. PPPs provide an opportunity for governments to provide social capital infrastructure in the form of schools, hospitals and roads while benefiting from greater cost-efficiency that may be achieved from private sector involvement. It is argued that alignment of incentives drives the efficiencies that are derived from PPP arrangements. Private sector participation in asset and service provision can maximize value for money for government by expediting financing, facilitating innovation, providing better risk management, and integrating life-cycle management.

Internationally PPPs have become increasingly attractive for governments seeking fiscal discipline. PPPs provide public agencies opportunities to deliver transportation facilities using private sector resources without necessarily committing public debt or equity. In the face of increasing gaps between infrastructure financing requirements and revenues, public agencies often view PPPs as a way to expedite critical infrastructure that may otherwise not be built.

In the United States, the trend towards PPPs in the provision and maintenance of highway infrastructure has been gradual due to the strength of the funding and institutional arrangements that supported the nation's traditional roadway development program. This included a dedicated transportation trust fund supported by motor fuel taxes, federal transportation agencies to provide administrative oversight of the program, and state transportation agencies which delivered the program through project planning, financing, development, and maintenance activities. However, as the U.S. highway system matured, the needs for repairing and expanding the nation's network of roads, bridges, and tunnels have escalated beyond the fiscal capabilities of traditional funding sources to pay for them at both the federal and state levels of government. This has resulted from a number of causes, including:

- The rapid pace of facility deterioration and functional as well as structural obsolescence due to the advanced age of many of these facilities and in some cases deferred maintenance of facilities by states which lacked the resources to perform normalized maintenance to better preserve these infrastructure assets.
- The growth in the nation's economy and its position in the global economy which has led to increasing movement of freight over the nation's highway system.
- Escalating growth in personal travel that is congesting the highway system which has grown little over the past 15 years.
- Rapidly rising costs of building and maintaining highway infrastructure as the price of construction materials has increased substantially in recent years due to greater competition from countries experiencing accelerated growth, particularly China, India, and Eastern Europe and major shifts in commodity prices due to political uncertainties in areas where such commodities largely originate, such as petroleum.
- The general unwillingness of elected officials at both federal and state levels to raise the motor fuel tax or institute an alternative funding strategy that will sustain the condition and capability of the nation's highway system to support economic growth, interstate and international commerce, and public and defense mobility.

The culmination of these interrelated conditions has led to an increasing willingness by transportation infrastructure agencies at both the federal and state levels to consider and in some cases apply alternative funding, financing, contract delivery, and life-cycle preservation methods to leverage the scarce public resources. The Federal government through the United States Department of Transportation/Federal Highway Administration (USDOT/FHWA) has promoted greater innovation in the ways highways are planned, financed, procured, and administered through workshops, sponsored research, demonstration projects, and the Special Experimental Projects-15 program (SEP-15), which are aimed at promoting innovative ways that encourage the use of PPPs in the national highway development and preservation program.

PURPOSE AND OBJECTIVES

The purpose of this report is to promote greater understanding of the role institutional factors (including statutory, regulatory, financial, organizational, procedural, and cultural) play in facilitating or impeding the formation and successful implementation of public-private partnerships and to identify effective strategies for overcoming institutional impediments and facilitating successful PPP development and implementation, based on the experience of a number of successful domestic transportation PPPs. To accomplish this purpose, the study team performed the following activities:

- Conduct a literature review to characterize the types and implications of various institutional factors that significantly impact the potential for successful implementation of transportation PPPs;
- Develop and execute a study plan to collect secondary and direct information on the major institutional issues that confronted successfully implemented PPPs for transportation projects in the U.S.;
- Develop a series of case studies and cameos of domestic PPPs that characterize transportation project PPPs by facility type and contract type, describe their institutional challenges and how these issues and their implications compare and contrast between projects, and identify strategies to effectively overcome these impediments to successful PPP implementation; and
- Synthesize and document the study findings in a guidebook to help prospective sponsors and participants in PPPs understand the institutional context for transportation projects, the institutional issues that can undermine formation or implementation of these PPPs, and ways to deal with or overcome these impediments based on best practices cited from PPPs successfully implemented in the U.S. and elsewhere.

SCOPE AND METHODOLOGY

The study team reviewed and summarized the available literature on the application and management of PPPs for transportation infrastructure in the United States and overseas. This provided a summary of benefits, risks and critical success factors arising from PPP arrangements in the United States and elsewhere. The study team then assembled a list of candidate transportation PPPs in the U.S. both domestic and international, from which a group would be selected for developing the individual case studies. From this broad group of projects, a finite set was chosen for investigation using direct surveys and in some cases interviews with

representatives of the public and private partners to these projects, including project sponsors, contractors, operators, and government agencies. This was augmented with project documentation available from the literature, including that provided by relevant project websites, annual reports and local knowledge. While general information is available about many PPP transportation projects around the world, there are relatively few such projects in the United States to choose from.

It should be noted that given the commercial and political nature of PPP arrangements, information required to provide a comprehensive evaluation of PPP projects is often incomplete, not available, or restricted. Furthermore, personnel from the private sector concession teams generally disperse at various junctures of the concession. For example financial and legal personnel involved in PPP projects disperse at financial closure of each project. Design and construction personnel often disperse after the project is opened to traffic. This further inhibited information that could be derived at either the consultation or development stages.

As a consequence of this, the study team found that project partners whom we attempted to contact were often either not available or reluctant to respond, particularly those in the private sector. When we were able to make contact, many were reluctant to answer questions regarding issues that arose during the project and the strategies used to overcome them. The public sector sources were far more forthcoming and candid in their discussion of the rationale for using a particular PPP arrangement to develop needed projects, as well as the key issues confronting their PPP projects and how they were addressed. As such, information presented in this report is based on the best available public information on each PPP project. This information is reflected in the domestic and international case studies and cameos.

U.S. TRANSPORTATION PPP CASE STUDIES AND CAMEOS

Seven case studies and three cameos were prepared for PPP projects located in the United States. These included the following PPP projects:

- **Case Studies**
 - Anton Anderson Memorial Tunnel - Whittier, Alaska
 - Atlantic Station 17th Street Bridge - Atlanta, Georgia
 - Chicago Skyway Long-Term Lease – Chicago, Illinois
 - Route 3 Rehabilitation Project – Burlington, Massachusetts
 - Route 28 Phase II Expansion – Fairfax and Loudon Counties, Virginia
 - South Bay Expressway (State Road 125) - San Diego County, California
 - Trans-Texas Corridor (TTC)-35 Toll Road Program – East Central Texas
 - Port of Miami Tunnel – Miami, Florida
- **Cameos**
 - Atlantic City Brigantine Connector - Atlantic City, New Jersey
 - Conroy Road Bridge and Approach Ramps – Orlando, Florida
 - Universal Boulevard Bridge – Orlando, Florida

This group of PPP projects provides a diversity of geographic locations, stakeholder groups, facility types, contract types, PPP compositions, and financing arrangements. The group includes completed and on-going projects, smooth-running and challenging projects, and projects prompted by a variety of purposes, including transportation, economic development, and/or environmental renewal. Information on project type, PPP composition, project delivery method, concession period, financing structures, and key issues and strategies, and results are presented for each of these projects.

REPORT STRUCTURE

The remainder of the report has the following structure:

- Chapter 2: Public-Private Partnerships in Transportation Projects
- Chapter 3: U.S. Transportation PPP Program Summary, Case Studies, and Cameos
- Chapter 4: Results and Conclusions
- Appendix A: Glossary of Terms
- Appendix B: List of Acronyms
- Appendix C: Bibliography

Several companion reports provide additional insights into transportation PPPs implemented in other countries and guidance for U.S. transportation agencies and public decision-makers considering their implementation in this country.

- The second companion report focuses on transportation PPP programs and projects developed by other nations around the world, including countries with long experience in the development and application of various approaches to transportation PPPs as well as other nations just beginning to use of PPPs to deliver needed transportation infrastructure to support their burgeoning or fledgling economies.
- The third companion report is a guidebook on transportation PPPs that is designed to help transportation agencies in this country understand, develop, implement, and manage transportation-related PPPs, based on the experience gained from PPP programs and projects in the U.S. and other countries.

2. PUBLIC-PRIVATE PARTNERSHIPS IN TRANSPORTATION PROJECTS

This chapter provides an overview of public-private partnership (PPP) approaches to delivering surface transportation infrastructure projects and services. This includes presenting background information on the evolution of PPPs, defining transportation PPPs and the various types of approaches to involving the private sector in public-sponsored transportation projects, the benefits and risks associated with PPPs, and critical factors for successful development and implementation of a PPP project. The benefits, risks, and critical success factors are relevant to PPP projects worldwide.

BACKGROUND

Private sector involvement in the provision of transportation infrastructure and services is not new to the United States. The first roadways were developed by the private sector in the late eighteenth century in the form of toll roads and turnpikes that opened passageways from the eastern seaboard to the virgin territories further inland. The private sector dominated the provision of roadway development until the twentieth century, when federal and state governments increased their involvement in funding road networks as the needs of a growing economy and population required improved accessibility and mobility beyond what the railroads could deliver on their fixed-rail systems. Until the establishment of a dedicated Highway Trust Fund and the initiation of the Interstate Highway System, the private sector played a major role in the development of the nation's first major highways as tolled facilities, principally in the Northeast quadrant but also in other parts of the country like Florida, Oklahoma, and Kansas.

With the initiation of the Interstate Highway Program and most of its capital costs paid from the dedicated Highway Trust Fund, the days of major toll road development came to a virtual end with the state highway agencies administering the program and projects using its own in-house resources to provide most functions except for construction. Another major factor which influenced the relative involvement of the private sector in transportation infrastructure projects was the various procurement reforms that occurred at the end of the nineteenth century and early twentieth century to control abuses in contracting and hiring practices by sponsoring agencies. This led to the strict regulation of project procurement and delivery approaches, focusing on the design-bid-build project delivery approach whereby the engineering design phase is procured separately using a qualification-based negotiated price approach, with the construction phase awarded on a low-bid basis. Operations and maintenance remained as public-sector functions.

It was only when the dedicated Federal Highway Trust Fund failed to keep up with the growing needs for highway rehabilitation, reconstruction, replacement, and expansion plus the need for new alignment that greater involvement by the private sector was sought to leverage scarce public resources, expedite project delivery, improve cost-effectiveness of project development, and increase access to capital markets through the application of alternative approaches to project funding, financing, contract delivery, and preservation, all involving greater degrees of private sector responsibilities and risks. This gradual move towards greater private sector involvement has been gaining momentum over the last fifteen years, as Federal funding statutes and regulations have begun to be relaxed in permitting these alternative approaches and private sector involvement.

The first transit projects were developed by the private sector in the late nineteenth and early twentieth centuries as a means to provide access to real estate developments extending from the

congested cities. These transit projects began with horse-drawn cars and trolleys on rails and were followed by electrified trolleys, streetcars, subways, and interurban transit systems. By the late 1950s, continued reinvestment in these transit systems by the private sector had declined because real estate interests had already captured the market required from residents and commercial tenants and the prevalence of automobile use had increased. The increasing use and popularity of the automobile diverted passengers from transit, depriving transit operators of the fare revenue required to run a profitable venture. As a result, many transit systems began to fall into disrepair, and local governments or other public agencies had to take over the facilities in order to maintain their safety and operability. Over the past 50 years, most transit services in the United States have continued to be heavily subsidized operations, with dedicated tax revenues and grants from local, state, and federal governments as the primary sources of operating and capital funding.

As these dedicated, traditional transportation funding sources become more constrained and public transportation needs continue to increase, transit agencies are seeking alternative ways to pay for and deliver public transit facilities and services. This includes involving the private sector in efforts to rehabilitate or replace aging facilities and equipment, expand existing systems, or develop new systems. By involving the private sector through PPPs, transit agencies improve their access to project development, finance, design, construction, and operations expertise as well as gain access to new revenues and financial markets.

DEFINITION AND TYPES OF PUBLIC-PRIVATE PARTNERSHIPS

Public-private partnerships are defined by the US DOT as follows.

“A public-private partnership is a contractual agreement formed between public and private sector partners, which allows more private sector participation than is traditional. The agreements usually involve a government agency contracting with a private company to renovate, construct, operate, maintain, and/or manage a facility or system. While the public sector usually retains ownership in the facility or system, the private party will be given additional decision rights in determining how the project or task will be completed.”¹

This definition emphasizes that with a PPP the public and private sectors share responsibility for the delivery of the project and/or its services. By expanding the private sector role, the public sector is better able to avail itself of the technological, managerial, and financial resources to leverage scarce public funds and expedite the delivery of a project and/or services in a more cost-effective manner and with reduced risk to the public agency sponsor. As noted above, the public sector bore most project delivery, financial, and operational risks. By sharing responsibility and resources for the delivery of a PPP project, both public and private sectors share in the potential risks and rewards from the delivery of the facility or service relative to what they retain responsibility for.²

PPPs come in a wide variety of arrangements, representing a broad spectrum of private and public sector involvement in the various phases of project development, finance, implementation,

¹ US DOT. *Report to Congress on Public-Private Partnerships*, December 2004, p.10.

² National Council for Public-Private Partnerships. “Public Private Partnerships Defined.” <http://www.ncppp.org/howpart/index.shtml#define>

operations, maintenance, and preservation. The five major types of PPP arrangements are listed below.

Private Contract Fee Services

For both highway and transit modes, private contract services represent the most common form of private sector involvement in surface transportation project and service delivery. For the highway mode this includes contract planning and environmental studies, facility and right-of-way maintenance, and operations, including the operation of transportation management centers and various ITS services. Transit agencies have long contracted for the operation of some or all of its modal services with the private sector, especially paratransit services for senior and persons with disabilities. In addition, many transit agencies contract for maintenance services on some or all of their vehicles, facilities, and infrastructure.

Alternative Project Delivery Approaches

In recent years surface transportation agencies have increasingly turned to PPP project delivery approaches (such as design-build or DB) in order to procure new or expanded facilities.

Agencies use PPP delivery approaches in an attempt to obtain time savings, cost savings, new technology, and more innovative, higher quality projects with reduced risks.

Multimodal Partnerships

Multimodal partnerships include transportation projects that involve more than one mode, such as park and ride lots, High Occupancy/Toll (HOT) Lanes with Bus Rapid Transit (BRT) services, airport transit extensions, or truck/rail transfer facilities. Multimodal partnerships may or may not be PPPs, depending on whether the private sector is involved in the design, construction, operation, maintenance, finance, and/or management of the multimodal project.

Joint Development

Surface transportation agencies are partnering with private developers to capture a portion of the increased value resulting from enhanced accessibility provided by proposed or recent transportation projects, often referred to as joint development or transit-oriented development (in the case of transit). Economic development-based partnerships provide access to additional capital and operating revenues for surface transportation agencies through the receipt of tax increment financing, special assessment or business improvement district fees, access fees, and increased toll or fare revenues, as well direct private sector funding of capital facilities that promote access between transportation facilities and private development.

Long-Term Lease or Concession Agreements

Concession agreements typically involve the long-term lease of publicly financed transportation facilities (such as toll roads or parking garages or air rights over transit stations or highways) to a private sector concessionaire for a specified time period in return for the right to collect the revenues generated by the facility. During the concession period, the concessionaire may be responsible for financing, developing, and delivering the project, as well as facility operation, maintenance, and preservation.

These five categories of transportation PPP arrangements in the U.S., their components, and the benefits of each are described in more detail below. Exhibit 2.1 illustrates the hierarchy of major types of PPPs discussed in this chapter, starting at the bottom with PPPs that have the least private sector role and ending on the top with PPPs with the greatest private sector role.

Exhibit 2.1 Major Types of Transportation PPPs



ALTERNATIVE PPP ARRANGEMENTS

The following pages describe each of the five major types of PPP arrangements for delivering surface transportation projects, including variations where developed and applied.

Private Contract Fee Services, including Contract Maintenance

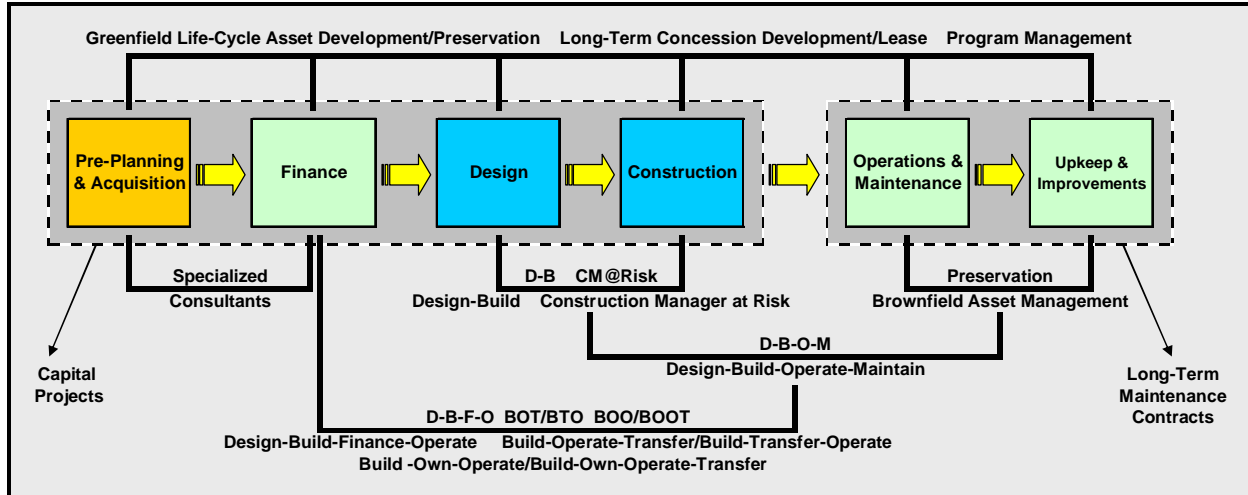
Private contract fee services are contracts between public agencies and the private sector for services that are typically performed in-house, such as planning and environmental studies, program and financial management, and/or operations and maintenance. These contracts generally are awarded on a competitive bid process to the contractor offering the best price and qualifications. The potential benefits of private contract fee services include:

- Reduced work load for agency staff;
- Potential for reduced costs; and
- Opportunities to apply innovative technologies, efficiencies, and private sector expertise.

Alternative Project Delivery Approaches

Exhibit 2.2 summarizes the major phases that comprise the delivery of infrastructure projects. Different project delivery approaches can be developed by combining various phases together that the private sector takes responsibility for. The primary combinations are discussed below.

Exhibit 2.2 Major Phases of Infrastructure Project Development and Delivery



Source: Pekka Pakkala. *Innovative Project Delivery Methods for Infrastructure – An International Perspective*. Finnish Road Enterprise, Helsinki, 2002, p.32.

- Design-Bid-Build.** Design-bid-build (DBB) is the traditional form of project delivery where the design and construction of the facility are awarded separately to private sector engineering and contracting firms. As a result, the DBB process is divided into a two-step delivery process involving separate phases for design and construction. In the design phase, the project sponsor either performs the work in-house or contracts with an engineering and design firm to prepare the preliminary engineering plans and environmental clearance, which results in a project plan at the 30 percent completion stage, and the final drawings and specifications for the project. Once the design phase is complete, the project sponsor separately contracts with a private construction firm through a competitive bidding process. Under a DBB contract, the project sponsor, not the construction contractor, is solely responsible for the financing, operation, and maintenance of the facility and assumes the risk that the drawings and specifications are complete and free from error. The DBB selection process is based on negotiated terms with the most qualified firm for the design phase; while, the award of the construction contract typically is based on the lowest responsible bid price.

The DBB delivery approach was developed in the late nineteenth century as a way to deal with increasingly complex and specialized design and construction services; the perceived need to provide a check and balance between the development and execution of project plans; and a desire to deliver projects at a minimum cost. With the passage of legislation formally separating the design and construction phases of infrastructure projects in 1893, DBB became the established project delivery method for transportation and other infrastructure industries. The majority of surface transportation projects still use the DBB approach.

The primary benefits associated with DBB delivery are:

- Division of work by specialization of effort (design versus construction);
- Reduced potential for collusion between the design and construction firms during the project delivery process that circumvents the contract terms; and

- Increased ability of local firms to compete for contracts which are more limited in scope and often smaller in scale.

By having separate contracts for design and construction, it is easier for smaller or specialty firms to compete with larger firms for the design or construction contracts, resulting in more bidders and frequently a more competitively priced bid.

- **Construction Manager-at-Risk.** Construction Manager at Risk (CM@Risk) is a project delivery approach in which the construction manager is brought into the project development process under separate contract during the design phase to minimize risk for all parties involved in a project by combining the experience, creativity, and skill of the engineering design and CM@Risk firms with the client's understanding of the project's requirements. In CM@Risk, the client selects the construction manager based on qualifications, not price, to provide constructability, technology, pricing, and sequencing analysis of the design. The construction manager becomes the design-build contractor when a guaranteed maximum price is agreed upon by the project sponsor and the construction manager.

CM@Risk includes construction management services for a project throughout the preconstruction and construction phases by a firm which is licensed as a general contractor and guarantees the cost of the project. CM@Risk is gaining popularity due to the following benefits:

- Collaboration of the client, designer, and construction manager to ensure a constructible design that is executed to meet the client's requirements;
 - Continued advancement of the project during price negotiations;
 - Potential for more optimal teaming because the construction manager can negotiate with all firms, rather than having to select from a limited number under DB delivery;
 - Higher level of direct client involvement than other alternative project development approaches (described below) during project development phases as a collaborator with the design and construction management firms; and
 - Reduced project risk by identifying design errors or omissions before they convey to the construction phase and guaranteeing the cost of project.
- **Design-Build.** Unlike DBB where the design and construction of projects is procured in two separate contracts with little or no overlap in the respective project work phases, the DB delivery approach combines the design and construction phases into one, fixed-fee contract. Under a DB contract, the design-builder, not the project sponsor, assumes the risk that the drawings and specifications are free from error. While the design and construction phases are performed under one contract, it is important to note that the design-builder may be one company or a team of companies working together. The DB selection process may be based on a negotiation with one or more contractors or a competitive process based on some combination of price, duration, and qualifications. Increasingly DB contracts are being awarded on the basis of best value, considering each of these factors.

When local government agencies began to take over the operation of transit services in the U.S. during the 1950s, DBB delivery approaches were the standard. As a result, the DB delivery approach is a relatively new process for the transportation industry in the U.S., particularly for transit. However, DB is a successful, well-established process for

delivering major capital projects by the private sector and the armed services. As transportation needs continue to grow faster than traditional transportation funding sources and other sectors experience success with DB delivery, transportation agencies are increasingly interested in the potential to apply DB as a means to improve the cost-effectiveness (time, cost, and quality) of traditional contracting practices.

The primary benefits that have been associated with DB delivery approaches compared to traditional DBB delivery include the following.^{3, 4, 5}

- **Time savings** - The potential for time savings results from early contractor involvement in the design phase, which increases the constructability of the design plans; the ability to work concurrently on the design and construction phases for portions of the project; and the elimination of the bidding process between the design and construction phases that is required of traditional DBB project delivery.
- **Cost savings** - The potential for cost savings results from continued communication between design, engineering, and construction team members throughout the delivery; reduced inspection requirements by the project sponsor because these activities are the responsibility of the design-builder; reduced change orders due to early involvement of the construction contractors in the design phase; and shortened project timeline.
- **Shared risks** - Since the potential project risks are shared among the public and private sectors, the risks may be assigned to the party best able to handle them. For example, the private sector may be better equipped to handle the risks associated with design quality, construction costs, and delivery schedule adherence since they are responsible for both the design and construction of the facility; while, the public sector may be better able to manage the public risks of environmental clearance, permitting, and right-of-way acquisition.
- **Improved quality** - The potential for improved quality results from the involvement of the design team through the project development and opportunities to incorporate project innovations and new technology that may arise based on project needs and contractor capabilities.

DB project delivery may include a variety of structures and combinations that result in private participation only in the design and construction phases or may extend into operations, maintenance, and project financing. These variations of the DB delivery approach are discussed in greater detail below.

- **Design-Build with a Warranty** - Under the DB with a warranty approach, the design-builder guarantees to meet material, workmanship, and/or performance measures for a specified period after the project has been delivered. The warranties may last five to 20 years. The potential benefits of the DB with a warranty approach include the assigning of additional risk to the design-builder and reducing the project sponsor's need for inspections and testing during project delivery.

³ Loulakis, M. C. *Construction Project Delivery Systems: Evaluating the Owners Alternatives*, AEC Training Technologies, 1999.

⁴ Pakkala, Pekka *Innovative Project Delivery Methods for Infrastructure: An International Perspective*, Finnish Road Enterprise, 2002.

⁵ Tenah, K. A. "Project Delivery Systems for Construction: An Overview," *Cost Engineering*, AACE International, Morgantown, WV, 43(1), pp 20-26.

- **Design-Build-Operate-Maintain** - Under a design-build-operate-maintain (DBOM) delivery approach, the selected contractor is responsible for the design, construction, operation, and maintenance of the facility for a specified time. The contractor must meet all agreed upon performance standards relating to physical condition, capacity, congestion, and/or ride quality. The potential benefits of the DBOM approach are the increased incentives for the delivery of a higher quality plan and project because the design-builder is responsible for the performance of the facility for a specified period of time after construction is completed. Since 2000, three transit projects have been procured as DBOMs: NJ Transit Hudson-Bergen LRT MOS-1 and MOS-2 and JFK Airtrain, which are discussed in detail in the next chapter.
- **Design-Build-Finance-Operate** - The design-build-finance-operate (DBFO) delivery approach is a variation of the DBOM approach. The major difference is that in addition to the design, construction, and operation of the project, the contractor is also responsible for all or a major part of the project's financing. The potential benefits for the DBFO approach are the same as those under the DBOM approach and also include the transfer of the financial risks to the design-builder during the contract period. While the project sponsor retains ownership of the facility, the DBFO approach attracts private financing for the project that can be repaid with revenues generated during the facility's operation.
- **Build-Operate-Transfer** - Build-operate-transfer (BOT) is similar to the DBFO approach whereby the contract team is responsible for the design, construction, and operation of the facility for a specified time, after which the ownership and operation of the project is returned to the project sponsor. Under a BOT approach, the project sponsor retains ownership of the facility as well as the operating revenue risk and any surplus operating revenues. The potential benefits of using a BOT approach are similar to the benefits associated with using a DBOM contract: increased incentives for the delivery of a higher quality plan and project because the contractor is responsible for the operation of the facility for a specified time period after construction.
- **Build-Own-Operate** - Under a build-own-operate (BOO) delivery approach, the design, construction, operation, and maintenance of a facility is the responsibility of the contractor. The major difference between BOO and DBOM, DBFO, or BOT approaches is that ownership of the facility remains with the private contractor. As a result, the potential benefits associated with a BOO approach are that the contractor is assigned all operating revenue risk and any surplus revenues for the life of the facility.

Full Delivery or Program Management

With a full delivery approach, the construction contractor provides a wide variety of services beyond construction to the project sponsor. These services generally begin during the design phase and may continue through the operation and maintenance of the facility. The potential benefit of the Full Delivery approach is that it allows the project sponsor to leverage its resources throughout the design, construction, and operation of the facility. A primary form of full-service delivery is the Long-Term Concession or Lease Agreement.

Long term lease agreements involve the lease of publicly financed facilities to a private sector concessionaire for a specified time period. Under the lease, the private sector concessionaire agrees to pay an upfront fee to the public agency in order to obtain the rights to collect the revenue generated by the facility for a defined period of time (usually from 25 to 99 years). In addition to the concession fee, the concessionaire agrees to operate and maintain the facility,

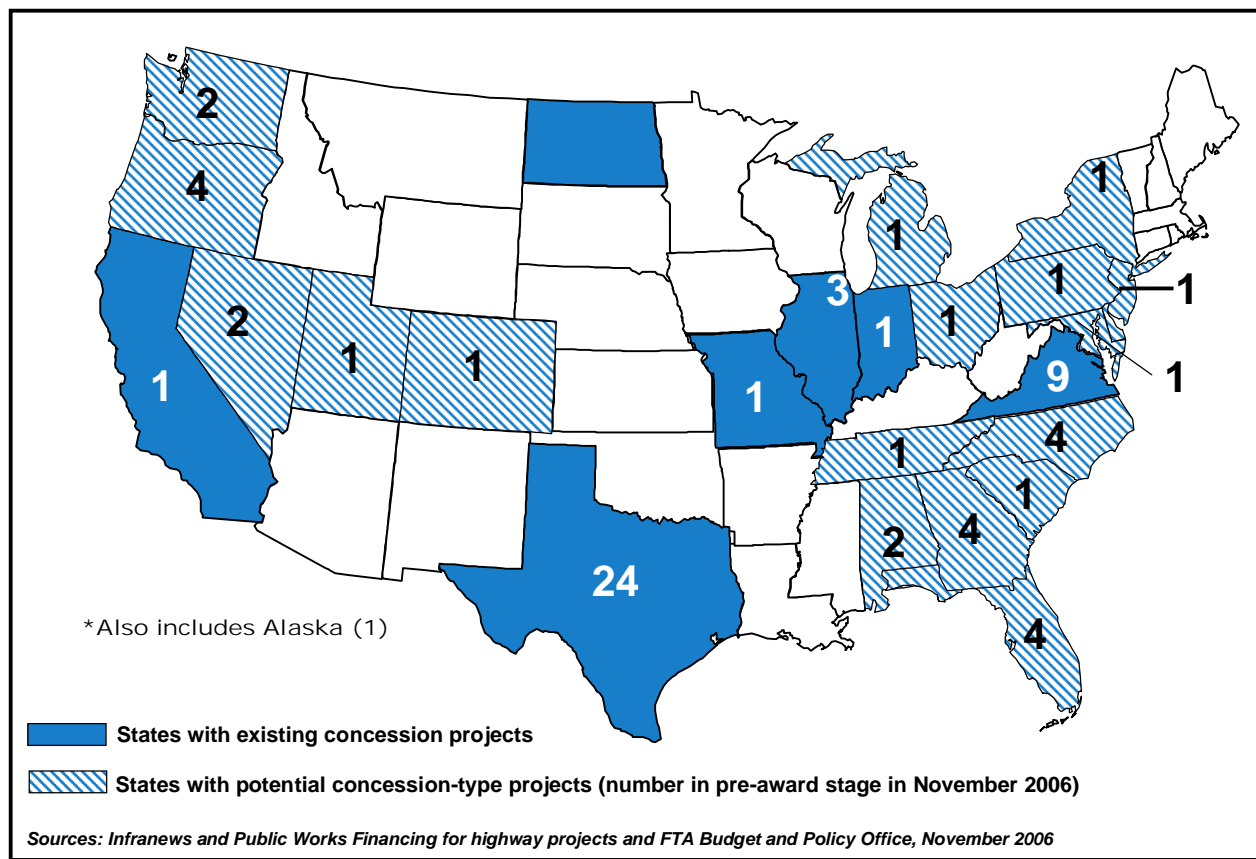
which may include capital improvements in some instances. Long term lease agreements are awarded based on a competitive process to a qualified bidder with the best bid price. Recent long term lease agreements include the Chicago Skyway, Indiana Skyway, and Chicago Downtown Parking Garages.

The potential benefits of long term lease agreements include:⁶

- Transferring responsibility for increases in user fees to the private sector;
- Generating large up-front revenues for the public agency;
- Transferring operations, maintenance, and capital improvement responsibilities to the private sector;
- Transferring most project, financial, operational and other risks to the private concessionaire; and
- Taking advantage private sector efficiencies in operations and maintenance activities.

There are many states considering long-term lease or concession agreement to take over responsibility for existing facilities (brownfield projects) or to develop new facilities (greenfield projects). Exhibit 2.3 shows the many states and the estimated number of such projects (71 actual and potential projects) by state near the end of 2006.

Exhibit 2.3 States Interested in Highway Concession PPPs in Late 2006



⁶ Federal Highway Administration PPP website, www.fhwa.dot.gov/ppp.

Transit Related Development Approaches

Transit related development is viewed differently by different agencies and regions depending on the status of the transit facility when the development is committed. However, the common thread between all of these definitions is that transit related development involves pedestrian-friendly, higher-density development near transit facilities. Within the transit industry, transit related development is generally defined as “a pattern of dense, diverse, pedestrian-friendly land uses near transit nodes that, under the right conditions, translates into higher patronage.”⁷ Transit related development typically includes higher density residential, commercial, and/or retail developments within a ¼- to ½-mile radius of transit stations and stops. Mixed use development is a common element of transit related development.

Transit related development can provide financial support for transportation infrastructure through four formalized development opportunities:

- Transit-Oriented Development;
- Joint Development;
- Business Improvement Districts; and
- Tax Increment Financing.

These opportunities are discussed in greater detail below.

- **Transit-Oriented Development.** Transit-oriented development (TOD) is commercial and residential development that is a consequence of proximity to an existing or recently opened transit station or terminal. TODs may involve the partnership of private developers with local governments, development agencies, and transit agencies in order to enhance the land use surrounding a transit facility. Transit agencies or local governments frequently own land located near existing or future transit facilities that is not being used, or could be put to a higher use. Developers are continuously looking for new development opportunities, and the location of available land with good access to transit is attractive for new development or re-development. With TOD, the private developer is solely responsible for the financing and risks associated with constructing the development on publicly owned land. Local governments may also play a role beyond that of land owner; they can provide incentives to developers in the form of density bonuses, rezoning, relaxing parking requirements, and streamlining regulatory requirements. It takes the commitment, communication, and coordination of all these public and private groups to make TOD successful.

The benefits of TOD are quite varied and extend well beyond transit usage. Exhibit 2.4 summarizes the primary and secondary benefits from the perspective of the public and private sectors.

- **Joint Development**

Joint development is a type of TOD involving transit agencies working with private developers in planning and executing a project. Joint development is project specific, dealing with the development on, above, or adjacent to land owned by a transit agency.

⁷ Cervero, Robert (Principal Investigator). *TCRP Report 102: Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects*. Transportation Research Board, 2004, p.7.

Exhibit 2.4 Public and Private Sector Benefits and Risks of Transit-Oriented Development

Public Sector – Primary Benefits/Risks	Private Sector - Primary Benefits/Risks
Increased ridership and fare revenues	Higher land values
Joint sharing of costs for mixed-use stations	Higher rental/lease rates and sales prices
Potential for dedicated property/sales tax revenue	More affordable housing opportunities
Potential for lease payments or other development-related revenues	Risk of development market decline negating value of developer investment in transit project
Risk that private development revenues fail to accrue due to delays in development activity	Risk of commercial development delays caused by transit project delays
Public Sector – Secondary Benefits/Risks	Private Sector – Secondary Benefits/Risks
Revitalized neighborhoods and commercial zones	Higher retail sales from greater customer exposure
Reduced traffic congestion and suburban sprawl	Increased access to labor
Reduced need for roads and other infrastructure	Reduced parking costs in suburban locations
Reduced crime and increased safety resulting from rejuvenated urban landscape	Risk that transit service levels do not match needs of development lessees, patrons, or residents
Risk of development requirements requiring costly changes to transit facility designs and operations	Risk of mismatch between transit patrons and retail or residential customers of related development

Source: Robert Cervero, TCRP Report 102: Transit-Oriented Development in the United States, TRB, 2004, pp.120-131. Revised by AECOM Consult, Inc. to reflect risk factors, 2007.

With joint development, the transit agency provides developers with the right to design and construct a residential, commercial, retail, or mixed use building on or above transit property in return for a negotiated payment. Developer payments to transit agencies vary significantly and may include an annual lease payment for a specified period of time as well as the construction of transit facilities, such as portals to transit facilities, parking facilities, and station facility improvements. The form of joint developer payments are project specific and depend on the benefits and needs of the developer and transit agency. The primary forms of joint development payment arrangements include:⁸

- **Ground Lease.** A ground lease involves an annual rent payment to the transit agency for the right to develop property owned by the transit agency. The length of the lease agreement must be long enough for the developer to receive an acceptable return on investment from the rents it charges to the occupants of the development. When the lease expires, ownership returns to the transit agency.
- **Air-rights Lease.** An air-rights lease is similar to a ground lease in that it involves an annual rent payment to the transit agency for an agreed upon period of time; however, the lease is for the right to build the development above the transit station. The length of the lease agreement must be long enough for the developer to receive an acceptable return on investment from the rents it charges to the

⁸ Cervero, Robert (Principal Investigator). *TCRP Report 102: Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects*. Transportation Research Board, 2004, pp.25-32.

occupants of the development. When the lease expires, ownership returns to the transit agency.

- **Operations Cost Sharing.** Operations cost sharing involves the sharing of certain operations costs between the transit agency and the development. Common examples include ventilation systems, parking, and utilities.
- **Construction Cost Sharing.** Construction cost sharing involves the developer paying for portions of the transit agencies construction costs, such as parking facilities, building foundations, access portals, transit centers, and bus shelters. Construction cost sharing is one type of joint development that is easily applied to bus service as well as rail.
- **Station Connection Fee.** A fee (may be one-time or annual) charged by transit agencies to a developer for the right to connect its development directly to the transit station. The connection allows riders direct access to properties without having to go outside the transit station.
- **Negotiated Private Contribution.** Transit agencies negotiate directly with developers to receive private contributions to transit facility improvements. The value of the contributions is based on the benefits received by the private developer from the transit investment. These contributions are generally a one-time fee or payment.
- **Benefit Assessment District.** A geographic benefit district is established around a transit station. Property owners within the benefit district are then assessed a fee based on the benefits they receive from the transit facility or improvement to help finance its construction. Residential properties are frequently exempted from the assessment.
- **Equity Partnership.** Equity partnerships involve the exchange of certain assets between the transit agency and the developer, such as a land sale. FTA’s recent joint development ruling allows transit agencies to keep land sale proceeds as long as the development is supportive of transit.
- **Incentive Agreement.** Incentive agreements involve the developer contributing or sharing the costs of transit investments, such as station connections or improvements, in return for density bonuses that allow the developer to add additional floors or space to their development, rezoning of property, or relaxing parking requirements.

The primary benefit of joint development for transit agencies is increasing agency revenues through increases in ridership, the generation of lease payments, capital or operating contributions, or one-time fees, as described below.

- The mixed use development at transit stations attracts additional riders to the transit system, thereby increasing fare revenues.
- JDAs may generate private sector capital and operating contributions as well as annual lease payments for transit agencies. These additional annual revenues and capital and operating contributions diversify transit agency funding and help offset some of the agency’s on-going capital and operating expenses.

The Washington Metropolitan Area Transportation Authority (WMATA) has been using joint development projects successfully for over 30 years to subsidize its capital and operating expenses. Some of WMATA's joint development activities include air-rights leases at two stations (Ballston and Bethesda), ground leases at 22 stations (including Silver Spring and Friendship Heights), operating cost sharing at eight stations (including Farragut West and Bethesda), capital cost sharing at 10 stations (including Bethesda), and station connector fees at seven stations (including Friendship Heights and Clarendon).⁹

In addition to the revenue benefits, joint development offers other secondary benefits or societal improvements, including:

- Increased economic activity and vitality of station areas;
- A safer environment around transit stations; and
- A more aesthetically pleasing place to live, work, and visit near transit stations and terminals.

These benefits may be secondary for transit agencies, but they are the primary benefits for private developers. Without these economic, safety, and attractiveness benefits, the private developers would not be interested in participating in joint development activities because the developer would not be able to attract the residential, commercial, and retail tenants necessary to make their investment profitable.

- **Business Improvement Districts**

Business Improvement Districts (BIDs) assess properties located within a defined geographic area to finance a variety of enhanced services in the area including security, maintenance, marketing, economic development, parking, transportation, and special events. BIDs usually are managed by a quasi-public agency or a nonprofit organization under the direction of a board composed of representatives from the various business and property interests within the district. Historically, BID transportation projects have focused on pedestrian facilities and movement within the district; however, as accessibility and congestion levels increase and impact economic development, BIDs have started to take on a greater role in transportation planning and initiatives. In some areas, BIDs have contributed to the financing of new or expanded transportation services in order to enhance the economic activity and growth in the district, such as a free trolley or circulator services in Tampa and Washington D.C. In addition, some BIDs have sponsored transportation enhancements or improvements to take advantage of the Federal and state transportation grants available to fund the majority of the project costs.

If the businesses and property owners within BIDs understand the benefits of transportation programs on economic activity and property values in the district, BIDs are more likely to contribute funding to transportation projects. In new developments, transportation initiatives offer the ability to provide better access to the district, generating more traffic and economic activity. Additionally, as congestion levels increase in existing districts, transportation improvement initiatives can move more people more efficiently through the district and increase economic activity. From the public transportation agency perspective, the potential benefits of including BIDs in transportation infrastructure projects include access to property tax assessment revenues;

⁹ WMATA's experiences with joint development are highlighted in greater detail in the next chapter of this deliverable report.

revenue diversification; creating partnerships with the businesses and property owners within the district; and coordination of transportation services with other services provided by the BID.

- **Tax Increment Financing**

Tax Increment Financing (TIF) is a tool used by municipalities to help finance the redevelopment of areas within a community through increased property taxes from the enhanced value of property (both developed and undeveloped) resulting from the implementation of infrastructure and service improvements. Localities may establish TIFs with the approval of property owners in the district. A TIF district is usually administered by local government officials or a quasi-public agency with the direction of a board or commission that makes the decisions on how and where the revenues will be applied. Tax increment financing uses the future increases in property tax revenues to finance current infrastructure investments (including transit and other transportation facilities). The idea behind the TIF is that the infrastructure investments will increase the value of existing property within the district as well as encourage new development that expands the tax base. As a result, private investors are willing to provide upfront capital for these investments because the debt service will be repaid through the increase in future property tax revenues. Portland has used TIF revenues to support extension to its Metropolitan Area Express (MAX) light rail transit system, including the Airport Extension, which is profiled in the next chapter.

The primary benefit associated with using TIF to fund transportation investments is that it provides access to capital financing markets with a dedicated revenue stream for debt repayment. In addition, a TIF provides access to new revenues without increasing taxes. A TIF does not increase the property tax rate in the district; rather, it dedicates a portion of future growth in the district's property tax revenues due to an expanded tax base for a specified time period (usually 20 to 25 years) to meet the debt service payments for the infrastructure investment.

Multimodal Partnerships

Multimodal partnerships provide opportunities to combine the development, financing, and/or operation of facilities that serve more than one transportation mode, including highway, transit, rail, and airports. With the passage of TEA-21 and SAFETEA-LU, there has been an increasing focus on multimodal development and the coordination of projects across modes. As transportation needs and connectivity requirements continue to increase in the U.S., successful multimodal partnerships will be essential components in improving transportation efficiency, market competitiveness, service quality, responsiveness to public needs, aesthetic appeal, and financial feasibility.

Multimodal partnership projects do not have to be PPPs. Some may be PPPs involving several public and quasi-public agencies. However, the opportunities for private sector involvement in multimodal partnerships are an area of potential growth for transit-related PPPs, particularly when toll roads and airports are involved due to the ability to leverage toll revenues and airport passenger facility charges for transportation investments. The Portland MAX Airport Extension project is a prime example of a multimodal partnership PPP where the public sponsor of the project (Tri-Met) created a partnership with other public agencies, including the Port of Portland, owner/operator of PDX Airport, and the Portland Development Commission (PDC), the City of Portland's urban renewal agency as well as the private DB contractor Bechtel in order to design,

construct, and finance the light rail airport extension. In return for the financing offered by the Port of Portland and PDC, Tri-Met was able to provide expertise and efficiencies in operating the light rail service. The MAX Airport Extension project is discussed in greater detail in the next chapter of this deliverable report.

Another example of a type of multimodal partnership arrangement is when underutilized High-Occupancy-Vehicle (HOV) s are converted to High-Occupancy-Toll (HOT) Lanes which continue to offer free access to car-pools, van-pools, and buses, but allows Single-Occupant-Vehicles (SOV) to use these special-purpose lanes if they pay a toll, which is often varied based upon the level of congestion on the HOT Lanes to ensure free-flow conditions for all users of these facilities. A number of these HOT Lane conversion projects have been implemented or are under development in several states, including California (I-91 Hot Lanes in Orange County and I-15 Express Toll Lanes in San Diego), Minnesota (I-394 MnPASS HOT Lanes), Colorado I-25 HOT Lanes), and Texas (Loop 1 – MOPAC HOT/Express Toll Lanes).

When originally developed, the HOV Lanes were recognized as a part of the regional transit fixed guideway system by the Federal Transit Administration, which enhanced the region's position relative to formula-based funding. However, in recent years the FTA has been asked to continue to count HOV Lanes converted to HOT Lanes as part of the regional transit fixed guideway system, even though they serve more than high-occupancy vehicles. Opponents have claimed that as more and more HOV Lanes are converted to HOT Lanes, the sponsoring regions will gain an unfair advantage in eligibility for federal transit formula funding by continuing to include HOT Lane-miles in the formula. The issue was resolved in early 2007 with the release of final rules governing the disposition of HOV Lanes being converted to HOT Lanes – essentially grandfathering those projects already implemented or approved, but not any new HOT Lane projects.¹⁰

Exhibit 2.5 shows those states and lists the various projects included in the Value Pricing Program of the Federal Highway Administration, many of which are HOV to HOT conversions. Hence this final rule is quite timely in providing guidance to regional transit systems whose calculation of fixed guideway miles may be reduced by such conversions.

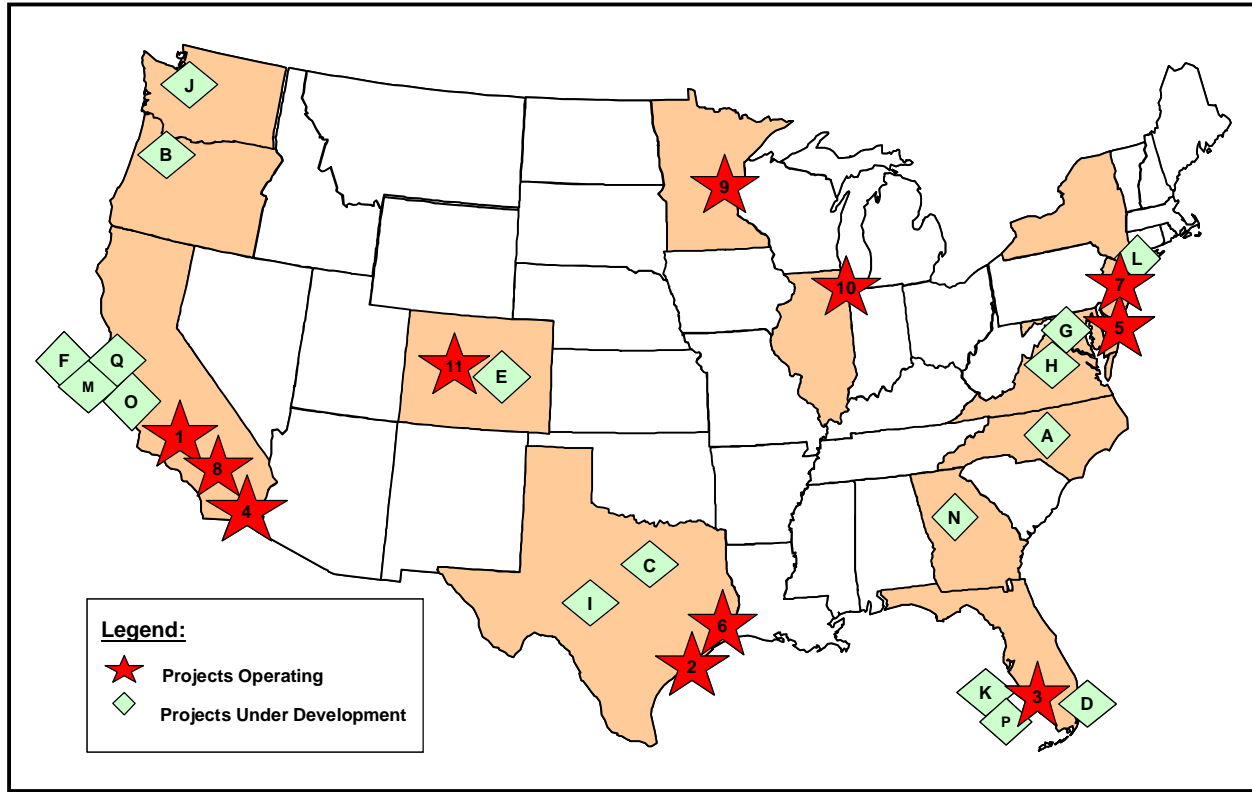
The primary results of multimodal partnerships include the ability to combine the strengths of each partner. By involving other public transportation agencies as well as private sector partners, multimodal projects have improved access to:¹¹

- More diverse revenues and financial markets to fund transportation investments;
- Increased economic development opportunities;
- Increased ridership;
- Commuter time savings; and
- Efficiencies in the operation of all involved modes.

¹⁰ Final Policy Statement on When High-Occupancy Vehicle (HOV) Lanes Converted to High-Occupancy/Toll (HOY) Lanes Shall Be Classified as Fixed Guideway Miles for FTA's Funding Formulas and When HOT Lanes Shall Not Be Classified as Fixed Guideway Miles for FTA's Funding Formulas. Federal Transit Administration, Office of the FTA Chief Counsel. Docket Number: FTA-2006-25750. Effective date: January 11, 2007.

¹¹ Hauser, Dr. Edd, P.E., Principal Investigator. *Volume III: Developing and Maintaining Partnerships for Multimodal Transportation Planning*. NCHRP Web Document 22, Project 8-32(41), June 1997, p.42.

Exhibit 2.5 Active Value Pricing Projects by State and Type of Project



Operating Projects

1. Express Lanes on SR-91 (Orange County, CA)
2. HOT Lanes on I-10 (Houston, TX)
3. Variable pricing (Lee County, FL bridges)
4. HOT Lanes on I-15 (San Diego, CA) (HOT Lanes extension under study)
5. Variable tolls (New Jersey Turnpike, NJ)
6. HOT Lanes on US 290 (Houston, TX)
7. Variable tolls (Port Authority Interstate vehicle crossings, NY and NJ)
8. Peak pricing on the San Joaquin Hills Toll Road (Orange County, CA)
9. HOT Lanes on I-394 (Minneapolis, MN)
10. Variable tolls (Illinois Tollway System)
11. HOT Lanes on I-25/US 36 (Denver, CO)

Projects Under Development

- A – HOT Lanes on I-40 (North Carolina)
- B – HOT Lanes on 217 (Portland, OR)
- C – HOT Lanes on LBJ Freeway (Dallas, TX)
- D – HOT Lanes on I-95 (Miami, FL)
- E – HOT Lanes on C-470 (Denver, CO)
- F – HOT Lanes on I-580 and I-680 (Alameda Co., CA)
- G – HOT Lanes on I-495 (Virginia/Maryland)
- H – HOT Lanes on I-95 and I-395 (Virginia)
- I – HOT Lanes on Loop 1 – MOPAC (Austin, TX)
- J – HOT Lanes on SR 167 (Seattle, WA)
- K – Cordon tolling (Fort Myers Beach, FL)
- L – Cordon tolling in central New York City (NY)
- M – FAIR Lanes (Alameda County, CA)
- N – HOT Lanes/FAIR Lanes/Truck-Only Toll Lanes (Atlanta, GA)
- O – HOT Lanes in Median of Route 1 (Santa Cruz, CA)
- P – Q-Jumps (Lee County, FL)
- Q – Cordon tolling (San Francisco, CA)

Source: *Issues and Options for Increasing the Use of Tolling and Pricing to Finance Transportation Improvements*, AECOM Consult study for FHWA's Office of Transportation Policy Studies, June 2006

BENEFITS OF PPPs

PPPs have the potential to offer benefits that may not otherwise be achievable through traditional public procurement procedures or through privatization. PPPs offer an opportunity for the public sector to reap the benefits of private sector involvement in infrastructure procurement while meeting community obligations and retaining control over potentially important public assets.

These and other potential benefits of PPPs are described below.

Stronger Working Relations

In comparison to shorter-term procurements methods, PPPs provide the opportunity for public sector agencies and private sector providers to develop long-term, high trust relationships. With the need to concentrate on long-term objectives, there is greater incentive for public sponsors and private providers to understand goals and share information to develop better long-term solutions. Further, the opportunity to develop strong long-term relationships provides a better forum in which to resolve problems and issues.

With transportation assets typically having long effective lives, a need exists for the public sector to develop a long term relationship with a provider to assist the development of transportation infrastructure, guide capital expenditure decisions and ensure that assets are maintained, safe and are of high quality upon transfer.

However, the development of a long-term relationship will need to account for the possibility that there may be a reduced desire on a provider's part to seek the best solution due to the security of the relationship. Public sponsors will also need to be mindful of the partnership proposing and selecting options that minimize damage to the relationship, but may not maximize community benefits.

Reduction of Financial Constraints

Many projects proposed by public entities are postponed or do not proceed due to limited financial resources, and in particular, the provision of upfront capital. PPPs provide an advantage with respect to financing by allowing the private sector to finance projects using private funds, in effect providing a form of off-balance sheet financing for public agencies. In turn, financing commitments from the private sector often bring forward the development of projects that may otherwise not proceed due to a lack of capital.

Faster Delivery

PPPs can expedite the financing and delivery of transportation projects through the involvement of the private sector in these phases of a project, that lower project costs by avoiding inflationary cost increases, applying best practices and new technology, and transferring more technical and other risks to the private sector which is often better able to manage these risks. The private sector has an incentive to minimize construction delays in order to minimize costs and bring forward their revenue stream. Contract conditions including early completion bonus payments and the inclusion of the construction period within the concession period can provide further incentives to bring forward delivery.

Innovation and Expertise

Private sector involvement encourages the development of new and creative approaches to financing, economies of scale, development, implementation and operation/maintenance. The private sector can also offer expertise in project, operational and risk management. In particular,

financial markets have become savvy in the methods that they use to structure finance to suit infrastructure projects through the use of stepped margin and indexed bonds.

Greater Cost Efficiency and Productivity

The private sector has an incentive to ensure its operations are as cost efficient as possible. In particular, the private sector is often better at managing third-party usage of facilities, thus reducing the net cost of a facility to transportation agencies. A private operator would also be motivated to increase the productivity and return from assets, with greater interest in implementing practices such as yield management and demand management when limited capacity exists and is expensive to create.

Integration

The potential integration of design, construction, maintenance, and operation provides incentives for the private sector to optimize expenditure and maximize innovation to achieve the greatest level of cost efficiency over the life of the asset through a life-cycle approach to asset delivery rather than minimizing the cost of a specific part of the asset lifecycle e.g. construction costs.

Greater Choices

Project sponsors can match specific types of PPPs to individual projects based on their characteristics and the capabilities and needs of public sector sponsors and private sector providers. This model was successfully used in Hong Kong before being incorporated into China when a number of transportation infrastructure projects were developed, each using a different project delivery approach (DB, DBOM, DFOM, BTO, etc.), based on the nature of each project and the interests and risk tolerance of the participating members of the partnerships.

Increased Competition

PPPs also can enhance competition in how highway facilities and services are provided from a functional, organizational, technological, and process perspective by engaging the private sector through properly transparent contracting procedures that can leverage public sector capabilities.

Risk Management

PPPs allow public sponsors to share the risk of a project with the private sector. In the risk sharing process, public sponsors have the opportunity to pass risks that may be more effectively managed by the private sector while retaining risks where it is in a better position to manage them or deal with their consequences. For instance, the private sector may be more effective in managing the variance in construction, operating, and maintenance costs while public agencies may be more effective in managing public liability, environmental clearance, and permitting risks.

RISKS OF PPPs

While providing a variety of advantages, there are also risks to consider when using public-private partnerships for transportation projects. The various categories of project risks associated with the use of PPPs in transportation infrastructure development are listed below in Exhibit 2.6.

Exhibit 2.6 Types of Risks Associated with Transportation Infrastructure Project PPPs

<ul style="list-style-type: none">• Demand/volume• Revenue• Environmental/archeological• Regulatory/contractual• Payment structure/mechanism• Transaction cost• Construction cost• Maintenance cost• Life-cycle cost• Liability/latent defects	<ul style="list-style-type: none">• Compensation and termination clauses• Changes of law• Economic shifts• Currency/foreign exchange• Taxation constraints• Moral hazard• Loss of control of assets• Political stability• Protectionism• Public acceptance
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Beginning on the next page, Exhibit 2.7 indicates potential consequences of a number of these key risk factors for members of a PPP and suggests ways to mitigate these results. Several of the major risk categories are discussed in more detail below.

Transaction Costs

Significant transaction costs can be incurred by public entities procuring a PPP, with PPP arrangements tending to be highly complex. Transaction costs are incurred by both public sponsors and potential private sector providers at the procuring stage while preparing and negotiating a PPP. When a PPP is awarded, additional costs may be incurred to monitor performance to ensure that a PPP agreement is being adhered to.

The impact of transaction costs can be reduced by providing the private sector opportunities to participate in projects that have scale, in terms of time and expenditure. For example, recent transportation funding legislation in the U.S. (SAFETEA-LU) reduced the project size thresholds for certain innovative financing and project delivery mechanisms to promote the use of PPPs for highway projects. For example, SAFETEA-LU lowered the threshold for using the credit support and low-cost loan features of the Transportation Infrastructure Finance and Innovation Act (TIFIA) from \$100 million to \$50 million per project. In contrast, public agencies in Australia have a variety of opinions on the appropriate minimum project value required before a PPP becomes worth pursuing. The Victorian Treasury recommends a project value of at least A\$10 million while New South Wales Treasury recommends a project value of at least A\$20 million. On the other hand, the Queensland Government considers A\$250 million as a minimum.

The impact of transaction costs can be mitigated through a variety of methods: decreasing administration complexity, standardizing PPP procurement procedures, combining a series of smaller scale projects, and increasing the lease period of a contract.

Exhibit 2.7 Consequences and Mitigation Strategies for Major Types of PPP Project Risks

Risk Category	Description	Consequence	Mitigation
Site Conditions	<ul style="list-style-type: none"> Existing structures may be inadequate. Contamination of site. Necessary approvals may not be obtained. 	<ul style="list-style-type: none"> Additional construction costs and time delays. Clean up costs. 	<ul style="list-style-type: none"> Commission studies to investigate suitability of site and structures Private sector to incorporate risk through refurbishment during construction phase.
Design, Construction and Implementation Risk	<ul style="list-style-type: none"> Facility incapable of delivering at the anticipated costs. Physical or operational implementation tests cannot be completed 	<ul style="list-style-type: none"> Increase in recurrent costs, delays. Delayed/lost revenue. 	<ul style="list-style-type: none"> Seek reputable constructors with strong financial credentials. Private party may pass risk to builder/architects while maintaining primary liability. Link payments to progress.
Financial	<ul style="list-style-type: none"> Interest rate risk. Financing unavailable. Contingent funding requirements 	<ul style="list-style-type: none"> Increased project cost. Non-completion of construction. 	<ul style="list-style-type: none"> Interest rate hedging. Financial due diligence. Bank/capital guarantees from companies and directors.
Operating	<ul style="list-style-type: none"> Inputs, maintenance may yield higher costs. Changes to government requirements with respect to facility operations. 	<ul style="list-style-type: none"> Increase in operating costs. Adverse effects on quality and service delivery. 	<ul style="list-style-type: none"> Long-term supply contracts where quality/quantity can be assured. Upfront specification by public sponsoring agency.

Exhibit 2.7 Consequences and Mitigation Strategies for Major Types of PPP Project Risks
- continued

Risk Category	Description	Consequence	Mitigation
Market	<ul style="list-style-type: none"> Fluctuations in economic activity on demand Competition, demographic change and inflation. 	<ul style="list-style-type: none"> Lower revenues. Diminution in real returns to the private party 	<ul style="list-style-type: none"> Private operator to seek an availability payment element to minimize impact on risk premium. Review likely competition for service and barriers to entry.
Legislative	<ul style="list-style-type: none"> Additional approvals required during the course of the project cannot be obtained. Changes in laws and regulation 	<ul style="list-style-type: none"> Further development or change in business operation may be prevented. Increase in operating costs with regards to complying with new laws 	<ul style="list-style-type: none"> Private sector to anticipate requirements. Public sponsor may mitigate such change by monitoring and limiting changes which may yield adverse consequences.
Asset Ownership	<ul style="list-style-type: none"> Loss of the facility upon premature termination of lease or other project contracts upon breach and without adequate payment. Different residual value to that originally calculated 	<ul style="list-style-type: none"> Loss of investment of private party Possible service disruption as additional capital costs incurred to upgrade the asset to the agreed value and useful life. 	<ul style="list-style-type: none"> Private party will be given cure rights to remedy defaults. Public sponsor may make payment for value in the project on a cost to complete basis if termination occurs pre-completion. Impose on the private party maintenance and refurbishment obligations. Secure services of a reputable maintenance contractor, with strong financial credentials.

Potential Higher Life-Cycle Costs

The private sector provider may require a higher rate of return than the public sector sponsor to cover the uncertainty of longer-term life-cycle cost risks, particularly when it is unable to diversify its risk across a portfolio of projects. The premise of lower overall costs, which is a key benefit of PPPs, is highly dependent on the innovation, scale, and expertise of the private sector, with cost savings outweighing the risk premium required by the private sector.

Taxation Constraints

In the U.S., local governments generally exempt concessions from property taxes due to the public service nature of the asset. However, the federal government has strict criteria for granting private concession leaseholders the ability to take accelerated depreciation credits against income on a 15-year straight-line basis, amortization of early concession payments and capital expenditures to upgrade facilities under concession lease, and annual deduction of revenue sharing payments. These conditions include:

- A lease term sufficiently long (at least 50 years) to indicate operational ownership of the infrastructure asset, even if the public sponsoring agency retains title to the asset; and
- The concession uses only taxable debt and equity and no tax-exempt debt financing.

In Australia, leasing provisions within the Commonwealth Income Tax Assessment Act (Sections 51AD and Division 16D) may deny private sector asset owners asset-related tax deductions. This legislation was originally introduced to combat tax avoidance. However, the legislation has had the effect of limiting the ability of private entities to claim infrastructure related expenditure as a tax deduction, if the asset was seen to be controlled by a public agency. This constraint has limited the incentive for private sector entities to invest capital for infrastructure related projects. Changes to the Income Tax Assessment Act to address these concerns have been pending for some time. Selecting project delivery methods that transfer ownership to the private sector have mitigated uncertainty with respect to tax concessions. It is for this reason that consortia within Australia pursue built-own-operate-transfer (BOOT) over built-operate-transfer (BOT) models.

Moral Hazard

Governments have an incentive to minimize political fallout from a PPP that is failing by covering some of the losses of the private partner in order to ensure that the project is delivered. Private sector proponents' awareness of this propensity of governments to avoid political fallout may result in them under costing risks with the knowledge that the public sector may provide financial support.

Loss of Control over Assets

PPPs potentially transfer control of assets to the private sector, limiting the ability of the public sector to provide community service obligations for the duration of the PPP arrangement. Government entities will need to ensure community service obligations are explicitly noted in PPP contract arrangements to ensure that community service obligations are met.

The loss of control over assets to the provider is a considerable concern if the sponsoring agency wishes to develop competing infrastructure in the future. The example of the SR-91 HOT Lanes in Orange County, California, in which the public sponsor bought out the interest of the private concessionaire so it could increase the overall capacity of the corridor served by SR-91, is often cited as a reason to exclude non-compete clauses in PPP contracts in the U.S. While this could

impede interest by potential investors and concessionaires, the Indiana Toll Road long-term concession lease limits the non-compete to a ten-mile corridor on each side of the toll road.

A number of instances have been cited in Australia where the public sector has been suspected of not being able to improve competing alternate toll-free routes and public transit route to ensure that they comply with “non-compete” clauses within various toll road PPP agreements.

CRITICAL SUCCESS FACTORS

A PPP will need to improve service quality as well as promote social and economic development if it is to have the best chance of succeeding. The following indicates what is considered to be the ‘critical success factors’ of PPPs.

Stakeholder Consultation and Support

Stakeholder consultation increases in importance if the potential impacts affect employees and the community. Experience with respect to PPPs has shown that there are misconceptions of PPPs, in particular, the perception that PPPs seek to privatize public assets. Stakeholder consultation should be used to understand opinions and address misconceptions about the proposed PPP and its value to the public. There may be a need to commit to ongoing stakeholder consultation, particularly if the duration of the PPP proposed is long. This includes on-going public outreach and communication.

Public Sector Involvement

Once a partnership has been established, the public agency sponsoring the project must remain actively involved in the project. Ongoing monitoring of the performance of the partnership is important in assuring its success, particularly with respect to safety and maintenance. The nature and frequency of monitoring should be stipulated in the contract.

Political Leadership

A successful partnership requires strong political leadership. Senior public officials must be willing to be actively involved in supporting the concept of PPPs. Officials need to be well-informed with respect to potential benefits. A political leader can play a critical role in minimizing misperceptions about the value to the public of a PPP and serving as a highly visible champion for the project, such as London’s mayor with respect to the Central London Congestion Charging PPP Program. Lack of senior political support can doom a PPP project even if otherwise justified.

Secure Public Control

In a situation where contracts are not complete, Government should ensure that it has some recourse rights to maximize the opportunity to resolve and take control if the private partner defaults on its obligations to ensure the continued delivery of services to the community. Recourse rights are particularly important where contract arrangements are incomplete.

Limited Complexity

PPP arrangements should be kept as simple as possible. Complexity of a PPP may result in higher transaction and monitoring costs and fewer bidders.

Appropriate Risk Sharing and Rewards

As noted above, one major attribute of PPPs is the opportunity to share risks between the public and private sectors. However, it is imperative that the risks are shared appropriately with

associated rewards. There is a need to identify the types of risks, the party best addressed to mitigate the risk and the premium required to compensate for the risk. An inappropriate transfer of risks potentially will result in a significant increase in the premium demanded by the private sector and the probability of provider default, as noted earlier in Exhibit 2.7.

Over the course of a PPP, the various kinds of risks will need to be considered by all parties to the PPP with a clear understanding of the extent to which partnership members are responsible for particular risk factors. Flexibility or risk-sharing in the PPP contract can have a significant impact on the bid prices provided by private sector teams, with both approaches likely to result in a lowering of the bid prices received.

Effective Working Relationships among Partners During/After Contract Negotiations

New business relationships are required when PPP approaches are used to deliver projects, often with larger national or international firms that can handle the increased risk and responsibility of a PPP contract. This, in turn generates competition and fairness concerns, both for the government (which must worry about attracting a sufficient number of bids for the contract) and for smaller contractors (who may feel unable to compete in the new environment). In addition, the scope and complexity of negotiations between the government and its contractors can increase significantly, as the allocation of risk, the acceptable rate of return, and the contract incentives must be carefully defined.

Legal Authority

A number of legal issues must be considered when deciding whether and how to proceed with a transportation infrastructure PPP. The legal authority to use PPPs to expedite delivery of a needed transportation project is based on statutes and regulations established by the responsible legislative bodies and regulatory agencies.

Exhibit 2.8 lists some of the many legal issues that can be resolved through flexible legislative and regulatory actions, giving the sponsoring agency and private provider the legal authority to advance the project in a timely manner, free of significant legal challenge.

Many state transportation agencies in the U.S. lacked the legal authority to undertake PPPs to deliver infrastructure projects until the past decade. In that time, 25 states have enacted some type of PPP legislation that enables transportation agencies (particularly highway agencies) to enter into PPPs with the private sector to develop, finance, implement, operate, and/or preserve necessary transportation projects long delayed by a lack of adequate public sector funding. A total of 32 state transportation agencies have authority to apply the DB approach to project delivery, an important tool for members of PPPs to expedite the project delivery process in a cost-effective manner.

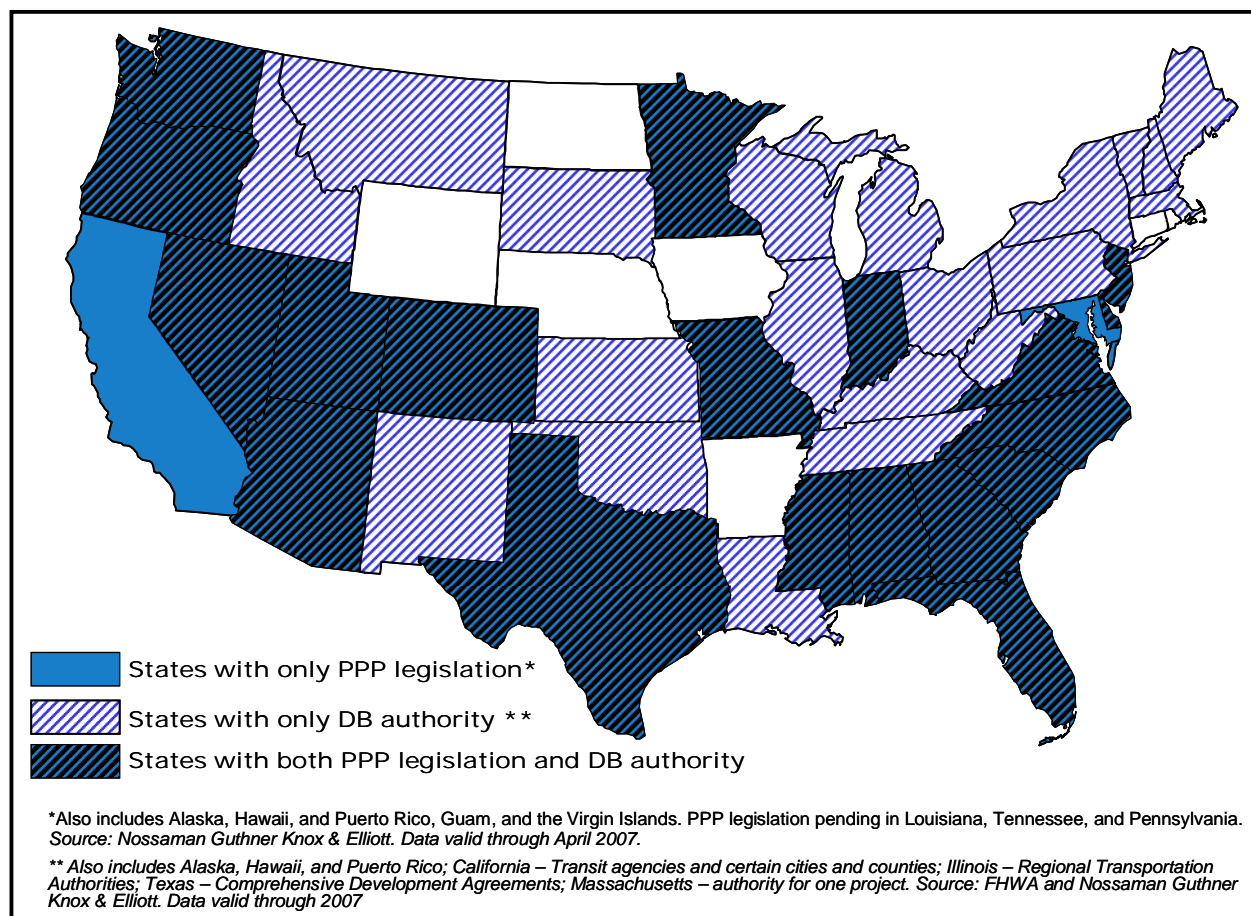
Exhibit 2.8 Legal Issues Associated with Transportation Infrastructure Project PPPs

- **Legal capacity of parties and legal requirement of the sponsor to provide services**
- **Ability of the private sector to be involved in infrastructure development, particularly foreign companies**
- **Ability of the private sector to acquire and own public-use infrastructure, especially foreign firms**
- **Existence and legal basis of cost recovery and tolling**
- **Ability to provide performance guarantees**
- **Property issues of land acquisition – condemnation, use, and disposal**
- **Administrative coordination**
- **Dispute resolution and liability provisions**
- **Special provisions associated with the use of public funds – Davis-Bacon, Buy-America, etc.**
- **Competition and anti-trust regulations**
- **Currency and profit repatriation rules**
- **Public sector borrowing restrictions**
- **Tax and accounting liabilities**
- **Adequacy of procurement and selection procedures**
- **Contract provisions**
- **Property and intelligent property laws regarding proprietary technologies and transfer of know-how**
- **Adequacy of oversight and monitoring procedures**
- **Authority of other public entities over infrastructure assets and access to them**
- **Authority to regulate services**
- **Ability and restrictions over transfer of private sector contract responsibilities to other parties**

Overall, 43 states (plus the District of Columbia, Puerto Rico, and the Virgin Islands) have legislation authorizing the use of PPPs and/or DB by state transportation agencies, as shown in Exhibit 2.9. This exhibit illustrates the trend sweeping the nation to allow state transportation agencies to engage in PPPs to expedite needed transportation improvement projects. Those states with both capabilities are in the best position to promote the use of PPPs to expedite needed transportation infrastructure projects.

In early 2007, the FHWA issued a working draft of model legislation for establishing the statutory authority for state and local governments to use PPP approaches to deliver transportation projects. The purpose of this model PPP legislation is to provide state and local jurisdictions with an example of basic elements that might be considered in developing PPP authorizing legislation. It is meant to serve as a representation of the core provisions dealing with issues that a state or local jurisdiction should consider when pursuing greater private sector involvement in the delivery of transportation services.

Exhibit 2.9 States with Legislative Authority for Transportation PPPs and/or Design-Build Project Delivery



This working draft of model PPP legislation was prepared solely for informational purposes and was not intended as a statement of United States Department of Transportation or Federal Highway Administration policy. In final form, this model PPP legislation will serve as a guide to those state and local jurisdictions which currently lack the ability to use PPP approaches for the delivery of transportation projects which are interested in developing their own PPP legislation.¹²

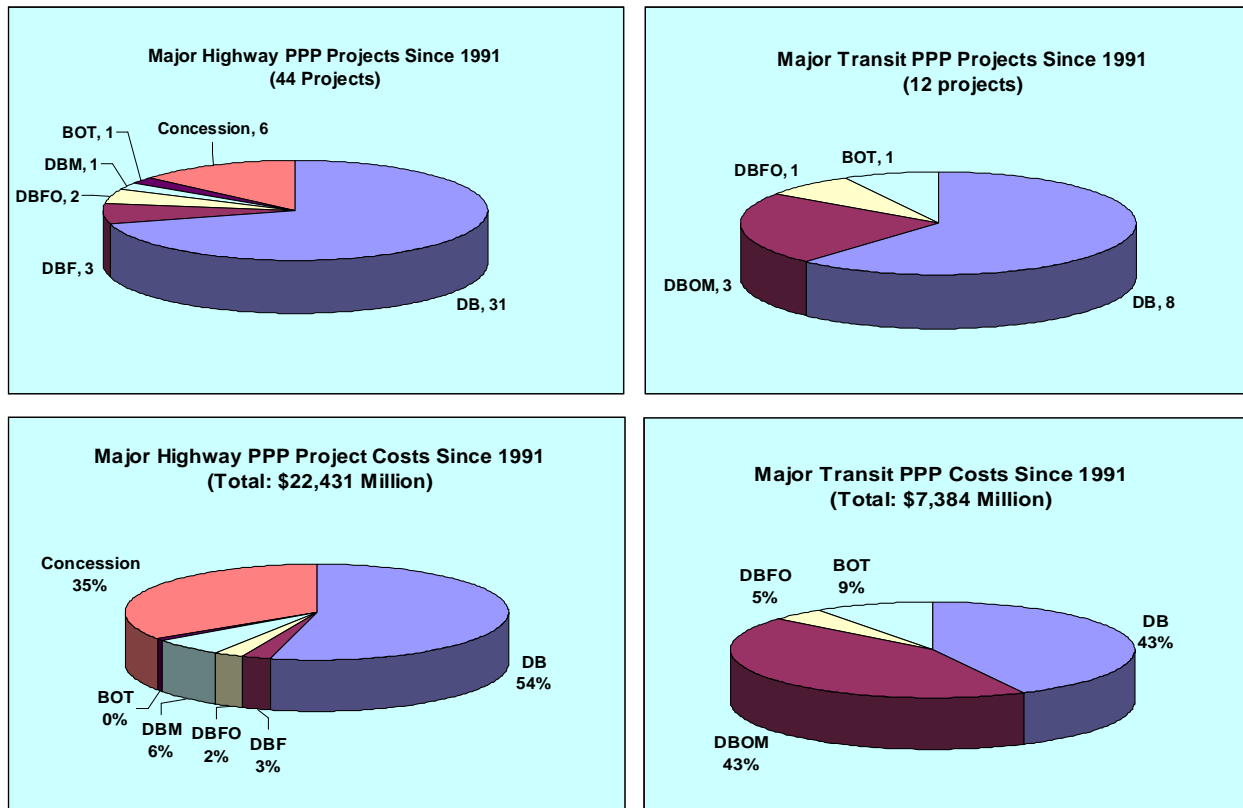
Other Key Success Factors for Transportation Project PPPs

In addition to the factors cited above, other critical factors include the following:

- Demonstrated transportation need (congestion relief, safety improvement, accessibility, travel time reliability, etc.);
- Willing public and private sector partners with mutually complementary interests; and
- Adequate funding or revenues dedicated to the project to make it financially viable relative to the criteria of rate of return on investment for the public partner(s) and a reasonable sharing of scarce public funding if available.

¹² WORKING DRAFT: Model legislation to allow public-private transportation initiatives at the state and local levels of government. Issued by the USDOT, Federal Highway Administration, January 10, 2007.

Exhibit 2.11 Use of PPPs for Major Highway and Transit Projects since 1991*
(project costs shown in millions of dollars)



* Figures are for capital projects at least \$53 million in size and with a notice to proceed issued on or after FY 1991.
Source: *Public Works Financing*, March, 2007, Volume 214, pp. 14-15.

According to Exhibit 2.11, a total of 44 highway and 12 transit projects worth over \$53 million each used some kind of PPP approach since 1991. These transportation projects represent \$22.4 billion and \$7.9 billion in project investments, respectively, for a total of 56 projects and \$30.3 billion. Most of the highway PPP projects have been delivered using the DB and concession approaches while most of the transit PPP projects have used the DB and DBOM approaches.

As more states have begun to undertake PPPs, lessons are being learned (both positive and negative) and impediments once thought to be insurmountable are being effectively addressed by project sponsors and providers acting together as partners. Moreover, the United States is entering a new phase in surface transportation investment with the advent of long-term concession contracts and joint development agreements. As a result, PPPs are likely to be increasingly relied upon by states and local governments to finance new transportation infrastructure projects. In the near future the primary PPP approaches likely to be used for surface transportation projects in the U.S. include the following:

- DB (medium to large new or reconstruction highway projects; transit new starts);
- DBOM (new tolled or non-tolled roads; transit);
- DBOM-F (primarily new toll roads);
- Concession (primarily existing and new toll roads); and
- Joint Development Agreement/Transit-Oriented Development (transit new starts).

New models of public-private partnering to deliver transportation infrastructure projects will continue to evolve to better match the changing objectives and capabilities of public sponsors and private providers.

* * * * *

The following chapter presents case studies and cameo descriptions of actual transportation infrastructure projects developed and implemented through PPP arrangements in the United States.

3. U.S. TRANSPORTATION PPP CASE STUDIES AND CAMEOS

This chapter presents a series of case studies and briefer cameos of major highway projects undertaken or still in progress that demonstrate the types of public-private partnerships being used to leverage scarce public resources and expedite needed transportation projects in the United States. Each case study and cameo provides insights into the issues encountered and strategies used to advance the project, at times in the face of determined opposition. The case studies and cameos also provide lessons that can assist agencies and their private sector partners beginning to consider and develop PPP arrangements to avoid or address impediments to PPP contracts and facilitate their successful implementation.

BACKGROUND

The rationale for partnerships between government agencies and private firms for the delivery of public services such as transportation (as well as water and sanitation) is strong. Especially in recent times, public investment budgets have flattened or been reduced, while at the same time the needs for both new investment and maintenance of older infrastructure have continued to grow. Increased taxation is politically unpopular, yet the public also demands continued improvements in the capacity, safety, and efficiency of its public services. Although they are not a panacea, public-private partnerships (PPPs) offer one to approach to solving this dilemma. The advantages of PPP project delivery methods include:

- Access to new private capital to supplement public funds.
- More rapid development of infrastructure assets under a PPP project structure.
- Higher quality and customer satisfaction due to focus on performance standards and enhanced quality control.
- Improved efficiency in construction, operation, and maintenance of the infrastructure should arise from innovations in service delivery, incentives in the PPP contract, and better institutional integration throughout the life of the project.
- Public agencies focus on their strengths of long-term service planning and management, having turned over financing and/or day-to-day operating responsibility to their private partners.

Despite these apparent advantages, PPPs in surface transportation have been relatively slow to develop in the United States., especially when compared to other nations around the world, especially in Europe, Asia, and some developed countries in South America. The notable feature of a PPP is a genuine sharing of the risks and rewards that accompany the project. This sharing of risk and reward is foreign to most public agencies in this country which are more accustomed to a strict delineation of public and private sector roles and responsibilities. In addition, numerous impediments confronted the early adopters of PPPs, particularly overseas and more recently in the U.S.

In most cases, enabling legislation has been required to allow state transportation agencies to enter into PPPs for surface transportation projects and use alternative project delivery approaches to improve the viability of proposed PPPs for these projects.

DOMESTIC TRANSPORTATION PROJECT PPP CASE STUDIES AND CAMEOS

The following pages provide detailed information about several highway or multi-modal projects that were or are being developed using some form of PPP. This includes seven case studies and three cameos of transportation PPP projects in the United States as listed below.

Case Studies

- Anton Anderson Memorial Tunnel - Whittier, Alaska
- Atlantic Station 17th Street Bridge - Atlanta, Georgia
- Chicago Skyway Long-Term Lease – Chicago, Illinois
- Route 3 North Rehabilitation Project – Burlington, Massachusetts
- Route 28 Phase II Expansion – Fairfax and Loudon Counties, Virginia
- South Bay Expressway (State Road 125) - San Diego County, California
- Trans Texas Corridor I-35 (TTC-35) Toll Road Program – East Central Texas

The following information is provided for each of these case studies:

- Project summary
- Background
- Project description
- Partnership arrangement
- Legal authority
- Funding and finance
- Institutional context
- Issues and strategies
- Results
- Conclusions
- Next steps

Cameos

- Atlantic City Brigantine Connector - Atlantic City, New Jersey
- Conroy Road Bridge and Approach Ramps – Orlando, Florida
- Universal Boulevard Bridge – Orlando, Florida

The cameos are briefer than the full case studies and offer insights into several unique PPP projects. Each cameo contains the following information:

- Overview
- Project description
- Partnership arrangement
- Funding and finance
- Impediments and strategies
- Results
- Conclusions

Together these ten PPPs represent a cross-section of surface transportation projects that involve a variety of infrastructure types, funding and financing arrangements, and delivery approaches in various parts of the nation. Each of these PPPs encountered a wide variety of challenges and opportunities and together they demonstrate how public agencies and their private sector partners either worked together to produce a successful project or reverted to traditional approaches that produced less favorable results.

TRANSPORTATION PROJECT PPP CASE STUDIES IN THE U.S.

ANTON ANDERSON MEMORIAL TUNNEL, WHITTIER, ALASKA

PPP Delivery	Construction/ Development Period	Concession Period	Contract Value	Status
Design-Build- Operate	2 years	Original contract: 4 years total, including 2 years for initial operation and maintenance.	\$57.0 million design-build- operate	Original contract completed in 2002
Operate- Maintain		Subsequent contract: 6 years, 9 months	\$16.9 million subsequent operate-maintain	In Operation

SUMMARY

The Anton Anderson Memorial Tunnel is the nation’s longest single-lane, bi-directional, dual-mode highway-rail tunnel. It connects the town of Whittier, Alaska on Prince William Sound to Seward Highway and the south-central Alaskan cities of Seward and Anchorage, as shown in Exhibit 3.1. The project is the result of a public-private partnership to convert a historic rail tunnel into a multi-modal facility capable of handling trucks, automobiles, and buses during certain portions of the day, and freight and passenger trains during other portions of the day. By converting an existing tunnel into a multi-modal facility, the state was able to save millions of dollars by avoiding construction of a parallel vehicular tunnel.

The project was sponsored by the Alaska Department of Transportation and Public Facilities (ADOT&PF). It was delivered as a design-build-operate contract by Kiewit, working in concert with Hatch Mott MacDonald as project designer and VMS as facility operator.

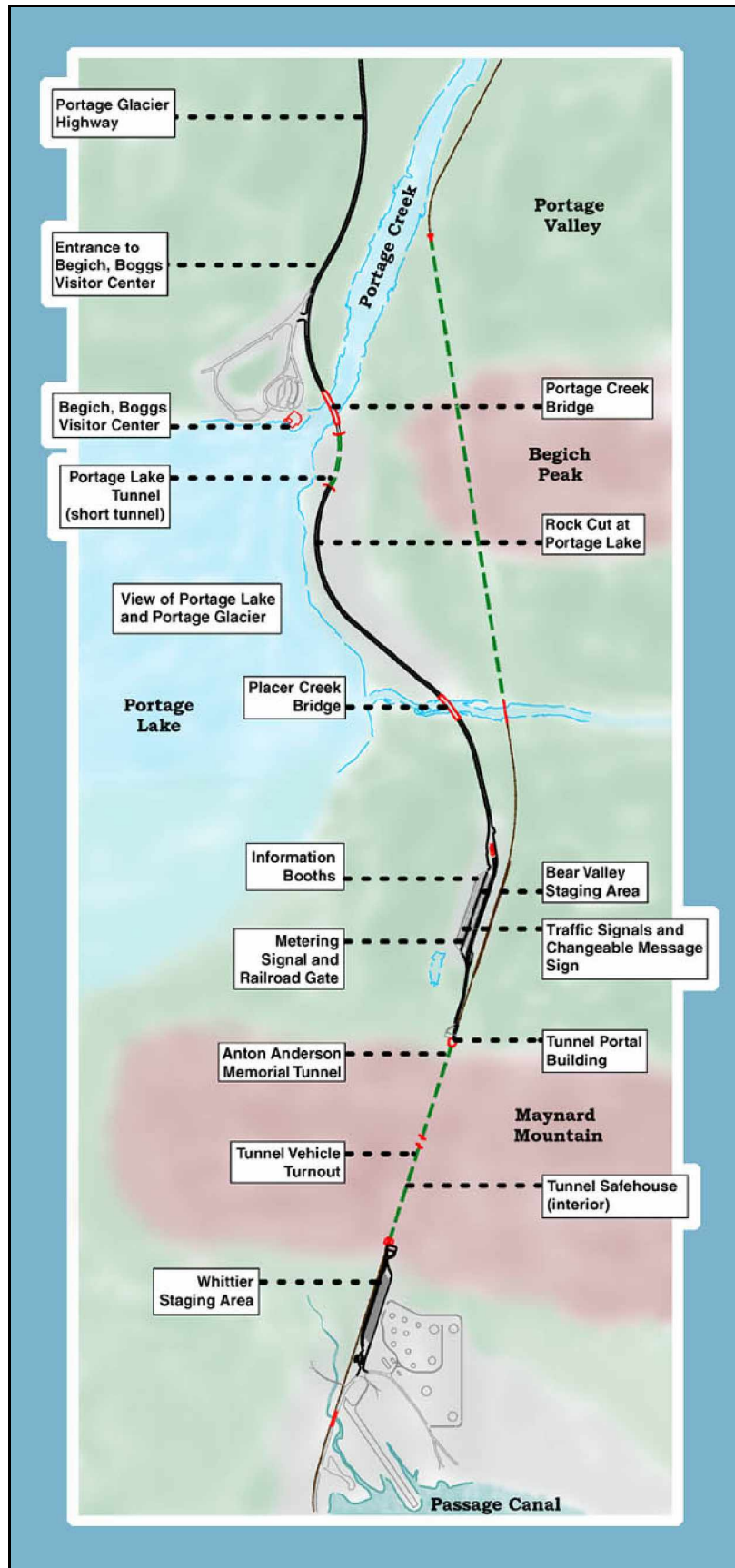
This case study examines the public-private design-build-operate partnership (PPP)—Alaska’s first—which delivered this unique tolled dual-use tunnel, as well as the PPP that continues to operate and maintain the facility today.

BACKGROUND

The port at Whittier, Alaska, on Prince William Sound, is the primary point of freight interchange between the Alaska Railroad and barges that connect Alaska with Canada and the continental United States. Whittier, with a population of approximately 200, has a year-round, ice-free deep water point, and is only 50 miles from Anchorage, Alaska’s largest city. Railcars traverse the mountains between Whittier and the Alaska Railroad mainline at Portage via a one-mile tunnel through Begich Peak and a 2.5-mile tunnel through Maynard Mountain.

The tunnels were constructed during the 1940s by the U.S. Army to provide an alternate supply link to Anchorage during World War II. Following the war, Whittier developed as a commercial port of entry for freight ships, cruise lines, fishers, and recreational boaters, and became a destination for visitors interested in touring Prince William Sound. In 1976 the passage was named after Anton Anderson, chief engineer of the project that first brought rail access to Whittier in the 1940s.

Exhibit 3.1 - Anton Anderson Tunnel Project Site Map



Source: ADOT&PF, 2002. URL: <http://www.dot.state.ak.us/creg/whittiertunnel/index.shtml>

Despite its popularity, Whittier remained disconnected from Portage, Anchorage, and other Alaskan cities by highway. The railroad remained the only mode of land transport in and out of the community. In the 1960s the Alaska Railroad developed a shuttle service in which vehicles and passengers were ferried between Whittier and Portage on flat rail cars. But the service reached capacity as Whittier became a more popular destination, and it became clear that a new overland mode of passage would be required to permit motor vehicles direct access to town.

In the mid-1990s the Alaska Department of Transportation and Public Facilities (ADOT&PF) studied several alternatives for improving access to Whittier, including:

- Increasing conventional rail service;
- Using a high-speed electric train service;
- Constructing a highway route over the mountain;
- Constructing a highway route through a parallel tunnel; and
- Constructing a highway to Maynard Mountain and engineering the 2.5 mile long tunnel to accommodate both a roadway and a railway.

The agency ultimately decided to extend the Portage Glacier Highway from its previous terminus at the Begich, Boggs Visitors Center in the Chugach National Forest at Bear Valley to the Maynard Mountain Tunnel, and convert the existing 2.5 mile rail tunnel to permit dual use. The renovated facility would be a one-lane, combination highway and railway tunnel in which motor vehicles and trains would alternately travel through the tunnel. To expedite the project and manage budget risks, the State of Alaska sought to deliver the project through a design-build-operate contract involving a public-private partnership, the first PPP project in Alaska.

PROJECT DEVELOPMENT

To get the project ready for issuance of a design-build contract, ADOT&PF retained HDR Alaska to prepare the environmental impact statement for the project. The Federal Highway Administration approved the resulting environmental impact statement in November 1995. The State subsequently retained CH2M Hill to design the highway approaches and bridges to the tunnel facility. The State then asked HDR Alaska to develop the conceptual designs and performance specifications for the proposed highway/railroad tunnel project.

The State awarded the overall design-build contract to Kiewit Construction Company in 1998. Kiewit subsequently hired Hatch Mott MacDonald to design the facility, and VMS, Inc. to operate the tunnel. HDR Alaska assisted ADOT&PF with contract management.

Construction began to convert the tunnel in September 1998. During the winter of 1998-1999, the original rail ties and ballast were sequentially removed from the tunnel and replaced with a concrete texturized driving surface for vehicles that included embedded rails for trains. The texturized driving surface consisted of 7.5-foot-long and 8-foot-wide precast concrete panels placed on a bed of crushed rock. Rails were positioned and tied down in grooves cut into the concrete panels to permit both rubber-tired and steel-wheeled vehicles to use the same facility (much like a grade crossing deck).

Cast-in-place concrete was placed adjacent to the concrete panels to form an 11.5-foot-wide paved surface. Asphalt was placed on the outside of the rail in the grooves to permit removal of the rails for maintenance or replacement. This was the first tunnel application of a road overlaying a railroad track. The crown (upper) height of the tunnel was increased by an average

of 1.5 feet to enable installation of jet ventilation fans, which supply the tunnel with fresh air. In addition, a second set of fans was installed to blow smoke and fumes away from motorists in the event of a fire or other toxic release. Eight safehouses, each with a capacity of 55 persons, were constructed along the length of the tunnel where a turnout is provided for disabled vehicles. Each safehouse provides a refuge for motorists in case of emergency. Exhibit 3.2 shows the driving surface and access to one of the safehouses in the tunnel.

Exhibit 3.2 - Tunnel Driving Surface and Safehouse Access



Source: ADOT&PF, 2002

Two new avalanche-resistant A-frame portal buildings were constructed at either end of the tunnel to house ventilation fans and electrical substations, and to garage fire trucks and other emergency response vehicles. Each portal included a train-sized steel door that could be rolled up to permit vehicle or train access, or rolled down during inclement weather or when the operation changes direction or mode of travel. The portal at the Whittier end of the tunnel is shown in Exhibit 3.3.

Exhibit 3.3 - Whittier Tunnel Portal and Staging Area



Source: ADOT&PF, 2002

To permit continued passage of Alaska Railroad trains through the tunnel during construction, work was limited to four six-day and six four-day windows between January and May 1999. As a result, tunnel closures were limited to 48 of 151 days between January 1 and May 31, with construction windows no greater than six consecutive days at a time.

PROJECT OPERATIONS

The Anton Anderson Memorial Tunnel has been a fully functional dual rail-highway tunnel since its opening on June 7, 2000. Operation and maintenance of the tunnel is managed by VMS, Inc. under a second PPP arrangement with ADOT&PF. VMS is a pioneer in privatized highway asset management, and provides roadway operations and maintenance services to agencies in five states and the District of Columbia. For the Anton Anderson Memorial Tunnel, VMS is responsible for toll collection and administration, tunnel and train signal control, systems monitoring, and maintenance operations for the railway and roadway.

Toll Rate Schedule

Toll collection began the next year, on April 1, 2001. Tolls to use the highway are \$12 round-trip for standard automobiles, motorcycles, recreational vehicles under 28 feet, and trucks less than six tons not pulling a trailer (this group is collectively referred to as Class A vehicles). Discount plans are available for frequent travelers. Seasonal passes are also available for \$550 for Class A vehicles and \$900 for somewhat larger vehicle combinations, but not large trucks. Truck tolls range from \$20 to \$300 depending on vehicle size or weight. Bus tolls are \$125. Tolls are not collected for rail traffic using the tunnel.

Tunnel Operations Schedule

A regular schedule is posted to indicate the time traffic is permitted to cross in each direction, with traffic from Whittier allowed to enter the tunnel in the 15 minutes following the top of the hour, and in the reverse direction in the 15 minutes following the bottom of the hour. The schedule allows 15 minutes between the entry of the last vehicle in one direction and the entry of the first vehicle in the opposite direction, although it generally takes less than seven minutes for each vehicle to cross.

Intermittently throughout the day the tunnel is closed to vehicular traffic to allow trains to pass. Most freight rail crossings are scheduled for the overnight hours, when the tunnel is closed to motor vehicles. The tunnel can accommodate an Alaska Railroad train on as little as 15- to 30-minute notice, but most rail passage is scheduled well in advance.

Operationally, the tunnel's staging area functions much like many automobile ferryboat approaches. Vehicles pay the toll at booths outside the control center on the Bear Valley side of the tunnel. Upon arrival at the tunnel entrance vehicles are queued by type, with space for 240 vehicles at the Bear Valley staging area and 280 vehicles at the Whittier staging area (shown in Exhibit 3 above). Traffic signals tied to a central system that controls traffic. Automobiles are permitted to cross first, followed by buses and finally trucks and RVs. Ramp meters regulate the distance between vehicles, with automobiles allowed every 2.5 seconds, buses every 45 seconds, and trucks and campers every 15 seconds. Temporal spacing minimizes the chance for accidents as vehicles navigate the single-lane tunnel, and spaces out the distance between high-occupancy vehicles such as buses in the event that an incident requires evacuation to one of eight tunnel safehouses.

Once inside, vehicles proceed at speeds of approximately 25 mph. In the event of an emergency, strobe lights at each of eight turnouts along the length of the tunnel alert drivers and passengers to evacuate their vehicles and seek refuge in an adjacent safehouse. Each safehouse is a fire-resistant room with a dedicated air supply and emergency kit. The capacity of each safehouse is 55 people. A public address system and a phone provide communications links to the tunnel control center.

Computer Operations Center

The state-of-the-art control center (Exhibit 3.4) applies two computer systems to facilitate vehicular and rail traffic through the tunnel. A tunnel control system regulates movements of vehicles through the tunnel via signals, ramp meters, and entry gates, and tracks vehicle movement through the tunnel. The system can also detect and alert tunnel monitors to any stopped vehicles in the tunnel. In addition, the system controls tunnel lighting and ventilation systems, as well as security cameras. A second system, the train signal system, operates train switches and signals.

In the years since the tunnel's opening this system has been integrated with the Alaska Railroad's statewide collision avoidance system, a positive train control system developed by the railroad. Both the tunnel control and train signal systems communicate with each other to ensure that traffic moves in only one direction at a time, and that only one mode is using any portion of the tunnel at once.

Exhibit 3.4 - Tunnel Control Center



Source: HDR Alaska, Inc., 2002

PARTNERSHIP ARRANGEMENT

This project involved two public-private partnerships. The first PPP involved a design-build-operate contract awarded to Kiewit Construction Company, and the second was a maintenance and operations contract awarded to VMS, Inc. The design-build-operate contract was procured via competitive bid. ADOT&PF issued a request for proposals and received three responses, from Kiewit and two other bidders. The agency ultimately selected the Kiewit team for its technical innovation and price advantage. The term of the original design-build-operate contract

was four years, with two years for design and construction of the tunnel—from July 1998 to June 2000—and two years for operation, from June 2000 to May 2002.

A subsequent PPP was for operation and maintenance of the tunnel beyond the original two years provided for in the first PPP. This second PPP arrangement provides VMS with a 6-year, 9-month term to operate the tunnel, from June 2002 through February 28, 2009.

Private Sector Partner Roles and Responsibilities

The design-build-operate partnership involved an agreement between Kiewit Construction Company and ADOT&PF, the project sponsor. After it was awarded the contract, Kiewit selected several firms to support its team, including Hatch Mott MacDonald to lead tunnel design efforts, and VMS to operate and maintain the tunnel during its first two years of operation. The design-build team was responsible for delivering a fully functional dual-mode rail-highway tunnel on time and on budget.

ADOT&PF established key project performance requirements in the RFP, including:

- Capability to carry 800 vehicles per hour with traffic reversals twice per hour;
- Completion of transfer from highway to rail mode within 5 to 30 minutes of a request for tunnel occupancy by Alaska Railroad;
- Ability to operate in the extreme weather conditions of the area, including temperatures of 40 degrees (F) below zero, average annual snowfall of 40 feet, wind gusts up 150 mph, and snow loads of 220 pounds per square foot on any tunnel entrance building roofs in avalanche zones; and
- Provision of means for safe exit or safe haven in the event of a fire, chemical spill, or other incident in the tunnel.

The design-build team was to assume the risk that its design would not perform under traffic, so a two-year operation requirement was built into the contract, in which the tunnel was to required to operate efficiently and safely for a two-year period before transfer of ownership to the State of Alaska.

ADOT&PF contracted with VMS directly to operate and maintain the tunnel after the initial two years of operation required of the design-build-operate team had expired. The contract to operate and maintain the tunnel beyond its initial two years of operation was also procured via competitive bid. ADOT&PF issued a request for proposals but received only one response, from VMS, which had already been operating the tunnel for two years as part of the Kiewit team.

Under its operations and maintenance contract VMS is responsible for toll collection and administration, tunnel and train signal control, systems monitoring, and maintenance operations for the railway and roadway—responsibilities that VMS also supported under Kiewit’s design-build-operate contract. VMS assumes all operational risks associated with the tunnel, including first-response duties in the event of any incidents in the tunnel. In fact, VMS operates the nation’s only private-sector fire brigade at the tunnel.

Public Sector Partner Roles and Responsibilities

As the project’s public sector sponsor, ADOT&PF conducted the environmental process for the project, established performance criteria for the design-build contractor, and managed construction of the project, with the assistance of HDR Alaska. The State of Alaska also provided project funding, applying a combination of state and federal transportation funds to

construct the project. ADOT&PF is also applying federal formula transportation grant monies to Alaska to cover operating and maintenance costs not funded by toll revenue.

Another public sector stakeholder was the Alaska Railroad Corporation, which is a self-sustaining, full-service railroad owned by the State of Alaska and governed by a seven-member board of directors appointed by the governor. The Alaska Railroad Corporation previously owned and operated the tunnel before its conversion to dual mode operation. The railroad worked with the project's public and private sector partners to ensure access to Whittier throughout construction, and continues to interact with the VMS-operated control center regarding railroad passage through the tunnel.

LEGAL AUTHORITY

Several legislative packages were passed to support the tunnel conversion project and partnerships that made it possible. Special legislation was passed to enable ADOT&PF to enter into design-build-operate contracts. Enabling legislation was also required to borrowing from the state infrastructure bank, as well to permit the collection of tolls on vehicles seeking passage.

The Federal Highway Administration approved the project for completion under the Special Experimental Projects No. 14 Innovative Contracting (SEP-14) program on November 1, 1996. This program evaluates project-specific innovative contracting practices, such as design-build, that have the potential to reduce the life cycle cost of projects, while maintaining product quality. Prior to publishing a final rule (or regulation) on design-build contracting in 2002, FHWA required states to seek federal approval for any design-build project funded with federal monies. This included the Anton Anderson Memorial Tunnel. FHWA studied the experience of these experimental design-build projects before issuing its final rule, which now permits any federally-funded ITS project totaling more than \$5 million and other federally-funded projects costing greater than \$50 million to advance as design-build with the approval of FHWA Division offices but without prior headquarters approval.

FUNDING AND FINANCE

The cost for design, construction, development of specialized computer systems, and the initial two years of operation of the 2.6-mile-long tunnel was \$57 million. Another \$23 million was expended to construct access roads, the short (400 foot) Portage Lake Tunnel, and bridges to access the long tunnel.

ADOT&PF applied a pay-as-you-go approach to cover most of the project capital costs, with 20 percent of funding from an ADOT&PF infrastructure bank loan, and 80 percent from federal formula transportation grants to Alaska.

The VMS O&M contract is a 6-year, 9-month fixed-price lump sum agreement totaling \$16.9 million. Tunnel operations and maintenance costs are covered by a combination of toll revenue and federal formula funds, with tolls providing roughly half the funding required for O&M. Federal funds will continue to be applied to tunnel operations until toll revenue is sufficient to cover operating and maintenance costs for the foreseeable future, as annual traffic growth has been in the single-digits in recent years.

INSTITUTIONAL CONTEXT

A number of institutional factors facilitated development of the Anton Anderson Memorial Tunnel as an innovative project from the perspectives of project scope, technologies, funding and financing, and delivery approach. Several of these are discussed below.

- ***A Design-Build Team with Broad Technical Know-How.*** ADOT&PF established challenging performance criteria for the Kiewit design-build team to achieve in two years' time for a project whose scope was unique in the annals of tunnel construction and operation in the United States. Given the remote location and extreme geographic and climatic conditions, engineers faced the challenge of delivering a unique project on-time and on-budget with limited information regarding the site and terrain. For example, snowfall records for the Bear Valley side of the mountain were non-existent, and the state required that exterior structures be able to withstand heavy snowfall and avalanche conditions. Using anecdotal weather data from locals, records from nearby areas, and building codes from Anchorage and other Alaska design standards, project engineers determined that tunnel structures should be constructed to withstand a ground snow load of 220 pounds per square foot.

Another design requirement called for collection and disposal of all water in the tunnel. While flows during spring snowmelt would provide the best information to design for peak conditions, the accelerated delivery schedule did not permit the design team the luxury of delaying drainage system design until this data was available. Using what limited information the design-build team was able to collect and anecdotal information from railroad workers, engineers were able to estimate peak flows and design a system adequate to meet performance criteria. The team's capabilities for problem-solving and developing innovative solutions were keys to the project's success.

- ***Existence of ITS Technologies.*** The conversion of a remote Alaskan single-lane, 2.5 mile-long rail tunnel to dual use by autos and trains would not have been possible without the existence of today's advanced intelligent transportation systems (ITS). The tunnel control system and train signal system harness state-of-the-art software to ensure that the tunnel is in use by only one mode at a time, and that traffic moves in only one direction at once. The security, ventilation, communications, and life-safety systems apply innovative technologies to meet the design specifications of ADOT&PF. Without this technology this project would have been difficult to accomplish just a few years earlier.
- ***Successful Public-Public Partnerships.*** The public-private partnerships that converted and operated the dual use tunnel would not have been possible without on-going public-public partnerships between ADOT&PF and other public agencies in Alaska and at the federal level. The tunnel itself was previously owned and operated by the Alaska Railroad, a state-owned corporation. An agreement between ADOT&PF and the railroad paved the way for tunnel conversion, a construction schedule that would permit continued use of the tunnel during conversion, and transfer of operations and maintenance responsibilities from the railroad through ADOT&PF to its O&M contractor, VMS. The federal government funded the project with transportation formula grants to Alaska, and FHWA permitted the project to proceed as a design-build project under its SEP-14 program.

IMPEDIMENTS AND STRATEGIES

There were several impediments to the success of the Anton Anderson Memorial Tunnel project which could have slowed or even stopped the project. The following section discusses the most significant project impediments and the strategies used by the project partners to successfully complete the project and continue to operate and maintain this unique facility.

- ***Difficult Weather and Terrain in this Remote Alaskan Corridor.*** A great challenge to converting the tunnel was the extreme environment in which the corridor was located. Given the project's performance criteria established by ADOT&PF, project engineers were required to find ways to design a facility able to operate in high wind, extreme cold, heavy snow, and avalanche conditions. The flexibility of the design-build delivery method enabled assembly of the large team of design specialists required to engineer the tunnel to ADOT&PF performance criteria. In the end, five design subconsultants supported the Hatch Mott MacDonald team.
- ***Safety Considerations in Operating the Tunnel to Serve the Needs of Users.*** Much of the expense in converting the tunnel and operating it today results from life safety, communications, and emergency support systems incorporated into the tunnel's design. ADOT&PF, the Alaska Railroad, and the private sector design-build-operate team participated in joint problem-solving exercises to create innovative safety devices. The partners also applied a team approach to create new procedures for operating the tunnel and staging traffic. ADOT&PF and VMS continue to work together to find innovative solutions to meet operating goals without compromising safety.
- ***Tight timeline for Project Delivery.*** ADOT&PF sought to have project design and construction completed within twenty-four months. By applying a design-build delivery approach, project design and construction timelines were permitted to overlap. This reduced the total duration of the project and allowed the design-build-operate team to meet the project deadline.
- ***Uncertain Funding to Build, Operate, and Maintain the Project.*** The cost of converting the tunnel and constructing staging areas and approach roads totaled \$80 million, with \$57 million for the tunnel conversion. This represented a large expenditure for Alaska with its limited population and tax base. To pay for the project, the state used state infrastructure bank funds to match federal grants. Federal funds continue to supplement toll revenues to pay for the continuing costs of tunnel operations and maintenance.
- ***Unique ITS Systems Required to Operate the Dual-Use Tunnel.*** The tunnel control system and train signal system were unique applications that needed to be developed and implemented, with all application problems resolved prior to opening of the dual-use tunnel. The downtime incorporated into the tunnel operating schedule, first for only trains and then for both vehicles and trains after the conversion was completed, enabled the delivery team to implement and de-bug the various operating systems without jeopardizing safety of tunnel operations or the project delivery schedule. ADOT&PF mitigated the risk associated with this unique approach to trackage rights sharing by having the design-build-operate team operate the tunnel for two years following completion of the conversion project. This ensured that tunnel operations were safe and efficient upon transfer to the state at the end of the design-build-operate contract.

RESULTS

The design-build delivery approach is credited with reducing the time to design and construct the tunnel by 16 months. The total duration of construction was 22 months. The project was also completed \$2.6 million under budget, with \$57.0 million expended versus \$59.6 million budgeted.

The design-build approach had limited impact on project funding as the conversion was funded by ADOT&PF primarily on a pay-as-you-go basis using a combination of state and federal transportation funds. The operations and maintenance contract held by VMS, Inc. is funded through a combination of toll revenue collected from tunnel users, as well as federal formula transportation grants to Alaska, until such time as toll revenue is sufficient to cover total O&M expenses.

The converted Anton Anderson Memorial Tunnel is a transportation and economic development success for the state of Alaska. Since opening the tunnel to vehicular traffic in 2000, travel to Whittier has grown six-fold, according to ADOT&PF. Tourism to the community has grown from 100,000 visitors annually to greater than 500,000. Recreational boating in the area has grown by 200 percent.

ADOT&PF is satisfied with the performance of the project and plans to employ design-build for project delivery in future construction projects. The agency has also extended its use of operations and maintenance contracts to other facilities, awarding an asset management contract for Ted Stevens Anchorage International Airport.

CONCLUSIONS

Among the lessons learned from this unique and innovative project, the following stand out for consideration by others considering the use of PPPs for expediting the delivery of infrastructure improvements:

- ***Apply a Flexible Project Delivery Approach to a Project with Demanding Design Requirements.*** The extreme conditions and operating requirements for this project necessitated ingenuity and expertise. By applying a design-build approach, the Kiewit team was able to bring on board the engineers best qualified to address this unique situation. And by specifying performance criteria instead of design specifics, ADOT&PF enabled the design-build team to find innovative and cost-effective ways to deliver the project on-time and on-budget.
- ***Collaborate and Communicate with Public and Private Sector Stakeholders.*** As project sponsor, ADOT&PF laid the groundwork for a smooth project by completing the environmental process, reaching an agreement with the Alaska Railroad to modify its facility, and seeking federal approval to apply the design-build delivery approach prior to initiating the project. The agency then worked closely with its private sector partners to find innovative solutions to meet the project's challenging performance criteria, and to ensure smooth operation upon completion.
- ***Unique Situations Require a Unique Approach.*** ADOT&PF tried a number of new approaches to deliver this project. It applied the design-build delivery approach for the first time, as well as its first operations and maintenance contract. It established the state's first toll road. In accomplishing these milestones, the agency established

proficiency in the application of innovative approaches to project financing and delivery that can be applied to future transportation PPPs across the state.

NEXT STEPS

The VMS contract to operate the Anton Anderson Memorial Tunnel expires in February 2009. Until then, ADOT&PF will work together with its O&M contractor to ensure smooth operation of the facility.

ATLANTIC STATION 17TH STREET BRIDGE, ATLANTA, GEORGIA

PPP Delivery	Construction/ Development Period	Concession Period	Contract Value	Status
Design-bid-build with PPP funding	4 years	Original contract: 4 years	\$76 million design-bid-build	Bridge opened to traffic in April 2004.

SUMMARY

The Atlantic Station 17th Street Bridge is a critical component of a major development known as Atlantic Station located on a former brownfield site in the northwest part of downtown Atlanta. The bridge provides essential transportation accessibility between the redevelopment site at the confluence of Interstates 75 and 85 (I-75/85) and the Midtown of Atlanta, linking Northside Drive with Peachtree Street and providing direct pedestrian access to the Metropolitan Atlanta Rapid Transit Authority (MARTA) Arts Center rail station just east of I-75/85 Connector that bisects the City of Atlanta.

Exhibit 3.5 shows how the bridge links downtown Atlanta with the 138-acre mixed use redevelopment site, which is expected to have an assessed value of \$600 million upon completion over the next 7 to 10 years.

Exhibit 3.5 – 17th Street Bridge Project Site Map



Source: Atlantic Station Web Site, July 2006. URL: <http://www.atlanticstation.com/home.php>

The bridge project and the entire redevelopment of the Atlantic Steel Mill site that it supports are products of a diverse public-private partnership (PPP) involving multiple public agencies at the federal, state, and local levels and private development firms. The success of this complex PPP derives from its ability to combine transportation accessibility, innovative financing, transit and pedestrian-oriented development, complete remediation and redevelopment of a blighted brownfield site, and promotion of highly compatible land use concepts desired by the city. This unique combination gave both the private development group and the city significant benefits – essentially resulting in a win-win situation for both the public and private partners.

The focus of this case study is on the bridge (known as the 17th Street Bridge), a \$76 million facility delivered through a design-bid-build contract managed by the Georgia Department of Transportation (GDOT) and funded through a PPP arrangement involving federal, state, local, and private sponsors. This singular structure was one of the prerequisites for the entire Atlantic Station redevelopment project to be viable. This case study identifies the major challenges that affected the ability to build the bridge and examines the evolution and nature of the PPP arrangements between the project developers and various public stakeholders to deliver this essential bridge, despite its location in a non-attainment area subject to U.S. EPA prohibitions. It also discusses a number of other impediments to the overall redevelopment project and the many strategies agreed to by the PPP stakeholders to bring the project to fruition.

BACKGROUND

In 1973, the site of the former Atlantic Steel Mill was put up for sale but took 25 years before being sold for \$75 million to a group of entrepreneurial developers and investment companies who had a vision to transform this highly polluted “brownfield” site into a 138-acre mixed-use development in the late 1990s. The concept for the \$2-billion mixed-use “live-work-play” cluster of residential, retail, commercial, and open spaces which became known as Atlantic Station emanated from a masters thesis by a student at Georgia Tech in 1995. The thesis discussed the potential for turning this brownfield industrial site into an up-scale in-town development that combined homes, shops, offices, and parks.

The thesis was brought to the attention of the President of Jacoby Development, an Atlanta-based real estate development company, who recognized and shared the vision of converting this eye-sore adjacent to downtown Atlanta into an upper-end multi-use development. Recognizing the potential for the plan, Jim Jacoby decided to pursue the project and brought on as financial investment partner the New York-based AIG Global Real Estate Investment Corporation, a member of the world’s largest insurance companies, to secure the up-front funding needed to launch the project and develop its initial office buildings.

The Development Group’s vision for Atlantic Station was for a 138-acre mixed-use in-town development with up to 30,000 employees and 10,000 residents, and the following land uses over a ten-year build-out period:

- 4 to 6 million square feet of commercial office space,
- 1 to 2 million square feet of retail space,
- 4,000 to 5,000 residential units (apartments, condominiums, and single-family homes),
- 1,000 to 1,200 hotel rooms, and
- 7,300 parking spaces (mostly underground).

Several key challenges faced the project right from the start:

- As a highly contaminated brownfield site, significant remediation of the entire 138-acre site would be required by removing significant amounts of contaminated soil from the site before site development could begin.
- The site was isolated from downtown Atlanta by being located on the west side of the 14-lane I-75/85 connector expressway without any direct transportation accessibility.
- The Atlanta metropolitan area was classified by the Environmental Protection Agency (U.S. EPA) as a non-attainment area with regards to air-borne pollution, caused largely by vehicular travel, which under Clean Air Act requirements prohibited adding any new highway infrastructure.
- The financial risks of remediating the site, installing the underlying infrastructure to support development, attracting tenants for the various form of land use proposed for this highly innovative mixed-use concept, and obtaining the various permits and approvals required from federal, state, and local agencies required before the project could proceed.
- Skepticism and sometimes outright opposition from local community and environmental groups who questioned the impacts on their neighborhoods and the ability /sincerity of the project sponsors to uphold their commitments to the environmental mitigation measures incorporated into the development plan.
- Assembling a development team with the expertise, credibility, and resources to successfully develop this massive project and weather the many obstacles it ultimately faced along the development process.

These hurdles were ultimately overcome through the cooperation and commitment that resulted from various PPP arrangements that evolved between the various stakeholders of the project, as discussed throughout this case study.

PROJECT DESCRIPTION

When the Atlantic Station Development Group (Atlantis 16th, L.L.C.) proposed to convert the polluted site of the century-old Atlantic Steel Mill into an up-scale mixed-use development containing housing, retail, commercial, and open space in the late 1990s, they quickly recognized the economic viability of the project would depend on providing some way to connect the site to Midtown Atlanta. The problem was that the redevelopment site was on western side of the Interstate Connector (I-75/85) and lacked direct accessibility to the more vibrant central business district of downtown Atlanta. The relative isolation of the site had promoted its decline into a blighted, industrial area with little economic activity and an eyesore to the rest of the city. Continued inaccessibility would doom any proposed redevelopment.

The solution was to design and build a bridge to span the 14 lanes of Interstate highways to the east of the site, just below the confluence of I-75 and I-85. The design called for an 830-foot long steel box girder bridge of approximately 100 feet in width. This would provide the essential linkage between the Atlantic Station redevelopment project and Midtown Atlanta, costing \$76 million.

The proposed facility was designed as a multi-modal bridge consisting of the following features:

- Two 11-foot wide lanes in each direction serving automobiles, buses, and trucks,
- Two 16-foot wide dedicated bicycle and transit lanes that can connect to the Metropolitan Atlanta Regional Transit Authority (MARTA)'s Arts Center rail station (thereby making the project a transit-oriented development (TOD), and
- A 24-foot wide pedestrian park and thoroughfare on the south side of the bridge containing landscaping, plus a covered sidewalk on the north side of the bridge.

Exhibit 3.6 provides an artist's rendering of the 17th Street Bridge, including the various modes, travel lanes, and architectural attributes of the facility.

Exhibit 3.6 – Rendering of Fully Operational 17th Street Bridge



Source: Georgia DOT, 2001. URL:

<http://www.dot.state.ga.us/specialsubjects/17thstreetbridge/index.shtml#photogallery>

Design and construction of the \$76 million facility was overseen under a design-bid-build contract by the Georgia Department of Transportation (GDOT). The 17th Street Bridge (the bridge) was designed in 2000-2001 and built in 2002-2004. This enabled the Atlantic Station development to open in 2005.

Exhibit 3.7 shows the placement of steel box girders of the bridge during construction as it stretched across I-75/85, with Midtown Atlanta in the background. Exhibit 3.8 shows how the bridge complements the urban landscape of downtown Atlanta.

Exhibit 3.7 – 17th Street Bridge under Construction



Source: Georgia DOT, 2003

Exhibit 3.8 – 17th Street Bridge over I-75/85



Source: Georgia DOT, 2003

PARTNERSHIP ARRANGEMENT

The 17th Street Bridge was developed as a design-bid-build, PPP-financed project that enabled the facility to open to traffic only four years after design began. This was made possible because Georgia already had existing legislation that permitted the use of PPPs in the delivery of needed transportation projects. The challenge was to find the right design, funding, and state, local, and federal support for building a major bridge spanning 14 lanes of Interstate highway - at a time when the city was prohibited from adding highway infrastructure since the Atlanta Metropolitan Region was not in conformance with Clear Air Act requirements for the level of air pollution. This required the bridge project to be sponsored and supported by a unique combination of public and private entities which included key stakeholders of the overall redevelopment project. As a result, the PPP arrangements that supported this project were more in the form of a set of cooperative agreements among a large number of stakeholders.

The major stakeholders involved with the 17th Street Bridge development effort included the following public agencies and private firms with a strong interest in both the redevelopment project and the bridge, including:

- Atlantic Station Development Group (Atlantis 16th, L.L.C., which is composed of Jacoby Development, Inc. and AIG Global Real Estate Investment Corporation),
- City of Atlanta,
- Atlanta Development Authority,
- Atlanta Regional Commission,
- Georgia Department of Transportation (GDOT),
- Georgia Regional Transportation Authority,
- Federal Highway Administration (FHWA),
- Federal Transit Administration (FTA),
- Metropolitan Atlanta Regional Transit Authority (MARTA),
- U.S. Environmental Protection Agency (U.S. EPA),
- Georgia Environmental Protection Division (EPD),
- Midtown Alliance,
- Georgia Conservancy,
- Georgia Tech,
- Nine neighborhood associations (such as the Home Park Community Improvement Association),
- URS Group and MACTEC Engineering and Consulting (design team),
- Bilson and Associates (landscape architect),
- C.W. Mathews and APAC (construction team), and
- Morris, Manning and Martin (law firm).

Private Sector Partner Roles and Responsibilities

The Atlantic Station Development Group served as the catalyst for the redevelopment project and champion for the 17th Street Bridge. The Development Group assumed responsibility for site remediation by removing over 11,000 truckloads of contaminated soil. They also committed to a number of environmental and energy conserving strategies, as well as auto travel reduction strategies that greatly enhanced the redevelopment's appeal to various environmental and citizen advisory groups, as well as the city. The Development Group further committed to fund a significant portion of the design for the bridge and for the construction of that portion of the facility on the redevelopment site.

The URS Group and MACTEC Engineering and Consulting oversaw or performed the design work for the bridge and its related facilities, Bilson and Associates performed the landscape design for the facility, while Morris, Manning and Martin provided legal advice to move the project forward through various statutory and regulatory hurdles. The contractor team of C.W. Mathews and APAC constructed the bridge.

These private sector roles were pivotal to turning an idle and blighted brownfield site into a vibrant mixed-use facility that would enhance the attractiveness of downtown Atlanta, remove a long-standing eyesore from the city's urban landscape, and encourage greater integration of economic activity in the urban core of the city instead of having that activity spread across the more distant suburban landscape. In addition to the 17th Street Bridge, the Development Group included a variety of traffic calming strategies in the on-street design for Atlantic Station to reduce vehicular speeds within the redeveloped area. Hotel and office buildings in the District portion of Atlantic Station were located in closer proximity so they could share planned underground parking structures, further reducing travel within the developed area. Bicycle lanes were also provided along 17th Street, State Street, and Center Street, with linkage via the 17th Street Bridge to the city-wide bicycle trail network.

Among the continuing responsibilities of the Development Group is the production of an annual report on the achievement of performance objectives of the project, related to travel volume and modal use, air pollution emissions, water quality, and energy consumption by buildings within the development. In addition, the Development Group developed and periodically updates a Stakeholder Participation Plan (SPP) whose purpose is to solicit continuing input from stakeholders throughout the duration of the project.

Public Sector Partner Roles and Responsibilities

Major roles were assumed by a number of public agencies to help make this project a reality and overcome its many challenges. The most significant was the willingness of the U.S. EPA to apply an innovative project approval process (called Project XL, short for Excellence and Leadership) that enabled the essential bridge to be built by considering it a Transportation Control Measure (TCM) that actually reduced auto travel, congestion, and pollution instead of increasing them. This will be discussed in more detail later in the case study.

The four-year timeline for environmental review and approval was fairly short for a project of this magnitude and complexity, as shown below:

- The Development Group first submitted the site plan in early 1998, which was approved by the Mayor of Atlanta a few months later.
- The Atlanta Regional Commission reviewed and approved the TCM designation for the project in mid-1999.

- The U.S. EPA designated the bridge as a TCM and granted its approval of the entire redevelopment proposal in 1999 as an XL Project due to its many accommodations to environmental protection, energy conservation, and integrated urban land use design.
- Other public stakeholder groups also offered their suggestions for improving the project and based upon the responses by the Development Team subsequently granted their approval and support for the project in 1999.
- Later in 1999, the Georgia EPD approved the site remediation plan and incorporated the TCM in its State Implementation Plan (SIP) which was submitted to U.S. EPA in early 2000.
- At the end of 2000, the U.S. EPA provided the final environmental clearance for the redevelopment project by issuing a “Finding of No Significant Impact” (FONSI).
- The Georgia EPD issued a “finding of no further action” in December 2001.

With the final go-ahead from the U.S. EPA and local agencies and community groups in 2000 and 2001, the various transportation agencies at the federal and state levels moved the bridge project and related transportation improvements forward through the development, funding, and delivery processes, with the federal and state transportation agencies contributing significantly to the costs of constructing the bridge over I-75/85 and the approach ramps and connections with the existing roadway network in the vicinity of the bridge facility. This included reviews and oversight by the GDOT, FHWA, FTA, and Atlanta Regional Transportation Authority. GDOT approved the developers’ concept report for the bridge in 2000 and produced the Interchange Modification Report in 2001, with final approval provided by FHWA and GDOT in 2001. This allowed the bridge design to be completed in 2000-2001 and built in 2002-2004.

This close cooperation between the various stakeholders of the bridge and the overall redevelopment project expedited bridge development and opening so that Atlantic Station could be officially opened on October 20, 2005.

LEGAL AUTHORITY

The bridge was delivered through the traditional design-bid-build process, with the GDOT working with the city and the Atlanta Regional Transportation Authority.

The major legal issues for the bridge project involved funding responsibility and the ability to undertake the project while the Atlanta Metropolitan Area was rated as a non-conforming region relative to the requirements of the Clean Air Act. Therefore the project needed a PPP arrangement to develop the necessary funding arrangements and agreements involving the EPA, the city, and other local stakeholder groups to enable the project to proceed as a TCM while the region was still considered a non-attainment area for air pollution.

When Atlantic Station began its planning and development effort, the state statute on brownfield sites was of little value to the project. Given the success of the Atlantic Station redevelopment effort, the Georgia Legislature updated its brownfield statute in 2002 and created tax incentives to spur additional brownfield redevelopments in 2003.

Another legal hurdle to the project and ultimately the bridge was the incompatible zoning of the site. Prior to redevelopment, the Atlantic Steel site was classified as heavy industrial with an adjacent single family residential area known as Home Park. To allow the redevelopment to proceed, including the construction of the 17th Street Bridge, the city needed to rezone the redevelopment area to C-4-C in 1998, which allowed for a mixed use development with attached

conditions and maximum development limitations. This zoning change was compatible with the city's Comprehensive Development Plan and building codes.

Another feature of the zoning changes and environmental approvals for the site was the provision of a conservation easement, which requires the Development Group to apply the same environmental protection, zoning, building code, and development standards as was applied to the Atlantic Station development for any additional property that is acquired for development adjacent to the current site without the need for special permits or notification.

FUNDING AND FINANCE

The Atlantic Station development represents a ten-year, \$2 billion undertaking. The Development Group paid for the office, hotel, retail, and residential spaces in Atlantic Station. The Development Group also contributed \$50 million worth of right-of-way for the development of roads in and leading to Atlantic Station.

Funding the \$76 million 17th Street Bridge came from federal, state, local, and private developer funds established under a PPP arrangement among the parties. GDOT and the city leveraged federal funding to provide \$60.8 million for the bridge, while the Development Group funded the remaining \$15.2 million. Out of this amount the Development Group funded the designs of the bridge, the southbound ramps, and the western end of 17th Street from Northside Drive to east of the railroad line. The Development Group also paid for construction of the center portion of the bridge facility through their main development area. The city assumed responsibility to maintain the facility, except for the bridges over I-75/85 which will remain a GDOT responsibility. This PPP approach was financially attractive to the city and helped mitigate legal and regulatory issues that may have stalled or stopped the project completely.

Prompting the city's support for the project and its willingness to fund certain infrastructure and environmental remediation efforts, and also assume maintenance responsibilities for the portion of the bridge facility not over I-75/85 was the expectation that the redevelopment would produce up to \$30 million a year in additional local property and sales taxes for the city. The assessed value of development in Atlantic Station at the time of build-out is expected to be about \$600 million. In its first year, the redevelopment project provided \$300,000 in additional local tax revenues to the city.

This expectation of significant increases in local tax proceeds from the redevelopment of the Atlantic Steel site prompted the city to create the Atlanta Steel Brownfield Redevelopment Plan and Tax Allocation District (ASBTAD) in 1999. The ASBTAD issued bonds to help pay for a portion of the infrastructure and environmental remediation efforts associated with the redevelopment project. The boundaries for the Tax Allocation District (TAD) primarily surround the Atlantic Station development. In late 2001, the ASBTAD issued \$75 million in Tax Allocation Bonds with a term of up to 25 years, benefiting from a tax-exempt rate. The city's own analysis of the project estimated a total bonding capacity for Atlantic Station upon build-out of \$252 million from additional property and sales tax proceeds collected by the city from tenants in the TAD. This provided a coverage ratio of 3.6 for the current ASBTAD bonds.

Assuming Atlantic Station develops as planned and the net tax proceeds materialize, a total of up to \$170 million in TAD bond proceeds may be allocated to the following purposes:

- \$60 million for roads and utilities on or leading to the site,
- \$60 million for parking facilities, and
- \$50 million towards environmental remediation.

Additional TAD funding that is made available to the project will be used to provide the local match for available federal and state funding of corridor improvements, such as traffic flow improvements, mass transit improvements, sidewalks, and streetscapes. The ASBTAD is expected to expire at the end of 2024.

INSTITUTIONAL CONTEXT

A number of institutional factors facilitated development of the 17th Street Bridge as part of the Atlantic Station redevelopment. Several of these are discussed below.

- ***Strong Private and Public Sector Champions.*** The \$2 billion Atlantic Station redevelopment project provided a major opportunity for the City of Atlanta to rid itself of a perennial urban eyesore and transform a highly polluted industrial area into a unique urban form that integrates residential, retail, commercial, open space, and multi-modal transportation features into a multi-faceted land use jewel in the middle of the city. It is the largest urban brownfield development in the United States, energy efficient, pedestrian-friendly, and a model for new urbanism and smart growth.

The current signature building in Atlantic Station is 171 Seventeenth Street, a 22-story office tower which was 73 percent leased when first opened in mid-2005. There will ultimately be 6 million square feet of Class A commercial office space in Atlantic Station. When fully built out, the redeveloped area will include 12 million square feet of retail, office, residential, and hotel space, as well as 11 acres of public parks – with room for 30,000 employees and 10,000 residents. This will make the site the 12th largest city in Georgia.

The vision for this transformation originated with a graduate student of Georgia Institute of Technology, a successful local developer, and the financial backing of an international insurance and investment firm. This vision was recognized by the leadership of the city and the agencies responsible for regional planning, environmental protection, and transportation planning. Because the redevelopment project promised significant benefits far in excess of the required investment of public and private resources, strong public and private sector champions emerged and remained committed to the project over the ten years required to bring the redevelopment to a reality. This included federal, state, and local transportation and environmental agencies.

Of major importance to the success of the project development process was the involvement and commitment of high level officials from the federal, state, and local levels of government. This included the Governor of Georgia, Mayor of Atlanta, and senior officials from U.S. EPA, U.S. DOT (FHWA and FTA), GA EPD, and GDOT who served as catalysts to move the project forward and overcome any obstacles that developed, whether they be financial, statutory, regulatory, or institutional.

- ***Highly Innovative Approach to Land-Use Development.*** The private developers of Atlantic Station produced an innovative and cost-effective mixed-use approach to urban land use design for the project that integrates residential, retail, commercial, and open space uses within a center-city area, drawing on the concepts of “smart growth” and “block development” embodied by the phrase used by the Atlantic Station Development Group: “live-work-play”. Underlying the entire redevelopment concept were the comprehensive remediation efforts to transform the brownfield site through removal of contaminated soil, an innovative water clean-up and reclamation process, single-occupant vehicle (SOV) travel reduction, and energy conservation strategies.
- ***Experienced Development Team.*** The project team had the technical and financial resources to successfully execute the full scope of the redevelopment project and weather the inevitable obstacles that emerged as the project evolved from concept to reality. Jacoby Development, Inc. was an experienced local developer with strong roots in the Atlanta region and a commitment to its renewal, while AIG Global Real Estate Investment Corporation understood the potential of this innovative redevelopment opportunity and provided both national and international financial expertise and resources necessary to sustain the project through periods of uncertain and delay. Without the commitment and capability of the Development Group to see the project through, the project could have floundered and stopped on many occasions throughout the development process. This was especially true in the aftermath of the terrorist attacks of September 11, 2001, when significant economic uncertainty threatened to undermine the timetable for completing and opening the 17th Street Bridge and portions of Atlantic Station to paying tenants.
- ***Willingness of Federal and State Agencies to Apply Innovative Approaches.*** These alternative project delivery approaches overcame traditional impediments to such projects which provide mutual benefits for both sponsors and the communities in which these economic development projects occur. The environmental benefits of transforming a long-standing brownfield site into a jewel of urban form and function prompted the U.S. EPA, Georgia EPD, City of Atlanta and the Atlanta Regional Transportation Authority to work together with the Development Group to facilitate this project and move it smoothly through the traditional bureaucratic hurdles that face most economic development projects.
- ***Successful Public-Public Partnerships between Major Stakeholders of the 17th Street Bridge and the Overall Atlantic Station Redevelopment Project.*** The willingness of the public and private sectors to work together and commit to various forms of public-private partnerships provided the assurances necessary to gain the trust between these parties to embrace innovative approaches and flexible strategies to move the redevelopment and bridge approval processes expeditiously forward. This included federal, state, local, and private funding for the 17th Street Bridge project, and local tax increment financing (TIF) through creation of a Tax Allocation District by the city to use additional property and sales taxes resulting from the redevelopment to help offset the costs of infrastructure and environmental remediation associated with the project.

ISSUES AND STRATEGIES

There were several impediments to the Atlantic Station project which could have slowed or even stopped the project. The following section discusses the most significant project impediments and the strategies used by the project partners to successfully complete the 17th Street Bridge in 2004 and officially open the development in October 2005.

- ***Difficulty of Aligning Project Approvals with Financing and Development.*** There was a strong possibility that the timing of zoning, environmental clearance, financing, and development activities would not correspond to enable the project to move forward in a timely manner, thereby delaying the overall redevelopment project and adding to its costs. In particular, the Governor of Georgia and the Mayor of Atlanta became quite involved in the project, ensuring that a strong coalition of stakeholders would support the project and commit to timely review and approval processes.
- ***High Cost of Brownfield Site Remediation.*** The 138 acres slated for redevelopment was a contaminated brownfield site which would require up to \$50 million to completely remove all contaminated soil from the site. The Development Group proposed a more cost-effective strategy for site remediation by limiting contaminated soil removal and replacement to those areas likely to be exposed, such as open spaces or where utilities and other types of conduits might require human access. As a result, the soil removal process amounted to 11,000 truck loads removed at a cost of \$10 million instead of \$50 million as originally estimated.
- ***Prohibition of Additions to Highway Network in Non-Attainment Area.*** The project required direct access over the I-75/85 Connector to the Midtown part of Atlanta, in the form of a bridge that could span the full 14-lane Interstate Connector despite Atlanta ***being considered a non-attainment area for air pollution.*** As a non-attainment area, the Atlanta region was prohibited from using federal funds to build new highway transportation infrastructure, such as the proposed bridge. To overcome this significant obstacle, the Development Group worked with the U.S. EPA and the Georgia EPD to consider the project under a new program called Project XL. The U.S. EPA developed the Project XL (short for Excellence and Leadership) program to encourage developers and communities to propose innovative approaches to advance environmental goals instead of using traditional regulatory approaches that might otherwise impede environmentally-beneficial projects. This was one of fifty projects developed under the Project XL process and became one of the program's most successful initiatives.

In preparing its application for Project XL status, the Development Group was able to demonstrate how the proposed redevelopment would produce sufficient environmental improvements to warrant consideration and approval as a Project XL whose bridge and the entire redevelopment project could be judged a Transportation Control Measure instead of a pollution contributor by enabling the following improvements:

- Remediation of a long-term, blighted brownfield site;
- Installation of wells within the project site to monitor and manage groundwater quality, and to prevent migration of groundwater from the reclaimed site to other areas beyond Atlantic Station;
- Management of surface water runoff by sophisticated stormwater and sanitary sewer systems;

- Environmentally-friendly cooling systems for buildings that use a network of water-chilled pipes to reduce the costs of air conditioning;
- Greater concentration of mixed use development near the center of Atlanta and its CBD to reduce commuting requirements for residents of the redeveloped site;
- Significant use of “smart growth” and urban “block development” design concepts;
- Provision of alternative transportation options to the single-occupant automobile and pedestrian-friendly amenities;
- Establishment and financial support of a Transportation Management Association (TMA) to monitor the number and types of vehicular trips made to, from, and within the redeveloped area; and
- Lower travel, pollution, and energy consumption by encouraging people to “live-work-play” within the urban core instead of commuting to and from the outer suburbs.

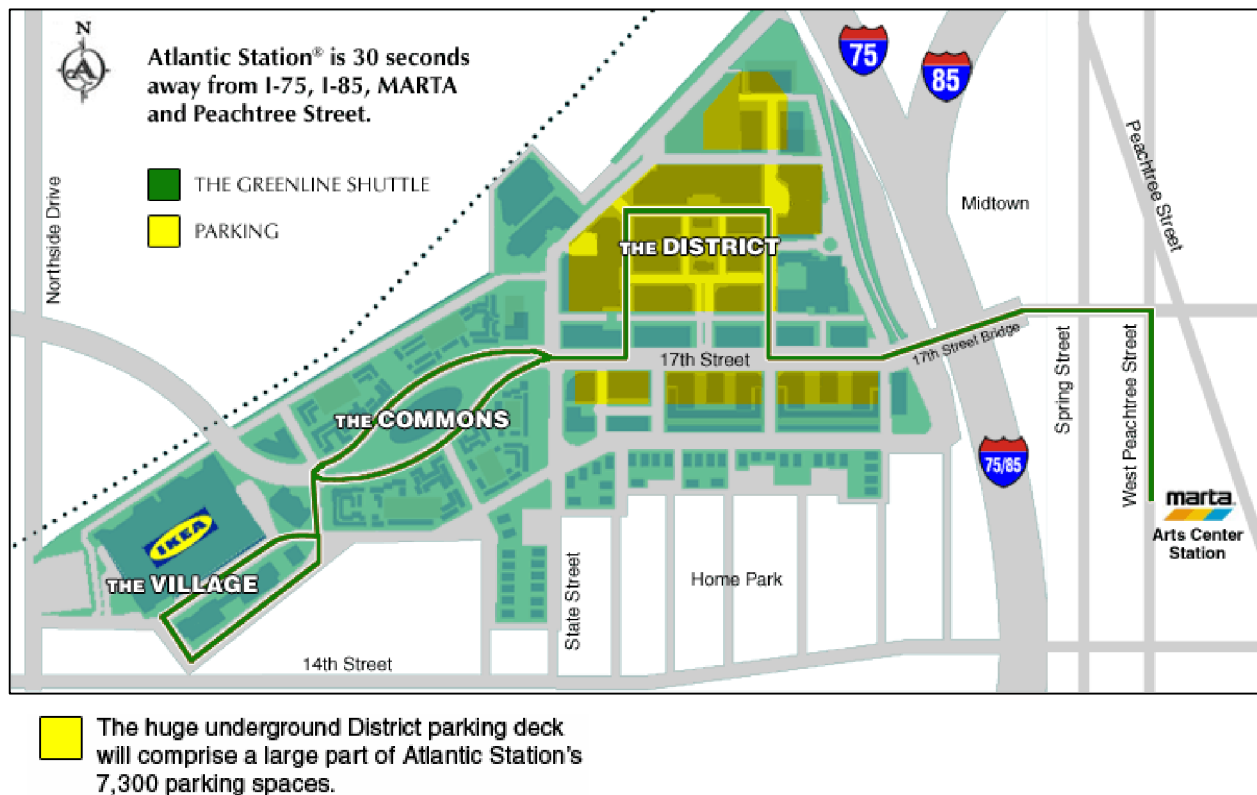
In reviewing the Project XL application from the Atlantic Station Development Group, the U.S. EPA designated the entire redevelopment project a TCM. After receiving Project XL status in 1999 and a “Finding of No Significant Impact” from the U.S. EPA, Georgia EPD issued a “finding of no further action” in December 2001, which meant that the project was clear of major environmental hurdles. This prompted the financial backer of the project, AIG Global Real Estate Investment Corporation, to fully commit to the project.

- ***Traffic Concerns of Environmental and Community Action Groups.*** Local groups expressed concerns over the amount of traffic that such a huge new development would produce in downtown Atlanta, adding to urban congestion and air pollution. One of the key objectives of the redevelopment project was to provide a variety of travel options to reduce the amount of single-occupant vehicle travel by residents, employees, and visitors. Atlantic Station therefore incorporated in its design ways to encourage commuters to live closer to their jobs. In early 2005, the Development Group unveiled its Atlantic Station Access Mobility Program (ASAP) which consisted of the following elements:
 - Transit shuttle services (the Greenline Shuttle) that connect the various parts of Atlantic Station, including the commercial District, the open space Commons, and the residential Village areas to the MARTA Arts Center Station using electric vehicles.
 - A variety of pedestrian and bicycle friendly amenities and facilities.
 - Vanpool, ridesharing assistance, and guaranteed ride home programs for commercial and retail employees.
 - Shared car program for residents of the development.
 - Incentives to reduce vehicle usage, such as transit discounts and preferential parking for ride-sharers, commuter rewards, and transit/movie combination discount programs.
 - Continuous monitoring of travel mode use by residents, employees, and visitors throughout the development.

Vehicle travel was also reduced by placing all commercial parking underground and closest to the peripheral points of access to the development near the District area of the development. The development design was also intended to create a community atmosphere where residents and other mixed-use tenants could participate in outdoor activities and festivals on site, particularly in the various public spaces and parks created within Atlantic Station.

Exhibit 3.9 shows the proposed transportation plan for Atlantic Station, including access to the MARTA Arts Center Station, shuttle bus routes, and parking locations. In addition, the major roadways and the 17th Street Bridge have paved pedestrian and bicycle paths. The Greenline Shuttle will connect the three parts of the development site to each other and to MARTA's Arts Center rapid rail station.

Exhibit 3.9 – Transportation Plan for Atlantic Station



Source: Atlantic Station Web Site, July 2006

As shown in Exhibit 3.9, the District is closest to the 17th Street Bridge and contains most of the underground parking, office space, hotel rooms, and mixed retail and entertainment space using the “block development” concept to establish a pedestrian-friendly urban landscape. The Commons and Village areas contain most of the residential units of various types (apartments, condominiums, and single family homes). The Village area will also include a technology center associated with the Georgia Institute of Technology, Georgia Research Alliance, and Georgia Tech Foundation.

- ***Energy Consumption Concerns.*** Another concern of environmental and community groups was the additional amount of energy the huge new development would consume, thereby contributing to the amount of thermal, air, and water pollution the on-site buildings would produce. To address these concerns, the Development Group committed to a green design for its buildings, including the 6 million square feet of Class A office space to meet the U.S. Green Building Council's Leadership in Energy & Environment Design (LEED) Green Building Rating System. The 22-story 171 Tower along 17th Street is the first building in Georgia to attain the LEED rating, demonstrating the Development Group's commitment to a "green development." As part of the redevelopment, 2,800 trees were also planted within the redeveloped area.

In addition, the Development Group provided an environmentally-friendly central cooling system on site that reduced construction costs of the development by \$35 million while operating 25 percent more efficiently than conventional heating, ventilation, and air conditioning (HVAC) systems, thereby lowering utility costs to tenants.

- ***Uncertain Real Estate Market to Support the Project.*** The timing for the development of Atlantic Station in its early formative years (late 1990s into the early 2000s) was not as fortuitous for economic development as the earlier 1990s or the last several years. Faced with a floundering economy and an overbuilt office market around the turn of the century, it was uncertain whether the up-front investments needed to move the project to fruition might take longer than anticipated, leading to building delays and higher borrowing costs. Several of the project's retail and residential developers left the project and several large-scale developments either moved to other locations or were delayed.

The Development Group was fortunate to have a well capitalized and experienced real estate investment firm in AIG which understood the vagaries of the real estate market and remained steadfastly committed to the project once the environmental hurdles were overcome in the late 1990s. As the nation began to pull out of the recession caused by the collapse of the high tech industry in 2000-2001 and the economic slowdown resulting from the events of September 11, 2001, the drop in interest rates and the recovery of the commercial and housing markets in the next several years justified their support. As a result, the bridge was funded and built and Atlantic Station opened in October 2005. For many, the completion of the 17th Street Bridge was the singular event that proved that the Atlantic Station project was for real.

Atlantic Station continues to grow and add stores and office facilities. There are already 47 retail establishments including 31 stores, 15 restaurants, a 16-theatre cinema complex, and several major banks within Atlantic Station. There are 6 major professional tenants of the development's office tower at 171 17th Street, shown in Exhibit 3.10 on the following page. Residential units include 600 apartments and lofts, 1,100 condominiums, and up to 3,300 homes

Exhibit 3.10 — View of 17th Street Bridge Crossing into Midtown Atlanta and 171 17th Street Office Building



Source: Atlantic Station Web Site, July 2006

RESULTS

The 17th Street Bridge is the signature transportation feature of Atlantic Station. The Development Group worked closely with GDOT, FHWA, FTA, Atlanta Regional Transportation Authority, and the city to develop a cost-effective design that would ensure that the bridge was both technically sound, multi-modal in function, and aesthetically appealing to those who use the facility or merely pass under it. Without the accessibility provided by this bridge, the site would have remained difficult to reach, lost much of its attractiveness to the Development Group, and reduced the potential to moderate auto travel to and from the site.

While the 17th Street Bridge helped make the Atlantic Station redevelopment plan economically viable by providing transportation accessibility to Midtown Atlanta and the nearby MARTA Arts Center rapid rail transit station, the roles of the U.S. EPA and Georgia EPD in classifying the proposed bridge as a Transportation Control Measure under EPA's innovative Project XL program was a major breakthrough for advancing the project. The Development Group worked closely with the U.S. EPA to gain Project XL status and designation of the proposed bridge facility and the entire redevelopment project as a Transportation Control Measure that would reduce regional congestion, pollution, and energy consumption. The Development Group also worked closely with the Georgia EPD to demonstrate the effectiveness of its plan to closely monitor the quality of water and traffic volumes on and around the development area to ensure compliance with defined performance targets, enabling that agency to grant the project a "finding of no further action."

As a consequence of their efforts to expedite this project, the U.S. EPA awarded the Atlantic Station redevelopment project the Agency's 2004 National Phoenix Award for Excellence in Brownfield Development, recognizing the Atlantic Station developers, Georgia EPD, and the engineering and legal support firms that helped move the project forward. As noted by the Georgia EPD Director in 2004: "Atlantic Station is evidence that government and business can work together [through a PPP arrangement] to safely clean up and redevelop contaminated property. It was been recognized as a model for brownfield projects and smart growth."

It took a concerted effort and commitment from a number of private companies and public agencies to bring Atlantic Station to fruition over the last ten years. The mixed-use project stands as one of the finest examples of what PPPs can bring to a challenging project to leverage the resources and interests of numerous stakeholders and overcome technical, institutional, and financial obstacles. Without the collaboration of the project's developers and the many other private and public stakeholder groups who participated in the development and approval processes, the hurdles facing this project may have undermined its commercial viability and left the brownfield site a continuing eye-sore for both residents and visitors to downtown Atlanta. Instead, these parties worked together in a multi-faceted PPP arrangement that allowed the project to address the many issues and concerns raised by environmental, transportation, neighborhood, and financial stakeholders, and proceed despite various unexpected economic setbacks during the early 2000s, and ultimately open on October 20, 2005 – just three years after the originally schedule opening date.

CONCLUSIONS

Among the lessons learned from this unique and innovative project, the following stand out for consideration by others considering the use of PPPs for expediting the delivery of infrastructure improvements supporting and supported by economic development:

- ***Partners to a PPP Must Share a Commitment to the Vision of the Project and Provide Continuity Throughout the Development and Execution Phases.*** The Atlantic Station redevelopment and its signature 17th Street Bridge reflect an ambitious vision shared by the Development Group of Jacoby Development and AIG Global Real Estate Investment Corporation, as well as the City of Atlanta and the State of Georgia, all of which recognized the substantial economic, environmental, and transportation benefits that could accrue from the project, generating economic benefits for the state and the city many times the investment of private and public capital to make the project a reality. In particular, the key players in the process, including the Development Group, have remained together in supporting and nurturing the redevelopment project through the many technical, financial, regulatory, and institutional obstacles that confront such a project, particularly in its early formative years.
- ***Buy-in from the Highest Level Officials is Essential to Timely Review and Approval of Regulatory and Institutional Requirements.*** The Governor of Georgia and the Mayor of Atlanta became ardent supporters of the redevelopment project when they understood its potential to greatly enhance the appearance and commercial viability of the Midtown area, revitalize downtown Atlanta as a place where urban professionals could find a place to “live-work-play” with minimal use of an automobile. Their support proved essential to gaining timely zoning changes and arranging state funding for selected amenities of the project, including the 17th Street Bridge.
- ***Project Participants Must be Flexible in Developing the Project and Confronting Obstacles with “Outside the Box” Solutions.*** The U.S. EPA employed its innovative Project XL Program process to expedite the redevelopment project through the environmental clearance process and enable the 17th Street Bridge to be considered a Transportation Control Measure, thus enabling it to be built at a time when the Atlanta Metropolitan Area was not in conformity with Clean Air Act emission standards. While using the traditional design-bid-build contracting approach to project delivery, GDOT put the project on a fast track to expedite delivery of the bridge since there was a PPP

arrangement to share the project costs between public and private sponsors. These innovations enabled this ambitious project to be realized despite significant potential regulatory hurdles.

- ***Project Stakeholders Should Maintain a Spirit of Openness and Cooperation, Soliciting Inputs and Communicating with Each Other and the Public Along the Entire Development Process.*** The Development Group and its major public agency stakeholders regularly shared information with all groups involved in the project or likely to be affected by its completion through a series of meetings, briefing, and reports during the formative years of project development. This provided the necessary transparency that promoted trust among the stakeholder groups interested in the project.

Under the Project XL agreement, the Development Group is committed to continuously monitoring numerous performance measures and annually reporting on the progress of the redevelopment project and the achievement of defined performance targets relating to emissions, groundwater quality and runoff, transportation volumes and modal use, and energy consumption. These take the form of status reports, stakeholder meetings, and postings on the following Atlantic Station web site:

<http://www.atlanticstation.com/home.php>

- ***Use Innovative Funding to Expedite the Bridge Development and Provide Legitimacy to the Overall Redevelopment Project.*** The existence of state statutes allowing the use of public-private partnerships enabled the 17th Street Bridge project to be completed on schedule and serve as a catalyst for continued financing and development of the entire redevelopment project. The resulting bridge is considered a landmark of the city, given its multi-modal and pedestrian-friendly design and unique citizen-chosen yellow color.
- ***It is Possible and Beneficial to Integrate the Objectives of Economic Development, Environmental Remediation of Brownfield Sites, and Transportation Improvements through a Win-Win PPP Arrangement.*** The Atlantic Station project provides a model for infill development and smart growth that is made possible by the value capture resulting from the remediation of a well-situated brownfield site and the accessibility provided by multi-modal transportation infrastructure and services aimed at reducing both the level of travel and air pollution compared to the alternative of suburban sprawl.
- ***Unique Situations Require Unique Approaches.*** The Atlantic Steel Mill site represented a unique opportunity to remediate a downtown brownfield site next to an existing residential neighborhood that closed in 1998 with little economic or tax benefit to the city or its citizens. This project combined a number of innovative approaches, including:
 - Joint public-private funding of a major bridge,
 - Environmental streamlining by designating the bridge and the entire redevelopment project as a Transportation Control Measure,
 - Tax increment financing by the city to help fund infrastructure and environmental remediation requirements on the site,
 - Transit-oriented development and transportation management,
 - Smart growth and urban block design concepts, and
 - Environment justice considerations.

These many innovative concepts were combined with advances in traffic management, groundwater management, and green building design to produce a jewel of urban design and function, comprising multiple land uses organized into compatible zones and linked by multi-modal transportation facilities and services that will generate significant long-term economic benefits for the city and financial rewards for the Development Group which originated the redevelopment project.

NEXT STEPS

The Atlantic Station project officially opened in late 2005 and is expected to be built-out over the next decade. Already there are many stores, restaurants, hotel rooms, and office tenants on site and many more commercial and residential projects underway or planned. In its June 8, 2006 Business Section, the Atlanta Journal Constitution recently referred to Atlantic Station's sold-out high-rise condominium and hotel tower "the Sexiest Address in Metro Atlanta." Named the *Twelve*, this 26-story building sold out its condo units in just 11 weeks. More recently, a 46-story, 400-unit condominium tower named the *Atlantic* was announced for construction on 17th Street. In the meantime, as development efforts accelerate based on the early success of Atlantic Station, the Development Group continues to monitor the environmental and transportation performance characteristics of the project and annually report on the results relative to earlier projections.

CHICAGO SKYWAY OPERATING LEASE

PPP Delivery	Construction/ Development Period	Concession Period	Contract Value	Status
Operating Lease	N/A	99 Years	\$1.83 billion	In Operation

SUMMARY

The Chicago Skyway is a 7.8 mile elevated toll road connecting Chicago, Illinois and suburban northwestern Indiana (see Exhibit 3.11). It is the primary highway facility approaching downtown Chicago from points south and east, connecting the Dan Ryan Expressway (Interstates 90/94) to the Indiana Toll Road (Interstate 90). Passenger cars account for over 90 percent of all traffic on the Skyway, with commuters make up 38 percent of weekday traffic.

Exhibit 3.11 – Chicago Skyway Over the Calumet River



Source: Christopher Smith / The Times of Northwest Indiana, 2006. URL: <http://www.tollroadforsale.com/images/slide10.html>

In October 2003, Chicago Mayor Richard M. Daley announced his plans to seek a long-term concession for the Skyway that would turn over responsibility for operating and maintaining the facility, including the collection of tolls, in return for a lump sum payment to the city at the beginning of the concession period. Following a request for qualifications process that reduced

the number of potential bidders from ten to five, three teams ultimately submitted bids in 2004 ranging from \$505 million to \$1.83 billion. The city announced that the Cintra-Macquarie consortium (called the Skyway Concession Company, LLC) submitted the winning bid in October 2004, and the concession deal closed in January 2005, with the consortium assuming operating responsibility immediately upon closing.

This long-term lease agreement represents the first privatization of an existing toll road in the United States. It predates by more than a year the seventy-five year operating lease for the 154-mile Indiana Toll Road, recently awarded to the same concession team of Cintra/Macquarie by the State of Indiana. This second long-term lease of an existing toll facility will provide an up-front payment of \$3.85 to Indiana. Both deals have dramatically changed the way tolled highway facilities are being viewed by their government sponsors – as valuable assets whose future cash flows can be turned into ready cash for cash-strapped state and local governments.

The Skyway deal occurred largely because of the willingness and capability of both public-sector sponsors and private-sector companies to apply innovative project financing and delivery approaches to maximize the present value of the facility. The resulting public-private partnership between the City of Chicago and the Skyway Concession Company provided the basis for repositioning the Chicago Skyway as a going concern that offers significant value capture potential to both parties. This is in sharp contrast to how the Skyway was perceived over much of its service life – that of an aging link in the Chicago-area highway network requiring major outlays for reconstruction or expansion and limited cash flow potential due to the public sector's inability to raise tolls to support these needs.

BACKGROUND

The Chicago Skyway opened to traffic in April 1958 as the tail end of a chain of toll superhighways connecting New York City and Chicago that was planned prior to creation of the Interstate highway system. The 7.8 mile elevated highway was originally constructed by the City of Chicago between 1956 and 1958 and subsequently operated and maintained by the city's Department of Streets and Sanitation. It is a rare municipally-owned facility bridging a portion of the Interstate highway system. It is the only toll highway facility in Illinois that is not operated by the Illinois State Toll Highway Authority. The Chicago Skyway is legally referred to as a toll bridge with long approaches (formally the "Chicago Skyway Toll Bridge System"), since under Illinois statutes incorporated cities are not permitted to operate toll highways. The facility originally cost \$101 million to construct over a period of 34 months.

The Chicago Skyway facility is entirely elevated and features a 120-foot high, ½ mile-long steel truss bridge over the Calumet River. It provides three traffic lanes in each direction, with a mainline toll plaza at its midpoint. There are six partial interchanges west of the toll plaza and two partial interchanges east of the toll plaza, as shown in Exhibit 3.12. All vehicles using the Skyway must pay the toll, with westbound (Chicago-bound) traffic entering the facility through two interchanges east of the toll plaza, and eastbound (Indiana-bound) traffic entering through six interchanges west of the toll plaza. There is a rest area with a McDonald's restaurant adjacent to the mid-point toll plaza, which makes concession payments to the Skyway operator.

Exhibit 3.12 – Chicago Skyway Alignment and Interchanges



Source: Skyway Concession Company, LLC, 2005. URL: <http://www.chicagoskyway.org/routes/>

From the start, traffic volume on the Skyway was well below projections, generating only half the revenue planners had projected in its first year of operation. To complicate the situation, several parallel freeways were soon developed by the departments of transportation in Illinois and Indiana. As a result many commuters used these alternate “free” routes to avoid paying the Skyway’s toll, causing Skyway traffic to drop to one-fifth of projected levels.

During the 1960s the city defaulted on its Skyway bond payments and was forced to subsidize the facility’s operating and maintenance costs. In the 1970s, 80s, and 90s, Skyway bondholders took the city to court several times to have the toll rates on the facility increased to enable the facility to pay its debt service costs, including deferred payments. The resulting toll increases had the opposite effect as the higher tolls created a downward spiral in traffic volumes as even fewer motorists used the facility. This led to calls for even higher tolls. With limited funding to operate or maintain the Skyway, the city was forced to defer maintenance on the facility during the 1970s and 1980s, causing it to fall into a state of disrepair. For a time the city considered

demolishing the facility and connecting I-90 to other State routes in northeast Illinois via other routes.

In recent years traffic growth on the Skyway has been fueled by suburban development in the Indiana counties of Lake and Porter and worsening congestion on competing, non-toll facilities in both Indiana and Illinois. In addition, the development of a casino in Hammond, Indiana, less than a mile from the Skyway's eastern terminus, generated additional trips on the facility. As a shortcut connecting out-of-state commuters and through traffic with downtown Chicago, an estimated 50 percent of Skyway commuters originate from or are bound for Indiana.

The growth in traffic generated additional toll revenue to fund much-needed improvements on the dilapidated facility, as shown in Exhibit 3.13. The city invested \$300 million to reconstruct the roadway between 2001 and 2004, reducing the operating and maintenance costs associated with the facility's steel structures by replacing certain elevated segments with a raised at-grade roadway built on fill dirt. By 2002, the last full year before construction-related delays forced motorists to use alternate routes, the facility attracted 18.7 million motorists and \$43 million in annual revenue, twice as much as when tolls were last raised to \$2.00 in 1993. Currently the Skyway handles about 50,000 passenger vehicles per day.

Exhibit 3.13 – Underside of Elevated Portion of Chicago Skyway During Rehabilitation



Source: K&K Iron Works, Inc., URL:
http://www.kkironworks.com/sitebody/projects/structural/chicago_skyway.html

With the facility newly rehabilitated and generating a steady stream of revenues, the city of Chicago sought to monetize the net present value of the Skyway by leasing the facility to a private consortium under a long-term contract that provides significant opportunities for the lessee to increase toll rates on a prescribed basis. As a result, the city would transfer the risks associated with operating an infrastructure facility outside of its core competency, and also rid itself of an asset that was not core to its mission. It would also have a sizable payment which could immediately be used to reduce the city's debt, establish reserve funds, and invest in various city programs.

PROJECT DESCRIPTION

The project involves the private sector operation, maintenance, and renewal of the entire Skyway facility for a period of ninety-nine years, ending on January 24, 2104. The Skyway Bridge toll plaza is shown in Exhibit 3.14. Tolls may be no higher than is specified in the agreement between the consortium and the City of Chicago, which retains ownership of the facility and continues to police the facility under paid contract with the concession consortium. The operator must comply with 300 pages of detailed operating standards to assure safety in operations and capital maintenance that meet high engineering standards during the full term of the lease. At the end of the ninety-nine year operating lease, the facility will revert back to the city in a reasonable condition, unless the agreement is extended beyond this period.

Exhibit 3.14 – Chicago Skyway Toll Plaza



Source: Christopher Smith / The Times of Northwest Indiana, 2006. URL: <http://www.tollroadforsale.com/images/slide10.html>

There are no non-complete clauses in the agreement prohibiting the development of parallel capacity, but a new highway in this highly-corridor would be highly unlikely given the density of urban development surrounding the Skyway. Segments of existing parallel highways, however, such as the Indiana and Illinois DOT-owned-and-operated expressways comprising Interstate 94, and the Illinois State Toll Highway Authority-owned-and-operated Northwest Tollway (I-294), are in the midst of improvement programs to relieve congestion, which could impact Skyway traffic when completed. Despite this, Skyway investor Macquarie notes that the Skyway facility has “significant” unused capacity, which makes the Skyway attractive to motorists who value the route’s time savings over the cost of the toll.

PROCUREMENT PROCESS

The City of Chicago conducted a competitive procurement process in which it issued a request for qualifications from potential concessionaires. Goldman, Sachs & Co., and Loop Capital Markets served as financial advisors to the city. The city received qualifications from 10 teams, five of which were deemed technically and financially qualified to bid on the concession. The five teams were provided additional information about the Skyway as well as the opportunity to comment on the city's draft of the concession agreement, which would be common to all bidders. The qualified bidders were then invited to submit competitive sealed bids on the amount they would pay under the terms of the ninety-nine year lease agreement.

Three firms submitted bids: Cintra-Macquarie, with a bid of \$1.83 billion; A group led by French Vinci Concessions and French toll operators Autoroutes du Sud de la France (ASF) and Cofiroute, \$700.5 million; and Abertis Infraestructuras, which bid \$505 million. The city reserved the right to reject all bids if none met the city's reserve price, which was reportedly between \$1.0 and \$1.2 billion.

Ultimately, the city selected the Cintra-Macquarie bid, which was over 2.5 times higher than its next closest competitor's offer. The city council approved the agreement between the consortium and the city in October 2004, and the deal closed on January 26, 2005. Cintra represents 55 percent of the partnership and Macquarie Infrastructure Group represents the remaining 45 percent.

The concession consortium plans to invest an additional \$60 million in capital improvements to the Skyway in 2006 and 2007, completing elements of roadway reconstruction not addressed by the city's Skyway improvements in 2003 and 2004. Projects include upgrading 19 bridges, resurfacing four miles of roadway, and reconfiguring toll plazas to ease traffic flow, including the introduction of dedicated electronic toll collection lanes. The eastbound lanes will be improved in 2006, followed by the westbound lanes in 2007.

PARTNERSHIP ARRANGEMENT

The public-private partnership involves a long-term operating lease in which the private sector concessionaire, Skyway Concession Company, LLC, is responsible for operating and maintaining the facility and collecting all toll and concession revenues on the facility for ninety-nine years in exchange for an up-front lump-sum payment to the City of Chicago, which retains ownership and continues to police the facility.

Private Sector Partner Roles and Responsibilities

Skyway Concession Company is a consortium owned by Cintra Concesiones de Infraestructuras de Transporte, S.A., and Macquarie Infrastructure Group. Cintra has a 55 percent stake in the consortium while Macquarie has a 45 percent stake. Both entities are partners responsible for the 407 Electronic Toll Road (ETR) just north of Toronto, Canada. This was the first totally privatized toll facility in North America and operates with no toll booths, using instead electronic toll collection (ETC) and photo-recognition systems to issue late fees to patrons who use the facility without having a transponder to automatically pay the toll upon exiting the system.

Headquartered in Madrid, Spain, Cintra is one of the world's leading private developers of transport infrastructure, managing 18 toll highways (more than 1,100 miles) in Spain, Portugal, Ireland, Chile, and Canada. Teaming with Zackary Construction of Texas, Cintra has a

comprehensive development agreement with the Texas Department of Transportation to develop Trans Texas Corridor I-35 corridor between Oklahoma and Texas, with initial plans to construct a toll road between Dallas and San Antonio.

Macquarie Infrastructure Group is an Australian-based infrastructure investment fund. Macquarie has invested in over a dozen toll facilities worldwide, including the Dulles Greenway in Virginia, the new South Bay Expressway near San Diego, California, and most recently the Indiana Toll Road.

Public Sector Partner Roles and Responsibilities

The public partner and project sponsor is the City of Chicago, owner of the Skyway and manager of the concession. In exchange for the up-front lump-sum payment from Cintra-Macquarie to operate and maintain the facility, the city relinquished any claim on toll and concession revenues for a period of ninety-nine years. However, the city retains title to the facility and will keep any revenues collected from advertising on the facility. For the duration of the lease the Chicago Police Department will continue to patrol the tollway, for which the city will be reimbursed by the concessionaires at a rate of \$6 million per year. At the end of the ninety-nine year contract term, the facility will revert back to the city which can then decide whether to extend the operating lease, renegotiate the operating lease, procure a new operating lease through competition, or retain operating control of the facility within city government.

LEGAL AUTHORITY

Under the constitution of the State of Illinois, the City of Chicago, as a home-rule unit of local government, “may exercise any power and perform any function pertaining to its government and affairs.” As a result, the only approval required to lease the Skyway concession was that of the Chicago City Council, which voted in October 2004 to approve the lease agreement between Cintra-Macquarie and the city. A second ordinance passed by the council specified how the city would spend funds earned from the sale of the concession. The only other potential impediment that could have impeded the operating lease agreement was possible opposition by the Federal Highway Administration (FHWA), which had helped the city with early funding of the project’s approach roads linking it to other non-tolled interstate roads. However, the FHWA was supportive of the operating lease concept as a public-private partnership and did not require repayment of the early investment of federal funding in facility-related access roads.

FUNDING AND FINANCE

Cintra-Macquarie’s Skyway Concession Company paid the city \$1.83 million for the right to operate the Skyway and collect the facility’s toll and concession revenues for a period of ninety-nine years. The consortium used a combination of private equity and financing to fund the up-front concession payment to the city. This included taxable bonds, partner equity, and bank debt.

At contract signing in January 2005, the up-front payment was financed with \$880 million in sponsor equity (corresponding with Cintra’s 55 percent stake in the Skyway Concession Company and Macquarie’s 45 percent stake) and a \$1.19 billion 9-year term loan from Spanish bank Banco Bilbao Vizcaya Argentaria (BBVA); Calyon, French bank Crédit Agricole Group’s corporate and investment bank; Ireland-based Depfa Bank plc; and Spanish bank Banco Santander Central Hispano, S.A. (SCH). By August 2005, the deal was refinanced when the partners issued \$1.4 billion in AAA-rated bonds plus \$150 million in subordinated debt. As a

result of the refinancing, the shareholders recovered \$400 million of their initial equity invested in the project.

In association with the concession transaction, Chicago Skyway tolls were raised in February 2005 by \$0.50 to \$2.50 for automobiles and \$1.20 per axle for vehicles with three or more axles. To discourage trucks and other heavy vehicles during peak hours the facility applies a heavy vehicle surcharge of 40 percent between 4:00 a.m. and 8:00 p.m. daily.

Over time the concession agreement allows the consortium to raise tolls by the greater of CPI or contractually-specified limits growing from the present \$2.50 toll to \$5.00 by 2017. Beyond 2017 the concession may raise tolls by CPI, nominal GDP per capita, or 2 percent annually, whichever is greater.

Prior to the concession agreement, all tolls on the Skyway were paid with cash. With the start of the operating lease in January 2005, the new Skyway operators modernized the Skyway's toll collection system by instituting an interoperable ETC system, that could accommodate both the Illinois State Toll Highway Authority's I-PASS transponders and the northeastern U.S. toll consortium's E-ZPass transponders. This has eliminated 15-minute peak-period wait times at the Skyway toll plaza for motorists with transponders.

Use of Proceeds from the Chicago Skyway Concession

An important aspect of the Chicago Skyway operating lease is the disposition of the \$1.83 billion up-front payment to the city. To gain public support for the deal and ensure City Council approval, the Mayor committed that the proceeds from the \$1.83 billion up-front payment would be used "to invest in our people and protect Chicago's taxpayers both today and in the future," according to Dana R. Levinson, City of Chicago Chief Financial Officer at the time of the contract signing. To accomplish this, city leadership elected to refund existing Skyway and other city debt, create several general reserve funds, and invest in neighborhood social programs. The city allocated the Skyway deal proceeds as follows:

- \$500 million for a long-term reserve fund (27%);
- \$375 million for a mid-term annuity that will serve as a rainy day set-aside to smooth the effects of economic cycles on the city's fiscal position (21%);
- \$100 million to fund quality-of-life investments in city neighborhoods, including assistance programs for needy residents, affordable housing and homeowner programs, job creation programs, and facilities and programs for school children and senior citizens (6%);
- \$463 million to refund existing Skyway debt (25%); and
- \$392 million to refund long- and short-term debt and to pay other city obligations (21%).

Almost half of the proceeds went immediately to retire city debt, thereby improving the credit rating for the city and reducing its costs of borrowing.

For its part, the Cintra/Macquarie partnership initiated a major capital improvement program for the Skyway, including upgrading bridges, resurfacing pavement, and reconfiguring approach and departure lanes at the toll plaza to facilitate traffic flow and access to the ETC lanes.

Among the purposes cited by city leadership for applying the up-front payment, only the retirement of Skyway debt had any direct relationship to transportation, where much of this debt was incurred to fund the recent rehabilitation project completed in 2004, prior to the start of the

operating lease. There was no specific use specified for the proceeds to rehabilitate or expand transportation facilities or services for the benefit of the citizens of Chicago. This has become a major issue among sponsors of highway infrastructure, who are concerned that these kinds of deals will lead to the diversion of the value associated with existing tolled highways to non-transportation purposes, with little opportunity to use the proceeds to rebuild or expand other existing highway facilities or to fund the development of new facilities.

Use of Proceeds from the Indiana Toll Road Concession

Following the Chicago Skyway deal, a Cintra-Macquarie consortium submitted the winning bid in January 2006 of \$3.85 billion for a concession to operate and maintain the Indiana Toll Road for a period of seventy-five years. The Indiana Toll Road is a 157-mile highway (I-80/90) that runs across the state's northernmost tier of counties, from the Chicago Skyway in the west to the Ohio Turnpike in the east. The facility carries 50 million vehicles annually. The Indiana Toll Road concession, inspired in part by the success of the Skyway concession deal, received approval by Indiana's legislature in March 2006.

The issue of how to use the proceeds from the concession operating lease became an important differentiator in developing the Indiana Toll Road operating lease agreement. Unlike the Chicago Skyway deal, the Indiana deal calls for a major portion of the \$3.85 billion up-front payment to go to help fund the shortfall in statewide transportation program funding, in addition to a \$4.4 billion commitment to upgrade the Indiana Toll Road over the term of the contract (including \$200 million to be spent over the next three years). In addition, the partners committed \$6 million per year to fund police service on the Toll Road, \$150,000 to reimburse the State for the costs of contract administration, and a one-time \$5 million payment made to the State upon contract closing to replace the State Police Post serving the facility and for equipment and vehicles used by the State on the facility.

Proceeds from the \$3.85 billion operating lease will be used to repair and rebuild highways across the state. This includes helping to accelerate the long-planned extension of I-69 from Indianapolis to Evansville. There is about \$794 million to fund local transportation improvement projects in each county of the State.

- Individual counties will receive from half a million dollars to over \$11 million each, depending on the size of their population and transportation program needs. Most of the counties will get between \$1-2 million, amounting to over \$150 million over the next three years.
- \$100 million in funds are set aside for the seven counties along the Toll Road which will be most impacted by the toll increases slated for the facility over time.
- \$200 million is designated to support economic development in the northwestern part of the State.
- \$344 million is slated for additional transportation upgrades in counties along the Toll Road Corridor.

These local commitments represent about 20 percent of the total up-front payment to the State from the seventy-five year operating lease.

INSTITUTIONAL CONTEXT

A number of institutional factors facilitated development of the Chicago Skyway operating lease as an innovative project from the perspectives of project funding and financing, use of new technologies, and structure as a public-private partnership. Several factors are discussed below:

- ***Strong Political Leadership and a Defined Project Champion.*** The ninety-nine year Skyway operating lease is the first Public-Private Partnership of its kind in the United States, and it took a strong political leader with the influence and legislative support that Mayor Daley had to make this conceptual deal a reality. Mayor Daley personally spearheaded the project and served as its champion. Supporting the Mayor's interest in this project were two key factors:
 - A newly rehabilitated asset worth upwards of a billion dollars that the city had no interest in continuing to operate; and
 - A growing budget deficit and limited finances to cushion the city in the event of an economic downturn.

Through the concession agreement the Mayor was able to convert an obligation with limited financial potential if left under city operation into an opportunity to address a number of fiscal challenges facing the city. With a long tenure in office and strong public support, Mayor Daley had the experience and political capital to take the Skyway operating lease concept to a contract. With almost \$2 billion suddenly available to the city's coffers, any political opposition to the deal quickly evaporated and the City Council promptly approved the deal shortly after it was awarded to the Cintra-Macquarie team.

- ***Large and Growing Metropolitan Population.*** The population of northeastern Illinois is projected grow by 24 percent over the next 25 years, growing from just over 8 million today to over 10 million by 2030. Employment is expected to grow by 29 percent to 5.6 million. These growth patterns will produce increasing demand for regional infrastructure which underscores for investment value of tolled highway facilities within highly developed urban corridors, such as the Skyway alignment where there is little opportunity to build additional parallel capacity.
- ***A Facility with a Long-Term Performance Record and Stable Revenues.*** While the Skyway had a troubled history in terms of traffic and revenues, its performance record in the dozen years preceding the concession was one of steady growth. Revenue doubled to \$43 million between the city's last toll increase in 1993 and 2002, the last year before the city began rehabilitating the Skyway infrastructure to prepare it for possible privatization through lease. Furthermore, an independent traffic and revenue study commissioned by the city prior to the concession sale projected that increasing tolls on the facility, while slightly reducing traffic, would improve annual revenues, thus indicating the Skyway's days of the downward spiral in traffic and revenue following court-mandated toll increases could be behind it. Following the \$0.50 toll increase in February 2005, traffic on the facility from January through November 2005 was down only 0.3 percent, while revenue was up 25 percent, surpassing analysts' projections.
- ***Recent Capital Investment in the Facility.*** Prior to completing the lease agreement, the city finished approximately \$300 million in improvements to the Skyway. Although additional improvements to the facility would be required, the Skyway was handed over

to the concessionaire in a relatively good state of repair relative to its historically dilapidated condition. This likely increased the size of the bids for the Skyway as concessionaires would not have to make these improvements themselves and face decreased traffic levels due to the rehabilitation efforts. By taking the lead in rehabilitating the facility prior to commencing the competition for the operating lease, the city relieved the prospective bidders of the traffic and financial risks associated with taking over a mature asset which had been subject to many years of deferred maintenance.

- ***No Directly Competing Parallel Facility.*** The Skyway is currently the shortest route to downtown Chicago from northwestern Indiana, providing an estimated time savings of 20 to 45 minutes versus other routes, depending on the time of day. This provides the private consortium with assurance that traffic volumes will continue to remain robust, even as toll increase. Moreover, the risk of the state or local government building or expanding a competing non-tolled facility parallel to the Skyway is mitigated by the lack of available right-of-way to site such a facility, given the density of urban development proximate to the Skyway.
- ***Potential for Efficiencies through Modernization.*** Under the city's operation the Skyway continued to accept only cash as toll payment, despite the introduction of the I-PASS electronic toll collection system on nearby Illinois Tollway facilities. This presented the eventual concessionaire with significant opportunity to modernize toll collection and other aspects of operation to reduce operating costs on the facility. The introduction of electronic toll collection will reduce the number of toll collectors needed on the Skyway and increase its throughput capacity by enabling patrons to pay their toll without having to stop. This improvement will enable the facility to attract additional patrons as wait times to pay tolls could be virtually eliminated.
- ***Seamless Transfer of Operations from the City to the Consortium.*** At the time the deal closed, operation of the Skyway seamlessly shifted from the city to the consortium. This required joint planning and execution of the logistical requirements for transfer by both the city and the consortium, and demonstrated the commitment by both parties making up the public-private partnership to the successful launch of the deal.

ISSUES AND STRATEGIES

There were several potential impediments to the implementation of the Chicago Skyway operating lease which could have slowed or even stopped the initiative. The following section discusses the most significant impediments and the strategies used by project partners to successfully complete the deal that provides for long-term stewardship of this critical transportation link and a sizable cash payment for use by the City of Chicago to address a number of its fiscal challenges. This section will also discuss several impediments that could threaten the success of the Chicago Skyway concession in the long term:

- ***Limited Competition from Neighboring, Non-Tolled Expressways.*** While no other highway offers the time savings between Indiana and the Loop that the Skyway does, the Indiana DOT and Illinois DOT freeways comprising I-94 as well as the Illinois State Toll Highway Authority's Tri-State Tollway (I-294) offer alternate routes from Indiana to the city and its Illinois suburbs. As capital improvements aimed at alleviating congestion on these highways are completed in the coming years, the Skyway may see some traffic divert to the improved facilities. In addition, job growth in the Chicago metropolitan area

is fastest in the suburbs, northwest of the City, which are better accessed from Indiana via these alternate routes.

There are several factors that will likely mitigate any significant impact of traffic diversion to alternative routes. The most significant is the lack of affordable, available property to site any new or expanded facilities. The second factor is the continued growth in the region, which will likely produce more travel demand than any combination of highway facilities will accommodate. This latent demand will readily compensate for any such diversion, enabling traffic levels on the Skyway to continue to expand until the facility reaches its effective capacity (which is being increased due to facility improvements and conversion to electronic toll collection).

- ***Slower Population Growth in Neighboring Indiana Counties who's Commuters Use the Skyway.*** While the Chicago area has experienced extraordinary growth in recent years, forecast population growth is expected to be much slower over the next 30 years in northwestern Indiana than the metropolitan area as a whole. Slower population growth in the counties that are home to most Skyway commuters may limit growth in toll revenue on the facility relative to projections based on recent trends.

The long timeframe for the Skyway operating lease (ninety-nine years) provides a significant hedge against economic and demographic shifts, particularly of a cyclical nature. With the award of the Indiana Toll Road operating concession to the same consortium team that runs the connecting Skyway, efforts are underway to implement a compatible electronic toll collection system on that facility as well. This will enable patrons to use both facilities without even having to stop to pay tolls, thereby enhancing the attractiveness of this interstate route, even after accounting for increasing toll rates.

- ***Difficulty Calculating Net-Present Value of Ninety-nine Year Lease.*** Standard financial planning techniques apply a discount rate to future revenues to calculate the net present value of an investment. When the time horizon of analysis stretches beyond a 20- to 30-year period (depending on the discount rate applied), the net present value of proceeds in outer years becomes negligible. This becomes problematic when evaluating the value of a-year concession using net present value as a basis as proceeds from much of the concession period do not affect the result. The wide variance in bids for the Skyway—from a low of \$505 million to the winning bid of \$1.83 billion—illustrates the methodological difficulties inherent in measuring the value of such a long-term investment, particularly when the concession period extends beyond 30 years.

To overcome this analytical dilemma, the winning consortium team converted all future costs and revenues to a single net present value that recognized the effects of escalating toll rates, the price elasticity of demand of a growing number of travelers in the corridor, and life-cycle cost control through the application of asset management techniques. In addition, the winning consortium employed private-sector financing resources that included a short-term bank loan and convertible equity, involving patient capital with modest rates of return. By using taxable debt to finance this project, the private sector concession team sought to take advantage of permitted tax credits during the initial years of the development contract. Each of these factors boosted the size of the winning bid. This strategy was successful, as the winning consortium was able to convert half of its direct equity invested in the project bid to taxable debt at a significant premium for the members of the consortium team.

- **Regulated Toll Regime that Makes No Allowance for Facility Congestion.** In the near term, critics of the Skyway concession will fault the city for allowing tolls to double over a span of 12 years, from 2005 to 2017. Beyond 2017, tolls may grow at the fastest of several rates of inflation or a minimum of 2 percent. These toll rates should ensure free-flow traffic conditions on the Skyway during peak periods given the following:
 - Traffic volumes currently using the facility;
 - Projected residential and employment growth patterns over the next 20- to 30-years for the area served by the Skyway; and
 - Increased throughput capacity resulting from the implementation of open road tolling using electronic toll collection technology that is compatible with what is used by toll agencies in Illinois and most northeastern states.

Over the course of the ninety-nine year concession, however, congestion on the Skyway may worsen as travel demand increases beyond the capacity of the facility. The toll regime specified in the concession agreement does not allow any increase in toll rates after 2017 beyond inflation or nominal GDP per capita, even to ensure free-flow traffic conditions. Without the ability to apply congestion pricing, the Skyway may become so congested that the effective throughput capacity of the facility decreases. This would reduce the optimal revenue potential of the facility after the effective capacity of the facility is exceeded. Hence the concession agreement may bind Skyway operators to a pricing scheme that results in a reduction of both facility capacity and revenue, to the detriment of both investors and patrons of the Skyway.

To remedy this situation, the lease agreement would need to be amended permit congestion pricing when the facility reaches a level of service that causes a reduction in throughput capacity. This could produce a significant windfall to the concession team. To avoid public backlash against the imposition of congestion pricing and the earning of excessive profits by the concession team, the increased revenues resulting from congestion pricing could be dedicated to or shared with the city.

- **Future Political Uncertainty.** The concession agreement is a fully enforceable contract between the Cintra-Macquarie team and the City of Chicago, ratified by a vote of the Chicago City Council. At the present time, both the mayor who brokered the deal and many of the aldermen who supported it remain in office and are satisfied with the concession arrangement. Over a span of ninety-nine years, however, changes in the political landscape could result in efforts to overturn or tamper with the agreement—especially after the original cash proceeds to the city are committed or spent. Such a scenario would most likely occur if it is perceived that the concessionaires are receiving windfall profits from the facility. Given current traffic and land use patterns, such a scenario will not likely occur for several decades.

To protect itself from political tampering, the lease agreement stipulates specific financial remedies due the concession team if the city were to prematurely terminate the deal or otherwise interfere with the ability of the concession team to generate revenue from the facility under the terms of the contract. Such penalties would place a significant financial burden on the city for renegeing on the contract terms.

RESULTS

The near-term results of the Skyway concession appear to be quite positive:

- The city immediately used a significant portion of the proceeds from the Skyway operating lease to reduce its debt, thereby increasing its credit rating and lowering its cost of future borrowing;
- The city is able to deliver on a number of social and neighborhood improvement programs made possible by proceeds from the Skyway deal;
- The facility is being well maintained in accordance with the provisions of the lease agreement;
- The concessionaires are making further capital improvements to the facility to increase its effective capacity and reduce the need for near-term rehabilitation efforts that could otherwise impede traffic flow and reduce future toll revenues when rates would be higher;
- The concessionaires have integrated the Skyway toll collection system with the technologies used on the connecting Illinois Tollway, thereby expediting the implementation of electronic toll collection on the Skyway;
- Patrons of the facility (motorists and truckers) are experiencing reduced wait times at the Skyway toll plaza since the introduction of electronic toll collection; and
- The concessionaires are moving to enable some lanes to become free-flow through the main toll plaza with the implementation of open road tolling technologies and equipment with which they have significant experience.

In the intermediate to long term it will be some time before the deal's outcomes can be assessed. The largest question looming over the Skyway deal is whether the city or the concession team will obtain the greatest value from the deal. The answer to that question will ultimately depend on Skyway traffic, which hinges on such variables as the economic health of the Chicago region, land use and development patterns, traffic and congestion on competing facilities, regional job growth patterns, political stability, and the performance of the consortium. Given the substantial up-front investment by the consortium and the lengthy duration of the concession, it will be decades before results are known, and even then the answer will assuredly be subject to debate.

The Chicago Skyway operating lease is a significant development in the advancement of public-private partnerships for highway programs and projects in the United States. The Skyway deal broke new ground in a number of important areas:

- Length of the contract term: ninety-nine years allows the deal to be considered a private operation to permit depreciation of the asset for tax purposes;
- Life-cycle operating lease: including provisions for operations, maintenance, and rehabilitation;
- Absence of a non-compete clause: which removes stigma of impeding transportation improvements in the corridor;
- Prescribed criteria and schedule for toll increases: thereby removing the risk of public sector reluctance to increase toll rates;

- Award based on maximum net present value, with proceeds provided to the sponsor for immediate use;
- Reliance on taxable debt and equity to finance the deal using private sector sources; and
- Prompt transition and implementation of electronic tolling.

The Skyway deal is already having significant repercussions throughout the highway development and investment community as similar concession deals are being proposed and evaluated in a number of states and regions across the nation. Indeed, the neighboring state of Indiana modeled its recent long-term operating concession on the Skyway deal, making adjustments based on lessons learned from the Skyway process and resulting deal, the condition and utilization of the Indiana Toll Road, and the unique political and institutional characteristics of the State of Indiana.

Perhaps the greatest legacy of the Chicago Skyway deal is that it demonstrated the potential for public and private partners to apply innovative financing and asset management techniques to highway infrastructure in the United States to maximize the value capture for both public and private sector partners to the deal. Instead of one side being declared a winner and the other side a loser from the deal, the Chicago Skyway long-term operating lease offers the potential for both sides to declare victory – sharing the value capture to their mutual benefit.

CONCLUSIONS

Although it is still too early to assess the long-term outcomes of the Skyway operating lease, there are a number of lessons learned from the Skyway deal that can benefit other agencies considering the application of a concession arrangement to the financing, development, and stewardship of their highway transportation assets. These are listed below:

- ***Public Agencies in the United States, under the Right Conditions, Can Privatize their Highway Assets.*** The Skyway concession represents a significant leap forward in the trend toward privatizing tolled highway facilities in the United States. This is the first existing toll road to be privatized in this country. It paves the way for other similar arrangements to follow in other parts of the country, such as the recently approved operating lease for the Indiana Toll Road, at the Skyway's eastern terminus.
- ***Political Leadership Seals the Deal.*** Without the presence of a strong and visionary leader like Mayor Daley, the Skyway deal would probably have fallen apart. The mayor assembled a team of well-qualified advisors to support the city in its dealings with potential concessionaires, and reaped the benefits of a large payment and smooth transition to private management. As the deal's principal public sector champion, the mayor also ensured the deal would survive politically, achieving buy-in from all 45 of the city's aldermen who voted unanimously to approve the lease agreement once the details of the deal were presented to them.
- ***Transparent Process Levels the Playing Field.*** The city ensured that its selection process was transparent, outlining the process on its web site and keeping the public informed through regular press releases. The city and its advisors were also successful in publicizing the sale to the tolling and infrastructure equity community, receiving no fewer than 10 statements of qualifications from various domestic and international teams. The five teams deemed qualified to bid by the city's financial advisors were further involved in a process by which the teams were invited to review and comment on the

proposed lease agreement, as well as conduct a thorough inspection of the Skyway's finances and facilities.

- ***Ample Documentation Reduced Risks of Skyway Proposals.*** The city had prepared significant documentation to support the privatization process, including historical and current information on the condition of the facility, traffic and revenue, operating costs, and patron characteristics. The city also commissioned a significant rehabilitation of the Skyway facility prior to initiating the privatization procurement process, thereby providing prospective bidders ample documentation on the condition of the facility and reducing the bidders' risks of having to cost the full rehabilitation of the facility as part of the deal. The city reduced the potential of lane closures required during facility repair or rehabilitation on future concession revenues by rehabilitating much of the Skyway infrastructure prior to takeover. One of the consequences of this was to increase the size of the up-front payment proposed by the winning consortium.

NEXT STEPS

With the first year of the Chicago Skyway operating lease completed, early indications from the city and other observers suggest that the transition to privatized operations has been smooth and successful. Besides the toll increase, apparent differences between operations by the city and consortium by the motoring public have been viewed as improvements, especially the introduction of electronic toll payment systems which have dramatically reduced wait times at Skyway toll facilities. At a press conference marking the one-year anniversary of the Skyway deal's closing, Chicago Mayor Daley remarked:

“I'm happy to state that our expectations have been met, and possibly exceeded. Cintra-Macquarie, as the operator of the Skyway, is living up to the letter and spirit of the agreement, and they've been a good partner for the City of Chicago. Both the city and the new operator enjoyed a smooth transition, and Skyway users have already seen the benefits resulting from improvements implemented by the new operators.”

The next step for the Chicago Skyway involves capital improvements to the facility by the Cintra-Macquarie consortium, completing the elements of reconstruction work not performed by the city during its recent program. While construction coincides with projects on adjoining and parallel facilities, which troubles transportation planners in northwestern Indiana, in the long run the project will finalize the Skyway's renewal, and provide a sound footing for the consortium's operation of the facility for decades to come with little need for lane closures due to facility repair or rehabilitation.

Beyond Chicago, the Skyway deal opens the door for other public-private partnerships to operate and reinvest in existing highway infrastructure around the country. Ample evidence of this is the decision by the State of Indiana to award another Cintra-Macquarie consortium a seventy-five year concession to operate and maintain the Indiana Toll Road in exchange for an upfront cash payment of \$3.85 billion. This latest deal is the first of what is likely to be numerous protégés of the Chicago Skyway concession initiative.

ROUTE 3 NORTH REHABILITATION

PPP Delivery	Design-Build Period	Concession Period	Contract Value	Status
Design-Build-Finance	2000 – 2006 (44 months became 76 months)	N/A	\$385-\$388 million	Operating/ Construction Phase being Completed with Addition of Noise Walls

SUMMARY

In August 2000, the Commonwealth of Massachusetts authorized its first highway-oriented public-private partnership (PPP) as a design-build (D-B) project to reconstruct and expand Route 3 North, a major commuter route linking Boston and its northern suburbs with New Hampshire. The project site map appears as Exhibit 3.15 on the next page, as provided by the project web site: <http://www.route3construction.com>

Special legislation passed in late 1999 was required to enable the Commonwealth’s Highway Department, which is part of the Executive Office of Transportation (EOT) to use a number of innovative financing and project delivery approaches to move this \$385 million project forward, at a time when available public funding for needed highway improvements was extremely scarce. These innovative techniques involved creation of a public-benefit corporation that arranged long-term tax-exempt financing for the project, the potential to extend the project contract to include operations and maintenance (making it a design-build-operate-maintain or DBOM contract), and provision of revenue-sharing opportunities through joint development rights along the highway corridor.

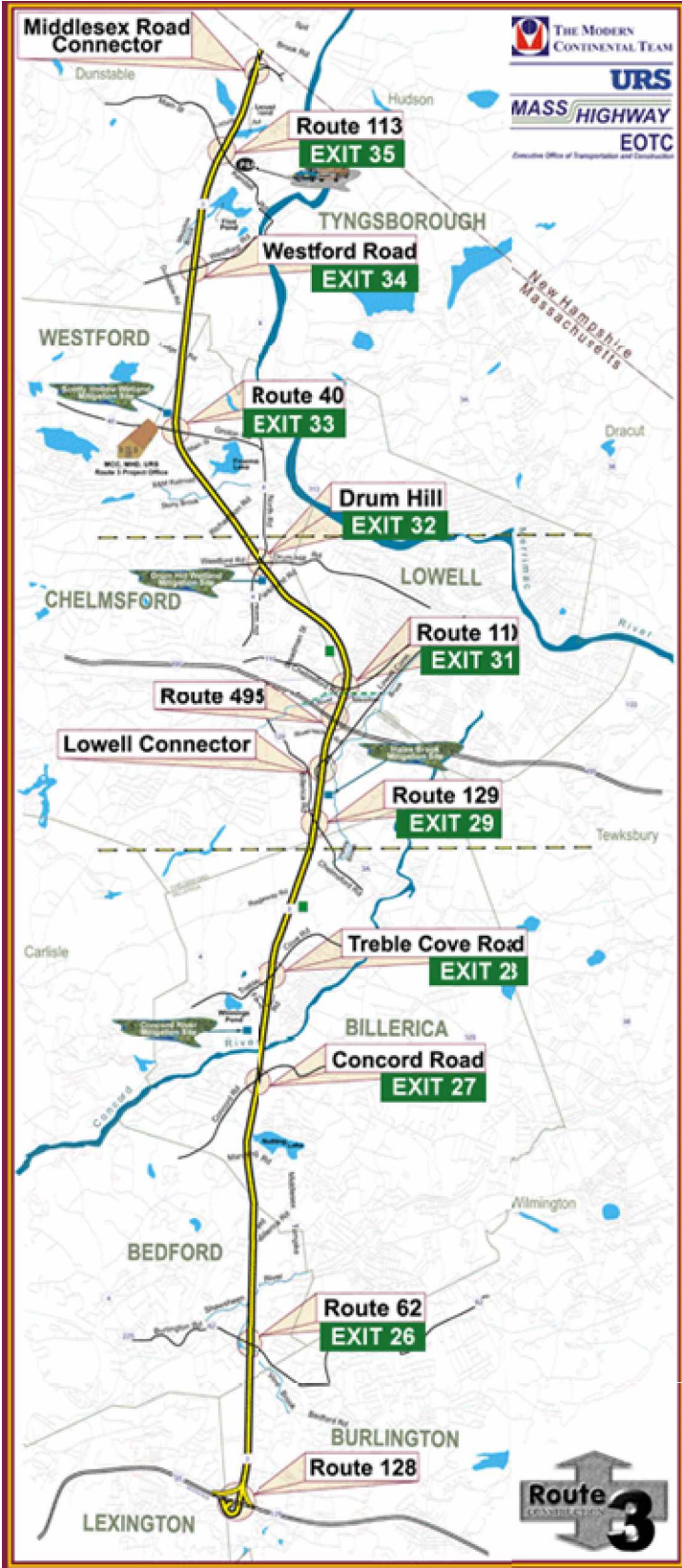
Despite efforts to expedite project delivery, completion of the D-B contract has been delayed almost three years due to differences in expectations between the project sponsor and the contractor team regarding project scope, cost, and schedule. As a result, EOT/MassHighway is unlikely to extend the contract scope to include operations and maintenance once the construction phase is completed later this year.

This project demonstrates the challenges facing sponsors and contractors when they begin to apply alternative approaches to project contracting, financing, and delivery, the potential consequences when partnering arrangements between public sponsors and private providers result in conflicts, and possible strategies for avoiding or mitigating these problems.

BACKGROUND

Route 3 North is a state highway in Massachusetts that links the northern suburbs of Boston to New Hampshire. It was built in the 1950s as a limited access four-lane divided arterial highway, but not to Interstate standards in terms of controlled access or design features such as shoulder width. Despite this, the highway has served as a major arterial for both automobiles and trucks moving between New Hampshire and eastern Massachusetts. It is also a major corridor for commuter traffic traveling to and from suburban communities in southern New Hampshire and northern Massachusetts and the major employment centers in and around Boston.

Exhibit 3.15 - Route 3 North Rehabilitation Project Site Map



Source: Modern Continental Route 3 Construction Web Site, 2006.
URL: <http://www.route3construction.com>

Since its initial construction, the highway has been maintained by the Commonwealth's highway agency (EOT/MassHighway). During the 1980s and 1990s, the highway deteriorated due to increasing volumes of both automobiles and trucks, while budget constraints postponed efforts to perform major rehabilitation of the roadway and bridges, many of which required widening as well as reconstruction. Competition for highway funding in the Commonwealth became even more intense in the 1990s due to the escalating costs of the multi-billion dollar Central Artery/Tunnel project. As a result, many urgently needed highway rehabilitation projects such as this were delayed by ten years or more.

By the later part of the 1990s, EOT/MassHighway sought alternative ways to address these other priority highway projects by applying alternative financing and project delivery approaches that would expedite their completion without overextending the Commonwealth's already strained statewide road and bridge program. First on the priority list was the reconstruction and expansion of Route 3 North, which by this time had fallen into a state of disrepair, both functionally and structurally.

PROJECT DESCRIPTION

The Route 3 North Reconstruction project consisted of the following components:

- Rehabilitate the 21-mile highway from its connection to Route 95/128 in Burlington, Massachusetts to the New Hampshire State border;
- Add a third lane to each direction of the highway, making it a six-lane divided highway with the addition of a ten-foot wide median shoulder in each direction;
- Replace 47 bridges along the highway, which had reached an advanced state of deterioration and required additional clearance to accommodate the additional lanes;
- Reconstruct 13 interchanges to handle the increased travel volumes that the expanded highway would carry, address their advanced state of deterioration, and bring the facilities up to current design and operational standards;
- Develop a park and ride facility; and
- Install fiber optic cables along the entire length of the highway corridor to serve the telecommunication needs of EOT/MassHighway along the highway, and provide excess capacity that could be leased to private telecommunications providers.

The proposed project was intended to deliver the following benefits to the traveling public:

- Reduce traffic congestion and travel times resulting in higher levels of service for users of the facility through the additional lane capacity;
- Reduce traffic on local roads as vehicles once diverted from Route 3 North due to unacceptable congestion could return to a facility running at much improved levels of service; and
- Provide a safer driving experience for drivers of the facility due to the elimination of functional and structural obsolescence of the roadway, bridges, and interchanges along the Route 3 North highway corridor.

Exhibit 3.16 shows newly paved lanes on Route 3 near Old Billerica Road in Bedford.

Exhibit 3.16 - Newly Paved Lanes on Route 3 near Route 62



Source: Modern Continental Route 3 Construction Web Site,

The project began in August 2000 and was expected to be completed by February 2004. The original price for the project was \$385 million, including design, construction, maintenance during the construction period (excluding snow and ice control), fiber optic cable installation, and financing costs. The current budget is \$388, based on adjustments to the project scope approved by EOT/MassHighway.

Exhibit 3.17 on the next page shows the original and replacement bridge carrying Stedman Street over Route 3.

PARTNERSHIP ARRANGEMENT

The Route 3 North Rehabilitation project was considered essential by the Massachusetts Governor and Legislature, as well as EOT/MassHighway in the late 1990s. Given the fiscal status of the Commonwealth's highway program, it was concluded that private sector financing and an alternative delivery approach would be needed to move the project forward without diverting scarce funding from the committed statewide road and bridge program. However, EOT/MassHighway did not have the legal authority to enter into a public-private partnership (PPP) to fund the project using private financing or alter the traditional design-bid-build approach to project delivery. Therefore special legislation was needed to allow

EOT/MassHighway to apply alternative project financing and delivery approaches to advance the project.

Exhibit 3.17 - Original and Replacement Stedman Street Bridge over Route 3



Source: Modern Continental Route 3 Construction Web Site,

The PPP team for this project consisted of the following organizations:

- EOT/MassHighway served as the public sponsor and provided project oversight and management, contract administration, and quality assurance.
- The selected contractor team, led by Modern Continental Construction Company, Inc., based in Cambridge, MA., consisted of the following members:
 - Construction: Modern Continental Construction Co., Inc.
 - Design: URS Corporation and Judith Nitsch Engineering
 - Traffic Management: VHB / Vanasse Hangen Brustlin, Inc.
 - Quality Assurance: Keville Enterprises, Inc.
 - Operations & Management: Roy Jorgensen Associates, Inc.
 - Environmental Compliance: The Smart Associates, Environmental Consultants
 - Community Outreach: Regan Communications and The Sanborn Group
 - Finance: Salomon Smith Barney
 - Legal Advisors: Hinckley, Allen & Snyder
 - Bond Counsel: Mintz-Levin

The Modern Continental Team established the Route 3 North Transportation Improvements Association to finance the project. This private non-profit entity took the form of a “63-20” organization, which under Internal Revenue Service (IRS) rules could issue tax-exempt bonds as a public-benefit corporation. The Association issued tax-exempt bonds to pay for project design, construction, and maintenance during the construction phase, to be repaid over the 30-year term of the bonds by the Commonwealth out of appropriated funds tied to an annual payment schedule. The result was a privately-financed and publicly-funded PPP arrangement that was intended to expedite delivery of the project and control its cost.

LEGAL AUTHORITY

In August 1999, the Massachusetts Legislature passed special legislation that exempted EOT/MassHighway from the standard procurement laws and financing methods for this specific project. The legislation enabled EOT/MassHighway to solicit competitive bids from contracting teams to rehabilitate and expand the highway on a design-build basis, whereby a contractor team would design and construct the improvements on an integrated basis through a single procurement. The contract was to be flexible enough to permit the contractor team to operate and maintain the facility following completion of the reconstruction and expansion phase, if approved by the Commonwealth. Thus the original legislation allowed for a design-build (D-B) project that could be extended into a full design-build-operate-maintain (DBOM) project.

The special legislation enabled EOT/MassHighway to select a contractor team for this project on a “best value” basis, using the following criteria in addition to price:

- Quality of the design

- Overall project delivery schedule
- Approach to maintenance of traffic during construction
- Approach to quality assurance and quality control
- Approach to environmental clearance and permitting
- Proposed finance plan, that could not include tolls

The legislation encouraged the contracting team to form a “special purpose entity” to secure private financing for the project. The legislation also allowed for revenue-sharing opportunities between the Commonwealth and the contractor team to reduce the overall costs of the project to the Commonwealth. The result was the Commonwealth’s first public-private partnership for horizontal (highway) infrastructure and its first design-build contract.

FUNDING AND FINANCE

The Commonwealth had limited bonding capacity for such a large project, particularly given the increasing commitments to the Central Artery/Tunnel project as its costs continued to escalate. To address this constraint, the Commonwealth tapped private financing through long-term, tax-exempt bonds issued by the Route 3 North Transportation Improvements Association. The Modern Continental Team enhanced the project financing by applying the following strategies:

- The Route 3 North Transportation Improvements Association purchased bond insurance that resulted in a AAA rating of the bonds by Fitch and Standard & Poor’s, which lowered debt service costs to the Commonwealth;
- Modern Continental served as co-insurer for the project risk insurance;
- The annual lease payments were scheduled late in the Commonwealth’s fiscal year, which eliminated the need for a liquidity debt service reserve; and
- Solomon Smith Barney provided an up-front payment of \$9 million as part of a forward purchase agreement.

In addition, the 63-20 Association established an independent trustee to control disbursement of project funds from the bond proceeds during both design and construction phases.

The PPP arrangement provided several financial inducements to the contractor team, including the provision of revenue-sharing arrangements associated with private development within the highway right-of-way limits, such as:

- Construction and sublease of a service plaza,
- Sale of rights to excess sub-surface fiber optic cables installed along the highway corridor, and
- Lease of air rights for development over the highway corridor.

However, due to problems encountered in meeting their own obligations under the D-B contract, the Modern Continental Team was unable to develop any of these revenue-sharing schemes. Once EOT/MassHighway accepts the completed highway corridor, it will be in a position to pursue these opportunities on its own or with other outside assistance.

INSTITUTIONAL CONTEXT

A feature of the traditional D-B-B approach to project delivery is that the public sponsor takes primary responsibility for project results, as the project moves from design to construction completion. This takes the form of extensive reporting and quality assurance and quality control activities to ensure that the construction firm delivers on time, within budget, and at prescribed standards and specifications to ensure project quality. To promote greater integration of the design and construction processes, reduce project costs, and expedite project delivery, EOT/MassHighway and the Modern Continental Team entered into a PPP arrangement through the D-B contract that placed greater responsibility for project performance on the contractor team.

Moving from the traditional D-B-B project delivery approach to D-B represented a significant cultural shift for both the project sponsor and contractor team. Since neither EOT/MassHighway nor the Modern Continental Team was experienced with the more flexible, adaptive, and collaborative approaches to contract administration associated with PPPs and the greater accountability assumed by a Modern Continental Team for project performance, it was difficult to overcome the traditional distrust between partners in this project, particularly when the Modern Continental Team sought cost and schedule adjustments to the D-B contract.

ISSUES AND STRATEGIES

Key challenges to the project and strategies to overcome them are listed below:

- **Financial Risks.** When the Route 3 North Rehabilitation project was being considered for implementation, the major problem it faced was a lack of available funding. Other high-profile projects (the Central Artery/Tunnel or “Big Dig” project) were consuming all available funding. Hence Special legislation was required to enable EOT/MassHighway to use innovative financing techniques to expedite the accumulation of funds to pay for design and construction. The result was the formation of a public-benefits corporation allowed by the IRS under Section 63-20 to permit issuance of long-term, tax exempt bonds to pay for the costs of the project and be repaid over a 30-year period.
- **Legal Issues.** EOT/MassHighway lacked statutory authority to use alternative approaches to project delivery and lacked procedures and methods to procure and administer design-build or design-build-operate-maintain contracts. Supported by the Governor, the Legislature introduced and passed special legislation that enabled EOT/MassHighway to deliver the project as either a D-B or DBOM contract under a comprehensive development agreement, with tax-exempt financing provided through a 63-20 public-benefit corporation established specifically for the project.
- **Technical Risks.** As an older facility requiring additional right-of-way for widening, the project posed a number of technical risks to EOT/MassHighway and the Modern Continental Team. These included:
 - Difficulty in obtaining final environmental clearances and required permits, including variances from local environmental laws and amendments to initial permits required by changes to the project as the design plans were finalized;
 - Uncertainty regarding the cost and time to acquire additional right-of-way for the expanded highway corridor based on the completed project design;

- Discovery of latent field conditions such as hazardous materials, additional underground utilities, or rock, during the construction process; and
- The ability to meet the project quality requirements, schedule, and cost limitations written into the D-B contract.

EOT/MassHighway took responsibility for obtaining environmental clearances for the project and all required permits from various federal, state, and local agencies. The Modern Continental Team was responsible for providing documentation to EOT/MassHighway to support applications for amendments to the original permits, based on changes to the project as the design process was completed.

EOT/MassHighway retained eminent domain rights to obtain property required by the project, while the Modern Continental Team was responsible for providing the documentation necessary to support these acquisitions. The property acquisition process took longer than anticipated by the Modern Continental Team, which contributed somewhat to the delay in project completion. The costs of additional parcels required by the project were funded separately by the Commonwealth to eliminate the uncertainties associated with estimating the costs of right-of-way in the D-B contract.

The risk associated with the potential to discover hazardous materials on the project site during the construction process and the costs of removing and disposing of these materials was mitigated by EOT/MassHighway, which agreed to share the costs of this particular risk with the Modern Continental Team. The remaining risks noted above were taken into consideration in structuring and pricing the D-B contract, whereby the Modern Continental Team was expected to incorporate the potential costs of these risks in its project quote.

- **Cost Risks.** The risks to the project sponsor for project cost overruns were mitigated through the following mechanisms:
 - Use of the design-build contract process, which placed most of the cost risks on the contractor team;
 - Unit pricing for project activities;
 - Performance-based payment structure specified in the contract; and
 - Construction acceptance procedures that involved an independent quality assurance role performed by on-site EOT/MassHighway design and construction staff.
- **Administrative Issues.** Applying a new project delivery approach posed a significant challenge to EOT/MassHighway staff since it involved a different procurement process, an integrated design and construction process, a payment structure with more limited opportunity for adjustment (to better control project costs), and independent quality assurance provided by the project sponsor. These new approaches challenged both the project sponsor and the D-B delivery team whose ability to constructively and cooperatively work together significantly influenced their ability to collectively achieve the objectives of the project within the terms of the D-B contract.

EOT/MassHighway personnel responsible for the project were initially hampered by a lack of written procedures or manuals to guide the procurement and contract administration processes needed to hold the Modern Continental Team accountable for compliance with the terms of the D-B contract. EOT/MassHighway attempted to

compensate for this by assigning highly qualified design and construction staff to oversee the work of the Modern Continental Team. However, they were less experienced with the integrated nature of the design-build delivery approach. In addition, the Modern Continental Team was less familiar with the contract administration requirements associated with the design-build approach, which placed greater accountability for project performance on the contractor team. This created friction between EOT/MassHighway's contract administration team and the Modern Continental Team, both of which were new to the D-B project delivery approach.

EOT/MassHighway attempted to mitigate these problems with various partnering techniques that included:

- Engaging the services of an experienced partnering facilitator at the beginning of the project;
- Conducting partnering seminars early in the project schedule to familiarize all members of the PPP with the concepts and approaches to project partnering;
- Holding periodic executive partnering meetings through 2005;
- Holding weekly internal meetings and bi-weekly briefings with the Modern Continental Team throughout the project; and
- Encouraging field-based decision-making by on-site EOT/MassHighway staff to expedite the project development process and resolve issues.

Despite these efforts, there were significant differences in expectations regarding project scope and responsibilities and the ability of the Modern Continental Team to request and receive approval of changes in work schedule, project approaches, and cost reimbursement. As a result, the partnering efforts became less effective as the project became more delayed and the Modern Continental Team was subjected to liquidated damages.

More familiar with the design-bid-build process and the more limited scrutiny provided by contract administrators for the other major project Modern Continental was performing for the Commonwealth, namely the Central Artery/Tunnel project, the Modern Continental Team was not accustomed to the greater scrutiny provided by EOT/MassHighway for this project to assure compliance with the terms of the D-B contract and keep the project on schedule and within budget. This led to several confrontations between EOT/MassHighway oversight staff and senior representatives of the Modern Continental Team over requests for schedule and cost adjustments.

Some of these problems could have been mitigated had procedures been established and documented in advance of the project procurement process so that both sponsor and delivery teams understood what was expected in terms of communications and coordination, and the degree of flexibility that the project sponsor would allow the contractor team regarding project cost and schedule issues. In addition, a more defined and formal issue resolution process would have enabled the partners to more quickly resolve some of the problems cited above and reduced the project delivery time.

RESULTS

The PPP arrangement placed most of the financial risks associated with the project on the Commonwealth of Massachusetts, through a lease-back payment schedule with the 63-20 Association. The use of the design-build project delivery approach placed project development risks associated with project cost, schedule, and quality primarily on the contractor team.

The project began in August 2000 and was originally scheduled to be completed in 42 months, with construction ending by February 2004. Due to conflicts between EOT/MassHighway and the Modern Continental Team over project scope, cost, and schedule, progress slowed on the project, particularly whenever differences in interpreting contract requirements were not addressed or resolved in a timely fashion. This was particularly evident as the project evolved, when final acceptance and initiation of a project warranty were delayed due to various issues. As a result, project completion has been delayed almost three years.

The Modern Continental Team has been assessed \$3.8 million in liquidated damages (one percent of the project cost), based on a contract provision that allowed EOT/MassHighway to collect \$10,450 per day that the project was delayed beyond the contracted schedule without justification, up to a total of 365 days. The project is not expected to be completed until the end of 2006, which is 34 months more than the original project schedule. In addition, the Modern Continental Team has been unable to exploit any of the private development rights provided by the authorizing legislation, which were expected to generate significant revenues to offset the costs of the project to the Commonwealth and be shared with the contractor team as an incentive.

Given the difficulties encountered during the project, EOT/MassHighway is not expected to extend the Modern Continental Team's D-B contract to a full DBOM contract. However the Modern Continental Team has been awarded a supplemental eighteen-month contract to design and build noise walls along the corridor for several million dollars. Exhibit 3.18 on the next page shows the location of the proposed noise barriers along the Route 3 North highway corridor.

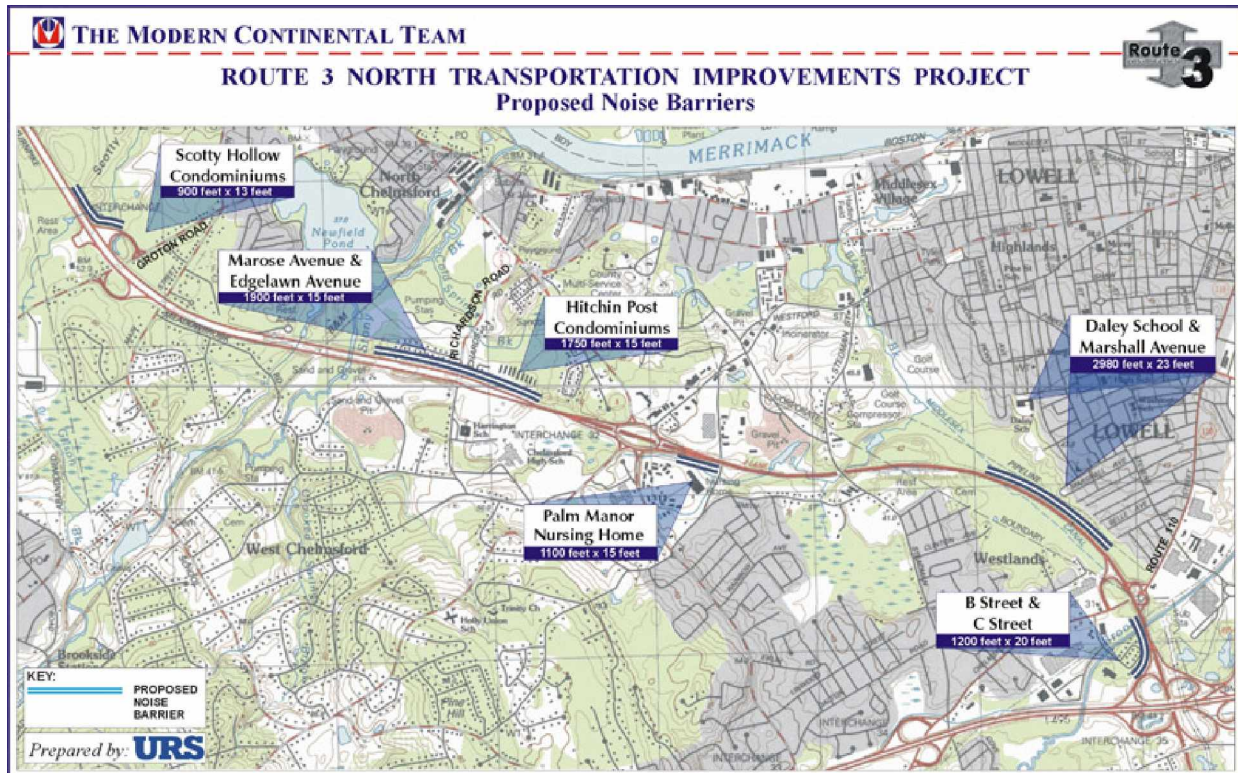
CONCLUSIONS

The Route 3 North Reconstruction project is a unique and valiant effort by the Commonwealth of Massachusetts to apply alternative approaches to project finance and delivery to expedite a needed transportation improvement. This included the first highway design-build contract, the first 63-20 public-benefit corporation to finance a highway project, and the first true PPP arrangement to accelerate project delivery. While the project will be completed within budget and according to EOT/MassHighway design standards and construction specification, its completion has been significantly delayed due to the difficulties experienced by both public and private partners in applying these new approaches to the project.

These results noted above suggest that the partnership arrangement between EOT/MassHighway and the Modern Continental Team did not fully mature but became less effective as the project advanced into the construction phase, as both parties reverted to the traditional roles of a D-B-B project delivery approach. Differences between EOT/MassHighway and the Modern Continental Team could have been mitigated if all parties had greater familiarity and experience in the application of the PPP process and design-build project delivery so that the issues regarding non-conforming work, additional cost items, and schedule compliance could be understood and resolved in a timelier manner. This is one of the prerequisites for a successful PPP: a clear

understanding by the project partners of their respective roles, responsibilities, risks, and rewards and the degree of flexibility defined by the project contract.

Exhibit 3.18 - Map of Proposed Route 3 North Noise Barriers



Source: Modern Continental Route 3 Construction Web Site,

NEXT STEPS

Despite these difficulties and the delays they created, the project stands as a testament to the commitment of all members of the PPP arrangement to complete this difficult project which would have taken another decade to accomplish using traditional methods. With the project nearing completion, EOT/MassHighway can benefit from the lessons learned from this project to improve its capabilities to effectively develop and administer other needed projects using innovative approaches that leverage scarce public resources.

The final steps for completing this project involve primarily cosmetic and safety-related additions, such as pavement reflectors and noise barriers. Once completed, the project will be taken over by EOT/MassHighway for on-going operations and maintenance.

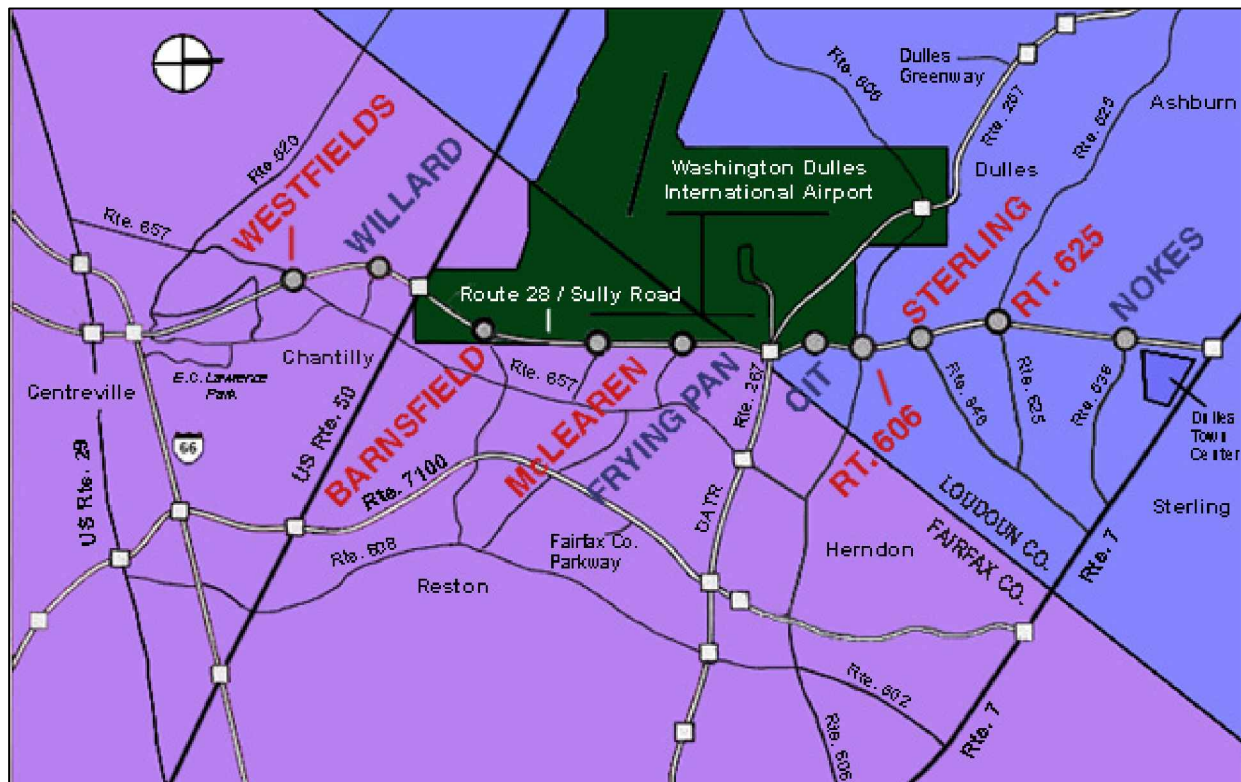
ROUTE 28 PHASE II EXPANSION, FAIRFAX AND LOUDON COUNTIES, VIRGINIA

PPP Delivery	Construction Period	Concession Period	Contract Value	Status
Design-Build-Finance	2002 – 2009 (7 years) for full Phase II project	N/A	\$390 million for the full Phase II project	Ten interchanges, Loudon County Parkway, and Ancillary Road Improvements

SUMMARY

The Route 28 Phase II project aims to convert ten at-grade intersections to grade-separated interchanges and widen several connecting roadways along a congested stretch of highway that divides Fairfax and Loudon counties in Northern Virginia, as shown in Exhibit 3.19 below. The Route 28 corridor provides highway accessibility in this rapidly developing suburban area near Washington Dulles International Airport. This is a follow-on to an earlier project that widened the roadway from two to six lanes in the late 1980s and early 1990s. The public-private partnership (PPP) responsible for the Phase II expansion includes private design and construction companies, the counties noted above, the Virginia Department of Transportation (VDOT), and the Metropolitan Washington Airports Authority (MWAA).

Exhibit 3.19 – Route 28 Phase II Expansion Project Site Map



Source: Route 28 Corridor Improvements, LLC, 2002. URL: <http://www.28freeway.com/>

The Route 28 Phase II PPP is using innovative project contracting and financing approaches to expand the operational capacity of Route 28 between Route 7 and Interstate 66. The project is being delivered through a design-build contract, involving Dewberry & Davis for design and Clark Construction Group's Shirley Construction Company for construction. Funding for the Phase II project comes from VDOT's highway improvement program and from special assessment fees generated by members of a transportation improvement district (TID) along the Route 28 corridor.

In 1995, Virginia's General Assembly enacted the Public Private Transportation Act to advance needed transportation projects like the Route 28 Phase II improvement project. With limited state funds to support timely construction of transportation infrastructure to alleviate congestion, the private sector teamed with local property owners and local governments to add significant capacity improvements in a timely, cost effective manner. Combining a public-private partnership arrangement with innovative project finance and delivery approaches enabled project sponsors to expedite this large and complex project and leverage scarce state funding for transportation infrastructure. Without these arrangements, construction of the proposed interchanges along Route 28 would have taken many more years—perhaps as long as 15 to 20 years—using traditional project funding and delivery approaches.

The design-build contracting approach enabled the project to be delivered on a compressed schedule, significantly cutting the duration from preliminary engineering to project completion. If construction continues on pace, the total Phase II project will be completed within seven years, ending in 2009.

BACKGROUND

The Dulles Corridor, a growing area along the 14-mile-long Dulles Toll Road between Washington Dulles International Airport and Washington's Capital Beltway (I-495), is one of the fastest-growing office centers in the United States. It is home to dozens of national and regional offices of defense contractors, information technology firms, consultant groups, media conglomerates, accounting firms, communications companies, and other technology-related industries. Like much of Northern Virginia, the Dulles Corridor suffers from traffic congestion as a result of its economic prosperity, and the Virginia Department of Transportation (VDOT) lacks the resources to build sufficient facilities to relieve this congestion.

In the late 1980s, when commercial development along the Dulles Corridor began its dramatic expansion, Route 28 was a two-lane country road that intersected the Dulles Corridor just east of Dulles International Airport. The growth in the region demanded that Route 28 be promptly upgraded to increase its capacity to handle the resulting traffic volumes. In 1985, VDOT hired Dewberry & Davis, a Fairfax-based architecture and engineering consulting firm to prepare the preliminary and final design plans for widening Route 28. However, VDOT lacked the resources to construct the project using traditional financing methods for many years if not several decades.

In 1987, the Virginia General Assembly, under the leadership of then-Governor Baliles, granted Virginia cities and counties permission to create special taxing districts to expedite the funding of needed transportation projects. The following year Fairfax and Loudoun counties formed the first transportation improvement district (TID) in the Commonwealth to expand Route 28. Through the vehicle of the TID, the two counties enacted an innovative special levy of twenty cents per one hundred dollar valuation on all commercial and industrial property inside the 10,204-acre district. Bonds were issued to fund design and construction costs, with debt service

costs to be paid from revenues generated by the Route 28 TID levies, with a back-up guarantee provided by the Commonwealth in the event that the TID tax revenues were unable to service the debt.

The initial Route 28 widening project began as a PPP between VDOT, the two counties, and the construction team of Clark Construction Group, Inc. and its road building subsidiary Shirley Construction Company, LLC (Clark/Shirley). The project consisted of widening a 15-mile stretch of Route 28 between Route 7 in Loudoun County and Interstate 66 in Fairfax County from two lanes to six lanes, and building three grade-separated interchanges at Route 50, Route 7, and the Dulles Toll Road. The Phase I widening project was completed three years later in 1991.

Over the next decade, economic development in the region flourished, facilitated in part by transportation infrastructure improvements such as the initial Route 28 expansion project. The resulting growth in traffic led to highly congested conditions during peak travel periods along segments of the Route 28 corridor, particularly in the vicinity of the numerous at-grade intersections along the corridor. These intersections impeded the efficient flow of traffic and caused significant safety problems for motorists. The time was ripe for the second phase of the Route 28 PPP program to relieve this congestion.

PROJECT DESCRIPTION

The Route 28 Phase II improvement project was initiated in 2001 as an unsolicited proposal to VDOT by the Clark/Shirley team, formally known as Route 28 Corridor Improvements, LLC. Originally, Clark/Shirley proposed constructing up to ten grade-separated interchanges and widening Route 28 from six to eight lanes along the corridor, forming a 63-20 public-purpose, tax-exempt corporation to finance construction with funding from transportation improvement district revenues.

After seeking competitive proposals from other interested teams, in accordance with the requirements of Virginia's PPTA, VDOT received a competing proposal from a team comprised of Fluor Daniel and Morrison Knudsen, LLC. This second proposal called for upgrading ten intersections and widening the Route 28 to ten lanes, four of which would be express high occupancy tolled (HOT) lanes.

Following conceptual approval of both proposals by Virginia's Commonwealth Transportation Board's, the Route 28 Advisory Panel was formed to formally review the two proposals. The panel based its final decision on team qualifications, engineering merit, financial feasibility, public support, and compatibility with the existing roadway network. On May 1, 2001, the panel made a unanimous recommendation to the VDOT Commissioner, who, pursuant to the PPTA and implementing regulation, made the final decision. The Clark/Shirley proposal was ultimately selected by VDOT, in part because of concerns that the Fluor/Morrison proposal would restrict access to the proposed managed (HOT) lanes by the very members of the Route 28 TID paying for most of the project costs through TID fees. Under the Fluor/Morrison proposal, tax district members would have only limited access to the additional HOT lanes because access points to these lanes were proposed only at the three interchanges with I-66, the Dulles Toll Road, and Route 7.

Following negotiations between VDOT and Clark/Shirley, the Route 28 Corridor Improvements Comprehensive Agreement was signed 16 months later, in September 2002, and construction began the next month. Due to escalating project costs, the initial scope of the project was pared

down to \$200 million in improvements over four years, including construction of six grade-separated interchanges. Exhibit 3.20 shows one of the six interchanges while under construction along the Route 28 corridor. The resulting agreement provided options for the team to construct four additional interchanges, build the Loudon County Parkway and several other related road segments, widen Centerville Road, and/or further widen Route 28 from six lanes to eight lanes.

Exhibit 3.20 Route 606 Interchange under Construction



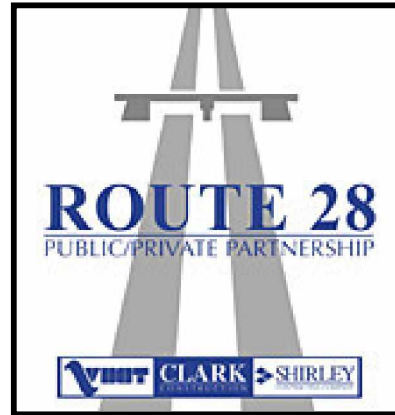
Source: Route 28 Corridor Improvements, LLC, 2002

PARTNERSHIP ARRANGEMENT

A central feature of the Route 28 improvement projects is the collaboration of both public and private sector stakeholders to expedite project funding and delivery. For the Phase II project, the PPP arrangement is in the form of a design-build contract, using both traditional and innovative sources of funding. As a design-build project, the Route 28 Phase II project is being designed and built under a single contract, without the need to separately bid out the design and construction portions of the project, as was the case for the Phase I widening project which was delivered under the traditional design-bid-build contracting method. This enables the design-build team to better integrate design and construction considerations throughout the project, reduce the project delivery timeframe, and provide greater accountability for project results.

Private Sector Partner Roles and Responsibilities

The private sector design- build team is led by Clark/Shirley, which is responsible for all right-of-way acquisition, utility relocation, site development, and construction services for the project. The design-build team also includes Dewberry & Davis, which is responsible for all design work for the project under contract to Clark/Shirley. Overall, the design-build team bears the risk of project delivery at a guaranteed price by a fixed delivery date.



Public Sector Partner Roles and Responsibilities

Public sector partners include VDOT, Fairfax and Loudon counties, and the Metropolitan Washington Airports Authority, the entity responsible for planning and managing Dulles International Airport, which adjoins Route 28. VDOT is helping to fund the project and is providing project management support to ensure the project's timely and satisfactory completion. Clark/Shirley and VDOT bear joint responsibility for right-of-way and utility cost risks. The two counties administered the TID while MWAA donated right-of-way along its eastern boundary to facilitate a new interchange that also serves as the primary access to the new Air & Space Museum Annex, located on airport property.

LEGAL AUTHORITY

Virginia's Public Private Transportation Act (PPTA) was passed in 1995. This innovative piece of legislation was one of the early state statutes that specifically authorized a state transportation agency to enter into public-private partnerships to expedite the delivery of needed transportation improvement projects. Going beyond new construction, the PPTA allowed private entities to enter into agreements to construct, improve, maintain, and/or operate transportation facilities in Virginia. The PPTA streamlined the public-private partnership application and approval process, and used a market-based approach that allowed for both solicited and unsolicited proposals. While VDOT may continue to solicit proposals from competent firms, the private sector is allowed to select projects and propose a solution on an unsolicited basis.

Under Virginia's PPTA, the public sector maintains flexibility in setting the scope and terms of the project, and retains responsibility for right-of-way acquisition when eminent domain is required to secure needed rights-of-way for a project. The public sector also retains responsibility for project oversight and facility ownership. While public support is needed to advance a PPTA project, it is the responsibility of the private sector to develop and submit either a solicited or unsolicited proposal for the project. To avoid the appearance of favoritism and to promote competition, all unsolicited proposals must be posted for a period of time to enable other teams to offer competitive proposals. The resulting group of proposals are then compared and evaluated, with the proposal team offering the best value to the Commonwealth selected to perform the project.

FUNDING AND FINANCE

Private sector members of the Route 28 transportation improvement district provide most of the revenues for the project, based on annual TID assessments. VDOT provides the remainder of the project's funding using state highway improvement funds. The two participating counties administer the Route 28 TID funding mechanism, financing the overall project through the issuance of county-backed revenue bonds.

The two counties committed a combined total of \$148.5 million (75 percent) for the initial portion of the Phase II project, to be derived from proceeds from an additional property tax assessment for members of the Route 28 transportation improvement district. Most of the land owners within the district are major developers with existing or planned mid- to high-density commercial and residential development along Route 28. As such, members of the Route 28 TID had the most to gain from increased access to their facilities provided by improvements to Route 28, and were highly supportive of the property tax increase required to fund the Phase II project.

In addition to the TID proceeds, VDOT committed \$70 million to the initial portion of the Phase II project, including a direct contribution of \$49.5 million (25 percent) to support project construction and \$20.5 million to support project management.

As project financing costs were analyzed, the involvement of Fairfax and Loudon counties increased to include financing the project with general obligation bonds, which ultimately proved more cost effective than the 63-20 non-profit corporation the developers had originally envisioned to issue debt on behalf of the project. It is estimated that using municipal debt resulted in a total savings on financing costs of approximately \$150 million. Assuming responsibility for financing created a moderate risk for the counties, but projections of debt service coverage ratios were based on very conservative projections of growth in the taxable value of property in the Route 28 TID, in contrast to the double-digit increases in proceeds from assessments in recent years.

Due to higher than expected proceed from the Special Assessment District fees over the last several years and a \$5 million grant and \$20 million loan from the Governor's Transportation Opportunity Fund, the PPP has recently been extended through 2009. This will enable the completion of the full Phase II project, including all ten interchanges and several ancillary roadways. Widening Route 28 from six to eight lanes remains a potential Phase III project.

INSTITUTIONAL CONTEXT

By all accounts, Route 28 was ripe for further capacity expansion by the end of the 1990s. The roadway had seen significant development bordering its right-of-way since its upgrade from two to six lanes in the early 1990s and with that development came a corresponding increase in traffic.

- ***A Willing Development Community.*** The public most directly impacted by the roadway was demanding improved accessibility, and was highly supportive of efforts to fund improvements using additional property taxes assessed through the TID and dedicated to corridor capacity improvement. In fact, the Route 28 project faced very little of the "not in my backyard" sentiment that challenges many projects.

Commercial developers, who represented the majority of property owners along the Route 28 corridor, were eager to improve the development potential of their properties through improved highway accessibility. Property owners, therefore, served as a major catalyst for improvements to the highway. Thanks to the creation of the TID in the late 1980s, an institutional mechanism already existed to tax these adjacent property owners who would most benefit from improvements to corridor capacity. Local governments were also eager to support the project to promote additional economic development along the corridor by providing additional highway accessibility.

- ***Minimal Environmental Risks for Both Public and Private Sector Sponsors.*** The environmental process had been completed by VDOT in anticipation of improvements prior to receipt of the unsolicited proposal from Clark/Shirley, so no further assessment was required to move the project forward. An element of the project was re-situated near Dulles Airport to avoid disrupting sensitive wetlands, but otherwise no major environmental mitigation was required.
- ***Ability to Move Major Portions of the Project Forward as a PPP.*** Upgrade of intersections along Route 28 had long been planned, and in fact was envisioned as a Phase II to the highway's original upgrade in the late 1980s from two to six lanes. The only problem was that VDOT, the state agency ultimately responsible for improvements to Route 28, lacked the funds to construct all ten interchanges in a timely manner. Fortunately, the Virginia General Assembly had passed legislation granting VDOT the ability to receive unsolicited proposals for needed transportation improvements such as the Route 28 Phase II project. This, in turn, enabled the Clark/Shirley team to submit an unsolicited proposal to design and construct a menu of capacity improvements, including the replacement of at-grade intersections with much more efficient grade-separated interchanges, widening of several parallel feeder routes, and ultimately adding more lanes to Route 28. The challenge was to determine which improvements could be funded using a combination of VDOT capital improvement funds, proceeds from additional TID taxes on adjacent landowners, and financing by the participating counties.

With a number of at-grade intersections impeding the throughput capacity of Route 28, it was decided to pursue those improvements that offered the most capacity improvement for the dollars spent. That meant prioritizing the elements of the Clark/Shirley proposal and selecting the highest priority pieces that could be done within the projected funding levels. This prioritization process revealed that the greatest congestion relief would result from converting at-grade intersections to grade-separated interchanges, not by adding additional lanes to Route 28 whose throughput capacity would remain constrained by the at-grade intersections. Hence the Route 28 Phase II project has focused on converting intersections to interchanges.

ISSUES AND STRATEGIES

In developing the PPP for this project, the partners faced several impediments that could have stopped the project from proceeding. These included the following:

- Escalating finance costs associated with the Clark/Shirley team's proposal to finance the project with a 63-20 corporation, and initial reluctance by local governments to use their municipal financing capabilities to reduce the costs of project financing.

- Conflicts between desires to see roadway improvements as soon as possible and conservative revenue estimates that required limiting the scope of improvements.
- Growth in right-of-way and utility costs associated with the project.
- Legal uncertainty over the applicability of the Public Private Transportation Act to the proposed project.

These issues and the strategies used to address them are described below.

- **High Project Finance Costs.** Clark/Shirley had originally proposed creating a 63-20 non-profit corporation to finance construction of improvements to Route 28. 63-20 refers to Internal Revenue Service (IRS) Rule 63-20 and Revenue Proclamation 82-26, which enables non-profit corporations to issue tax-exempt debt on behalf of private developers of public use infrastructure. Often, however, public agencies are able to obtain cheaper debt than 63-20 corporations, as they generally have a longer track record of borrowing and an established credit rating, which leads to more favorable interest rates and a lower overall cost of borrowing. This was the case for the Route 28 project, with estimated finance charges associated with 63-20-issued debt of \$150 million for \$200 million in improvements. Ultimately, the public sector project sponsors were not willing to absorb the cost of additional finance charges related to 63-20 financing, and the partnership looked to Fairfax and Loudon counties to finance the project.

Initially, there was resistance by the counties to become involved in financing the project, which stemmed from a distrust of the financial viability of the proposal. At times it appeared that a resolution was unlikely—that the proposal would not hold up to fiscal scrutiny and the TID stakeholders would walk away. While the counties conducted a careful financial review of the proposal, the Route 28 property owners encouraged county financing. The limited public opposition to the project—indeed, the overwhelming support for the project and the financing proposal by affected property owners—ultimately led to total county-backed bond issues of \$90 million to support the project. The municipal bonds were backed by a moral obligation by Fairfax and Loudon counties to repay them, supported by revenues from the transportation improvement district. Ultimately this led to lower cost financing plan, saving approximately \$150 million in debt service costs.

This outcome would not have been possible without county officials becoming more involved in the project development process. Ultimately the two counties concluded that the benefits to the region of enhanced transportation accessibility and the willingness of the adjacent property owners to support increased assessments to pay for most of the project outweighed the risks associated with the counties issuing the debt to support the project. With lower costs of borrowing, more of the original project scope could be preserved within the fiscal limitations of VDOT and TID funding. A public united in support of the project also facilitated county financing.

- **Conservative Growth Projections.** There is an inherent conflict between the desire of proponents to make roadway improvements as soon as possible and the conservative caution of the financial community regarding expected revenues to support these improvements. In developing their financial assessment of the Clark/Shirley proposal, financial officials from Fairfax and Loudon counties assumed a very conservative rate of growth in property tax assessments in the TID, whose proceeds would be used to fund the Route 28 improvements.

In the case of Fairfax and Loudon counties, property tax assessments have been growing at double-digit rates since the end of the 1990s due to rapid economic expansion and escalating costs of real estate. Some have suggested that faster growth in commercial property assessments than what was projected by the counties produces surplus revenues from the TID that should be used to upgrade the remaining four interchanges as soon as possible. The counties' financial analysts, however, want some assurance that the higher rate of TID revenue growth will continue before recommending the issuance of additional bonds to pay for the remaining intersection improvements along Route 28. It may take several years to determine whether current trends in TID revenue growth can be sustained as the real estate market moderates its rate of growth.

An alternative approach would be to issue debt through a less conservative entity, but as was the experience with the 63-20 corporation for this project, the terms of financing may not be as favorable. In the case of this project, stakeholders found municipal debt to be so much more cost effective than forming a 63-20 corporation or any other approach to issuing debt that the conservative assumptions underlying the financial plan were tolerable. Besides, a 63-20 corporation would likely have been even more conservative than the counties given its reliance on one revenue source to repay debt.

- **Escalating Project Costs.** While increasing property values provide more property tax revenues to fund the project, they also impact project costs by driving up the cost of right-of-way needed for the project. Both right-of-way and utility costs grew faster than initial projections by the Clark/Shirley team, resulting in an \$8 million increase in project costs. Initially it was unclear which parties to the PPP were responsible for covering the additional costs, but in the end the two counties and VDOT applied project contingency funds and agreed to proportionately share any additional funding requirements due to escalating costs.

As a PPP, both the public and private sector partners for this project could have shared responsibility to cover the costs of overruns. Placing greater risk for increased right-of-way and utility costs on the project developer would have reduced the direct fiscal impact on the public sector, and mitigated the need for VDOT and the counties to secure several million dollars in additional revenue to cover these costs. However, this likely would have increased the original bid price for the project since proposing teams would have to allocate part of the project estimate to cover the risks of higher utility and right-of-way costs. As a design-build project, the Clark/Shirley team bore the risks of escalating costs for such items as steel and concrete, both of which have experienced significant gyrations in unit prices in recent years.

- **Legal Questions.** Initially, there was a question about whether the final arrangement of the Route 28 Public-Private Partnership met the requirements of Virginia's Public Private Transportation Act. To resolve the issue, VDOT obtained clarification of statutory requirements from its Chief Financial Officer and the state Attorney General's office that allowed the project to be considered under the PPTA. This result demonstrates the importance of having appropriate legal counsel confirm the statutory basis and legal status of any proposed partnership agreement, especially if the application is novel or the first of its kind.

RESULTS

The private-sector partners have completed and opened to traffic the six planned grade-separated interchanges and the Loudon County Parkway. Design and engineering activities are underway in early 2007 for the remaining four interchanges and Innovation Avenue. Construction plans are approved for widening Centerville Road and building Pacific Boulevard. However no final agreement exists that defines the timing and funding for the option to widen Route 28 by constructing an additional lane in each direction. Early indications are that the new grade-separated interchanges are already helping to alleviate congestion along the Route 28 corridor, which may push back the need to widen Route 28 in the near-term.

The Clark/Shirley team and their public agency partners were able to expedite this needed set of improvements despite significant funding constraints by tapping the expanded project development capabilities provided by Virginia's Public Private Transportation Act of 1995, effectively applying the design-build process, and obtaining additional financial support from both public and private sector stakeholders in the project. This reduced the impact of inflation on project costs, providing much needed capacity improvements to the Route 28 corridor years ahead of what would otherwise have been possible using more traditional project financing and delivery methods. Ultimately the key to the success of this PPP project was a set of public and private partners with the capability and mutual trust to move the process ahead by applying flexibility and ingenuity to overcome various impediments encountered along the way.

CONCLUSIONS

While design of the remaining four interchanges and construction of add-on project improvements continues, the Route 28 Phase II project is already providing congestion relief along one of the most important commercial corridors in Northern Virginia, paid for primarily by the owners of adjacent property. The design-build project delivery process has been credited with part of the project's success as it specified project completion at a fixed price within a committed time frame. Given strong stakeholder support for this project from all of the key stakeholders and their willingness to adjust the terms of the PPP to address these issues, the project was able to proceed to development and is expected to be completed by the end of next year – on time and within budget.

Lessons learned by project stakeholders included the following:

- ***Keep the Project Moving.*** One of the elements credited for the success of the Route 28 project was the swiftness with which the project was developed and implemented. When a project is delayed by disagreements among its partners or inaction, costs can increase significantly and stakeholder support can dissipate, enabling opponents to gain momentum and kill the project.
- ***Collaborate with Major Project Stakeholders from the Start.*** In early PPTA projects in Northern Virginia, VDOT took charge of project development and only allowed local governments 60 to 90 days to comment on the project scope after it was already drafted. For this project, VDOT took a different approach. By working proactively and collaboratively with local governments and adjacent landowners to scope the project, the PPP team was able to iron out major issues before they became impediments. This is credited with creating a higher quality project and turning potential adversaries into advocates for the project.

- **Carefully Analyze Project Agreement Language.** Project sponsors can most effectively mitigate project risks by understanding the nature and extent of these risks prior to developing and finalizing a PPP contract. For this project, although public sector partners shared responsibility for right-of-way and utility cost overruns, there was uncertainty as to whether VDOT or the local counties were responsible for covering the public sector’s share of the cost overruns. Given their commitment to the project and the PPP, the parties agreed to an equitable distribution of funding responsibilities after the PPP had already been approved and initiated. Without a timely resolution, this issue could have severely delayed the project or undermined its viability as a PPP.
- **Each Party Should Carefully Scrutinize the Financial Elements of Any Proposal, Regardless of Responsibility for Project Funding or Cost Management.** In the case of the Route 28 Phase II PPP, Fairfax and Loudon counties were not initially involved as project finance partners, but later stepped up their involvement when the cost of the original financing plan was realized. Due diligence analysis of the project by each stakeholder is essential to test alternative approaches and ensure that the partnership arrangement can withstand adversity in the form of traffic volumes and revenues, project costs, and environmental issues.
- **Bring all of the Relevant Experts on Board at the Beginning.** In assessing most transportation projects agencies will apply various tests of engineering feasibility:
 - Does the project respond to well-defined transportation needs?
 - Is the project constructible from both engineering and environmental perspectives?
 - Can the project be operated in a safe and efficient manner?

In the case PPPs, there are also legal and financial questions that require feasibility assessment:

- Is the proposed PPP agreement legal?
- Does the project advance and protect the interests of the agency?
- Is the project financial plan feasible?
- Does the project contract mitigate risks to the sponsoring entity?

Answering these questions requires the involvement of appropriate functional experts who are familiar with these kinds of projects and their issues early in the process. For the typical transportation agency, PPPs represent a paradigm shift from the usual project delivery and financing approach and therefore a broader battery of feasibility tests.

- **Look for Receptive Partners Eager to Build a Successful Partnership.** Stakeholders from both the public and private sectors attributed the project’s success to the quality and commitment of the members of the project PPP. Even when it appeared that the project would not move ahead for various reasons, the commitment and flexibility of the partners enabled the project to proceed. Having quality project delivery firms on the PPP team with proven relevant expertise in this kind of project lent credibility to the project, facilitated efforts to overcome impediments, and retained the confidence of project stakeholders among the members of the TID and the sponsoring public sector agencies.

NEXT STEPS

All project elements initially obligated by the Phase II agreement between VDOT and Clark/Shirley are expected to be completed by the fall of 2007. Exhibit 3.21 shows the ribbon cutting for one of the six interchanges already completed as part of the Phase II project.

Exhibit 3.21 – Ribbon Cutting for the Westfields Boulevard Interchange, October 2005



Source: Route 28 Corridor Improvements, LLC, 2002

Dewberry and Davis is currently developing design plans for the four remaining interchanges originally proposed by Clark/Shirley but pared from the scope of improvements under the initial Phase II contract. In addition, the sponsoring counties have retained the Clark/Shirley team to construct the remaining four interchanges and related road improvements, with completion planned for the fall of 2009.

In the case of both Loudon and Fairfax counties, the experience with Route 28 has fueled a desire to find ways to quickly delivery additional projects at a fixed price. Both are exploring additional opportunities to apply design-build and public-private partnerships to advance infrastructure projects in their counties. Loudon County, which is consistently ranked as one of the five fastest growing counties in the country, has passed its own ordinances to apply the state's Public Private Transportation Act, as well as the related Public-Private Education Facilities and Infrastructure Act (PPEA) to advance construction of much-needed transportation and education facilities.

VDOT has continued to apply the PPTA to advance projects throughout the Commonwealth. To date, VDOT has completed two infrastructure development projects, is actively constructing five projects (including Route 28), and is presently evaluating several managed-lane proposals to construct HOT lanes along I-95/395 approaching Washington and on portions of the I-495 Beltway in Virginia. There are an additional three proposed projects being described as “upcoming.”

After ten years, the state’s PPTA continues to serve as model legislation for other states considering the use of public-private partnerships to expedite the delivery of needed transportation projects.

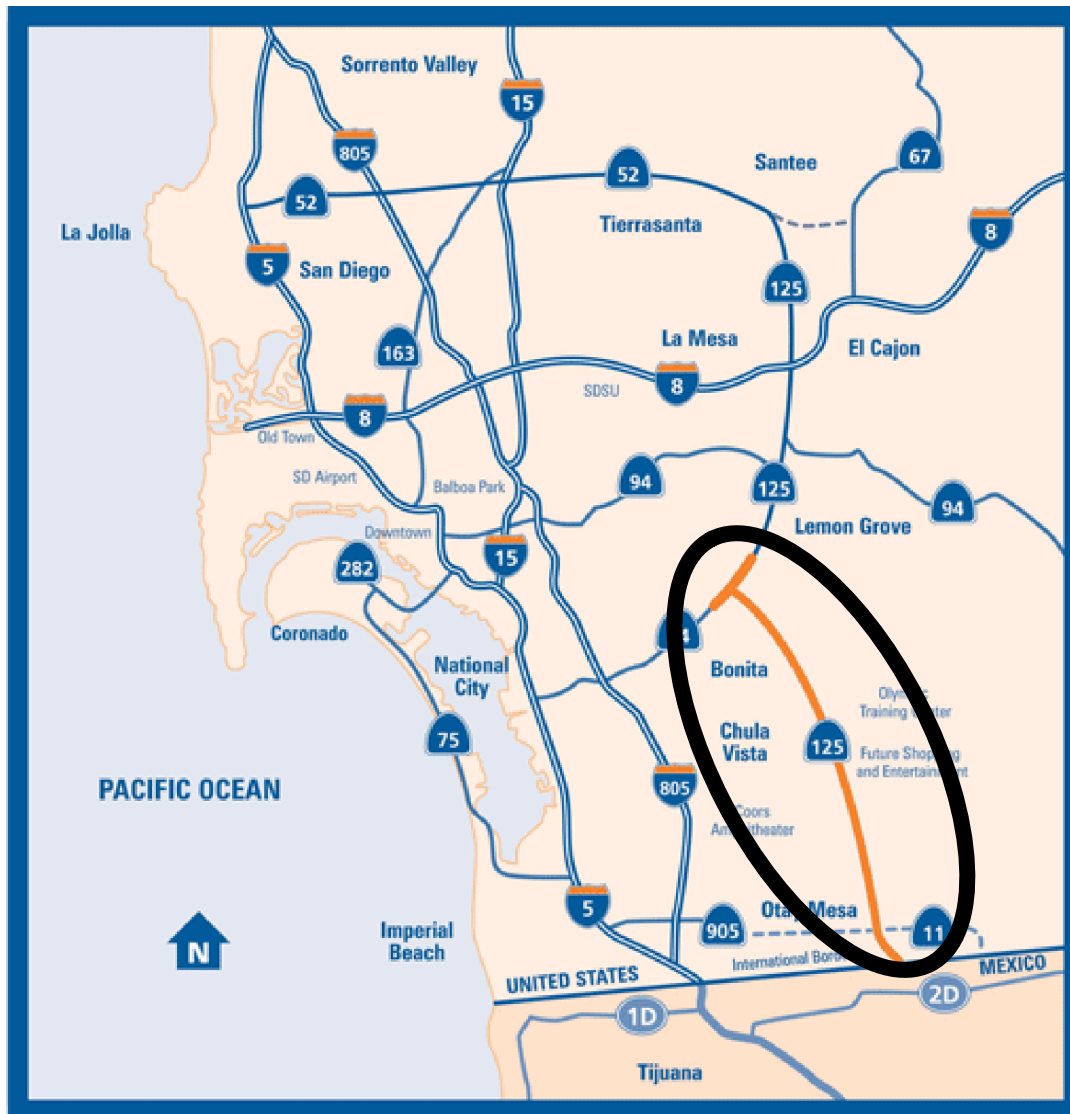
SOUTH BAY EXPRESSWAY (SR-125) TOLL ROAD, SAN DIEGO COUNTY, CALIFORNIA

PPP Delivery	Construction/ Development Period	Concession Period	Contract Value	Status
Design-Build-Finance-Operate	15 years Development; 3 years Construction	35 years	\$635 million	Under Construction

SUMMARY

The State Route 125 South toll road is a \$635 million, 9.5 mile highway alignment planned to connect the only commercial port of entry on the US-Mexico border in San Diego to the regional freeway network, as shown in Exhibit 3.22.

Exhibit 3.22 – SR-125 Toll Road Site Map



Source: South Bay Expressway, 2005-2007. URL: <http://www.southbayexpressway.com/learn.shtml>

SR-125 South is a 35-year franchise awarded in 1991 under California Assembly Bill 680 to be constructed as a privately financed and operated toll road. The SR-125 South project took nine years just to achieve environmental clearance. After more than a decade of struggles the original franchise owners sold their interest to a new ownership team before ground was finally broken to construct the facility.

Sixteen years after developers first signed a deal with the California Department of Transportation (Caltrans) to construct the highway, the SR-125 South toll road, rechristened in 2005 as the South Bay Expressway, is scheduled to open to traffic by late spring 2007. This case study examines the setbacks and accomplishments of this project, as well as the strategies employed to complete the project after so many years of delay.

BACKGROUND

The driving force behind the highway has been the continuing development around the City of San Diego since the end of World War II, especially in areas to the southeast of the city where cross-border trade with Mexico has flourished since enactment of the North America Free Trade Agreement (NAFTA) in 1991. The proposed highway runs near the City of Chula Vista. With over 200,000 residents, Chula Vista is the second-largest city in San Diego County and has consistently ranked as one of the 15 fastest-growing cities in the United States over the past several years. The SR-125 South corridor is adjacent to Otay Ranch, a 5,300 acre planned community and the largest residential development planned in the county.

In addition to the traffic generated by residential growth, the area has experienced a significant increase in commercial truck traffic. The Otay Mesa Port of Entry at the southern end of the South Bay Expressway was developed in 1985, beginning with northbound cargo operations and a passenger port of entry. In 1994, the federal government moved all southbound commercial cargo traffic to Otay Mesa from the border crossing at San Ysidro (at the end of I-5 to the west). Otay Mesa is the largest commercial crossing along the California-Mexico border and handles the second highest volume of trucks and third-highest dollar value of trade among all U.S.-Mexico land border crossings.

According to the Otay Mesa Chamber of Commerce, since the enactment of NAFTA, the annual volume of trucks at Otay Mesa has increased over 45 percent, to 1.4 million trucks. Yet until the South Bay Expressway is completed, the border crossing will not have direct access to limited access highways. In addition to truck traffic from the border crossing, Otay Mesa is the largest area of undeveloped, industrial-zoned land remaining in San Diego County.

Planning for the South Bay Expressway corridor originated in the late 1950s, with the proposed facility adopted into the state highway system by the California Transportation Commission in the early 1960s. But the state was not able to identify funds to construct the freeway so the corridor was dropped from the plan in 1976. In 1984, the San Diego Association of Governments (SANDAG), the region's Metropolitan Planning Organization, added SR-125 to the Regional Transportation Plan, but a lack of funds continued to delay construction of the project.

In 1988, San Diego County began collecting a voter-approved half-cent sales tax to support what it called "TransNet" transportation projects. The program supplemented constrained state and federal transportation funds to address the region's growing backlog of transportation needs. TransNet provided funding for the San Miguel Connector at the north end of SR-125 South, but

not funding for SR-125 South itself. In fact, SANDAG estimated that public monies to fund SR-125 South would not be available until 2020 or later.

Parsons Brinckerhoff joined with Egis Projects and other partners to create California Transportation Ventures, Inc. (CTV), which proposed to finance, design, build, operate, and maintain SR-125 South to the California Department of Transportation (Caltrans). Given the pressing need to serve the growth in residential and international truck traffic in the South Bay communities, and the inability of Caltrans to use internal funds to build the facility, the agency selected the CTV proposal for advancement under the state's initial public-private partnership legislation known as AB 680. A development agreement was reached in June 1991, granting a 35-year franchise to operate the facility once it opened to the public, at which time control would transfer to Caltrans.

It took nine years, however, for the project to receive final environmental approval. During this period, seventeen conceptual alignments were evaluated in developing the environmental impact report. These alignments were subject to an intense public review process and ongoing coordination with several public agencies and land use authorities. The process was drawn out by a number of setbacks, including legal challenges, identification of endangered species habitat in the corridor (as shown in Exhibit 3.23), and resistance to the project from several federal agencies, including the Army Corps of Engineers and the Environmental Protection Agency. The California Transportation Commission adopted the final alignment for SR-125 in early 2000. The final environmental permits were received in the summer of 2001.

Exhibit 3.23 – Wildlife Habitat along Project Corridor



Source: SR-125 South Project, 2006. URL: <http://www.sr125.com/overview/index.htm>

Meanwhile the original owners of CTV sought to limit their investment in the SR-125 South franchise. The partners considered a variety of ownership models, including formation of a non-profit corporation to construct and operate the franchise. Ultimately, the franchise agreement was not conducive to non-profit ownership, and CTV was sold to new investors. In September 2002, Macquarie Infrastructure Group (MIG) acquired an 81.6 percent stake in CTV. In May 2003, MIG acquired the remaining 18.4 percent of CTV from various minority interests, and remains the majority shareholder in CTV today.

With the franchise in new hands and environmental clearance in place, construction on SR-125 South began in September 2003. Exhibit 3.24 shows the ground breaking ceremony for SR-125.

Exhibit 3.24 – Ground Breaking for SR-125 (South Bay Expressway)



Source: South Bay Expressway, 2005-2007. URL: <http://www.southbayexpressway.com/learn.shtml>

PROJECT DESCRIPTION

The South Bay Expressway, formerly known as State Route 125 South and the San Miguel Mountain Parkway, is a toll road that will serve the growing South Bay suburbs of San Diego, California, including the city of Chula Vista. The north-south toll road will stretch 9.5 miles from SR-905 in Otay Mesa at its south end to SR-54 in Spring Valley at its north. The 4-lane toll road will have 6 interchanges, a major toll plaza, and a $\frac{3}{4}$ -mile, pre-cast segmental bridge crossing the Otay River. In addition, additional interchanges are planned at two roads not yet constructed near the southern terminus of the toll road. The design of the toll road allows for expansion to three lanes (southern section) or four lanes (northern section) in each direction to meet future traffic increases.

The new toll highway is expected to achieve the following goals:

- Complete a missing link in the San Diego freeway network;
- Reduce traffic congestion on I-5 and I-805;
- Greatly reduce traffic congestion on Otay Mesa Road and local streets in Chula Vista and Bonita;
- Reduce drive time from Eastlake to downtown San Diego by 34 percent and to Otay Mesa by 75 percent;
- Improve regional mobility in the South Bay and access for residents and businesses to the employment centers on both sides of the U.S./Mexico border; and
- Serve the already planned and approved communities that are under construction in the South Bay.

The highway will provide a third high-speed limited access alternative inland of the existing Interstate 5 and Interstate 805 corridors in south suburban San Diego. The facility will also provide a limited access connection to the Otay Mesa Port of Entry, the only border crossing for commercial vehicles in San Diego County. In addition, the route will improve access to downtown San Diego, the Sorrento Valley, I-8, and I-15. Exhibit 3.25 provides a view of the Otay River Bridge, one of the largest structures to be built along the SR-125 corridor.

Exhibit 3.25 – Otay River Bridge Construction



Source: South Bay Expressway, 2005-2007. URL: <http://www.southbayexpressway.com/learn.shtml>

The toll road was officially renamed South Bay Expressway during the summer of 2005 to emphasize the area to be served by the toll road, as well as the way in which traffic will move along the highway, according to project sponsors.

A related project under development at the north end of the South Bay Expressway is a publicly-funded connection to an existing section of SR-125 to the northeast. The San Miguel Connection or “the Gap” will connect the South Bay Expressway with SR-54 and SR-125, ensuring a limited access connection between the South Bay Expressway and San Diego’s existing highway network. Once constructed, the 1.5-mile San Miguel Connection will be operated and maintained by Caltrans.

The project is in its final year of construction. The partners recently celebrated the groundbreaking for the toll road’s customer service center in Otay Mesa, which will serve as the hub for the Expressway’s operations.

PARTNERSHIP ARRANGEMENT

The South Bay Expressway is currently being developed as a public-private partnership (PPP) among CTV, Otay River Constructors, the U.S. Department of Transportation, Caltrans, San Diego Association of Governments (SANDAG), the City of Chula Vista, and developers of land adjoining the corridor. The project is being delivered as a design-build-finance-operate (DBFO) contract under an agreement originally made in 1991 between Caltrans and the San Diego Expressway Limited Partnership to finance and build the facility. As the general partner of San Diego Expressway, LP, CTV currently manages the project and administers the contracts. The term of the operating franchise is 35 years, beginning upon completion of construction of the South Bay Expressway and commencement of revenue service.

Private Sector Partner Roles and Responsibilities

California Transportation Ventures, Inc. is a privately-held, for-profit corporation based in Otay Mesa, California. CTV is owned in its entirety by Macquarie Infrastructure Group (MIG), an Australian-based infrastructure investment fund. Macquarie has invested in over a dozen toll facilities worldwide, including the 407 Express Toll Route in Toronto, the Dulles Greenway in Virginia, and the Chicago Skyway in Illinois.

Under the terms of the franchise, CTV has responsibility for design, construction, and financing of the 9.5-mile toll road. CTV is also responsible for construction of the publicly-funded 1.5 mile San Miguel Connection. Upon completion of the toll road and connection, ownership will transfer to the State of California. CTV has a 35-year franchise to operate the toll road, and will contract with Caltrans to maintain the road and with the California Highway Patrol to provide routine patrol services and incident management. In exchange, CTV will set and collect tolls on the South Bay Expressway and may retain any toll revenues remaining after expenses and debt service as a “reasonable return on its investment,” subject to a cap of 18.5 percent of its total investment in the facility.

CTV contracted with Otay River Constructors—a joint venture of Fluor Daniel and Washington Group—to design and construct the South Bay Expressway toll road as well as the San Miguel Connection. The agreement is a fixed-price, fixed-delivery schedule contract. In addition, Parsons has a construction management contract, and InTranS has a contract for design and implementation of the facility’s toll collection system, including highway-speed open-road tolling.

Public Sector Partner Roles and Responsibilities

The role of public partners is limited to funding and financing assistance of portions of the project, as well as franchise management and the usual role in the project and permit approval process and other supervisory oversight.

Caltrans issued and manages the franchise on behalf of the state. Ownership of South Bay Expressway will transfer to the state upon completion of construction, but the state will not control the toll road until the CTV franchise expires in 2041. Under contract from CTV, Caltrans will maintain the roadway, and another state agency, the California Highway Patrol, will police the facility. Prior to Macquarie’s acquisition of CTV, Caltrans and CTV entered into a lump sum agreement to provide staff to a joint project team to complete the environmental process.

The U.S. Department of Transportation has provided a total of \$140 million in federal loans under TIFIA (Transportation Infrastructure Finance and Innovation Act of 1998). The direct loan and line of credit will close the funding gap and enhance the credit worthiness of the project. TIFIA's flexible repayment features with deferred interest and principal will reduce debt service pressure during the early years of the loan, and the line of credit will serve as a traffic guarantee during the first 10 years of operation.

The City of Chula Vista has played an important role in funding the South Bay Expressway project by facilitating a land dedication program required for right-of-way.

SANDAG is involved in funding the San Miguel Connection with regional sales tax revenues. Federal Surface Transportation Program funds will also be applied to the Connection.

LEGAL AUTHORITY

In one of the first legislative initiatives to establish PPPs in transportation in the United States, the California legislature enacted AB 680 in 1989. The act specified four pilot PPP projects but did not allow the application of state or federal money to fund the projects, with tolls as the principal source of revenue for the projects. Of four projects only two advanced: The 91 Express Lanes in Orange County and SR-125 South. The others failed due to a lack of financial and community support.

FUNDING AND FINANCE

South Bay Expressway will cost \$635 to construct. AB 680 legislation authorizing the SR-125 South franchise specified that state or federal grants could not support the project. Therefore, the project is being privately financed by CTV. Financing includes:

- \$400 million in bank loans from two global infrastructure financiers, Spanish-based Banco Bilbao Vizcaya Argentaria, S.A. and Irish-based DEPFA Bank plc;
- Federal loans totaling \$140 provided by the U.S. Department of Transportation under TIFIA; and
- Private equity capital from Macquarie Infrastructure Group.

Land developers dedicated approximately 70 percent of right of way for the project, valued at more than \$40 million. Financing will be repaid through tolls on the South Bay Expressway. Toll rates for the facility have not yet been announced.

The San Miguel Connection, bridging the gap between the South Bay Expressway and existing highways SR-125 and SR-54 is a \$139 million link publicly funded with regional tax revenue and federal Surface Transportation Program funds. The project is part of the SANDAG TransNet program, which is funded by a voter-approved half-cent sales tax dedicated to transportation projects.

INSTITUTIONAL CONTEXT

Several institutional factors influenced how this PPP project evolved, some of which advanced the project while others delayed the project. These are discussed below.

- ***Demonstrated Transportation Need.*** Plans have been in the works for a new north-south highway to serve San Diego County's South Bay area since the late 1950s. With the passage of NAFTA and burgeoning cross-border commercial truck traffic at the Otay Mesa border crossing, as well as the commercial and residential development of Chula Vista, the future growth that planners foresaw fifty years ago is occurring. It is expected that there will be high demand for the roadway when it opens.
- ***Early PPP Enabling Legislation to Advance the Project.*** Assembly Bill 680, passed by the California legislature in 1989, permitted Caltrans to enter into agreements for four pilot privately-financed, privately-developed transportation projects. This innovative piece of legislation provided the impetus for this project to proceed as a PPP, using private capital and innovative project delivery methods to develop the facility.
- ***Willing Private Sector Participation.*** While the initial owners of the SR-125 franchise sold their interest in the project, the acquisition of the franchise by Macquarie Infrastructure Group suggests that the project remains financially viable. In time, toll revenues generated by the South Bay Expressway are expected to cover the cost of design, construction, operations and maintenance, and compensate the franchise holders for their investment in the corridor. The facility's projected ability to generate significant toll revenues by serving a growing transportation need is what has attracted private sector investors in this project.
- ***Stakeholder Support.*** Throughout the setbacks experienced by this project over the years, local governments—including SANDAG and the City of Chula Vista—remained committed to the development of the South Bay Expressway by funding related projects to connect the proposed toll road to the existing highway network and dedicating right-of-way to the corridor. In addition, a majority of the public remained supportive of the project throughout the many years of delay caused by environmental challenges. Without local efforts to support the facility and make it a reality, this franchise may have been abandoned like others chartered under AB 680.

ISSUES AND STRATEGIES

The South Bay Expressway faced some of the most daunting issues of any transportation project in the United States that eventually reached fruition. These impediments include the following:

- ***Availability of Project Funding.*** Initially, funding for construction of a highway through South Bay delayed this project. Neither Caltrans nor SANDAG were able to identify adequate tax-based funds to pay for the highway. Ultimately, the lack of public funding for the project, its demonstrated transportation need, and the projected viability of toll-based financing combined to make this an attractive candidate for private investment under AB 680.

The South Bay Expressway is being financed in part by a federal TIFIA loan. The sole purpose of the TIFIA loan is to reduce the cost of borrowing during project development and toll revenue ramp up. Although AB 680 prohibited the use of state or federal funds

for projects authorized under this statute, the TIFIA loan is permitted under the terms of AB 680 since toll revenues will be used to pay the full debt service costs of the loan. Therefore, toll revenues and private equity are fully funding the development of the toll road (franchise) portion of the project without any direct state or federal funding.

- ***Environmental Clearance Process.*** The greatest threat to the South Bay Expressway project turned out to be the environmental clearance process. Under the terms of the franchise agreement, the San Diego Expressway Limited Partnership assumed all of the risks associated with obtaining an environmental record of decision for the project. Since the environmental review of the project had not been completed prior to the issuance of the franchise, the private partners to the deal bore the responsibility to carry out the full environmental review and clearance process, including preparation of an environmental impact statement resulting in a record of decision.

During a protracted environmental review process that took over nine years to complete, the franchise holders incurred significant costs to overcome a variety of legal and institutional challenges to the project. These challenges came from environmental advocacy groups, as well as state and federal environmental permitting agencies. Issues raised by these groups included concern over the loss of wildlife habitat and protection of endangered species found in the corridor. As a result of the extended environmental clearance process and the resulting mitigation measures adopted for the corridor, the cost of the project escalated while toll revenues that could have been collected had the project proceeded on schedule were lost.

Despite the setback in schedule, increased costs, and foregone toll revenues, the project is more environmentally friendly as a result of this process, with mitigation measures including wetlands restoration, protected wildlife habitats, and recreational improvements in adjacent communities.

- ***Managing Project Risks.*** The original owners of the SR-125 franchise did not anticipate the lengthy and costly environmental process that ensued. Had these risk factors been better understood prior to entering into the franchise for the project, the original team may have declined to invest in the franchise or only done so after the state had completed the environmental clearance process. For the subsequent owners of the franchise, who came in only after the environmental clearance process was successfully completed and all right-of-way obtained for the project, there was much greater understanding of project risks. With many of the most significant project risks already absorbed by the prior investment team and with significant increases in development-induced latent demand for the facility, the new investment team could better judge the financial feasibility of the project prior to making their offer to acquire the franchise.

This experience suggests that the public sector sponsors of PPP projects are in a better position to handle the environmental clearance process as well as the land acquisition process. To the extent that these requirements can be met prior to the franchise holders making significant investments in a project, the risks to the private sector partners can be significantly reduced.

RESULTS

The South Bay Expressway is expected to open to revenue traffic in the spring of 2007, 16 years after the franchise agreement was originally signed. If Caltrans had funded the project using traditional methods of financing, the opening of the highway would have been delayed even further—to 2020 or later. This additional delay would result in increased congestion on the highway network serving San Diego and its fast-growing communities to its south, slowed economic development in this area, and constrained international trade through the region's sole commercial inland port of entry at Otay Mesa. In addition, further delays would result in increased project costs due to the rising price of materials.

When construction is completed, CTV's 35-year franchise to operate, maintain, and collect tolls on the facility will begin, at the end of which ownership of the facility will revert to Caltrans. The volume of traffic in the highway's initial year of operation will be a prime indicator of latent demand for the facility, and the trend in volume over the first several years should illustrate whether the facility will be profitable for CTV.

CONCLUSIONS

At the time of its passage AB 680 was considered groundbreaking legislation by enabling private involvement in the development of public-use highway infrastructure. However the bill placed nearly all project risks on the private sector and precluded the use of public funding for the project. These restrictions doomed two of the projects originally planned under the act and severely delayed construction of SR-125 South. Over time, AB 680 earned a reputation as a PPP legislative model to avoid, and the act was repealed by the legislature in 2002.

- ***Public Sector Partners Should Assume Responsibility for Environmental and Other Permit Clearance.*** The key lesson learned from the AB 680 experience, and from the South Bay Project in particular, is that the public sector is better positioned to manage the risks associated with the environmental clearance process. Few, if any, PPPs attempted in recent years have placed the risks associated with environmental clearance solely on the private sector partners. Most potential private sector partners will avoid investing in PPP initiatives that have not already achieved environmental clearance. The same can be said for obtaining other public agency permits for the project, and for obtaining needed land for right-of-way. Public sector sponsors of these projects can better manage the risks of dealing with other public permitting agencies or acquiring property by using its powers of eminent domain. Having public sector partners involved in or full responsible for these functions will reduce project risks for private sector partners and thereby enhance the attractiveness of the PPP project to the private sector.
- ***Make State PPP-Enabling Legislation Flexible.*** Another lesson learned from this project is that PPP enabling legislation should be more flexible in defining the roles and responsibilities of public and private sector partners. Other state PPP statutes permit the use of both public and private sector funding and allow the partners to assume different roles and responsibilities for the project commensurate with the risks and potential for return from the project proceeds.
- ***Emphasize Non-Resident Contributions to Project Costs through Tolling.*** The presence of a defined cash flow from the project in the form of a toll or shadow toll (such as availability payments) is an important ingredient to attract private sector interest in PPP

projects. The South Bay Expressway PPP is predicated on the use of toll revenues to cover the full costs of the project over the first 35 years of operation, including financing, development, operations, and preservation costs. With much of the traffic on the facility expected to be international truck movements, the tolling concept is much more attractive to local residents of the corridor since the costs will be shared with non-resident and commercial users who also benefit from the facility.

NEXT STEPS

After nearly 50 years in planning and 16 years in development, the South Bay Expressway will finally open in 2007, launched by early PPP legislation (since repealed) that enabled the roadway to proceed as a PPP but also handicapped its development by prohibiting the use of any state or federal funding for the project. AB 680's legacy is that rigid enabling legislation for PPPs will achieve limited success and may even undermine the projects it is intended to foster. In its wake, a number of states—including Virginia and Florida—have adopted more flexible legislation that accommodates a variety of PPP models that allow both private and public funding sources. These legislative initiatives have in turn have served as models for other states seeking to enable PPPs for highway improvement projects, including Texas, Georgia, North Carolina, and, most recently, California.

In 2006 the California State Legislature enacted the first legislation enabling up to four state-sponsored transportation PPPs for the first time since AB 680 was passed in 1989. This new PPP legislation allows Caltrans to collaborate with regional transportation agencies to enter into comprehensive development lease agreements with public and private partners to develop up to four new transportation facilities, either by solicited or unsolicited proposal (Chapter 32, Section 143 and Section 149.7).

It is hoped that the lessons learned from AB 680, PPP enabling legislation from other states, and both successful and unsuccessful PPP projects in other states can help the fledgling California PPP legislation succeed in fostering the use of PPPs to develop needed highway infrastructure in the state.

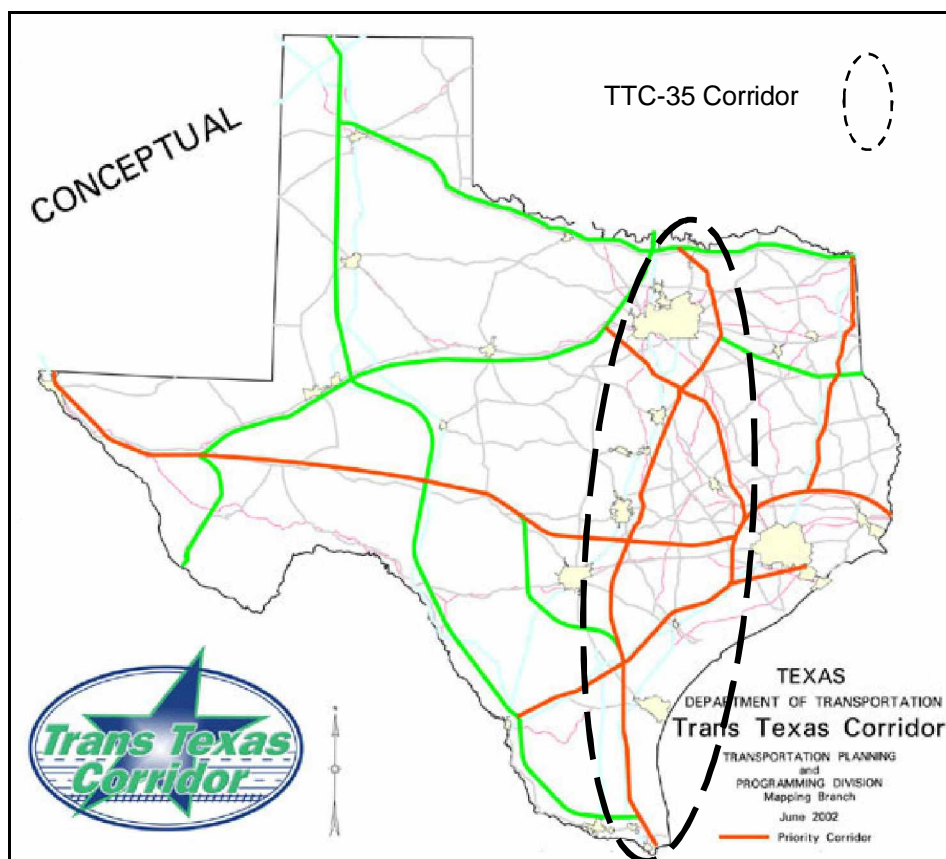
TRANS TEXAS CORRIDOR TTC-35 TOLL ROAD, TEXAS

PPP Delivery	Construction/ Development Period	Concession Period	Contract Value	Status
Design-Build- Finance-Operate	TBD	TBD	\$7.2 billion, as proposed	Under Development

SUMMARY

The Trans Texas Corridor (TTC) program is a grand scheme designed to propel the State of Texas into the 21st Century through the development of an entirely new and primarily self-funded multi-modal transportation network linking the major cities in Texas. As envisioned, the 4,000-mile TTC network would consist of a series of interconnected corridors containing tolled highways for automobile traffic and separate tolled truckways for motor carrier traffic; freight, intercity passenger, and commuter rail lines; and various utility rights-of-way. A key element of the program is TTC-35, a route currently under study between Dallas and San Antonio consisting of a four-lane toll road that could eventually include separate truck toll facilities, utilities, and freight, commuter, and high-speed rail lines, as shown in Exhibit 3.26.

Exhibit 3.26 – Trans Texas Corridor Program Concept Map



Source: Texas Department of Transportation, June 2002. URL:
<http://www.corridorwatch.org/ttc/map2002junepriority.htm>

In 2005, the Texas Department of Transportation (TxDOT) selected a consortium led by Cintra and Zachry Construction Corporation under a comprehensive development agreement (CDA) to develop preliminary concept and financing plans for segments comprising this 316-mile portion of the 600-mile Interstate 35 (I-35) corridor in Texas. The Cintra-Zachry team has proposed to invest up to \$6 billion to design and construct the highway and provide the state up to \$1.2 billion in up-front payments for a 50-year concession to operate the TTC-35 as a toll facility. This case study examines this initial segment of the Trans Texas Corridor, which maximizes private investment, minimizes the use of public funds, and accelerates development.

BACKGROUND

Like many southern and western states, Texas has experienced substantial population and economic growth in recent years. This is most apparent in and around the state's major metropolitan areas such as Dallas, Houston, San Antonio, and Austin. Texas has over 3,200 centerline miles of interstate highways, but much of its urban interstate system is highly congested. This impacts inter-regional, interstate, and international travel and commerce as traffic slows near metropolitan areas.

TxDOT states that its interstate highway system was originally designed to serve transportation needs over a 30-year span, a term which has long since expired as the nation's Interstate Highway System celebrates its 50th anniversary in 2006. Today, there is not a single Interstate highway in Texas one can travel, from end to end, without hitting congestion—except at night. Interstate 35 (including I-35E through Dallas and I-35W through Fort Worth) was originally constructed over twenty years from the 1950s to the early 1970s, with subsequent upgrades to congested interchanges and corridors. But improvements have not and will not keep pace with the growth in traffic: A Federal Highway Administration study found that Texas would have to expand I-35 through downtown Austin to 18 lanes (from its present six lanes) in order to meet anticipated demand by 2025.

Options for widening existing routes are limited as urban development abuts interchanges and other highway rights-of-way, making it financially prohibitive to acquire additional right-of-way to widen existing roadways. This is especially true between Dallas-Fort Worth, Austin, and San Antonio, where more than half of the state's population resides. The portion of I-35 that connects these cities has become clogged with traffic as growing suburbs border the highway, and commuters use the route for intra-regional travel. This burdens both urban commuters and longer-distance through traffic, including trucks, intercity buses, and recreational travelers. Without investment in new highway infrastructure, conditions will likely worsen in the corridor as its population is projected to double over the next 50 years.

Texas has also witnessed significant increases in freight traffic in the decade since the North American Free Trade Agreement (NAFTA) was enacted. An estimated 80 percent of Mexico's trade with the United States passes through Texas, and approximately 75 percent of that trade moves on I-35. Commercial vehicle crossings at the U.S./Mexican border at Laredo, the southern terminus of I-35, has grown six-fold since NAFTA passage, and trade related to NAFTA is expected to double before the end of the decade. This will result in further congestion along I-35, as truck traffic grows 6 percent annually statewide and 10 percent annually in the Austin-San Antonio corridor—compared to a national rate of growth of 2 percent.

Trans Texas Corridor Program

The Trans Texas Corridor (TTC) concept was first proposed by Governor Rick Perry in January 2002. The TTC concept consists of a network of transportation infrastructure corridors criss-crossing the state, connecting Texas' largest metropolitan areas such as Dallas-Fort Worth, Houston, Austin, and San Antonio, as well as smaller cities in the state's border, western, and coastal regions. The Governor describes the plan as "a new vision for transportation that leverages the resources of the private sector to build roads faster, cheaper and with fewer taxpayer dollars spent up front for construction."

In promoting the TTC concept, the Governor claims that the program will:

- Boost the state's economy by creating hundreds of thousands of jobs;
- Save travel time with highway design speeds of 80 miles per hour;
- Take hazardous cargo out of the most populated areas;
- Enable high-speed passenger rail service between major cities in Texas; and
- Reduce air pollution.

The Trans Texas Corridor is proposed to be a multi-modal, statewide network of transportation routes in Texas that will incorporate existing and new highways, railways, and utility right-of-ways into quarter-mile wide corridors. As currently envisioned, each corridor would include:

- Separate tolled highway lanes for:
 - Passenger vehicles and smaller trucks
 - Large trucks
- Separate rail lines for:
 - Freight trains
 - High-speed intercity passenger trains
 - Regional commuter rail trains
- Utility corridor for:
 - Water lines
 - Oil and gas pipelines
 - Transmission lines for electricity, broadband, and other telecommunications services

Plans call for the TTC to be completed in phases over the next 50 years with routes prioritized according to Texas' transportation needs. TxDOT will oversee planning, construction and ongoing maintenance, although private vendors will actually deliver these and other services, including daily operations. When completed, the TTC network will provide approximately 4,000 centerline miles of multi-modal transportation infrastructure facilities throughout Texas, paid entirely by user fees. Construction of the entire network is expected to take at least 50 years to complete and cost upwards of \$184 billion. The costs for developing, operating, and preserving the system will come from user fees collected on the different modal segments of the system.

According to TxDOT, the TTC will move people and goods faster by providing:

- Additional driving lanes;
- Routes to divert long-distance traffic from local roadways; and
- Options for different modes of travel, including rail.

In addition, TxDOT asserts that the TTC will improve traffic safety and spur economic development.

By combining roads, rail lines, utilities and energy pipelines into a single corridor, it is expected that the TTC will require less land than traditional methods of transportation infrastructure expansion. In addition, the TTC will alleviate Texas' growing traffic congestion problems on its existing transportation facilities by constructing new routes expressly designed to serve through traffic, including freight and passenger movements.

PROJECT DEVELOPMENT

The Texas Transportation Commission formally adopted a Trans Texas Corridor action plan in June 2002. The plan, shown in earlier Exhibit 1, identified four priority segments of the Trans Texas Corridor, which roughly parallel the following existing routes:

- I-35 from Oklahoma to San Antonio and I-37 from San Antonio south to the border with Mexico;
- I-69 from Texarkana to Houston to Laredo;
- I-45 from Dallas-Fort Worth to Houston; and
- I-10 from El Paso in the west to the border with Louisiana at Orange.

Factors considered in prioritizing corridor segments included:

- Congestion relief for metropolitan areas;
- Existing hazardous material routes;
- Corridors most likely to generate toll revenue; and
- Opportunities for economic development.

In November 2002, a consortium led by Fluor Enterprises, Inc. submitted an unsolicited proposal to TxDOT to develop a toll road paralleling I-35. But the state did not yet have in place enabling legislation for unsolicited public-private partnerships (PPPs) in transportation. In June 2003 the Texas State Legislature passed several bills that amended pre-existing statutes to enable the implementation of the Trans Texas Corridor Plan, namely, to enable solicited and unsolicited proposals for PPPs.

Procurement Process

Following passage of this legislative package, TxDOT issued a request for competing proposals and qualifications to develop a 600-mile Trans Texas Corridor segment roughly parallel to I-35 between Oklahoma and Mexico, now labeled TTC-35. By the September 2003 submission deadline, TxDOT received three competing proposals and qualifications, from Fluor, Trans Texas Express, LLC (a Skanska-led consortium), and the consortium Cintra-Zachry LP.

TxDOT conducted a month-long internal evaluation of the proposal and developer qualifications in which all three firms were advanced to the next stage in the evaluation process. An industry

review process followed, in which the industry was invited to share with TxDOT how any requests for proposals and contracts should be shaped to achieve the best interests of the State of Texas. Meanwhile, TxDOT drafted a request for detailed proposals and met with and received comments from proposers. TxDOT issued a request for detailed proposals to all three teams in April 2004, with an August 2004 deadline.

During the fall of 2004, TxDOT performed a comprehensive review of each proposal to determine the best value proposal for the state, evaluated on the basis of innovative financial strategies, understanding of the environmental process, realistic development schedule and previous experience with similar projects. The Cintra-Zachry proposal was the highest rated of the three proposals, and was selected by unanimous vote of the Texas Transportation Commission at its December 16, 2004 meeting.

The Cintra-Zachry proposal called for development of TTC-35 in seven segments. It would incorporate the SH-130 toll road currently under construction between Austin and Georgetown as an element of the corridor. The proposed schedule includes:

- Austin (SH-130) to Seguin (near San Antonio), 2007-2009
- Dallas northeast connector, 2009-2012
- Dallas southeast connector, 2009-2013
- Dallas to Temple, 2010-2013
- Temple to Georgetown, 2010-2013
- San Antonio southeast connector, 2010-2014

The proposal also called for relocation of the Union Pacific railroad in central Texas. Note, however, that all phasing is subject to change as part of the master development and financial planning processes presently underway, which as noted above will define corridor segments to be developed in the near-term, mid-term, and long-term. TxDOT notes that the initial proposal may change significantly before final plans are approved as environmental reviews, community and traffic assessments, and other detailed studies are completed.

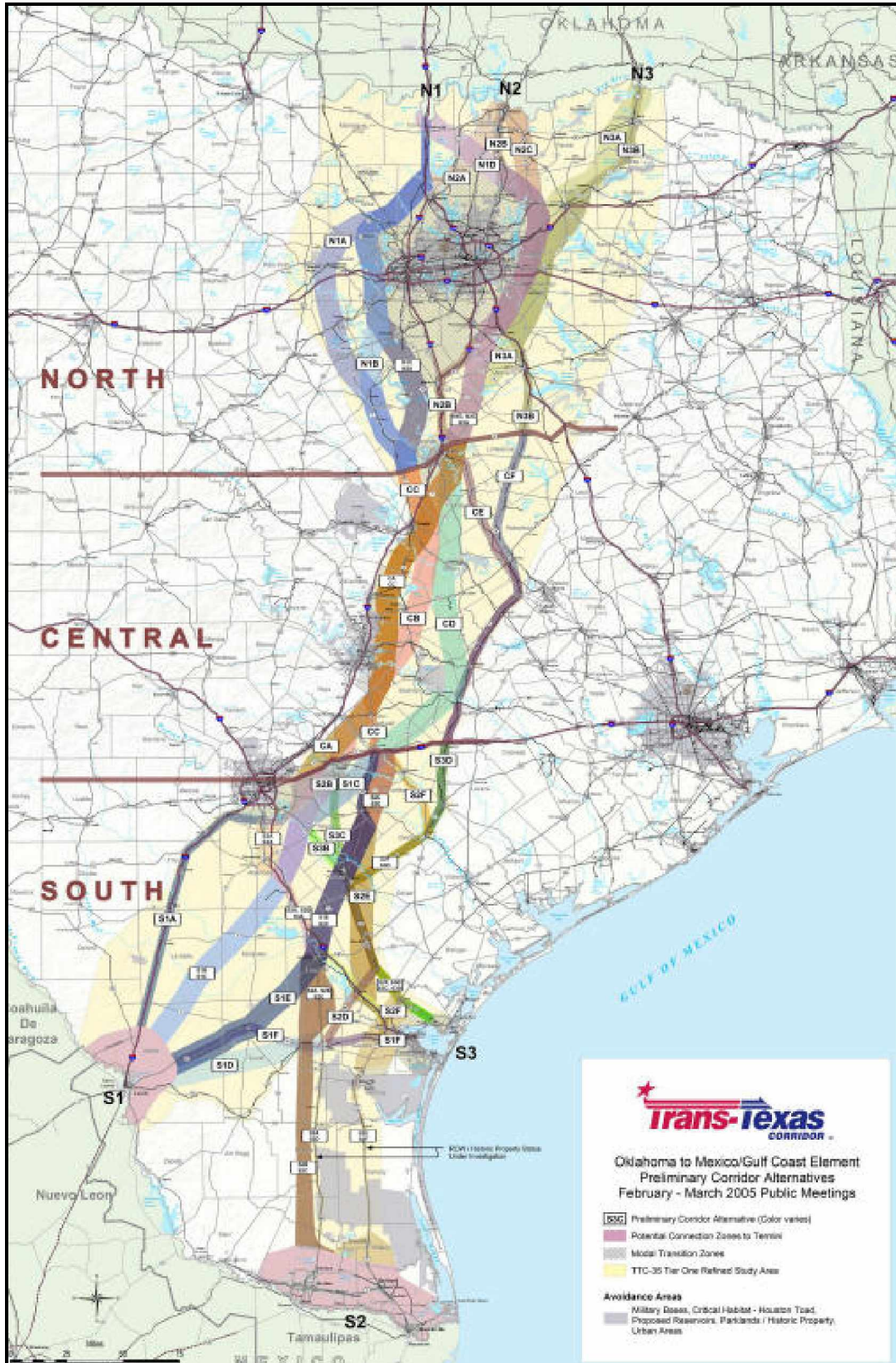
Exhibit 3.27 on the next page shows the various alignments considered for this strategic north-south NAFTA corridor in early 2005. These alternatives were subsequently narrowed to the recommended preferred alignment for TTC-35 shown in Exhibit 3.28 on the following page.

Environmental Approvals

Concurrent to its review of the private-sector proposals development proposals and with Federal Highway Administration permission, TxDOT began the staged environmental process for the TTC-35 corridor in February 2004. The study area was finalized in July of 2004; preliminary corridor alternatives were identified and refined over the fall of 2004 and winter of 2005; and a draft environmental impact statement was issued during the winter of 2005. Public meetings and other public involvement were conducted throughout the process.

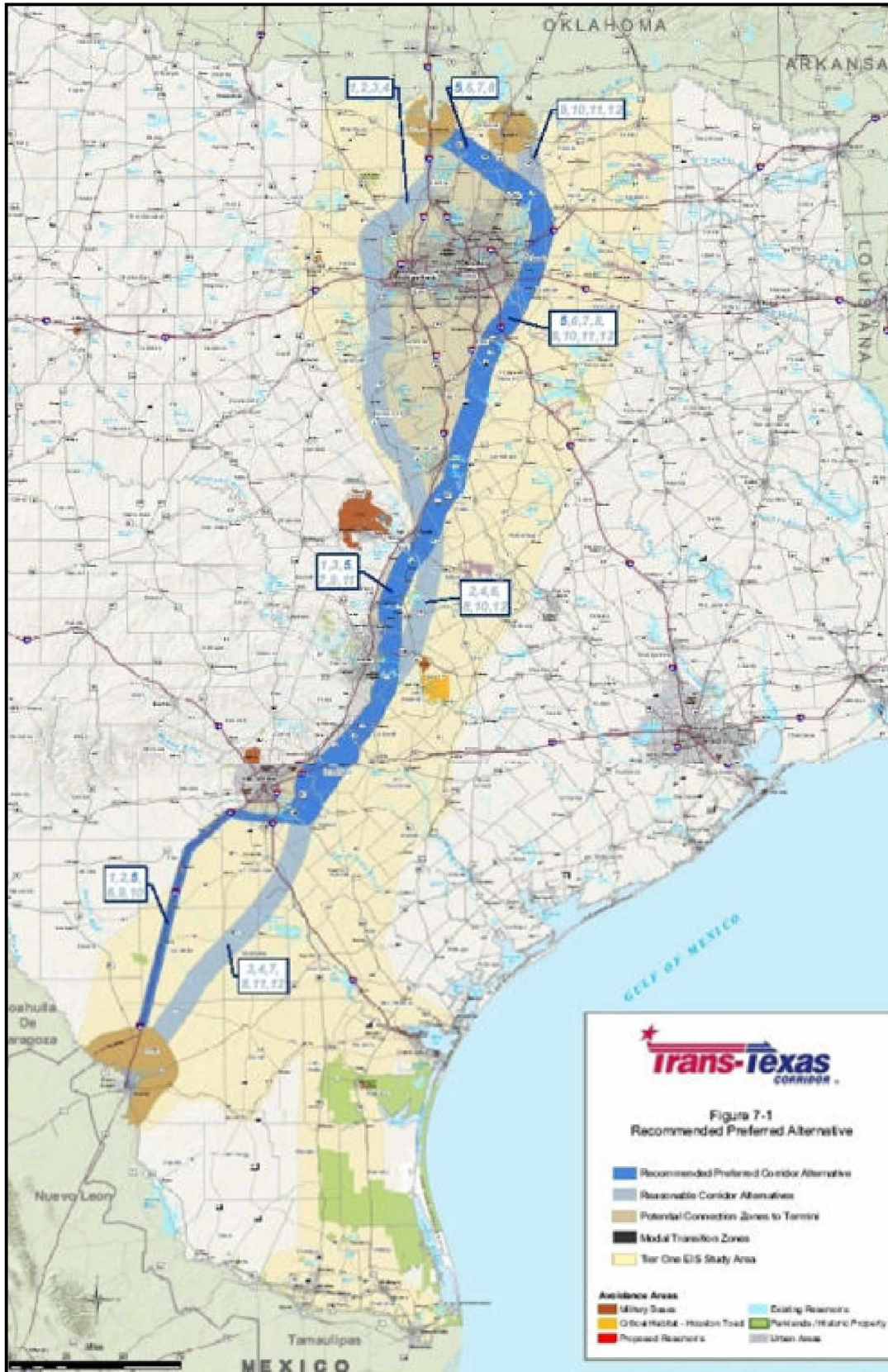
The draft environmental impact statement was approved by the Federal Highway Administration in April 2006. The document identifies a recommended preferred corridor alternative for the TTC-35 Project, and which will serve as the new study area for future environmental studies for a TTC-35 facility. At present, the final environmental impact statement is under development and expected to be issued in early 2007, with federal approval (a record of decision) anticipated by the summer of 2007.

Exhibit 3.27 – TTC Oklahoma to Mexico Preliminary Corridor Alternatives – February 2005



Source: CorridorWatch.org, 2007. URL: http://www.corridorwatch.org/ttc_2007/CW00350300.htm

Exhibit 3.28 – TTC-35 Recommended Preferred Corridor Alternative – April 2006



Source: CorridorWatch.org, 2007. URL: http://www.corridorwatch.org/ttc_2007/CW00350300.htm

Comprehensive Development Agreement

In March 2005, the Texas Transportation Commission and Cintra-Zachry signed a comprehensive development agreement, which authorizes a \$3.5 million planning effort only. The comprehensive development agreement is a public-private partnership agreement “setting forth the framework for the conceptual, preliminary and final planning of the Project and Facilities, and for financing, building, operating and maintaining Facilities, through collaborative efforts of TxDOT and the Developer.” The agreement states that:

“By ‘public-private partnership’, the parties intend and acknowledge that a highly cooperative, mutual collaboration will be pursued . . . to engage the Developer’s innovation, private sector resources, entrepreneurial skills, risk sharing and management capabilities, and technical and financial expertise, and to engage TxDOT’s governmental authority, planning capabilities, risk sharing and management capabilities, and technical and financial expertise, to bring the project and facilities to fruition. As such, the agreement contemplates significant roles and responsibilities for the developer that go beyond the typical work and services provided by engineering and construction firms under contracts routinely let by TxDOT.”

Under the terms of the comprehensive development agreement, Cintra-Zachry must produce the master development and financial plan for TTC-35 within 12 to 15 months. Once the master plan is complete, individual project segments—be they road, rail, utilities, or a combination of these—may be developed, as specified in the facility implementation plans described above. Cintra-Zachry may opt for “self-performance,” the provision of work or services to support development specific facilities. Self-performance activities include financing, planning, design, construction, maintenance, and toll collection and operation. During the preparation of the master plan, one or more near-term facilities (with a total estimated cost of at least \$400 million) will be identified and approved by TxDOT as suitable for self-performance by Cintra-Zachry. The consortium will have the right of first negotiation for development of those facilities, subject to TxDOT’s approval.

While the comprehensive development agreement between TxDOT and Cintra-Zachry calls only for development of a master development and financial plan for the TTC- 35, the agreement is structured to involve Cintra-Zachry in future design, construction, and operation activities. Cintra-Zachry proposed a 50-year concession to operate the Dallas to San Antonio toll road along TTC-35, but this is subject to future negotiation with TxDOT.

Master Development Plan

In June 2005, TxDOT issued a notice to proceed for the initial scope of work, consisting of a master development plan and financial plan. This document, which was submitted to TxDOT in September 2006, includes:

- A list of specific transportation facilities that could be developed in the near-term (2005-2010), mid-term (2010-2025) and long-term (after 2025);
- An overall project schedule describing implementation of the specific facilities, subject to federal environmental approval;
- A master financial plan; and
- Identification of facilities Cintra-Zachry would like to develop itself (i.e. self-performance). Facilities listed in this category would require negotiation with TxDOT before self-performance is approved.

The plan proposes development of seven primary toll road segments over the next five to ten years. The consortium could privately deliver five near-term roadway facilities of more than 260 miles under a Design, Build, Finance, Operate and Maintain structure. The concession model would allow the consortium to pay all capital investment costs, including approximately \$5.9 billion in initial engineering, right-of-way and construction costs. In addition, the consortium could provide a concession payment of approximately \$2.4 billion to the State of Texas. The five segments include:

- Dallas Northeast Connector
- Dallas Southeast Connector
- Hillsboro to Temple
- Temple to Georgetown
- San Antonio Southeast Loop

Two additional near-term roadway facilities totaling 69 miles and over \$1.6 billion in cost could be cross-financed with a portion of the concession payment and still not require any public funding. These segments include the Northwest and Dallas/Fort Worth North Connector and the San Antonio South Loop. To fund the development of these seven facilities the consortium would inject more than \$2.7 billion in private equity.

The segments proposed for development in the master development plan are outlined in Exhibit 3.29 below.

Exhibit 3.29 – TTC-35 Corridor – Proposed Near-Term Roadway Facilities

Reference	Name	Initial Design, Construction and ROW Cost (\$000s)	Project Length (Miles)	Concession/ (Subsidy) ^(*) (\$000s)	Developer Equity ^(*) (\$000s)
P3	Dallas NE Connector	931,948	47.5	354,559	358,675
P4	Dallas SE Connector	1,504,424	56.8	492,014	498,828
P12	Hillsboro to Temple	1,101,475	57.0	580,253	583,388
P13	Temple to Georgetown	1,018,357	49.6	418,112	514,295
P17A	San Antonio SE Loop	1,307,737	52.3	408,804	416,539
<i>Sub Totals</i>		<i>5,863,941</i>	<i>263.2</i>	<i>2,253,741</i>	<i>2,371,726</i>
P1_2	NW and D/FW North Connector	1,184,903	46.1	(294,250)	278,147
P17B	San Antonio South Loop	422,253	23.3	(269,050)	92,281
<i>Sub Totals</i>		<i>1,607,156</i>	<i>69.4</i>	<i>(563,300)</i>	<i>370,428</i>
Totals		7,471,098	332.6	1,690,441	2,742,154

^(*) Assumes 12% discount rate from financial close date to 2006

Source: Master Development Plan: TTC-35 High Priority Trans Texas Corridor, September 2006. URL: http://www.keeptexasmoving.com/pdfs/projects/ttc35/master_development_plan/Executive_Summary.pdf

In addition, the developer has identified three additional components of TTC-35 as ready for development, including an extension of SH-130 south towards San Antonio, a Dallas/Fort Worth southern loop tollway, and a freight rail facility from Dallas/Fort Worth to Mexico

The identified near-term facilities are mapped in Exhibit 3.30 below.

Exhibit 3.30 – TTC-35 Corridor – Identified Near-Term Roadway Facilities



Source: Master Development Plan: TTC-35 High Priority Trans Texas Corridor, September 2006.
 URL: http://www.keeptexasmoving.com/pdfs/projects/ttc35/master_development_plan/Executive_Summary.pdf

Each facility identified in the master plan includes:

- A conceptual design, including requirements for support services such as rest stops and maintenance yards;
- Preliminary traffic and revenue studies;
- Preliminary cost estimates, as well as sources of funds for development and operation;
- Identification of other transportation projects that could impact the potential facility;
- A plan for complying with mitigation and environmental requirements of permits and other necessary approvals; and

- Identification of potential third party agreements and approvals that will be needed to develop the facility.

Final determination of TTC-35 alignment will be made after completion of the federal environmental review process under the National Environmental Protection Act. At present, the final environmental impact statement is under development and expected to be issued in the spring of 2006, with federal approval (a record of decision) anticipated by the summer of 2006.

Right of First Negotiation

Under the terms of the agreement, Cintra-Zachry would have the right of first negotiation to develop any segments that have received environmental approvals and are otherwise ready to proceed to construction. The process for developing a project begins with a request from TxDOT or Cintra-Zachry for a facility implementation plan, which includes a general overview and description of the project, estimated cost to develop the proposed project, disadvantage business enterprise (DBE) and historically underutilized business zone (HUB) goals and recommended project delivery method.

If TxDOT approves the request, the developer will finalize the facility implementation plan. This will include a detailed budget and project schedule, responsibilities of all parties, and other necessary work needed to bring the proposed project to a financial closing and potential construction in the future. If the implementation plan is approved, TxDOT will enter into a facility agreement authorizing the developer to proceed with the work as outlined. TxDOT retains the option to seek competitive bids for facility agreements from other developers.

Once the environmental impact statement for the corridor is complete, TxDOT and Cintra-Zachry will jointly explore their next steps in developing the corridor, as specified in the comprehensive development agreement and outlined in the master development plan. Under the comprehensive development agreement, a variety of project delivery options may be employed, including design-bid-build, design-build, design-build-operate-maintain, and a design-build-finance-operate-maintain concession.

PARTNERSHIP ARRANGEMENT

This partnership involves a flexible planning and development concession, with the potential for increasing responsibility for Cintra-Zachry as the project progresses. Under the terms of the comprehensive development agreement (CDA) between TxDOT and Cintra-Zachry, following completion of the master development and financial plan for the TTC- 35, the consortium has a right of first negotiation with TxDOT to design, construct, and operate a portion of the highway. The contract is a vehicle for TxDOT to further involve Cintra-Zachry in development activities for any segments deemed viable for construction, while retaining the option to open development of any single proposed facility to competitive bidding.

Private Sector Partner Roles and Responsibilities

The consortium Cintra Zachry LP is 85 percent owned by Cintra Concesiones de Infraestructuras de Transporte, S.A. and 15 percent owned by Zachry Construction Corporation.

- Headquartered in Madrid, Spain, Cintra is one of the world's leading private developers of transport infrastructures, managing 18 toll highways (more than 1,100 miles) in Spain, Portugal, Ireland, Chile, and Canada, as well as the 8-mile Chicago Skyway (and soon the 157-mile Indiana Toll Road) in the United States. The firm is publicly traded.

- Zachry Construction Corporation is a privately-owned construction and industrial maintenance service company located in San Antonio, Texas. In addition to highways and bridges, the firm constructs power plants, chemical refineries, and dams, as well as U.S. embassies and other specialty projects throughout the world.

The Cintra-Zachry consortium is supported by 16 other firms, including: Ferrovia-Agroman (a sister operating company of Cintra's with extensive experience in infrastructure construction); Earth Tech, Inc.; Price Waterhouse Coopers, LLP; JP Morgan Securities, Inc.; Bracewell & Patterson, LLP; Pate Engineering, Inc.; Aguirre & Fields, LP; Rodriguez Transportation Group; OTHON, Inc.; Railroad Industries Incorporated; Amey, PLC; Mercator Advisors, LLC; Public Resources Advisory Group; Southwestern Capital Markets, Inc.; National Corporate Network; and HRM Consultants.

The Cintra-Zachry team produced the master development plan and financial plan for TTC-35 and may opt to perform additional activities such as financing, planning, design, construction, maintenance, and toll collection and operation of approved segments of the approved development plan for the corridor. The consortium will have the right of first negotiation for development of selected near-term facilities, subject to TxDOT's approval.

Public Sector Partner Roles and Responsibilities

The Texas Department of Transportation (TxDOT) is the project sponsor. TxDOT will supervise development, conduct environmental and public hearing processes, and hold title to all land and facilities developed within the boundaries of corridor right-of-way. The state will retain powers of eminent domain, and will ultimately select the final alignment of the route, subject to public input and completion of environmental impact studies. TxDOT will select the project delivery option appropriate for each facility. The agency will manage the contract with Cintra-Zachry, and will have the option of developing facilities with Cintra-Zachry or other groups.

LEGAL AUTHORITY

Over the past five years, the Texas State Legislature has exhibited strong leadership in developing and passing critical bills that have paved the way for the state to pursue innovative approaches to finance and develop surface transportation infrastructure in an expedited manner. These bills have provided a broad framework for utilizing PPPs to leverage scarce federal and state resources with private and local resources.

Two legislative actions were essential to enabling development of the Trans Texas Corridor through the comprehensive development agreement process. The first statute was Proposition 15, a 2001 amendment to the Texas state constitution approved by the state's voters which allowed a variety of funding mechanisms to pay for projects such as the Trans Texas Corridor in addition to transportation improvements within the state's metropolitan areas. The measure enables public-private partnerships through comprehensive development agreements, and funding options like toll equity, the Texas Mobility Fund and regional mobility authorities.

The second, a series of bills known collectively as HB 3588 passed by the Texas State Legislature in June 2003, amended pre-existing statutes to enable the implementation of the Trans Texas Corridor Plan. The bill creates Regional Mobility Authorities, which can function independently of TxDOT in the development and execution of transportation PPPs, thereby significantly decentralizing the transportation project planning and delivery processes. The bill also allows TxDOT, the Texas Turnpike Authority, and Regional Mobility Authorities to accept solicited and unsolicited proposals for PPPs.

On May 29, 2005, Texas State Legislature passed HB 2702 which clarified certain provisions of prior legislation regarding the use of private-public partnerships to promote development of toll roads in the state, including the Trans Texas Corridor program. The bill increased the cap on the annual level of TxDOT equity in toll facilities from \$800 million to \$2 billion, limited most toll concessions to fifty years, and prohibited converting existing free roads or those currently under construction to toll roads, unless approved in a public referendum. The bill also required that connections or access be made between TTC corridors and nearby interstate, U.S., state, and other types of roads.

HB 2702 clarified a number of local government issues. It allowed state and local authorities to approve the methodology used by private entities to set and raise toll rates, but not to set the rates themselves. The bill also prohibited non-compete clauses that would limit or prohibit projects by local governments, or projects contained in the state's approved Unified Transportation Plan.

The bill also responded to public concerns over the State's use of eminent domain to acquire land from private individuals for commercial purposes only tangentially related to the TTC. The bill limited approved uses to gas stations and convenience store located within the corridor right of way. In addition, property owners in the right of way for TTC facilities were allowed to retain development rights to their property.

On May 31, 2005, the Texas Attorney General's Office ruled that the entire CDA for TTC-35 between TxDOT and Cintra-Zachry must be released to the public, including the conceptual financial and development plans contained in the agreement.

FUNDING AND FINANCE

Initial cost estimates for the full 4,000 mile TTC project range from \$145 billion to \$184 billion in 2002 dollars, as reported in TxDOT's June 2002 Trans Texas Corridor Plan. This is based on an estimated construction cost of \$126 billion or \$131.4 million per centerline mile; right-of-way costs ranging from \$11 billion to \$38 billion; and miscellaneous costs at \$8 billion to \$20 billion.

The final Cintra-Zachry TTC-35 proposal called for a capital investment of \$6 billion in a toll road linking Dallas and San Antonio, and \$1.2 billion in concession payments to TxDOT for the right to operate the facility for 50 years. TxDOT would have the option to invest concession funds in road improvements or high-speed and commuter rail projects along the corridor.

Cintra-Zachry proposed to fund the project, including its capital investment plus a \$1.2 billion front-end concession payment, from the proceeds of tolls collected along the corridor. The comprehensive development agreement between Cintra-Zachry and TxDOT does not specify how toll rates will be set and adjusted or the term of any toll concessions for the corridor.

The master development plan calls for construction of five segments with initial design, construction, and right-of-way costs totaling \$5.9 billion, with a concession payment to the state of \$2.3 billion and developer equity of \$2.4 million. With all seven proposed segments, in which concession payments from the first five segments subsidize construction of the remaining two, initial design, construction, and right-of-way costs total \$7.5 billion, concession payments total \$1.7 billion, and developer equity totals \$2.7 billion. However, the environmental process is not yet complete, and the exact alignment of the highway is currently unknown. Therefore, capital costs are subject to change.

INSTITUTIONAL CONTEXT

Texas is one of the fastest growing states in the country, with a diversified economic base and a desirable Sunbelt location along the Gulf of Mexico and the Rio Grande River. As a major NAFTA state with the longest contiguous border with Mexico, Texas carries large and growing volumes of freight traffic on its highways and rail lines. Much of this freight moves through the state with origins and destinations outside the States' borders. Within the state, Texas boasts numerous burgeoning metropolitan areas, surrounding such cities as Houston, Dallas-Fort Worth, Austin, San Antonio, and El Paso. Population growth in these metropolitan areas is leading to increased traffic congestion along existing highway facilities, whose expansion has lagged due to the lack of funding.

The combination of local economic development and the growth of interstate and cross-border freight and automobile movements have placed a huge burden on the state to upgrade and expand its transportation infrastructure networks. These include all types of transportation infrastructure, including highways, rail lines, pipelines, and utility lines. The Trans Texas Corridor program is designed to help address the challenges of meeting the mobility needs of the State's growing economy and population for decades to come. It does so by focusing on funding sources that significantly leverage state and federal proceeds from fuel taxes through the application of user fees, such as highway tolls (auto and truck), trackage access fees, and utility access fees. These proceeds are then committed to pay for the debt service costs of financing the capital costs of corridor improvements that are developed.

The guiding principals established to advance the Trans Texas Corridor concept include a number of provisions promoting the application of PPPs. These include the following:

- The public sector is no longer able to fully fund the expansion and improvement of the State's highway system using traditional sources of revenues.
- Government does not have all the answers to the transportation challenges facing Texas and needs the innovation and financial resources of the private sector.
- The transportation infrastructure needs in the state are multi-modal in nature and lend themselves to multi-modal solutions involving both public sector and private sector providers of transportation services, such as the sharing of corridor rights-of-way to minimize land use requirements and costs.
- Transportation improvements in Texas must be completed faster and can not afford to wait for full project funding to be accumulated through traditional "pay-as-you-go" methods, particularly when the costs of project inputs are rising much faster than the cost of capital.
- Local officials should help determine how communities access Trans Texas Corridor facilities.
- People and carriers which pay fees to use Trans Texas Corridor facilities must be treated as customers.
- State agency staff and contractors must work in concert with local entities to provide high-quality service to users of the corridors.

- Trans Texas Corridors must be built with public/private partnerships in order to provide the up-front capital infusion needed to pay for the initial capital costs of new facilities and to minimize costs to taxpayers.

The Trans Texas Corridor program and the TTC-35 initiative in particular are facilitated by a number of institutional features, including:

- ***A Growing Population.*** The state is experiencing tremendous growth, and will require new infrastructure to facilitate the millions of people who will move to Texas in the coming years.
- ***Increasing traffic volumes.*** Traffic volumes on Texas interstate highways have grown dramatically in recent years as a result of growth in the state's population and economy, as well as truck traffic resulting from increased trade with Mexico following enactment of NAFTA. Texas serves as a primary port-of-entry for trade with Mexico, and must facilitate through-movement of truck traffic that is not destined for Texas metropolitan areas, through which all existing Interstates pass.
- ***Congested and Constrained Alternative Roadways.*** Existing highways have reached capacity near many Texas cities. Financially-viable options for widening routes are limited as extensive urban development borders highway rights-of-way, making land acquisition costs prohibitive. Building parallel routes to provide additional highway capacity is one method of alleviating this congestion.
- ***Toll Viability.*** The four priority corridors identified in the Trans Texas Corridor Plan would connect the state's largest cities, paralleling existing routes that are overly congested. It is estimated that parallel toll highways comprising the TTC would attract sufficient traffic from congested interstates in Texas to generate more than enough toll revenues to fund construction and operation of these new facilities. Based on the Cintra-Zachry CDA, it is estimated that TTC-35 would throw off sufficient toll revenues for the consortium to pay TxDOT \$1.2 billion in up-front concession fees to finance, develop, and operate the San Antonio-to-Dallas segment of the toll road.
- ***Political Leadership.*** Governor Perry has staked his political reputation on advancement of the Trans Texas Corridor concept, and with the support of allies in the state legislature, has been successful in advancing the vision to date. The success of the TTC vision as an ongoing program beyond his term in office will be measured by the speed with which near-term elements of TTC-35 can be planned, built, and opened to traffic. The ultimate success of the program will be measured by the willingness of both interstate and intrastate travelers to pay the tolls to use these facilities.
- ***Willing Private Sector Participation.*** TxDOT received three proposals from firms highly qualified to develop the TTC-35 project, which indicates strong private sector interest in the program. This interest should be sustained as long as the private sector perceives TxDOT as a cooperative partner, and there is opportunity for a reasonable return on investment.
- ***Legal Authority.*** Texas laid the groundwork necessary to advance TTC-35 as a public-private partnership, including a 2001 constitutional amendment providing TxDOT greater financial flexibility to advance projects and the 2003 legislative package that enabled solicited and unsolicited public-private partnerships. With passage of HB 2702 in 2005, the state legislature reaffirmed its support for the TTC program and the TTC-35 project

while also addressing both public and private concerns that were threatening to undermine the program and the TTC-35 CDA.

ISSUES AND STRATEGIES

The Trans Texas Corridor concept has quickly advanced in only four years, with TTC-35 the first major component of this enormous undertaking. As with any first step in such a complex program, this evolving initiative faces a number of impediments to the vision sketched by TxDOT and Cintra-Zachry in their conceptual proposal. The most significant of these are discussed below, as well as how the project partners are addressing them to move the project forward in an expedited fashion:

- ***Environmental Clearance.*** TxDOT will soon wrap-up the final environmental impact statement for the TTC-35 project, and advancement will require a positive record-of-decision by federal officials. Until the outcome of this process is complete, precise alignments and other particulars of TTC-35 cannot be determined. Even upon receipt of a record-of-decision, project segments will require environmental permits and related approvals, a process that can be time-consuming and subject to risk.

TxDOT has addressed this by making the environmental approval process as transparent as possible. It has already hosted four rounds of public meetings for the TTC-35 environmental study. It has maintained open communications with the public through an extensive web site describing the Trans Texas Corridor program and projects (which can be found at <http://www.keeptexasmoving.com>). This web site includes general information about the TTC program, the current status of TTC projects, a page for citizens to submit comments on the TTC-35 project, and a section containing the entire TTC-35 comprehensive development agreement.

- ***Opposition from the Public and Politicians.*** 2006 was an election year in Texas and the Trans Texas Corridor program was a major campaign issue raised by several challengers to the incumbent governor who was re-elected in the general election in November 2006. However, there continues to be organized opposition to the Trans Texas Corridor program, with several state legislators and county boards opposing elements of the TTC plan.

TxDOT has acted to implement the Trans Texas Corridor program as a matter of public policy and statutory direction, rather than politics. As noted earlier, TxDOT sought and received statutory changes from the state Legislature to implement the corridor concept. While the agency was criticized for quickly approving the Corridor Plan in 2002 with limited public input, it has been much more deliberate in its efforts to include the public in the environmental review and clearance process for the TTC-35 component of the system. TxDOT has devoted time and effort to educate the public on the benefits of tolling and PPPs, while emphasizing that the state has conceded none of its decision-making authority to the Cintra-Zachry consortium.

Thus far the partnership continues developing the master development plan and financial plan for the various components of the project. However it has not yet proceeded with development of any single segment of TTC-35 pending completion of the phased environmental clearance process. However, various segments of TTC-35 and other portions of the Trans Texas Corridor system are under active solicitation and procurement of bids from interested private sector teams. With the Cintra-Zachry consortium having the right of first refusal on the earliest segments of

TTC-35 to be advanced, there is strong incentive for the CDA team to select project segments with the best prospects for fast advancement and strong public support. To maintain its momentum, the TxDOT/Cintra-Zachry partnership must continue its efforts to be communicative, inclusive, and responsive to the public.

RESULTS

Without a mature toll network to help cross-subsidize its efforts to develop major new transportation infrastructure, TxDOT is employing public-private partnerships to advance the toll-funded Trans Texas Corridor program. In developing the TTC program, TxDOT is accelerating efforts to leverage its scarce public resources by engaging the private sector in the finance, design, construction, operation, maintenance, and management of these facilities. It is only through PPPs that TxDOT can expect to develop the massive TTC program, which is unprecedented in its size and multi-modal scope. The use of PPPs not only leverages available public resources, but promises to advance the program in a more cost-effective and expedited manner.

Congress has not increased the federal motor fuel tax since 1993 (and most of this was used for deficit reduction). Texas has not raised its 20 cent-per-gallon tax on gasoline and diesel since 1991. Recognizing that elected officials are unlikely to raise motor fuel tax rates at either the federal or state levels, Texas officials have concluded that major new investments in surface transportation infrastructure can only be made if the facilities are significantly funded by tolls and other forms of user charges. Therefore the state is moving towards expanded use of tolling to pay for new highway capacity, including the Trans Texas Corridor and intra-metropolitan projects sponsored by newly established Regional Mobility Authorities. Indeed, all new highway projects being planned by TxDOT must be considered as possible toll roads.

While TTC-35 remains under development, it is highly likely that the highway portions of this route, as well as other highway elements of the Trans Texas Corridor program, will be primarily funded with toll revenues. The use of tolling to generate an expanding stream of project revenues makes the TTC-35 project attractive to the private sector since there is expected to be dedicated funding sources to pay for the costs of developing, financing, and operating the facility over its full life-cycle. While the project could be funded over the long term by toll revenues without involving private sector partners, the use of PPPs facilitates the application of innovative project financing, development, and delivery approaches to these ambitious projects, thereby increasing their attractiveness to the private investment community. Tolling provides the securitizable revenue stream that makes this public-private partnership, and the associated cost and schedule benefits described above, possible.

Given the early stage in the development of the Trans Texas Corridor program, the prospects for success cannot yet be determined. To date, TxDOT has succeeded in advancing the concept to the threshold of development, using public-private partnerships and innovative financing and project delivery approaches to accelerate the process. The first indication of the TTC-35's prospects for sustained momentum came last year when the federal government's environmental record of decision was issued for the initial segments of the corridor selected for development. Subsequent indicators of progress will be the assignment of specific project segments for development by Cintra-Zachry or other interested consortia over the next few years. In some cases, project segments will involve relocating railroad lines. These project segments offer the potential for other modal infrastructure to be jointly developed in or near the TTC right of way,

such as truck-only toll lanes, intercity passenger or commuter rail lines, and utility transmission lines or pipelines – paid for largely by direct user fees.

CONCLUSIONS

The key lesson learned thus far from the Trans Texas Corridor program and the TTC-35 project is that the public represents a critical stakeholder that must be understood and responded to for the project to reach the implementation stage. It is preferred to start this dialogue early in the concept development process and continue it throughout the project development and delivery processes. However, members of the sponsoring public-private partnership and public official advocates can recover from early omissions by instituting a strong public outreach and communication process that is on-going. This is especially critical when introducing a new approach that represents a paradigm shift not only in the provision and management of transportation infrastructure, but also in how these facilities are integrated and operated.

A statewide network of quarter-mile wide corridors containing ribbons of highways, rail lines, pipelines, and utility conduits that link major metropolitan areas of the state and its state and international neighbors is a novel and ambitious concept that requires new approaches to project development and financing. Therefore it is incumbent on the sponsoring agency (such as TxDOT) and other project advocates to clearly explain:

- How such a new and unusual facility will address existing and future needs;
- What the costs to the public will be in terms of tolls and other fees;
- Potential savings from expediting the project through innovative project financing and delivery approaches; and
- Ways in which the project is expected to contribute to a higher quality of life for citizens of the areas served by the facilities.

Public outreach and involvement requires continuous two-way communication. Public inputs and opinion must be incorporated into all project deliverables to create a resilient plan of action that can be successfully implemented. The state of Texas and the TTC-35 partners have demonstrated flexibility in responding to public concerns through the passage of corrective or clarifying legislation and refinements to the CDA. The partners have also shown strong determination to move the process forward by allowing it to evolve as issues and opportunities arise. This level of project development flexibility is a key feature of the Comprehensive Development Agreement process adopted by TxDOT. The CDA provides a framework for involving the private sector in the integrated development and financing of the overall project and the delivery of individual segments of the project over time.

NEXT STEPS

TTC-35 is a work in progress, and the first true test of TxDOT's partnership with Cintra-Zachry will come as the partners collaborate to implement the first phases of the master development plan and move to the development of individual project segments. The first segment of the corridor is still years away from opening, even under the most optimistic schedule. The partnership's success in utilizing the relative strengths of its public and private partners, being flexible in addressing impediments, and applying the lessons learned from this and other partnerships, will ultimately determine how this program will develop and the degree to which individual components will succeed.

PORT OF MIAMI TUNNEL, MIAMI, FLORIDA

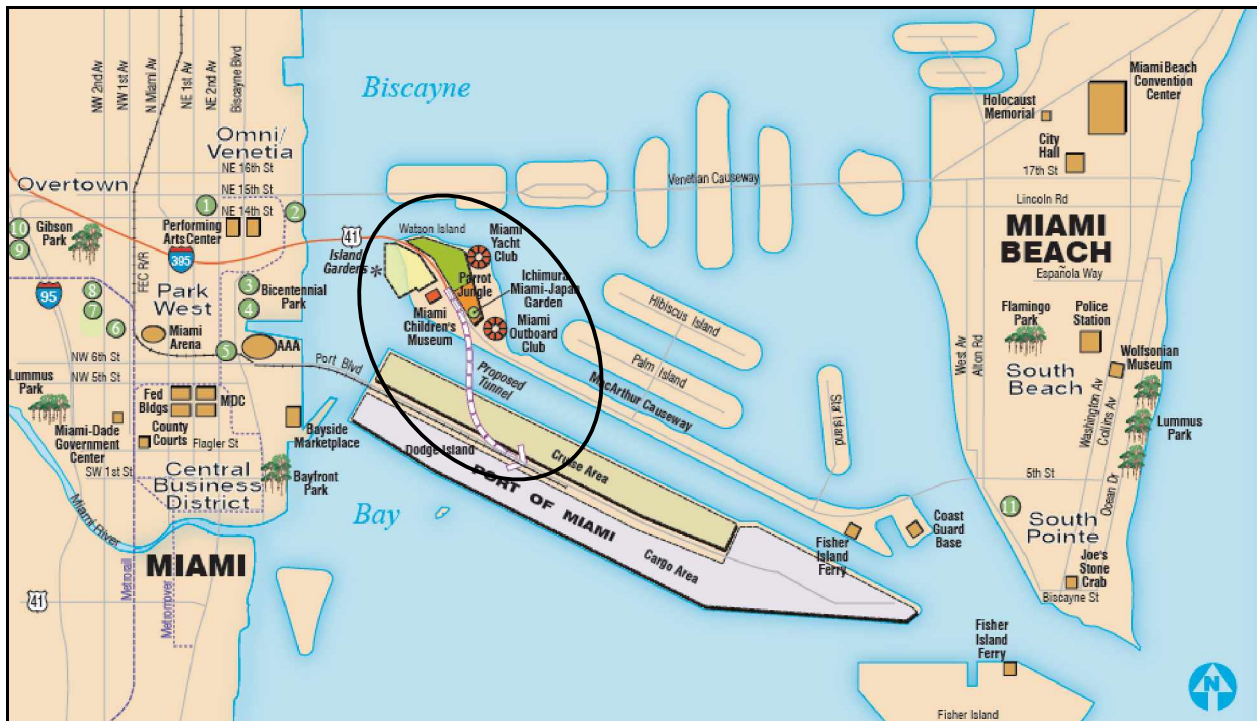
PPP Delivery	Pre-Construction/ Development Period	Concession Period	Contract Value	Status
Design-Build- Finance-Operate- Maintain	1981 to 2012	35 years, including 5 years to develop the facility and 30 years for O&M	\$1.4 billion	Concession contract awarded

SUMMARY

The Port of Miami Tunnel (POMT) project will create a new, direct-access roadway connection from South Florida’s Interstate highway network to the Port of Miami (POM). The POM is widely recognized as the “Cruise Capital of the World” and also serves bulk and container cargo ships. Currently all auto, bus, and truck traffic headed to and from the Port must traverse local city streets, creating severe congestion in downtown Miami. The POMT will route much of this Port-related traffic directly onto nearby Interstate highways, thereby improving safety, facilitating redevelopment, and maintaining the Port of Miami’s competitiveness.

The POMT will consist of three integrated components: twin bored tunnels underneath the Main Shipping Channel between Dodge Island and Watson Island; widening of the existing MacArthur Causeway Bridge; and connections between the tunnel and the existing Port road network. Figure 3.31 below shows the alignment of the tunnel relative to the Port and downtown Miami. The length of the entire facility is approximately three miles.

Figure 3.31 - Port of Miami Tunnel Site Map



Source: Florida Department of Transportation, 2007, www.portofmiamitunnel.com

The total base cost for the POMT is expected to be approximately \$1.4 billion. The Florida Department of Transportation (FDOT) in cooperation with Miami-Dade County and the City of Miami will collectively provide the funding for the project over its service life. However the exact sources of the local contribution have not been fully determined. FDOT chose to develop the POMT through a public-private partnership, with the private sector responsible for designing, constructing, and financing the entire facility over a five year period, and operating and maintaining key segments of the facility for 30 years after the POMT opens to traffic. Instead of receiving revenue from direct user tolls, the concessionaire will receive “availability payments” from FDOT throughout the duration of the contract to repay the up-front private sector financing of the design and construction of the tunnel plus the costs of operating and maintenance efforts once the facility is completed and placed into operation.

One of FDOT’s major goals in procuring the POMT as a PPP was the ability to transfer significant portions of the project risk to the private sector concessionaire. In general, all risks which are not expressly assumed in whole or in part by FDOT are assumed by the concessionaire. Thus the concessionaire will bear substantially all of the risk associated with design, construction, operating, maintenance, and financing. However, the unique geotechnical risks associated with a tunnel of this size requires risk-sharing with regard to potential changes in site conditions, such as unforeseen geotechnical conditions that increase project costs. Several layers of risk sharing are provided to mitigate the cost burden on either the private developers or public sponsors of the project due to unforeseen geological or other site conditions impacting the project as it proceeds.

In early 2007, three international concessionaire teams bid “maximum” availability payments over prescribed timeframes, with availability payments to be made on a monthly basis, less any deductions assessed if contractual performance standards are not met. The performance standards include measures of availability, service quality, and safety. This approach creates incentives for both timely completion of project construction and high operating and maintenance standards. FDOT has also included a “High Traffic Payment” as part of the availability payment, which will compensate the concessionaire for higher maintenance costs if traffic levels greatly exceed the forecasts. The winning consortia, Miami Access Tunnel (headed by Bouygues of France) will receive maximum availability payments totaling \$33.2 million per year, distributed in monthly increments to the concessionaire from FDOT throughout the duration of the contract.

BACKGROUND

Access improvements for the POM have been in various stages of planning and development for over a quarter-century. By the late 1970s, cruise and cargo traffic to the POM was growing and was projected to continue to grow substantially, but access was limited to a two-lane bascule highway bridge (carrying Port Boulevard) and a single-track bascule railroad bridge (carrying the Florida East Coast (FEC) Railway). A report issued as part of the Port of Miami Master Development Plan in June 1979 recommended that the existing Port Boulevard Bridge be replaced with a four-lane high-level fixed span bridge and that Port Boulevard be grade-separated over Biscayne Boulevard (U.S. Route 1). Other proposals for alternate access routes were only briefly considered, but a Seaport Development Order issued later that year by the City of Miami demanded a more detailed examination of alternatives. The objectives of this examination were to define an environmentally acceptable truck route for accessing the POM and to reconsider the proposed Port Boulevard routing across Biscayne Boulevard in order to minimize the impacts on nearby Bayfront and Bicentennial Parks.

A study by the Seaport Department in July 1981 put forward four alternatives for vehicular access to the POM. These alternatives covered four basic alignments for accessing Dodge Island – via I-395, Watson Island, the Miami central business district (CBD), or Interstate-95 (I-95) – but all the alternatives considered only a bridge facility. In 1982, the Dade County Metropolitan Planning Organization (MPO) established a Port of Miami Task Force that further evaluated those alternatives. Most of the bridge alternatives were eliminated due to cost considerations and impacts on the CBD, but the I-395 bridge alignment was retained and a tunnel alternative was added. The proposed tunnel would have run east of, and parallel to, Biscayne Boulevard and merged with I-395.

In June of 1983, an independent Feasibility and Cost Study of Tunnel Alternatives was completed and three separate tunnel alignments were brought under consideration. Two of the tunnel alternatives would have run parallel to the existing Port Boulevard Bridge, with one connecting directly to Biscayne Boulevard and the other running north (parallel to the shoreline) and connecting to I-395. The third alternative envisioned a tunnel crossing under the Main Channel connecting to the MacArthur Causeway.

In August 1984, a three-phase Transportation Improvement Plan (TIP) was approved by the County Board of Commissioners, which gave further support to a tunnel. The TIP called for improvements to the existing Port Boulevard intersections (particularly with Biscayne Boulevard), construction of a new high-level Port Boulevard Bridge (which was successfully completed in 1991), and construction of a four-lane underwater/underground tunnel connecting the POM with I-395. Figure 3.32 below shows the existing high-level Port Boulevard Bridge and the original bascule road and rail bridges (looking eastward into the POM).

Figure 3.32 - Existing Access to the Port of Miami



Source: Greater Miami Convention and Visitors Bureau

Progress on a tunnel then lagged for approximately five years until October 1989 when FDOT began a Project Development and Environment (PD&E) study to develop and evaluate cost-effective alternatives for linking the POM to the Interstate system. A total of eight different tunnel and bridge alignments were considered in this study, including some previously reviewed alternatives as well as some new alignments that envisioned utilization of the FEC right-of-way, connection to the Rickenbacker Causeway to the south, and connection to Alton Road in Miami Beach to the east. In September of 1990, after approximately a year of analysis and meetings between community members, local officials, FDOT, and the Federal Highway Administration (FHWA), a tunnel under the Main Channel to Watson Island was selected as the preferred alternative.

Over the next ten years, the project moved slowly through the various environmental review processes at the state and federal levels. A Draft Environmental Impact Statement (EIS) was signed by FHWA in April 1996 and the project's Public Hearing was held two months later. However, due to concerns raised by the Florida Department of Environmental Protection (FDEP) about negative impacts on Biscayne Bay from blasting and dredging, the proposed tunnel construction method was re-evaluated for the use of a tunnel-boring machine. The tunnel-boring method was found to be less environmentally intrusive. As a result, FHWA downgraded the project's environmental determination from EIS to EA/FONSI (Environmental Assessment/Finding of No Significant Impact) in May 1997 and in December 2000, they granted Location and Design Concept Acceptance for a bored tunnel. This cleared the way for the project to move from the preliminary planning and environmental clearance phases to design and construction once sufficient funding was identified for the project.

However, the POMT was not yet ready to move into the final design and construction phases. In June 2003, Florida's Turnpike Enterprise (FTE) initiated a Project Re-evaluation that included additional geotechnical analysis of the project site to ensure that the proposal to use a bored-tunnel approach was technologically feasible, to review of construction methods for the preferred alternative, and to update the PD&E project documents. The re-evaluation was completed and approved by FHWA in December 2005, and while the project was given clearance to advance, a number of design changes were recommended. The most significant of the changes included the widening of the MacArthur Causeway Bridge, reduction in the grades inside the main tunnel alignment, and flood gates (for hurricane surge protection) on the Dodge Island tunnel portals.

Efforts by the prior Governor to champion the project near the end of his last term put it on a fast-track by committing significant FDOT funding to the project and encouraging its development and delivery through an expedited public-private partnership approach. During the process of internal analysis by FDOT, supported by Florida's Turnpike Enterprise (a part of FDOT which is responsible for developing and operating many of the tolled facilities in the State), it was concluded not to impose direct tolls on users of the tunnel facility due to concerns that vehicular traffic would divert to the existing bridge or, even more negatively, that some cargo or cruise ship traffic would divert to other competing ports in Florida and other east coast states. Instead of collecting tolls directly from users, project sponsors decided to pay for the project over 35 years by using availability payments to a concession team that would provide the up-front financing to design and construct the dual tunnel project and its related approach facilities over the first five years of the project contract and 30 years of operations and maintenance thereafter.

PROJECT DESCRIPTION

The Port of Miami (POM) is widely recognized as the “Cruise Capital of the World.” It serves eight cruise lines that carried over 3.6 million passengers in 2005 via the Port. The POM also serves bulk and container cargo ships that moved about 9 million tons of freight through the Port, including over 500,000 TEU (twenty-foot equivalent units) in container traffic during 2005. All of these activities are served by cars, buses, and trucks, which must travel on local roads in downtown Miami, creating severe traffic congestion.

The Port of Miami Tunnel (“POMT”) project will create a new, direct-access roadway connection from the MacArthur Causeway (State Road A1A) on Watson Island to the Port of Miami (“POM”) on Dodge Island in Biscayne Bay east of downtown Miami. The POMT project will consist of three integrated components. The first is the construction of twin-bored tunnels underneath the Main Shipping Channel between Dodge Island and Watson Island. The second is the widening of the existing MacArthur Causeway Bridge connecting Watson Island with the mainland and Interstate 395 (I-395). The final component is the creation of connections between the tunnel and the existing POM road network on Dodge Island. Figure 3.33 below shows a conceptual graphic of the tunnel looking southward from Watson Island passing beneath the Main Channel. The length of the entire facility, including connecting roadways, is about 3 miles.

Figure 3.33 - Conceptual Graphic of the Port of Miami Tunnel



Source: URS, <http://www.urscreativeimaging.com/miamiporttunnel0>

The alignment and configuration of the tunnel and its connecting roads are severely constrained by existing land uses, traffic flow, and environmentally sensitive areas. Once completed, the POMT will relieve the congested downtown Miami streets of Port-related passenger and heavy truck traffic, which will improve traffic safety, keep the POM competitive with other ports, and facilitate ongoing and future development plans in downtown Miami.

The POMT project is being sponsored by the Florida Department of Transportation (FDOT) in cooperation with Miami-Dade County, the Port of Miami (a department of the County), and the City of Miami. FDOT has chosen to develop the POMT through a public-private partnership (PPP). The winning bid was selected in early May 2006, and a single consortium of firms (Miami Access Tunnel, headed by Bouygues of France) will be responsible for not only the design, construction, and financing of the entire POMT facility, but also the operation and maintenance of key segments of the facility for 30 years after the POMT opens to traffic. There will be no direct fees or tolls charged to users of the tunnel facility. Instead of receiving revenue from tolls, the concessionaire will receive “availability payments” (explained in detail below) from FDOT throughout the duration of the contract in exchange for maintaining a pre-determined level of availability, service quality, and safety on the facility. The level of these availability payments will be determined as part of the contract bidding.

PARTNERSHIP ARRANGEMENT

When completed, the POMT will be a public facility and a part of the Intra-State Highway System. FDOT will exercise public authority over the facility and also act as the contracting entity for the concession. FDOT has described its procurement approach for the POMT in the following way:¹³

“The POMT is being procured as a public-private partnership (PPP) designed to transfer the responsibility to design-build-finance-operate-and-maintain (“DBFOM”) the project to the private sector. It is a high-risk, technically challenging project that has attracted three bidding consortia comprised of several of the most technically sophisticated and financially-sound constructors and financiers in the world. In addition, the POMT approach has attracted national attention as states around the country contemplate PPP programs and seek to avoid the open-ended risk experienced on projects like the “Big Dig”. Under the POMT Concession contract, the concessionaire will finance the project based on the expectation of earning annual “availability payments” once the project opens for service. Essentially these will be payments from FDOT, contingent upon actual lane availability and service quality. Local partners in Miami-Dade County are committed to share 50% of the capital cost of the project.”

Public and Private Sector Partner Roles and Responsibilities

The respective roles of the public and private partners comprising the PPP for the POMT are summarized below by functional area, reflecting the relative allocation of responsibilities and risks between FDOT and the private concession team:

- **Permit Responsibility:** FDOT identified a set of major regulatory permits that are required for the project, including approvals from the Florida Department of Environmental Protection, the Miami-Dade County Department of Environmental Resource Management, the U.S. Army Corps of Engineers, the U.S. Environmental

¹³ Port of Miami Tunnel Project, “Project Overview,” FDOT, March 19, 2007.

Protection Agency (through the National Pollutant Discharge Elimination System), and the U.S. Coast Guard. The concessionaire bears the responsibility for obtaining all these necessary local, state, and federal permits.

- **Right-of-Way:** FDOT developed preliminary right-of-way plans for inclusion in the RFP, and FDOT expects to secure that right-of-way in a timely fashion without involving the concessionaire. Any additional right-of-way deemed necessary by the concessionaire – including permanent right-of-way for the facility or for off-site operations and maintenance needs, as well as temporary space during construction – is the responsibility of the concessionaire.
- **Utility and Railroad Relocation:** The RFP included a preliminary utility work schedule, and FDOT has the responsibility of securing utility agreements with the impacted utility companies prior to awarding the contract. In addition, the concessionaire will also be responsible for relocating railroad tracks which are in the proposed project right-of-way on Dodge Island and which are owned by the POM.
- **Maintenance of Vehicular Traffic, Vessel Traffic, and Port Operations:** The concessionaire must ensure that there are no reductions in the number of existing traffic lanes on the MacArthur Causeway during peak hours; that access to the POM is maintained at all times; and that scheduled vessel movements (in both the channel and the turning basin) are not interrupted.
- **Taxes and Financial Structuring:** The concessionaire is responsible for tax planning and compliance with applicable tax laws. Payments to or from FDOT will not be adjusted for any deficiencies in tax planning, and the concessionaire bears the risk of future changes in U.S. or foreign tax laws. In addition, each proposal included a detailed financial model, which showed projected income and cost estimates and an internal rate of return (IRR) for each year of the concession period. Miami Access Tunnel’s financial model will be incorporated into the concession agreement and will be referenced if there are cost overruns for which FDOT bears risk or if there are settlements required following an early termination or discharge of the concession agreement.
- **Handover:** At the conclusion of the 30-year operating period specified by the contract, the concessionaire must hand over the facility to FDOT. At that time, an inspection will occur (following the terms set forth in the RFP), and efforts to meet contract obligations associated with performance warranties may extend the involvement of the concessionaire beyond the operating period until any deficiencies are corrected to the satisfaction of the project sponsors.

Risk Sharing

One of FDOT’s major goals in procuring the POMT as a PPP is the transference of significant portions of the construction and operating risk to the private sector concessionaire. In general, all risks, which were not expressly assumed in whole or in part by FDOT, were assumed by the concessionaire. In particular, the concessionaire bears substantially all of the risk associated with design, construction, operating, maintenance, and financing. Figure 3.34 summarizes the allocation of project risk between FDOT and the concessionaire.

Figure 3.34 - Overall Risk Allocation

Risk Category	Description	Risk Allocation		
		FDOT	Concessionaire	Shared
Political	Intergovernmental Agreements needed for award of concession	X		
Financial	Appropriation risk for Const. Milestone Payments and Avail. Payments		X	
	Equity and debt funding (financial close, interest rate and currency risk)		X	
Right-of-Way	Areas within Preliminary Right of Way Plan	X		
	Areas outside Preliminary Right of Way Plan		X	
Permits	Obtaining Federal, State and Local Permits		X	
Utilities	Agreements, schedules and relocations			X
Procurement	Legislative and regulatory authorities for award of concession	X		
Construction	Unforeseen conditions			X
	Impacts on vehicle traffic and POM operations beyond agreed levels		X	
	Impact to adjacent communities during construction above agreed levels		X	
	Unforeseen increases in material costs and labor		X	
Operations & Maintenance	Meeting availability and O&M criteria		X	
	Inflation during the Operating Period			X
	Traffic exceeding specified levels			X
Hand-Back	Return O&M Segments in specified condition when concession ends		X	
Force Majeure	Specified events not covered by insurance or performance specifications			X

Source: Port of Miami Tunnel – Project Information Memorandum (2/17/06)

However, the unique geotechnical risks associated with a tunnel of this size required that risk-sharing occur with regard to changed conditions. In their supplement to the Project Information Memorandum (dated 3/17/06), FDOT described the risk-sharing as follows:¹⁴

“FDOT will accept risk sharing for uninsured losses if the Concessionaire’s technical approach is appropriate for the project scope and the conditions in Baseline Geotechnical Report. If the Concessionaire proceeds appropriately and experiences cost overruns due to geotechnical conditions that were not foreseen in the Baseline Report (“Changed Conditions”), then several layers of risk sharing are contemplated. ... FDOT also anticipates that in the most extreme case, the discovery of an extraordinary condition or major unforeseen event (as defined in the Concession Agreement), will trigger the option to terminate the Concession Agreement under a contractually-mandated termination settlement formula. Changed Conditions which result in overruns greater than \$180 million would be considered extraordinary. In addition, if a Changed Condition which is likely to be extraordinary is discovered early in the design or construction process a termination option also may be triggered.”

¹⁴ Port of Miami Tunnel Project, “Project Information Memorandum Supplement,” FDOT, 3/17/06

Figure 3.35 shows the preliminary risk allocation associated with changed conditions that were included in the Supplement to the Project Information Memorandum.

Figure 3.35 - Risk Allocation for Changed Site Conditions

Uninsured Losses (x)	Risk Allocation
x < \$10 million	100% Concessionaire
\$10 million < x < \$160 million	100% FDOT
\$160 million < x < \$180 million	100% Concessionaire
x > \$180 million	90% FDOT / 10% Concessionaire

Source: Port of Miami Tunnel Project, “Project Information Memorandum Supplement” (3/17/06)

Concessionaire Selection

As noted in the Project Summary, the POMT project had three consortia bidding for the concession rights. These three consortia were short-listed in April 2006 based on their responses to a Request for Qualifications (RFQ) that was released in March 2006. The short-listed groups were then given the opportunity to respond to the full Request for Proposals (RFP) for the tunnel project, which was released in November 2006. The three consortia were:

- **Miami Access Tunnel:** This consortium, which ultimately was selected as the winner, is led by Bouygues Travaux Publics of France, which has the lead on all contracting and engineering efforts. The firm of Jacobs Civil, Inc. will provide additional engineering support, and Transfield Services Ltd. is the lead firm for operations and maintenance of the facility upon completion. In addition, Babcock & Brown Infrastructure Group is an equity partner in the consortium.
- **Miami Mobility Group:** This consortium was led by ACS Infrastructure/Dragados of Spain, Odebrecht Construction of Brazil, and Parsons Transportation Group, all of which were equity members. Dragados was the lead tunneling contractor, Odebrecht was the lead non-tunneling contractor, and Parsons was the lead tunnel design engineering firm. In addition, DMJM Harris was the lead non-tunnel engineering firm, and Iridium Concesiones de Infraestructuras (which is affiliated with ACS/Dragados) was the lead operations and maintenance firm.
- **FCC Construcción/Morgan Stanley:** This consortium was headed by FCC Construcción of Spain, which was to provide equity and take the lead on all contracting as well as operations and maintenance. Morgan Stanley will also to provide equity. Tunnel design engineering was to be led by Hatch Mott MacDonald Florida, and non-tunnel engineering by Edwards and Kelcey.

On April 3, 2007, FDOT made public the sealed project bids from the three consortia, each with a different maximum availability payment (MAP) over the 30-year operating and maintenance contract term of the proposed project. Miami Access Tunnel proposed a MAP of \$33.2 million per year and a construction plan requiring 50 months; Miami Mobility Group proposed a MAP of \$39.8 million and a 47-month construction plan; and FCC Construction/Morgan Stanley proposed a MAP of \$63.2 million and a 42-month construction plan. These availability payments would be adjusted annually for inflation throughout the term of the contract.

At that public opening, reports were also made to the project's Technical Scoring Subcommittee by the technical expert panel that had been reviewing the proposals since their submission in early March. In mid-April, the financial expert panel presented its fact-finding to the Financial Scoring Subcommittee. Finally, on May 2, 2007, FDOT announced a Notice of Intent to Award the contract to Miami Access Tunnel. When combined with \$100 million in progress payments and a \$350 million payment upon completion of construction, this results in a project cost of approximately \$1.4 billion.

LEGAL AUTHORITY

The State of Florida has been a leader in utilizing public-private partnerships (PPPs) for the procurement and delivery of transportation infrastructure. Florida Statute 334.30 ('Public-private transportation facilities') provides the authorization for a wide range of private sector involvement in the design, financing, and operation of transportation facilities. The key elements of this enabling legislation:

- Allow both solicited and unsolicited proposals for PPP projects.
- Allow private sector funds and local/state/federal funds to be combined on a PPP project, including the lending of funds from the Toll Facilities Revolving Trust and loans from the State Infrastructure Bank.
- Allow private entities to set the level of tolls and other user fees, subject to regulation by FDOT to avoid "unreasonable costs" to users.
- Do not include limitations on the modes of transportation eligible to be developed as PPPs.
- Allow the public sector to grant long-term leases or franchises to the private sector for the construction, operation, and maintenance of transportation facilities.

FUNDING AND FINANCE

The total base project cost will be approximately \$1.4 billion, though the final figure will depend on the degree to which geotechnical, inflationary, and other risks manifest themselves. Given the size of this mega project, funding will be required from both State and local sources with financing provided through the concession contract, as described below. FDOT will provide milestone and availability payments to the project at various stages during construction and operation.

Funding Overview

FDOT, Miami-Dade County, and the City of Miami will share the cost of the project, although the source of the local contribution (County and City) has not been fully determined. County voters approved \$100 million in bond funding for the project in 2004, and the County Manager has outlined a plan to dedicate over \$100 million in transportation fees and \$47 million in donated right-of-way to the project. However, the balance of the funding has yet to be identified. Various proposals for additional port user fees and tax increment financing have been suggested.

As noted above, FDOT will make \$100 million in progress payments to the concessionaire during the construction period, as well as another \$350 million payment upon completion of construction. Construction is expected to begin in 2008, and availability payments would then be

initiated upon opening the project to traffic. The Miami Access Tunnel's equity contribution will be around \$50 million.

Federal Private Activity Bonds (PABs) authorized under SAFETEA-LU¹⁵ will be used as a bridging facility until the US\$350m payment from FDOT is received. The construction period is estimated to be four to five years, although the bonds will have a longer repayment timeframe with a call option in the event of delays. A \$330 million long-term amount of PABs with a maturity of 35 years will also be issued against the availability payments which are due during the 30-year operating and maintenance period. FDOT will provide the funds needed for the availability payments. The Miami Dade County Industrial Development Authority will be the conduit issuer for the PABs. Lehman Brothers is arranging and structuring the bonds. The two groupings of PABs will be insured by MBIA and XL Capital.¹⁶

Availability Payments

Many concessions in the transportation arena are financed through direct user fees, such as highways tolls or airport landing fees. However, user fees can be supplemented or even replaced by public sector revenue streams in situations where direct user fees alone are insufficient, difficult to predict, or unacceptable from a policy perspective. In the case of the POMT, all three of these reasons apply to varying degrees:

- The existing un-tolled Port Boulevard bridge will continue to provide alternative access;
- Activity at the POM itself will be outside the concessionaire's control;
- There is little physical space available for tolling infrastructure; and
- A major goal of the project is to divert trucks and buses off Port Boulevard and remove them from the downtown street network.

Thus, FDOT chose to utilize availability payments as its method for reimbursing the private sector concessionaire. Availability payments are regular (in this case, monthly) payments that are made to the concessionaire in return for having a facility available for public use at a pre-determined level of capacity and quality. This payment mechanism has been used frequently in the United Kingdom, but the POMT is the first major U.S. transportation project to be concessioned this way. Unlike shadow tolling, availability payments do not depend on the volume of traffic utilizing the facility, and the concessionaire is not directly responsible for maximizing traffic volume. Instead, the concessionaires bid a "maximum" availability payment over a specified contract term, and the winning team (in this case the Miami Access Tunnel team) will receive that payment on a monthly basis, less any deductions it is assessed based on failure to meet certain contractual performance standards. The performance standards include:

- Availability (usually measured in lane hours or tunnel hours, but may also include time for clearing of accidents and disabled vehicles);
- Service quality (including lighting, ventilation, pavement surface, and cleanliness); and
- Safety (including incident response time and traveler information).

This approach has a number of distinct benefits:

¹⁵ http://www.fhwa.dot.gov/ppp/private_activity_bonds.htm

¹⁶ P3 Americas Newsletter. *Minmi Tunnel Financing Taking Shape*. **June 8, 2007**.

- Creates an incentive for timely completion of project construction (since availability payments do not begin until the facility opens);
- Provides an incentive for continued high operating and maintenance standards; and
- Lowers the concessionaire’s cost of capital by eliminating traffic risk.

High Traffic Payments

FDOT added an additional risk-sharing component to the POMT concession contract by including a “High Traffic Payment” as part of the availability payment. This payment is intended to compensate the concessionaire for higher maintenance costs that accompany higher than expected traffic levels, particularly heavy truck traffic. In the Supplement to the Project Information Memorandum, FDOT included an example showing that if heavy truck and bus traffic levels exceed the baseline projections by 20 to 33 percent, the concessionaire will receive an incremental payment equal to 2 percent of the maximum availability payment (MAP). If traffic is 33 to 50 percent above the baseline, the incremental payment is 3 percent of the MAP. If traffic is 50 percent above the baseline, the incremental payment is 3.5 percent of the MAP. In addition, if high traffic persists for more than five consecutive years, then the entire basis for the MAP can be re-evaluated following a cost audit.

The availability payment does not simply cover day-to-day operations and maintenance costs, but also covers initial capital expenditures, financing, and major rehabilitation costs. The fixed availability payment transfers the risk associated with these costs to the concessionaire, which will use the resulting revenue stream to reimburse its financing partners.

INSTITUTIONAL CONTEXT

Despite its long and difficult development history, the POMT is finally moving toward final design and construction, and the selection of the DBFOM concession approach has played a critical role in making the project feasible. Yet this particular procurement and delivery approach is highly dependent on the institutional, technical, and financial contexts surrounding the POMT.

- ***Demonstrated Transportation Need.*** Plans have been in the works for the project since 1981 due to the impact of port-related truck, bus, and auto traffic on street congestion in downtown Miami which has been exacerbated by the growth in Port activity over the last 25 years.
- ***Strong Support for PPPs in Florida:*** As noted above, the legislative and political environment in Florida is particularly supportive of public-private partnerships for transportation, and many PPPs of various kinds are already completed or underway in the state. In many other states, a concession for such a large and visible facility – especially one that will not be supported by tolls or other direct user fees – might have faced substantial opposition, but FDOT was willing not only to pursue a PPP, but also to use an innovative financing mechanism (availability payments) to make the project feasible as a PPP.
- ***Bored Tunnel Technology:*** After the FDEP raised concerns about blasting and dredging in Biscayne Bay, it became clear that the project would only be able to proceed if bored tunnels, rather than immersed tube tunnels, were constructed. There were also concerns about risks of interrupting port operations during construction of the immersed tube tunnels located in close proximity to the turning basin used by the large cruise ships that are based at the POM. However, since the most advanced tunnel boring technology is not

available from domestic construction firms, international constructors were invited to participate in the procurement for the project. Many international firms have significant experience with PPP delivery methods and tend to prefer long-term concessions to traditional Design-Bid-Build or even Design-Build procurement for two reasons. First, the combination of high technology requirements and high construction cost and schedule risks generally require higher rates of return for the firms to cover the potential costs of assuming these risks. Second, long-term financing arrangements generally result in better equity returns for the financing partners. Thus, FDOT selected a delivery method that would attract highly sophisticated and experienced international tunnelling contractors.

- **High Construction and O&M Risks:** The POMT is a massively complicated project, with very significant construction risks (both technical and financial) that increase the likelihood of cost and/or schedule overruns. The long-term operating and maintenance risks are also large, given the mix of traffic and the difficult operating environment. FDOT was willing and able to shift most of those risks onto the private concessionaire in exchange for larger availability payments in the future. This arrangement is seen as benefiting FDOT and the public sector in multiple ways:
 - Cost overrun risk is mitigated, since the concessionaire must finance the construction privately and has no recourse to ask FDOT for additional funding.
 - The concession team is incentivized to mitigate both the delay risk and O&M quality risk by the availability payments, since payments do not start flowing to the concession team until the project opens, and payments will be reduced if O&M quality is deficient relative to performance standards specified in the contract.
 - Construction quality is assured by the long tenor (30 years) of the operating period, since the effects of sub-standard construction should be felt by the concessionaire well before operational responsibility for the facility is transferred to FDOT.
- **Advantageous Timing:** With the concession PPP project delivery model being used in various forms in a number of states, including Illinois (the City of Chicago), Indiana, Texas, and Virginia, the U.S. transportation market is becoming more receptive to PPPs based on project delivery by private sector concession teams. In addition, some observers see an “excess of liquidity” across the global economy, and many private investors around the world are looking for high-yield projects in which to invest. This makes it an advantageous time to be seeking private sector partners for the POMT.

ISSUES AND STRATEGIES

The Port of Miami Tunnel project is a large and technically challenging project that requires sophisticated financial and technical approaches to become feasible. These issues and strategies are summarized below:

- **Obtaining Cost-Effective Bids from the Private Sector for a Mega-Project.** FDOT was able to get multiple competitive bids from qualified consortia because of the structure of the procurement and detailed due diligence efforts. The due diligence efforts included risk-sharing mechanisms; a Value for Money analysis, which helped determine an appropriate contract length; extensive geotechnical sampling that gave the bidders sufficient confidence about the technical feasibility of the project to offer proposals; and a willingness to listen to the bidders and modify the project in response to their concerns.

- ***Sharing Project Risks among Partners.*** Through PPP delivery mechanisms, public sector sponsors are increasingly seeking to transfer project risks to private sector partners. On many dimensions, particularly regarding financial risk, the private firms are willing and able to bear these risks. However, the risks must not be so large or so difficult to predict that the firms' cost of capital becomes a barrier. In the case of the POMT, the geotechnical risks associated with the tunnel had to be shared in order for the project to proceed.
- ***Multiple Stakeholder Participation in Project Financing.*** Transportation mega-projects are often too large to be funded or financed by a single public or private sector source. Project sponsors in Florida solved this problem for the POMT by turning to availability payments. This approach puts the responsibility for initial project financing on the private sector, and then the public sector sponsors pay back those costs over time. This public funding responsibility, in turn, is divided between FDOT, Miami-Dade County, and the City of Miami.
- ***Strong Political Support is Necessary.*** The POMT remained stuck in the planning stage for two decades until the project received strong support at state level, which helped to bring together disparate stakeholders and create a mutually-agreeable financing and delivery solution among the project sponsors.

RESULTS

The POMT project is the largest and most innovative PPP in the history of Florida and the FDOT. It is also the first application of availability payments for reimbursing concessionaires over the contract terms, following project completion. The facility is expected to open in 2012 and be operated and maintained by the private concession team until 2042 at a total cost just under the engineer's estimate for the project. Once completed, the project is expected to significantly reduce traffic congestion, air pollution, and fuel consumption in downtown Miami while increasing the safety of vehicles travelling to and from Port facilities via the tunnel which will be linked directly to the regional interstate system.

CONCLUSIONS

The following conclusions highlight key findings from the procurement and concessionaire selection process.

- ***Some Risks must be Shared between the Public and Private Sector.*** FDOT's goal throughout the procurement has been to shift as much construction and O&M risk as possible onto prospective private concessionaire teams while counting on competition to minimize the availability payment. In general, the private sector concessionaires have proved willing to take on significant amounts of risk in this project, but the geotechnical risks associated with the POMT had to be shared with FDOT due to their continued uncertainty. Without the sharing of geotechnical risk, the private sector firms would likely have had much greater difficulty finding cost-effective financing and would likely have demanded significantly higher availability payments.
- ***Detailed Analyses are Required to Determine the Best Procurement Structure.*** FDOT undertook a structured 'Value for Money' (VfM) analysis before proceeding with the procurement process. This VfM analysis determined if it was more cost-effective for FDOT to build the POMT itself or to award a concession. The analysis looked at both

construction and long-term operation and maintenance requirements, and considered a wide range of issues, including cost of capital, risk transfer, and completion time. This process not only convinced FDOT that a concession would be more cost-effective, but it also gave the Department the information necessary to select the duration of the concession (30 years) that balanced the benefits to FDOT of risk transference with the private sector's need for equity returns.

- ***A Well-Structured Procurement Process can Result in Effective Competition for a “Mega-Project” Concession.*** Original FDOT estimates anticipated MAPs of approximately \$38 million per year over the term of the contract. While FDOT did receive one proposed MAP that was 66 percent above that figure, it also received one that was only 5 percent above the estimate and one that was 17 percent below the estimate. The MAP is not the only factor used in selecting the winning bid, since FDOT utilized a Best Value approach that also took into consideration the proposed construction schedule, project management, and quality control. However, the MAP is a major factor, and FDOT appears to have managed the process in such a way as to reduce the uncertainty for the bidding firms and make the POMT an attractive project.
- ***Availability Payments can be a Useful Approach for Facilities Where Direct Tolling is not an Attractive Option.*** State and local officials in Florida decided not to impose direct tolls on users of the tunnel facility due to concerns that vehicular traffic would divert to the existing bridge or, even more negatively, that some cargo or cruise ship traffic would divert to other competing ports in Florida and other east coast states. Only time and experience will prove if FDOT's decision to use an availability payment mechanism is cost-effective. However, it appears that the approach is appropriate given the number of competitive bids received. Its use for this project may encourage other agencies and transportation departments to consider shadow tolling or availability payments in situations where direct tolling or other user fees are not feasible.
- ***Political Leadership is Required to Move such a Large Project Forward.*** If the POMT project opens on schedule, it will have been in development for over three decades. The project had languished in various environmental and public review stages for years, and it was particularly hampered by competition between various state and local stakeholders, including FDOT, the City of Miami, and Miami-Dade County (through its Ports Department). It was only when political leadership at the state level made the project a top priority and committed state seed moneys for the project through FDOT that it finally moved off the drawing board towards development. The POMT is not unique in this – very few large projects, no matter how worthy, are successfully implemented without strong political support that enables disparate stakeholders to convene and ultimately reach a mutually acceptable solution.

NEXT STEPS

The contract between FDOT and Miami Access Tunnel is expected to be signed sixty days after the Selection Committee has announced its final decision. After 25 years in planning and 5 years in upcoming development, the Port of Miami Tunnel will finally open in 2012, enabled by the State's existing PPP legislation and funding commitments from FDOT, Miami-Dade County, and City of Miami, and the Port of Miami.

TRANSPORTATION PROJECT PPP CAMEOS IN THE U.S.

ATLANTIC CITY BRIGANTINE CONNECTOR

OVERVIEW

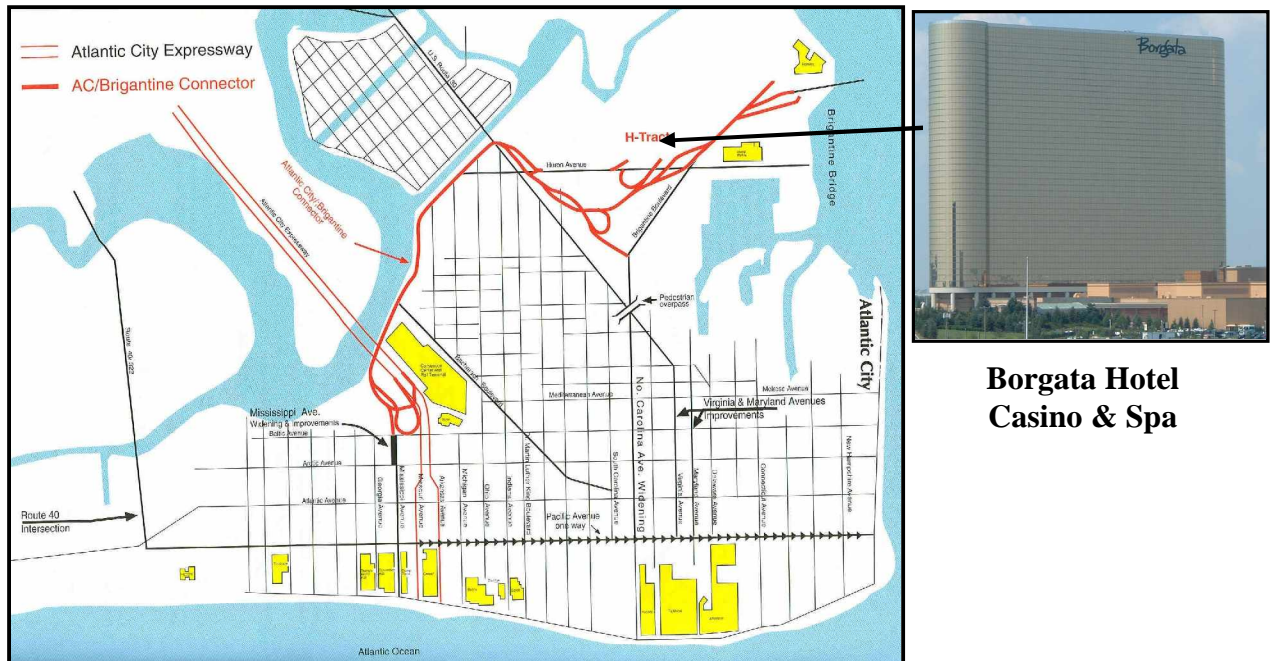
The Atlantic City Brigantine Connector is a roadway, tunnel, and related ramps that link the Atlantic City Expressway to a former landfill site which is now home to the Borgata Hotel Casino & Spa. The exhibit below illustrates the extent of the project within Atlantic City. This \$330 million design-build project was made possible by a public-private partnership (PPP) between Atlantic City, South Jersey Transportation Authority (SJTA), New Jersey Department of Transportation (NJDOT), and Mirage Resorts, Inc. (MRI). The project opened up the Marina District to significant economic development that included not only the \$1.3 billion Borgata on Renaissance Pointe, opened in 2003 as a joint venture between Boyd Gaming and MGM MIRAGE - the first new hotel property opening in Atlantic City in 13 years, but also expansions of several existing casino hotels in or adjacent to the Marine District.

PROJECT DESCRIPTION

The project involved three components:

- Remediate a former landfill site at a cost of \$30 million.
- Construct a 2.6-mile connector from the tolled Atlantic City Expressway to the site under a design-build contract for \$300 million (see site map below for project limits).
- Develop a major casino and hotel on the reclaimed site which was given to the casino developer (MRI), which paid for site cleanup and one-third of project cost (\$110 million) (see Borgata Hotel Casino & Spa location on site map in Exhibit 3.36).

Exhibit 3.36 - Atlantic City Brigantine Connector Site Map



Source: South Jersey Transportation Authority, April 2005. URL: <http://www.phillyroads.com/roads/ac-brigantine/>

PARTNERSHIP ARRANGEMENT

The South Jersey Expressway Authority took the project lead and used a design-build contracting approach to deliver the project under a Comprehensive Road Development Agreement (CRDA) with the city, state, and MRI. Sponsor pre-qualified prospective bidders and retained control over project inspections. The design-build contract provided for both a performance bonus for early completion and liquidated damages for late delivery. A \$28 million contingency fund was also set aside for environmental and other uncertainties, whereby 85 percent of unused portion could be used to fund the performance bonus.

FUNDING AND FINANCE

Funding for the \$330 million PPP project came from three primary sources:

- NJDOT - \$95 million from fuel taxes (28%)
- SJTA - \$125 million from tolls and parking fees (38%)
- Mirage Resorts Inc. - \$110 million from cash and advance alternative cash credits from incremental property, sales, and business tax proceeds resulting from the newly-constructed Borgata Hotel, Casino & Spa, under the CRDA with Atlantic City (34%)

ISSUES AND STRATEGIES

Key strategies used to overcome project challenges included the following:

- Frequent meetings among partners with complementary interests in the project.
- PPP contract with clearly defined roles, responsibilities, and risks by partners.
- Community outreach and communications to explain project objectives, solicit input, and potential benefits, including increased property values and local jobs (15,000 jobs during construction and 5,500 permanent jobs at Borgata Hotel Casino & Spa).
- Remediation of former brownfield site and avoidance of sensitive wetlands
- Depressed highway/tunnel design that minimized disruption to adjacent neighborhood and created a neighborhood park over the tunnel portion of the facility.
- Compensation of homeowners directly impacted by project construction.

RESULTS

The clean-up and roadway projects were delivered in six years, beginning in 1995 and ending in 2001. This included two years for clean-up and four years for project design and construction under a design-build contract issued by the SJTA as part of the CRDA. This schedule enabled MRI's Borgata Hotel Casino & Spa to open in 2003. In addition, the improved accessibility provided by the project promoted the expansion of Harrah's Hotel & Casino in the Marina District and several hotel casinos along the Boardwalk, including Caesar's, Tropicana, Showboat, Resorts, and the Hilton. Besides improved access to the Marina District, the project reduced congestion on local streets in Atlantic City and improved evacuation access from Brigantine Island east of the project limits.

Exhibit 3.37 below shows the project connector and tunnel sections under construction, just southwest of the Marina District where the Borgata Hotel Casino & Spa would be built.

Exhibit 3.37 - Atlantic City Brigantine Connector Tunnel



Source: South Jersey Transportation Authority, April 2005

CONCLUSIONS

The hospitality and gaming industries are essential and growing parts of the urban fabric that support the revitalization of Atlantic City as an important tourist and recreation destination along the mid-Atlantic coastline in South Jersey. This PPP project combined transportation, environmental, and economic development interests to promote further growth of Atlantic City's hospitality and gaming amenities, which in turn has provided the city and its surrounding region with significant increases in jobs and tax proceeds to boost continued economic growth.

ORLANDO HIGHWAY BRIDGES FUNDED BY TAX-INCREMENT FINANCING

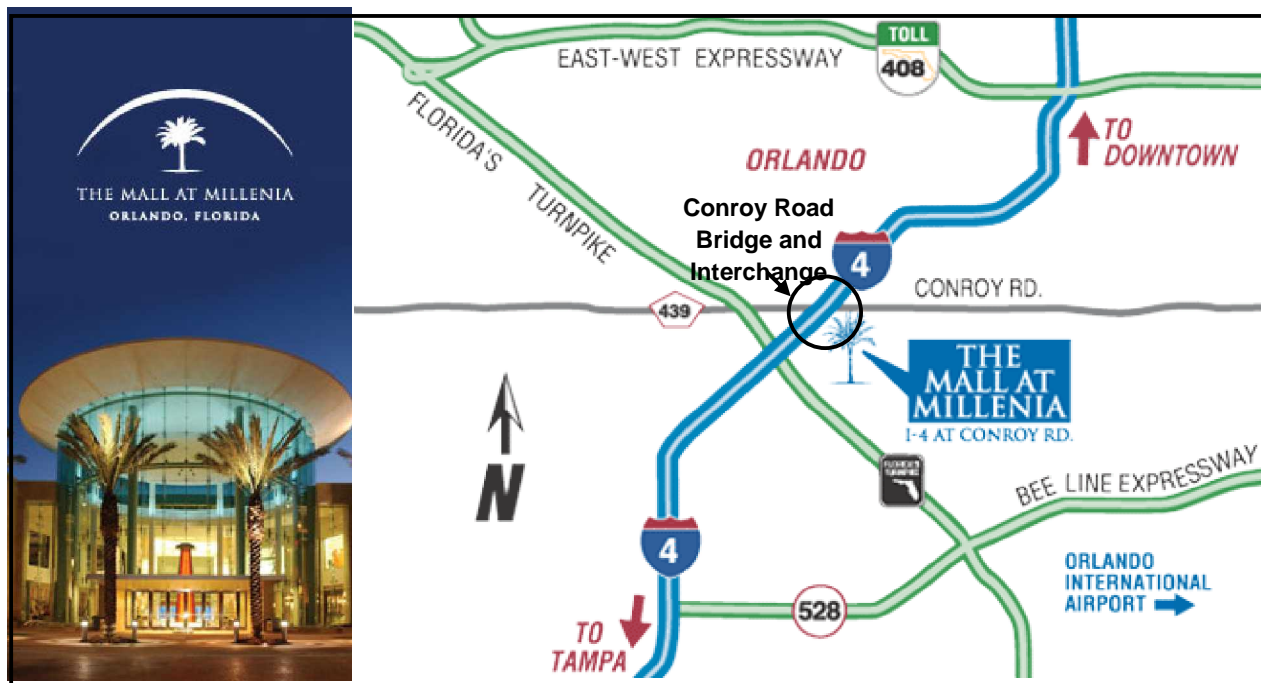
This cameo presents two examples of urban highway bridges being financed and developed through the creative use of tax-increment financing. In both cases, the costs of the bridges were offset by incremental property taxes generated by the resulting development for the sponsoring jurisdictions. These projects represent prime illustrations of how land use and transportation objectives can be achieved in a win-win funding solution through successful public-private partnerships.

CONROY ROAD BRIDGE

OVERVIEW

The Conroy Road Bridge and related on/off ramps is located just west of the City of Orlando where it crosses Interstate 4 (I-4), as shown in Exhibit 3.38 below.

Exhibit 3.38 - Conroy Road Bridge and the Mall at Millenia Site Map



Source: The Mall at Millenia, 2006. URL: <http://www.mallatmillenia.com/information.htm>

The bridge and ramps provide accessibility to a 400+ acre parcel of property situated on the east side of I-4 which contains a high-end mega-mall named the Mall at Millenia and other commercial development, including retail space and an office park. It was only through a public-private partnership (PPP) between the City of Orlando, Orange County, the Florida Department of Transportation (FDOT), and the Millenia development group that the site could be made accessible and therefore viable for significant development.

PROJECT DESCRIPTION

In the mid-1990s, with the economy recovering from the recession of 1990-1991, the Millenia development group approached the city with a proposal to build a large high-end mall and related commercial development on parcels comprising the site then located in unincorporated Orange County. If substantially developed, the overall site and its component parcels would produce significant property tax benefits to the jurisdictions in which it was located, sales tax benefits to the State of Florida, Orange County, and the City of Orlando, and financial returns to the developers of parcels comprising the site from parcel sales or building leases. The major challenges facing the development group was obtaining the necessary zoning and construction of transportation infrastructure needed to make the site accessible to persons traveling along I-4, the most highly used thoroughfare in the region, and the local road network.

Exhibit 3.39 shows the completed bridge and its unique features proclaiming the facility a gateway to Orlando and the Mall at Millenia.

Exhibit 3.39 - Conroy Road Bridge over I-4 in Orlando, Florida



PARTNERSHIP ARRANGEMENT

To achieve the objectives of this development project, a public-private partnership (PPP) was developed between the City of Orlando, Orange County, FDOT, and the development group for the Millenia project and mall (consisting of the Forbes Company of Southfield, Michigan and Taubman Centers, Inc. of Bloomfield Hills, Michigan). The following lists roles and responsibilities of the various partners to the Conroy Road Bridge PPP:

- Orange County agreed to have the City of Orlando annex the site and zone it for the proposed type and level of development so that a Community Redevelopment Authority (CRA) district could be formed to serve as the vehicle for issuing tax-exempt bonds for the project;
- Since Orange County collects property taxes from all property in the county, whether unincorporated or incorporated, this arrangement enhanced the property tax proceeds from the site since both the county and city could apply their respective millage rates to the same site;
- FDOT provided a \$5 million loan to the project to get it started and managed the design and construction of the Conroy Road diamond interchange at I-4; and
- The development group agreed to a complex financial plan which committed it to pay for most of the costs associated with the required transportation infrastructure improvements regardless of the actual level of development which occurred either through annual fees or credits based on incremental property taxes generated by the development.

Key to the success of the project was the creation of CRA district by the City of Orlando which could be used as the vehicle for issuing tax-exempt bonds to advance the funding for the necessary transportation infrastructure connecting the site to I-4, the willingness of Orange County to facilitate the annexation, and the ability of the Florida Department of Transportation (FDOT) to advance the project so design could begin as the financial arrangements were completed.

FUNDING AND FINANCE

For the Conroy Road Bridge PPP to work, the private development group committed to pay back the city, county, and FDOT for the costs of the bridge and supporting ramps through special assessment district and/or transportation impact fees, unless the increases in property taxes resulting from the planned development were able to cover the full debt service costs of the CRA district-issued bonds, plus the initial grant by FDOT. This PPP arrangement placed most of the financial risks associated with the \$28 million Conroy Road Bridge project on the Millenia development group. The resulting financial arrangement was developed by the city's Finance Department in concert with the other members of the PPP. This innovative arrangement included the following key features:

- FDOT provided a \$5 million loan to launch the project, to be repaid out of future excess tax proceeds.
- The city, with the support of Orange County, created a CDA district based on the criteria of a transportation blighted area and floated tax-exempt municipal bonds with low interest rates to advance the remaining \$23 million needed to design and build this transportation facility.

- By using its excellent credit rating and tax-exempt status, the city provided lower borrowing costs than if the private development group financed the bridge facility.
- The Millenia development group contributed 40 acres needed for the bridge and ramps.
- The Millenia project development group agreed to have the site and building developers repay the city for debt service associated with the bridge project bonds through an annual special assessment district fee that was fixed regardless of the level of development built, plus a transportation impact fee based on the level of development under permit to be built.
- To expedite development of the parcels comprising the site and the resulting property tax proceeds, the city agreed to forgive the developers of each parcel fee payments in those years when the level of incremental property taxes resulting from the development on their respective parcel exceeded their portion of the project's debt service costs.

This PPP arrangement used the concept of Tax Increment Financing (TIF) as a performance-based approach to link payment for the transportation improvements with the resulting economic development. This creative arrangement enabled the city and county to finance most of the cost of the needed transportation infrastructure through the CRA district and encourage the site and building developers to proceed in earnest with their plans.

Although both the city and county gave up their respective portions of incremental property tax proceeds resulting from the development until the debt service costs on the Conroy Road Bridge project were paid off, these incremental tax proceeds would not have occurred without the transportation improvements enabling the development to occur. In addition, once the debt service on the bridge project was paid off, both the city and county would reap the full incremental property taxes resulting from the development, which would likely grow over time. In addition, the state, county, and city reaped the full benefits of additional sales tax proceeds resulting from the completed retail development as they accrued, since they were not linked to the CRA district bond repayment arrangement with the Millenia development group.

ISSUES AND STRATEGIES

Key challenges to the project and strategies used to overcome them are listed below:

- Although the Millenia development group originally proposed the project, the city and its Finance Department became the champion for the PPP project once it realized the many benefits to the city, including quality economic development, a signature bridge to enhance the city's image, and significant long-term tax proceeds, as shown in the exhibit above.
- Getting the partners to the bridge project to cooperate in the first PPP of this kind for the City of Orlando, Orange County, FDOT, and the Millenia development group required each to understand and value the projected benefits of the proposed development in terms of transportation accessibility, economic development, and tax proceeds.
- Gaining county approval for the site to be annexed into the City of Orlando enabled the city to establish the CRA district to provide the bond financing for the bridge without losing property tax proceeds from the site. Further encouragement for the city and county to cooperate came from the potential added sales taxes each jurisdiction would receive from the site, which was not included in the financing agreement with the Millenia development group for the bridge project.

- The risks inherent in such an undertaking were mitigated by the willingness of the development group to agree to pay for the debt service on the bridge through a variety of fees, even if the development did not materialize – which encouraged the developers to move quickly to develop parcels on the site.
- The cost of the project was reduced through a financial plan that included contributions of various kinds from each of the partners, including low cost municipal bonds that accelerated the delivery of the bridge project by more than a decade.
- The typical lag in providing transportation infrastructure to serve land use development was avoided by delivering the necessary transportation infrastructure to serve the proposed Millenia development before the mall was opened.
- The developers of the Millenia site reacted to changes in the development market for commercial office and retail space by adapting the original plan to accommodate the demand for more retail space and less office space.

RESULTS

The Conroy Road Bridge was designed and built between 1998 and 2000, after the city annexed the site and created the CDA district. FDOT contributed \$5 million to the project to expedite the project, which was later repaid out of excess property tax proceeds. The resulting economic development that occurred on the Millenia site provided significant sales tax proceeds to the state, county, and city. With the city using the bonding authority of the CDA district it created to advance most of the funding, the project was accelerated on the regional transportation plan by 10 to 15 years. This reduced the potential for increases in material costs raising the price of the project while taking advantage of favorable municipal bond rates. Exhibit 3.40 shows some of the signature features of the Conroy Road Bridge and its connecting ramps.

Exhibit 3.40 - Signature Features of Conroy Road Bridge and Approach Ramp



Source: City of Orlando, 2004

Within five years of the start of the mixed-use development project, the Millenia development group had completed the Mall at Millenia, numerous retail outlets, and several office buildings, with retail development outpacing office park development according to the original development schedule. This resulted from the changing commercial real estate market in recent years, as office space became overbuilt. However, the increase in retail development offset the effects of this on the viability of the overall development. As a result, the assessed value of the site rose from \$6.5 million to over \$250 million.

The increase in city and county property taxes resulting from this development exceeded the annual debt service on the Conroy Road Bridge by 15 percent within 4 years, with continued growth assured to repay the full debt service costs of the CDA district bonds issued for the project plus the FDOT loan. This relieved the development group from having to pay special assessment district fees or transportation impact fees from that point forward. The excess property tax proceeds also allowed the CRA district to reimburse the development group for fees paid to the district in the early years of the project.

The city and county also benefited from incremental property and sales taxes generated by additional off-site development that occurred as a direct result of the Mall at Millenia and its related development.

CONCLUSIONS

This collaborative effort and innovative PPP arrangement between the City of Orlando, FDOT, and the Millennium development group produced the following results:

- Accelerated delivery of an attractive, highly-visible signature bridge along I-4, often referred to as the Orlando City Gateway. Exhibit 3.41 shows another view of the Conroy Road Bridge and east ramp.
- Use of tax increment financing to largely pay for the bridge facility, with financing risks taken by private developments of the Mall at Millenia other parcels on the site.
- Provision of improved accessibility and attractive economic development to the residents and visitors to the City of Orlando and Orange County.

Exhibit 3.41 - Conroy Road Bridge and Ramp Facing East Towards the Mall at Millenia



Source: City of Orlando, 2004

This project represents a true win-win solution for all partners to the arrangement, which is the hallmark of a successful PPP.

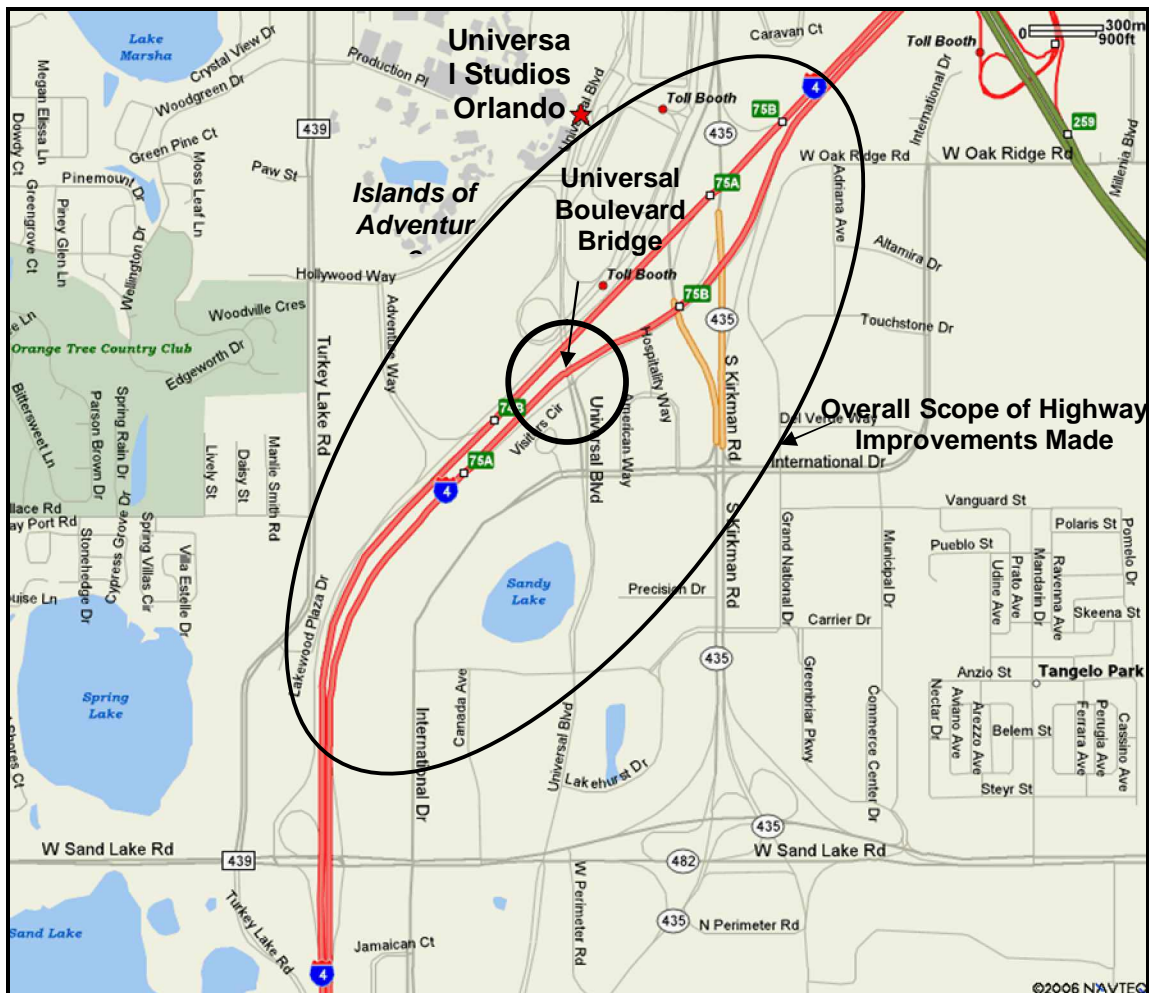
UNIVERSAL BOULEVARD BRIDGE

OVERVIEW

Another innovative public-private partnership (PPP) project from Orlando, Florida, was proposed by Universal Studios to the City of Orlando in the mid-1990s. This project involved constructing a new bridge across Interstate 4 (I-4), linking International Drive to a major expansion of Universal Studios known as the Islands of Adventure theme park, just south of the original Universal Studios Orlando. Many of the key features of this PPP project are similar to the Conroy Road Bridge project since it occurred shortly after the Conroy Road Bridge PPP. This PPP project description is also presented as a cameo that focuses on those aspects of the PPP arrangement that differentiate it from the Conroy Road Bridge project.

Exhibit 3.42 below shows the limits of highway infrastructure improvements that the new theme park and its related development required in Orlando, Florida, including providing the enhanced crossing of I-4 by Universal Boulevard.

Exhibit 3.42 - Universal Boulevard Bridge Project Site Map



These improvements included further separating the opposing lanes of I-4 as well as Kirkman Road where they intersect to provide a way to insert access ramps to and from the Universal Studios theme park. In addition, additional frontage roads were needed to enable more direct access to and from the proposed Islands of Adventure theme park and I-4 and Sand Lake Road via a new road called Adventure Way. Most of these transportation improvements were funded and administered by the Florida Department of Transportation (FDOT) and the city and county transportation departments.

PROJECT DESCRIPTION

In the mid-1990s, Universal Studios approached the City of Orlando with a proposal to more than double the size of the Universal Studios Park just west of I-4 by adding a new theme park to be called the Islands of Adventure. This new theme park would be adjacent to the original Universal Studios Orlando theme park and feature numerous thrill rides and other entertainment and retail facilities. Universal Studios also planned to build two huge parking lots and three hotels on the site. Universal Studios requested that the city annex the property so that it could establish a Community Redevelopment Authority (CRA) as the financing vehicle to expedite the project.

The focus of this case is on a \$43 million six-lane bridge that would extend Universal Boulevard (formerly Republic Road) across Interstate 4, thereby providing a direct connection to the proposed garages and hotels included in Universal Studios' expansion plans from International Drive and Sand Lake Road to the south. This facility would provide the most direct access to the Universal Studios theme parks and the on-site facilities to be provided for those arriving by automobile. It was the new bridge at this location, shown on the following exhibit, that Universal Studios sought assistance from the city in the form of a public-private partnership arrangement.

PARTNERSHIP ARRANGEMENT

The public-private partnership for this project was originally proposed by Universal Studios based on the success of the earlier Conroy Road Bridge project PPP. It used the same criteria of transportation blight (inadequate transportation accessibility that inhibits economic development or redevelopment) to allow the City of Orlando to form a Community Redevelopment Authority (CRA) as the financing vehicle for the project. The resulting CRA district was made possible when Orange County and the City of Orlando agreed to have the site of the new theme park and related facilities annexed to the city. The CRA district could then issue lower-cost tax-exempt bonds to finance most of the new bridge, whereby Universal Studios would commit to repayment of the principal and interest on the bonds through a variety of mechanisms based on its progress in completing the proposed development on the site.

The partnership in this case was less complicated than the Conroy Road Bridge project PPP since there was only one private development partner to deal with, namely Universal Studios.

The partnership consisted of the following members with the indicated responsibilities:

- Orange County agreed to have the City of Orlando annex the site and zone it for the proposed type and level of development to so that a CRA district could be formed to serve as the financing vehicle for the project. Since Orange County collects property taxes from all property in the county, whether unincorporated or incorporate, this arrangement enhanced the property tax proceeds from the site since both the county and city could apply their respective millage rates to the same site;
- The City of Orlando annexed the site, zoned it for the proposed level and type of development, and created a CRA district based on the criteria of transportation blight (inaccessibility-impeded development or redevelopment of a site).
- The CRA District for the site issued tax-exempt bonds to fund the \$43 million project at favorable rates.
- Universal Studios agreed to an innovative financial arrangement to repay the debt service associated with the CRA-issued bonds, based on the following components:
 - Special assessment district fees regardless of development built; and
 - Transportation impact fees based on development permitted for construction.
- The city and county agreed to forgive these two fees if the incremental property taxes resulting from actual development were equal to or above the annual debt service costs of the bridge.

FUNDING AND FINANCE

This PPP arrangement placed most of the financial risks associated with the \$43 million bridge on Universal Studios. However, this risk was significantly mitigated by the commitment of Universal Studios, as the sole developer, to build the new theme park and the CRA's willingness to forgive the fee payments in those years when the level of incremental property taxes resulting from the development exceeded the project's debt service costs. In addition, early payments of these fees as the project was being developed were later refunded from excess incremental property taxes earned by the city and county.

This PPP arrangement used the concept of Tax Increment Financing (TIF) as a performance-based approach to link payment for the transportation improvements with the resulting economic development (similar to the Conroy Road Bridge PPP). This creative arrangement enabled the city and county to finance most of the cost of the needed transportation infrastructure through the CRA district and encourage Universal Studios to proceed in earnest with its plans. This accelerated delivery of the new Universal Boulevard Bridge without direct cost to the developer since the city and county were willing to forego incremental property tax proceeds made possible through the resulting development until the bridge financing costs were fully paid off. It also provided both the city and the county long-term property tax proceeds after the bridge debt was repaid, as well as sales tax proceeds from the additional retail activity resulting from the new theme park, Islands of Adventure. None of this would have been possible without the necessary transportation accessibility provided by the bridge through the PPP.

ISSUES AND STRATEGIES

Key challenges to the project and strategies used to overcome them are listed below:

- Although Universal Studios originally proposed the project, the city and county became champions for the PPP project once they realized the many benefits to the region, including significant new economic development, a high-capacity bridge over I-4 that provides convenient access to the Orlando Studios' two theme parks, and significant long-term property and sales tax proceeds.
- Getting the partners to the bridge project to cooperate in the second PPP of this kind was made easier by the experience gained by the City of Orlando, Orange County, and FDOT when developing the Conroy Road Bridge project PPP for the Mall at Millenia site.
- As with the Conroy Road Bridge project, gaining county approval for the Island of Adventures theme park site to be annexed into the City of Orlando enabled the city to establish the CRA district to provide the bond financing for the bridge without the county losing property tax proceeds from the site. Further encouragement for the city and county to cooperate came from the potential added sales taxes each jurisdiction would receive from the site, which was not included in the financing agreement with Universal Studios for the Universal Boulevard Bridge project.
- The risks inherent in such an undertaking were mitigated by the strength and size of the Universal Studios development proposal and their ability to promptly deliver on the proposed development, thereby generating significant property and sales tax proceeds for both the city and county.
- The typical lag in providing transportation infrastructure to serve land use development was avoided by obtaining the funding to design and construct the bridge up-front.

RESULTS

The Universal Boulevard Bridge was designed and built between 1997 and 2002, after the city annexed the site and created the CDA district. The city supported the project and used a performance-based Tax Increment Financing (TIF) approach to help finance the project and accelerate its completion. The city and county both recognized the benefits of the project in terms of new jobs (in the short term during construction and over the long term at the park), plus the significant increase in property and sales taxes that would result from the new addition to Universal Studios Orlando.

The economic development resulting from the new theme park increased the property value of the site by \$750 million due to the ensuing development that included the following components:

- New theme park – Islands of Adventure;
- Two 9,600 space parking garages – among the largest parking garages in the world; and
- Three hotels (with over 1,000 rooms).

One of the consequences of the new development and speed in which it occurred was that the proceeds from the incremental property taxes rose to more than twice the debt service costs of the bridge bonds within only 2 years of construction. Hence the CRA-issued bonds are being

paid back with no out-of-pocket costs to Universal Studios for the transportation infrastructure produced, with excess property taxes used to refund Universal Studios for the fees paid in the early years of project development and delivery.

In 2002, the CRA refinanced the bonds from variable to more favorable fixed-rates over a 25-year period payable from city and county TIF proceeds. Any extra property taxes and all incremental sales tax proceeds are allocated to the city and county to augment their General Funds. Hence the city and county are already gaining partial advantage of the incremental property taxes resulting from the new theme park and related development even before retirement of the CRA bonds.

CONCLUSIONS

This is another outstanding example of economic development and transportation improvements occurring for the benefit of both the public and private sector partners through a PPP that encouraged the private partner to act promptly on the proposed development and gave the public partners significant short and long-term benefits that included:

- Accelerated economic and related transportation infrastructure development through TIF bonding of the bridge project.
- Additional jobs for the city and county, in the short term during bridge project development and over the long term from on-going theme park operations.
- Improved accessibility to one of the premier attractions in Orlando without direct cost to the public partners, including the City of Orlando, Orange County, and FDOT (over whose highway the bridge was built), or the development partner, Universal Studios.

Ultimately the tax proceeds from the development paid for the bridge, proving that the nexus between transportation and land use is infrastructure financial. Through the PPP process, this project became a win-win solution for all partners to the arrangement.

* * * * *

COMPARISONS AND CONTRASTS OF TWO BRIDGE PPP PROJECTS IN ORLANDO, FLORIDA

The two PPP projects in Orlando, Florida utilize the same economic-driven incentive for applying tax increment financing to expedite the two bridges and open previously-undeveloped portion of Orange County to quality development that benefits the whole region. Both projects were of modest size and achieved tax-based coverage of debt service within a few years of construction. The City of Orlando used a three-tiered approach to reduce its financing risks and encourage prompt development of the two respective sites to produce high property and sales tax returns.

In contrast, the Universal Boulevard Bridge project was a simpler PPP to arrange and manage because there was only one major developer to deal with and the city had learned various lessons from the earlier Conroy Road Bridge PPP. The Conroy Road Bridge project included a joint venture of two large-scale developers for the overall site, but many individual developers for parcels to be developed on the Millenia Mall site served by the bridge. In this case, the PPP for this project was more complex and the risks to the primary developer team were greater since

there was less control over the nature and speed with which the individual parcels comprising the site were to be developed. Part of this risk was mitigated by the two major developers completing the Millenia Mall in a timely manner, which encouraged other developers to move ahead with their development plans. In addition, the changing economic development market in the early 2000s prompted some of these subsidiary developers to adjust their plans by converting commercial office space to more retail space.

Ultimately, the city bore little financial risk for either PPP project since it would receive debt service payments regardless of development progress through a combination of special assessment district fees and transportation impact fees.

4. RESULTS AND CONCLUSIONS

This chapter summarizes the key insights provided by the U.S. transportation PPP project case studies and cameos presented in Chapter 3 of this report. This includes issues that often confront agency sponsors and private providers of PPP projects and strategies used to address and overcome these potential impediments. The chapter also contains summaries of the results and lessons learned from the PPP case studies and cameos. It concludes with remarks regarding the use of this report, a companion report on international PPPs, and a PPP Guidebook for use by both practitioners and individuals or groups interested in the use of PPPs to help address the fiscal and resource crises facing the surface transportation community in this country.

ISSUES AND STRATEGIES TO ADDRESS THEM

Based on the PPP transportation projects documented as case studies and cameos in Chapter 3, Exhibits 4.1 through 4.4 provide summaries of the major issues and impediments faced by these projects and the strategies used to address them by U.S. sponsoring agencies and their respective private sector partners. The summary information is organized into four categories:

- Legal and Technological
- Funding and Finance
- Environmental
- Administrative

These issues and strategies illustrate how certain members of the PPP project teams (including both public and private partners) dealt with problems that arose during project development, financing, and implementation. In few cases were the partners unable to fully overcome the impediments they faced in applying the PPP approach to surface transportation project delivery. Even in these cases, the strategies suggest courses of action for resolving these issues in the future. These summaries are not intended to suggest the full spectrum of possible impediments that transportation PPPs might encounter or all possible ways to address them. However, they provide a sampling of what sponsoring agencies and provider teams might encounter in pursuing transportation project delivery as a PPP.

RESULTS OF U.S. TRANSPORTATION PPP PROJECT CASE STUDIES AND CAMEOS

The results of the U.S. transportation PPP projects presented as case studies or cameos in this report are summarized in Exhibit 4.5. Included in the case study and cameo results summaries are the following information for each project:

- PPP Contract Type
- Project Timeframe
- Project Cost
- Project Quality
- Economic Development Consequences
- Other Pertinent Results

LESSONS FROM U.S. TRANSPORTATION PPP PROJECT CASE STUDIES AND CAMEOS

The key lessons from the U.S. transportation PPP projects described in this report are summarized in Exhibit 4.6. The lessons noted in the exhibit are instructive for any sponsor or provider actively involved in or considering participation in a transportation PPP project. Exhibit 4.7 summarizes the critical success factors for transportation PPPs based on the case studies and cameos presented in Chapter 3.

CONCLUSIONS

Public-Private Partnerships (PPPs) represent a wide variety of project financing and delivery approaches whose common element is that the public sector sponsor of infrastructure projects engages the private sector to varying degrees in the performance of certain functions previously handled by the public sector. This can range from contracted services like maintenance to full financing, development, operations, and preservation over a long term. The variety of PPP approaches continues to evolve and offer increasing choices to state and local transportation agencies to fulfill their missions. Though not appropriate for all projects, PPPs are likely to benefit a number of projects, particularly large-scale projects, which would not otherwise be to move forward for many years or even decades under traditional financing and delivery approaches.

The public sector's interest in PPPs has been stimulated by the widening gap between the needs for improving and expanding our aging transportation systems and the available public funding to address these needs. Facing increasing congestion, declining accessibility, unreliable freight delivery, and obsolete facilities, the public sector has begun to realize it cannot address these needs by relying solely on traditional financing, delivery, and operating practices. PPPs enable public sponsors of transportation projects the potential to expedite their transportation infrastructure programs and leverage their scarce public resources by accessing private sector best practices, new technology, and capital markets more quickly to deliver and operate transportation facilities in a more timely and cost-effective manner. With the U.S. Department of Transportation and its surface transportation administrations encouraging state and local transportation agencies to consider the selective use of PPP approaches to expedite urgent transportation projects, there is significant opportunity for these agencies to add PPP approaches to their means of accomplishing their missions.

Interest in the use of PPPs to expedite surface transportation is growing as state and local jurisdictions face the combined challenges of rehabilitating their aging and often outdated surface transportation infrastructure and adding necessary facilities and expanding services to support an ever-growing economy and population whose requirements for mobility, reliable accessibility, and safety continue to expand. Experience from other countries which have used PPPs for transportation infrastructure projects shows that the structure and delivery methods selected are highly dependent on the following features:

- Enabling statutes and regulations;
- The capabilities of all members of the PPP to execute their roles and responsibilities;
- Flexibility and a proactive approach to identifying and resolving issues that arise during the project planning, development, and implementation phases;

- Underlying taxation arrangements that may lower the cost of the project; and
- The ability of capital markets to deliver financing structured to suit each PPP project.

The case studies and cameos contained in this report illustrate how these issues can vary and therefore should be addressed on a project-by-project basis. Particularly important are potential risks arising when state or local transportation agencies attempt to implement PPPs for the first time where legal authority to use PPP approaches are not clearly defined or there is strong political, local, or institutional opposition.

The many challenges facing state and local transportation officials and agencies, as noted above, require a broader array of tools to improve the cost-effectiveness of project delivery and the operational efficiency of transportation facilities. While not a panacea for the fiscal, staffing, and technological shortages facing state and local transportation agencies, PPPs can provide additional resources to the provision of transportation infrastructure and services. The number of state and local agencies participating in project PPPs is rapidly growing, while the domestic financial investment community has begun to realize the opportunities associated with this emerging market for transportation infrastructure financing.

Because PPPs represent new ways of performing their traditional responsibilities, there is considerable uncertainty about using alternative approaches that rely more heavily on the private sector than in the past, when there was a clear distinction in responsibilities between the sponsor/owner agency and the private firms that performed such services as highway final design and construction. Therefore it is important to emphasize that PPPs involve a sharing of project responsibilities, as well as risks and returns on investment associated with these responsibilities, between public owners of transportation facilities and their private sector partners. Arriving at a balanced and acceptable sharing of responsibilities, risks, and rewards with the private sector through a contractual partnership poses the greatest challenge and opportunity for public agencies seeking to rebuild and expedite their transportation programs. Effectively administering PPPs can help state and local transportation agencies be assured that their expectations for project performance are being met, consistent with the terms of the PPP contract.

While PPPs represent change for officials and staff of many of these agencies, the uncertainty associated with introducing PPP approaches can be reduced through the experience of other agencies which have successfully developed and implemented PPP projects. The case studies and cameos presented in this report highlight various PPP approaches and the strategies used to address impediments that arose as the projects evolved. This information is intended to inform those officials and agencies considering the use of PPP approaches or interested in learning more about what peer agencies in the U.S. are doing to develop and implement successful PPP projects. Armed with this information, it is the intent of this report to encourage broader application of PPP approaches to leverage scarce public resources and expedite financing and delivery of essential transportation projects in the United States.

* * * * *

Several companion reports were also prepared as part of this project. One report presents case studies and cameos of surface transportation PPP projects from other countries, with an emphasis on PPPs in England and Australia. Another report serves as a guidebook for individuals, agencies, and companies interested in using PPP approaches to expedite transportation projects. The PPP Guidebook provides summary information regarding the background underlying the

growing interest and use of PPPs for surface transportation projects, the various types of PPP approaches available, key impediments that face public agency sponsors and private delivery firms considering PPP approaches to deliver transportation infrastructure improvements, and various strategies to effectively address and overcome these impediments to a successful PPP project based on both domestic and international PPP projects.

Each of these reports draws significantly from the results of actual transportation PPP projects and the experiences of public and private partners involved in these projects. Hence these reports go beyond the theoretical and base their results on actual PPP projects. This is intended to provide a candid view of the challenges and opportunities that PPPs offer sponsors and deliverers of transportation infrastructure.

Exhibit 4.1 Legal and Technological Issues and Strategies Used to Address Them for U.S. Transportation PPP Projects

Issues	Strategies
Lack of state or local statutory authority to enter into PPPs or DB project delivery for surface transportation projects	Created special legislation for a single project to allow the application of innovative financing and project delivery approaches as part of a PPP.
	Established as a matter of public policy state statutes that provide legal authority to transportation agencies to enter into PPPs to deliver projects and services. The legislation provided wide flexibility to apply innovative project financing and delivery approaches for surface transportation projects as PPPs. (USDOT issued model legislation in January 2007 that states can use to establish the statutory authority for transportation agencies to use PPPs to delivery infrastructure projects and services.)
Legal challenges to projects as eligible PPPs under existing PPP statutes	Sponsoring agency and private partners sought legal opinion from transportation agency chief financial officer and state attorney general to confirm statutory basis and legal authority to proceed with project as a PPP.
Willingness of multiple jurisdictions to cooperate in helping local economic development groups establish PPP involving innovative financing approaches, including Tax Increment Financing (TIF)	Developer partners approached city have sites annexed from county to allow for TIF-based PPPs, that included provisions for funding back-up by transportation impact fees and transportation improvement district fees. This minimized the financial risk to the city and placed it primarily on the developers as an incentive to expedite development on the sites once annexed. The county readily agreed since it retained its property tax rights to the sites and could also benefit from the enhanced property and sales tax proceeds resulting from the proposed PPP projects (bridges) that opened the sites to development.
Risks of introducing and applying new technologies in the PPP project	Build into implementation schedule of project scheduled service downtime to permit conversion and de-bugging of the new systems for PPP projects that are built under continuing transportation service.
	Used Design-Build-Operator (DBO) approach to PPP project for a specified period after the construction phase is completed (2 years minimum for operating systems) to ensure the operating service and control systems work properly without jeopardizing public safety.

Exhibit 4.2 Funding/Financial Issues and Strategies Used to Address Them for U.S. Transportation PPP Projects

Issues	Strategies
<p>Uncertainty regarding adequacy of available funding</p>	<p>Combined federal, state, local, and toll revenues to provide adequate project funding.</p>
	<p>Used innovative funding and project delivery approaches, including PPPs and Design-Build, authorized by state statutes.</p>
	<p>Used PPP project delivery, tolling, innovative financing approaches involving private sector access to private capital markets, and tolling to expedite project delivery.</p>
	<p>Used TIFIA loan from FHWA to lower cost of project debt and accelerate project initiation and opening.</p>
	<p>Formed 63-20 public-benefit corporation to issue lower cost tax-free debt and expedite project development and delivery.</p>
	<p>Leveraged available federal transportation funding with state and local matching funds augmented with a 20 percent contribution from economic development group whose project would benefit from the accessibility provided by a new bridge overpass.</p>
	<p>Used tax increment financing (TIF) to pay for the debt service costs associated with low cost municipal bonds sold to finance two bridges and access ramps to provide access to two proposed economic developments, backstopped by special assessment district fees and transportation impact fees if the developments did not materialize in a timely manner to generate expected increases in local property taxes, thereby placing the financial risk of the projects on the private developers. One project achieved a debt service coverage ratio of 1.15 within four years of opening while another project achieved a debt service coverage ratio of over 2.0 within two years of opening. Ancillary sales tax proceeds from the resulting economic development and added property taxes produced by adjacent economic development produced added windfall revenues for the city and county.</p>

Exhibit 4.2 Funding/Financial Issues and Strategies Used to Address Them for U.S. Transportation PPP Projects - continued

Issues	Strategies
Public or political opposition to tolls or rising toll rates	Project sponsors emphasized contributions to project funding by tolling non-resident users.
	Contract agreement stipulated criteria to allow for annual toll rate adjustments.
High cost of obtaining additional right-of-way	Project sponsor retains land acquisition responsibility using cost-effective and timely eminent domain authority.
	Project sponsor separately funds right-of-way acquisition costs to eliminate cost risk for land acquisition to provider team, thereby reducing uncertainty in costing fixed-price design-build project.
High cost of site remediation and other project elements	Value engineering to lower soil remediation costs by focusing on exposed areas (saved \$40 million).
	Installed environmental-friendly, centralized HVAC system (saved \$35 million) and increased operating efficiency by 25%.
Escalating project costs	Public sponsors incorporated contingency funds into contract to cover possible escalation in right-of-way and utility relocation costs; while private providers accepted financial risks of material costs, which increased significantly in recent
Funding jeopardized by early project delays caused by external economic forces	Obtained long-term commitment of financial backing for project from major investment partner with patient capital.

Exhibit 4.2 Funding/Financial Issues and Strategies Used to Address Them for U.S. Transportation PPP Projects - continued

Issues	Strategies
Political tampering by efforts to cancel or change contract terms of agreement	Lease agreement provides ample remedies to private concession team if project sponsor seeks to terminate the contract agreement prematurely and without merit, or interfere with ability of project to generate revenues from facility under terms of contract agreement.
Potential threat to project revenues due to competition from nearby	Recognition of very high cost of adding capacity to nearby congested facilities mitigates against traffic diversion and revenue loss.
	Captive market with no reasonable alternative highway facility.
	High growth of region served by facility provides more than enough latent demand to compensate for potential traffic diversion.
Slowdown in population growth in primary market served by facility	Long-term concession agreement mitigates against traffic and revenue risks due to continued economic and demographic growth.
	Improvements to patron service through interoperable electronic toll collection systems along connected facilities, including open road tolling.
	Reduced project scope by 40 percent to match lower expected cash flow from local Transportation Improvement District fees - full project scope restored later when actual development growth increased to levels needed to fully fund the project.

**Exhibit 4.2 Funding/Financial Issues and Strategies
Used to Address Them for U.S. Transportation PPP
Projects - continued**

Issues	Strategies
Maximizing net present values of long-term concession contracts	Apply innovative funding, financing, and asset management techniques and incorporate future revenues and costs.
	Use private-sector financing approaches that include short-term taxable bank loan and taxable equity convertible to institutional debt instruments with patient capital and modest rates of return.
Traffic and revenue risks	Incorporate a prescribed toll rate schedule that allows increases on a defined timetable based on agreed to indices or minimum percentages as part of the PPP contract agreement.
	Use toll rates to manage traffic and provide free-flow conditions to optimize throughput volume.
Unusual site condition risks	Public sponsor agency agrees to share costs of unusual site risks, such as hazardous materials discovered on project site during construction.
Higher financing costs of using a 63-20 corporation to gain tax-exempt status for project debt	Due to strong local support for the project from local elected officials and the willingness of adjacent property owners to increase their Transportation Improvement District fees, the local counties elected to use county-backed bonds to finance the project, saving \$150 million in debt service costs.

**Exhibit 4.3 Environmental Issues and Strategies Used to Address Them
for U.S. Transportation PPP Projects**

Issues	Strategies
<p>High costs of environmental challenges and environmental clearance process</p>	<p>When the public sponsors placed full responsibility for environmental clearance on the private partners, a nine-year delay in the project resulted due to environmental issues that had not been resolved prior to initiation of the PPP, which resulted in increased project costs and delayed capture of toll revenues.</p>
	<p>Have public agency partners retain responsibility for obtaining environmental clearance, permits, and right-of-way early in the project development process.</p>
	<p>Have public agency partners conduct the environmental clearance process using a transparent and phased approach (using the SEP-15 process) to ensure environmental issues are recognized and addressed in a timely manner in the early phases of the PPP process.</p>
<p>Site location risks that may cause environmental delays and costly mitigation requirements, such as hazardous materials, buried ordinance, brownfield sites, and non-attainment area restrictions</p>	<p>Establish a flexible DB delivery approach and contract performance criteria.</p>
	<p>Incorporate on the PPP team several technical specialty subcontractors to address certain types of special conditions relating to the environment.</p>

Exhibit 4.3 Environmental Issues and Strategies Used to Address Them for U.S. Transportation PPP Projects - continued

Issues	Strategies
<p>Restrictions on developing transportation facilities in non-attainment area</p>	<p>Obtain exemptions to restrictions from federal and state environmental protection agencies (such as through the former EPA program, Project XL) by demonstrating environmental advantages of the project versus the status quo by classifying the facility as a Traffic Control Measure where regional environmental benefits outweighed the impacts of the new transportation facility.</p>
	<p>Implement environmental-friendly, smart-growth techniques in the proposed PPP project early in the project concept development process to turn potential adversarial groups into advocates. Techniques include: design mixed-use downtown development to encourage live-work-play environment to minimize suburban commuting (sponsored on-site activities for residents); commit to green design for building (based on Leadership in Energy & Environmental Design or LEED building rating system) install and use environmental (groundwater) monitoring systems; provide alternative transportation options (shuttle bus, transit system access, pedestrian-friendly facilities), construct underground parking located near periphery of development, and establish transportation management association.</p>
	<p>Foster strong political and local community champions for the project, at the federal, state, and local levels.</p>

Exhibit 4.3 Environmental Issues and Strategies Used to Address Them for U.S. Transportation PPP Projects - continued

Issues	Strategies
Lack of state or local authority to use PPPs or DB to deliver transportation projects	Created special legislation for a single project to allow the application of innovative financing and project delivery approaches as part of a PPP.
	Established state statutes that provide legal authority to transportation agencies to enter into PPPs to deliver projects. The legislation provided flexibility to apply innovative project financing and delivery approaches for transportation projects as PPPs. In January 2007, US DOT issued model legislation that states can use to establish the statutory authority for transportation PPPs.
Legal challenges to projects as eligible PPPs under existing PPP statutes	Sponsoring agency and private partners sought legal opinion from transportation agency chief financial officer and state attorney general to confirm statutory basis and legal authority to proceed with project as a PPP.
Willingness of multiple jurisdictions to cooperate in helping local economic development groups establish PPP involving innovative financing approaches, including Tax Increment Financing (TIF)	Developer partners asked city to annex sites from the county to allow TIF-based PPPs, backed by transportation impact fees and transportation improvement district fees. This minimized the financial risk to the city and placed it primarily on the developers to expedite site development once annexed. The county agreed since it retained its property tax rights to the sites and could also benefit from the enhanced property and sales tax proceeds resulting from the resulting development made accessible by the PPP bridge projects.
Risks of introducing new technologies in a PPP project	Build into implementation schedule of project scheduled service downtime to permit conversion and de-bugging of the new systems for PPP projects that are built under continuing transportation service.
	Use Design-Build-Operator (DBO) approach to PPP project for a specified period after the construction phase is completed (2 years minimum for operating systems) to ensure the operating service and control systems work properly without jeopardizing public safety.

**Exhibit 4.4 Administrative Issues and Strategies Used to Address Them
for U.S. Transportation PPP Projects**

Issues	Strategies
<p>Risk of using new project delivery and financing approaches that result in differences in understanding and expectations between</p>	<p>Promote on a pro-active basis public outreach and communication with the public early in the PPP project concept planning to obtain inputs regarding project issues and ways to address these issues and continue the process throughout the project development process.</p>
	<p>Promote two-way communication with project stakeholders throughout project development process to expose and resolve issues before they become impediments to the project that slow progress and threaten successful completion within budget and schedule terms of the PPP contract agreement.</p>
	<p>Employ experts on the alternative project delivery and financing approaches and what makes for a successful PPP relationship throughout the project to assist public sector agency managers and staff involved in the PPP project understand their roles and responsibilities and how to handle the partnering process.</p>
	<p>Bring in a noted specialist in partnering early in the project development process to conduct workshops that familiarize the partners to the PPP project of how the partnership arrangement should work and methods of communication, coordination, and dispute resolution without resorting to claims and counter-claims.</p>
	<p>Assign experienced staff to the PPP project that are familiar with the project delivery and financing approaches and are experienced in managing PPP-type contracts.</p>
	<p>Apply partnering techniques that facilitate the PPP project development process and build a productive and trustful working relationship between the public and private partners. These include: (1) use facilitated services on partnering techniques; (2) hold periodic executive partnering meetings from the beginning of the PPP project that include senior members of the PPP project management team; (3) hold weekly project status meetings among internal staff assigned to the PPP project; (4) hold bi-weekly meetings among project supervisors from public sponsor agency and private provider team to obtain briefings on project status, issues, and solution strategies; and (5) encourage field-based decision-making by public sponsor agency supervisors.</p>

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
Anton Anderson Memorial Tunnel Multimodal Conversion	DBO	Reduced 38-month schedule by 16 months (-42%)	Reduced \$59.6M budget by \$2.6M (4%)	Consistent with federal and state standards	Volume of auto traffic to and from Whittier increased by 500%. Number of annual tourists to Whittier area increased by 400%. Recreational boating in Whittier area increased by 200%.	Project operating and maintenance (O&M) costs paid from user fees (auto tolls), augmented by federal grants until no longer required.
Atlantic Station Redevelopment 17th Street Bridge	DBB-F	Within schedule	Within budget	Consistent with state and local standards	New bridge opened area to multi-use development in downtown Atlanta in transformed brownfield site - earning the development the National Phoenix Award for Excellence in Brownfield Development in 2004.	By 2006, Atlanta Station consisted of 5,000 residential units, 47 retail outlets, several banks, and shuttle bus service throughout development to nearby MARTA rail transit station.
					Atlantic Station Development opened 3 years late due to adverse economic conditions from 1999-2002.	Atlantic Station officially opened October 20, 2005.

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects - continued

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
Chicago Skyway Bridge Long-Term Lease	Concession Lease	99-year lease	\$1.83B up-front payment to City for lease	Concession contract assures the facility will be well operated and maintained over its 99-year term	\$1.83B in proceeds from long-term lease used to reduce City debt, repay cost of bridge rehabilitation prior to lease, establish a reserve fund, and provide a variety of neighborhood improvement projects and services.	Reduction of City outstanding debt improved its credit rating and lowered its cost of future debt.
					Lease proceeds not dedicated to any specific transportation improvement projects or services, making the deal a net transfer of the value of the transportation infrastructure asset to non-transportation purposes, thus reducing the transportation asset base of the City of Chicago and its future potential value capture.	Concession lease enabled concession team to implement electronic toll collection and open road tolling to improve convenience of using the facility with the option of cashless toll collection.

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects - continued

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
Route 3 North Highway and Bridge Rehabilitation	DB	Increased 42-month schedule by 34 months (+81%) caused by difficulty of project provider to meet sponsoring agency quality requirements	Within budget	Consistent with state standards because of public agency insistence on acceptable products	Opportunity for joint development along the corridor was lost as the project provider team became pre-occupied with completing the project within budget and schedule.	Potential DBOM project was limited to a DB project due to problems with project delivery, which cost the contractor \$3.8M in liquidated damages (capped at 1% of overall contract budget) due to completion delays.
		Contractor underestimated effort and time to develop and deliver documents needed to support right-of-way acquisition by the sponsoring agency				Lack of familiarity of both public and private sector members of PPP team led to district and a breakdown of the partnership approach to the project, which reverted to a more traditional approach to design and construction management.

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects - continued

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
Route 28 Phase II Expansion	DB	Within fixed-time schedule	Within fixed-price budget	Consistent with Commonwealth standards	Increasing economic development within Route 28 Special Assessment District enabled full Phase II project to be authorized, with 6 out of 10 interchanges built to replace inefficient at-grade intersections which has vastly improved operating efficiency of arterial and reduced congestion at these bottlenecks.	Project expedited improvements needed to reduce congestion along the Route 28 corridor and reduced the inflationary effects on project costs.
					Upgrading of Route 28 will further enhance value of commercial property and hasten development along the corridor within the Route 28 Special Assessment District.	Use of county-based debt further reduced costs of the project by up to \$150M over the life of the debt.

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects - continued

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
South Bay Expressway (State Road 125)	DBOM-F	12-year delay caused by local community and environmental concerns. Project opened to traffic in late 2006	Project costs increased due to local community environmental issues and inflation during the delay	Consistent with state and local standards, under scrutiny of CALTRANS and its QA contractor	Long project delay reduced accessibility enhancements to adjacent land owners, which delayed economic development along the corridor to be served by SR-125.	Renamed the facility the South Bay Expressway to provide a fresh image to the corridor long tarnished by the environmental and local community issues that plagued the project during 12 years or protracted negotiations and law suits.
		Despite 12-year delay, the project was completed 4 years earlier than the state or county could have built the project using their own funds			Twelve-year delay in project opening resulted in significant loss of toll revenues during this timeframe.	Long delay of project and efforts to address environmental and local community concerns undermined profitability of project for initial project team, which sold its interest in the project to another team in May 2003 which completed and now operates the project.
Trans-Texas Corridor - I-35 Corridor Toll Road Program	Comprehensive Development Agreement	Initial planning and environmental clearance completed for portions of corridor and several portions are entering procurement and award stage	To be determined as project segments are developed and opened	To be determined as project segments are developed and opened	TTC program is highly leveraging its limited public funding for surface transportation to develop a state-wide multimodal transportation corridor system that services interstate, cross-border (NAFTA-related), and intrastate travel by auto, truck, and rail, using user fees (tolls) to pay for this huge program.	Flexibility and broad capabilities provided by PPP legislation passed by the Texas legislature makes toll projects in the TTC program highly attractive to would-be project providers from the U.S. and overseas, include concessionaires.

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects - continued

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
Port of Miami Tunnel	DBFO with Availability Payments	Procurement and selection process completed; awaiting final financial terms to be negotiated	To be determined as project development gets underway in later 2007	To be determined as project development, operation, and maintenance proceeds	Project expected to significantly reduce congestion on local streets in downtown Miami near Port of Miami.	No direct tolls will be charged to users of the facility due to the potential for ship and truck traffic diversion from the Port to other competing ports in Florida. Instead availability payments will be made to the concession team by FDOT, based on funds provided by FDOT, Miami-Dade County, the City of Miami, and the Port of Miami. The project will make extensive use of tax-exempt Private Activity Bonds (PABs) to lower the cost of financing over the 35-year concession contract term.

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects - continued

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
Atlantic City - Brigantine Road and Tunnel Connector	DB-F Joint Development	On time	Within budget	Consistent with state and local standards	Project reduced congestion on local streets in Atlantic City.	South Jersey Transportation Authority (SJTA) tolls, parking fees and up-from cash contribution from the Brigantine Casino, Hotel, and Spa, incremental property taxes (TIF) generated by new developed made accessible by the corridor, and NJDOT funds used to pay for the project.
					Project corridor improved access to and from (in case of emergency evacuation) from Brigantine Island east of the project limits.	\$28 million contingency fund established for environmental problems encountered during construction, 85% of which could be used for a performance bonus to the contractor if not needed for environmental mitigation for on-time completion within budget.
					Project produced 15,000 jobs during construction and 5,500 permanent jobs at the Brigantine Casino, Hotel, and Spa once opened.	

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects - continued

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
Conroy Road Bridge	DBB - Joint Development (TIF)	On time	Within budget	Consistent with state and local standards	Bridge and approaches off I-4 provided direct access to the site that produced \$244M in new economic development and city property taxes greater than the annual debt service costs of the project within 4 years of opening.	This PPP project was initiated by private sector developers who gained the support of the city, county, and state transportation agency to proceed as an expedited Tax Increment Financing (TIF) project.
					Significant off-site economic development surrounding the Mall at Millenia site have produced additional incremental property tax revenues for both the city and county.	Site was set up under a Community Redevelopment Authority (CRA) to facilitate rezoning and financing arrangements.
					The Mall at Millenia and surrounding development have produced significant incremental sales tax revenues for both the state and county.	Project funding consisted of CRA-issued tax-exempt debt, state transportation agency loan (later repaid out of excess TIF proceeds), and right-of-way donated by the private development partners.
					Significant increase in jobs during construction of the Mall at Millenia and to staff the mall and related development once opened.	

Exhibit 4.5 Key Results of Using PPPs to Deliver U.S. Transportation Projects - continued

PPP Project	PPP Type	Timeframe	Cost	Quality	Economic Development	Other
Universal Boulevard Bridge	DBB - Joint Development (TIF)	On time	Within budget	Consistent with state and local standards	Bridge and approaches off I-4 provided direct access to site that produced \$750M in new economic development and city property taxes more than twice the annual debt service costs of the project within two years of opening.	This PPP project was initiated by private sector developers who gained the support of the city, county, and state transportation agency to proceed as an expedited TIF-funded project.
					Significant increase in jobs during construction of new theme park and to staff the park, hotels, and parking facilities once opened.	Site was set up as a Community Redevelopment District to facilitate rezoning and financing arrangements.
						Project funding consisted of CRA-issued tax-exempt debt.

Exhibit 4.6 Key Lessons from U.S. Transportation PPP Projects

- Unique situations often require unique solutions. Differences in projects and their institutional environments make each project unique in certain ways and this needs to be taken into consideration when structuring a PPP contract agreement.
- Allow a flexible project development approach for projects that have demanding design requirements to enable the private partner team to introduce innovative design and construction techniques that control the cost and timing of the project. This suggests the public agency partner not over design the project before bringing the PPP team on board but instead take the preliminary design process to the point where the basic requirements of the project are defined so the PPP design team can take it from there. It also suggests that the PPP partners should work collaboratively and constructively in confronting obstacles that invariably arise during project development with creative solutions, instead of playing the "blame game". This requires trust among the members of the PPP.
- Having champions for a PPP project among top elected and appointed officials is essential to moving PPP projects forward in a timely and cost-effective manner, especially in the early stages of environmental clearance, permitting, and financing.
- PPPs can benefit by combining multiple objectives that benefit numerous stakeholders, beyond just the PPP members, such as economic development, remediation of brownfield sites, congestion relief, and safety that provide a "win-win" solution set that enhances the chances of the project proceeding.
- PPPs can bring together various stakeholders in a project, some of which might ordinarily serve as an adversary to a project but by being a party to the PPP or the PPP development process from an early stage, might become advocates of the project or at least have their opposition neutralized by having their concerns addressed for the full term of the PPP agreement.
- Transportation PPPs are more likely to survive the stresses of development and implementation if the partners share a common vision of the project that provides continuity and mutual commitment throughout these phases of project delivery.
- Successful PPPs begin with a clear understanding of the respective roles, responsibilities, risks, and returns each partner will assume during the terms of the project contract agreements with each party held accountable for delivering according to the terms of the contract.
- Members of the PPP team should maintain a spirit of openness (transparency) and cooperation throughout the project development and implementation processes, soliciting inputs from and communicating with each other and key stakeholders, including the general public. This will help keep the project moving as the parties work out issues in a collaborative manner.
- Risk management can be optimized by retaining a private sector project delivery team with extensive experience and capabilities in delivering PPP projects that meet the full terms of the contract.

Exhibit 4.6 Key Lessons from U.S. Transportation PPP Projects - continued

- The public agency project sponsor should take responsibility for the environmental clearance and permitting processes, as well as right-of-way acquisition, particularly if the use of eminent domain or "quick take" approaches are required to obtain needed parcels for the project.
- Public agencies should develop clear criteria for privatizing their highway infrastructure assets, such as transportation need, lack of available public funding, need to expedite the project, environmental constructability, financial viability, private sector interest and willing to assume certain project risks in return for an acceptable return on their investment, and reasonable risks for both public and private members of the PPP.
- Transparent solicitation and procurement processes provide equal opportunity for participation in a proposed PPP project by interested private sector firms or teams through comprehensive documentation of facility attributes and project requirements.
- Have qualified staff or consultants (legal, procurement, contract administration, financial, traffic and revenue estimation, value engineering, project partnering, and public outreach) participate in the development of the PPP contract agreement and scrutinize the resulting agreement prior to contract execution to mitigate project risks, position responsibility for project risks among the partner(s) best able to manage them, and determine if the project remains financially viable under a reasonable range of project risks.
- Inexperience by both public and private members of a PPP can lead to distrust and a dysfunctional partnership, where the respective parties revert to their traditional roles of public sponsor client and overseer tightly holding the private designer and contractor to prescribed standards and specifications in an atmosphere of distrust.
- Instead of resolving disputes amicably and having the private provider team apply its ingenuity to cost-effectively address project issues as they arise, the lack of a mature partnership arrangement can result in a return to frequent requests for change orders, extra work orders, and claims against the project sponsor agency for reimbursement of costs incurred due to unexpected conditions, causing project delays and increased costs that should have been avoided under a partnership arrangement.
- The project sponsor agency should provide due diligence oversight throughout the project development process to ensure all partners are upholding their commitments and that the partnership can withstand various risk factors, such as cost, traffic, revenue, and environmental risks.
- The general public may be more accepting of paying tolls on bridges and tunnels than highways.
- Other surface transportation facilities nearby a PPP-delivered facility may help or hurt the success of the PPP arrangement depending on if these facilities channel additional traffic to the facility or compete with the facility for the same customers.

Exhibit 4.7 Critical Success Factors for PPP Transportation Projects

- Stakeholder consultation through regular meetings at both the managerial and technical levels
- Active public involvement through public outreach and on-going communication between project partners and stakeholders
- Political leadership that supports the project and serves as a champion for its successful implementation
- Secure public control of the infrastructure assets through continued public ownership and PPP team accountable for project results consistent with the contract terms
- Limited complexity of the PPP arrangement and contract agreement to ensure stakeholder understanding and compliance
- Well defined legal authority for the public sector to enter into PPP arrangements and apply alternative methods of funding, financing, and delivering transportation infrastructure
- Financial viability under a wide range of risk factors
- Clear delineation and balance of project roles, responsibilities, and risks among the PPP partners commensurate with their potential returns
- Demonstrated transportation need (congestion relief, safety improvement, better accessibility, and travel time reliability) and public support among numerous stakeholder groups
- Capable public and private sector partners with mutually complementary interests in the project and a willingness to accommodate changing conditions and opportunities consistent with the desired project outcomes and performance requirements
- Adequate dedicated funding sources for the full term of the PPP contract
- Environmental constructability to ensure the project can be cost-effectively constructed without serious damage to the environment through environmental and context-sensitive design and value engineering
- Ample number of capable private sector firms and teams to ensure a competitive procurement and selection process

APPENDIX A - GLOSSARY OF TERMS

- **Build-Own-Operate:** a private contractor constructs and operates a facility while retaining ownership. The private sector is under no obligation to the government to purchase the facility or take title. “Public-Private Partnerships: Terms Related to Building and Facility Partnerships.” GAO/GDD-99-71, April 1999, <http://www.gao.gov/special/pubs/Gg99071.pdf>
- **Concession Benefits:** rights to receive revenues and other benefits (often from tolling) for a fixed period of time.
- **Construction Manager at Risk:** hired construction manager (CM) begins work on the project during the design phase to provide constructability, pricing, and sequencing analysis of the design. The CM becomes the design-build contractor when a guaranteed maximum price is agreed upon by the project sponsor and CM. (32 CFR 636.103)
- **Design-Bid-Build:** the traditional project delivery method where design and construction are sequential steps in the project development process. (32 CFR 636.103)
- **Design-Build:** an agreement that provides for design and construction of improvements by a contractor or private developer. The term encompasses design-build-maintain, design-build-operate, design-build-finance and other contracts that include services in addition to design and construction. Franchise and concession agreements are included in the term if they provide for the franchisee or concessionaire to develop the project which is the subject of the agreement. (23 C.F.R. 636.103)
- **Developer Financing:** a type of financing where a private party finances the construction or expansion of a public facility in exchange for the right to build residential housing, commercial stores, and/or industrial facilities on the site. This type of financing often takes the form of capacity credits, impact fees, or exactions. “Public-Private Partnerships: Terms Related to Building and Facility Partnerships.” GAO/GDD-99-71, April 1999, <http://www.gao.gov/special/pubs/Gg99071.pdf>
- **Electronic Toll Collection:** the use of electronic devices such as transponders, cameras, and photo-recognition technology to identify, classify, and toll vehicles entering and/or leaving a toll highway, bridge, or tunnel without the need for direct human involvement in the process or the handling of cash.
- **Innovative Contracting:** innovative contracting practices meant to improve the efficiency and quality of roadway construction, maintenance, or operation. Examples of innovative contracting include: A+B contracting, lane rental, the use of warranties, design-build, design-build-operate, design-build-finance-operate-maintain.
- **Innovative Finance:** innovative methods of financing construction, maintenance, or operation of transportation facilities. The term innovative finance covers a broad variety of non-traditional financing, including the use of private funds or the use of public funds in a new way, e.g., GARVEE bonds or special tax districts.
- **Life-Cycle Costs:** the costs of a project over its entire life: from project inception to the end of a transportation facility's design life.

- **Private Activity Bonds:** Section 11143 of Title XI of SAFETEA-LU amends Section 142 of the Internal Revenue Code to add highway and freight transfer facilities to the types of privately developed and operated projects for which up to \$15 billion in private activity bonds may be issued. This change allows private activity on these types of projects, while maintaining the tax-exempt status of the bonds. The law directs the USDOT Secretary of Transportation to allocate PABs among qualified facilities without being subject to state bonding caps.
- **Public-Private Partnership:** a contractual agreement formed between public and private sector partners, which allows more private sector participation than is traditional. The agreements usually involve a government agency contracting with a private company to renovate, construct, operate, maintain, and/or manage a facility or system. While the public sector usually retains ownership in the facility or system, the private party will be given additional decision rights in determining how the project or task will be completed. The term public-private partnership defines an expansive set of relationships from relatively simple contracts (e.g., A+B contracting), to development agreements that can be very complicated and technical (e.g., design-build-finance-operate-maintain). In the context of this report, the term public-private-partnership is used for any scenario under which the private sector would be more of a partner than they are under the traditional method of procurement. Further, the broad definition used for public-private partnerships includes many elements that are applied fairly regularly on appropriate projects. “Public-Private Partnerships: Terms Related to Building and Facility Partnerships.” GAO/GDD-99-71, April 1999, <http://www.gao.gov/special/pubs/Gg99071.pdf>
- **Revenue Bonds:** instruments of indebtedness issued by the public sector to finance the construction or maintenance of a transportation facility. Revenue bonds, unlike general obligation bonds, are not backed by the full faith and credit of the government, but are instead dependent on revenues from the roadway they finance. Terms Related to Public-Private Partnerships, The National Council for Public-Private Partnerships: How Partnerships Work, <http://ncppp.org/howpart/pppterm.html>
- **Shadow Tolling:** Shadow tolls are per vehicle amounts paid to a facility operator by a third party such as a sponsoring governmental entity. Shadow tolls are not paid by facility users. Shadow toll amounts paid to a facility operator vary by contract and are typically based upon the type of vehicle and distance traveled.
- **Toll Credits:** toll credits are earned when a State, a toll authority, or a private entity funds a capital highway investment with toll revenues from existing facilities. States may increase the use of available eligible Federal funding on a project, up to the normal State/local matching amount, and debit the sum of the toll credits that have been earned by that same amount.
- **Tolling:** the process of collecting revenue whereby road users are charged a fee per roadway use. Tolls may be collected on a flat-fee basis, time basis, or distance basis and may vary by type of vehicle.
- **Warranty:** when used in public-private partnerships for the construction of roads, warranty clauses guarantee that the roadway will meet a certain level of quality or else repairs will be made at the private contractor’s expense. There are currently two types of warranties used in highway construction: (1) materials and workmanship warranties and (2) performance

warranties. Under the first type, the contractor is responsible only for defects caused by poor materials and workmanship. Under the latter, the contractor is responsible for the product meeting certain agreed upon performance thresholds, regardless of whether materials and workmanship met State standards.

APPENDIX B - LIST OF ACRONYMS

AASHTO	American Association of State Highway & Transportation Officials
AGCA	The Associated General Contractors of America
ARTBA	American Road and Transportation Builders Association
BOO	Build-Own-Operate
BOT/BTO	Build-Operate-Transfer/Build-Transfer-Operate
CBO	Congressional Budget Office
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CM	Construction Manager
CM@Risk	Construction Manager at Risk
CPTC	California Private Transportation Company
DB	Design-Build
DBB	Design-Bid-Build
DBF	Design-Build-Finance
DBOM	Design-Build-Operate-Maintain
DBOM-F	Design-Build-Operate-Maintain-Finance
DOT	Department of Transportation
EBRD	European Bank for Reconstruction & Development
ECI	Early Contractor Involvement
EIB	European Investment Bank
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ETC	Electronic Toll Collection
FHWA	Federal Highway Administration
FOIA	Freedom of Information Act
FTA	Federal Transit Administration

GAN	Grant Anticipation Notes or Bonds
GAO	General Accounting Office
GARVEEs	Grant Anticipation Revenue Vehicles (bonds or notes)
HBA	Highway Beautification Act
HOV	High Occupancy Vehicle
HUD	U.S. Department of Housing & Urban Development
IFB	Invitation for Bid
IDB	Inter-American Development Bank
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
JDA	Joint Development Agreement
LTM	Louisiana TIMED Managers
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act of 1969, as amended
NHS Act	National Highway System Designation Act of 1995
NHS	National Highway System
NMSHTD	New Mexico State Highway & Transportation Department
OCTA	Orange County Transit Authority
PDC	Project Development Contractor
PABs	Private Activity Bonds
PPP	Public-Private Partnership
PPTA	Public-Private Transportation Act of 1995 (Virginia)
RFP	Request for Proposal
RFQ	Request for Qualifications
RMAs	Regional Mobility Authorities
RSPA	Research and Special Programs Administration
SAFETEA	Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003

SEP-14	Special Experimental Projects–14 program which allows state transportation and local transportation agencies using Federal-aid funds to apply for permission to use a variety of alternative procurement approaches to deliver projects
SEP-15	Special Experimental Projects–15 program which allows state and local transportation agencies using Federal-aid funds to apply for permission to use alternative approaches to transportation planning, financing, contracting, environmental clearance, and right-of-way acquisition that are more efficient than traditional approaches and promote involvement by the private sector through PPPs
SCDOT	South Carolina Department of Transportation
SIBs	State Infrastructure Banks
STP	Surface Transportation Program
TEA-21	Transportation Equity Act for the 21 st Century, as amended
TIFIA	Transportation Infrastructure Finance & Innovation Act
TxDOT	Texas Department of Transportation
U.S.C.	United States Code
USFWS	United States Fish & Wildlife Service
UDOT	Utah Department of Transportation
USDOT	United States Department of Transportation
VDOT	Virginia Department of Transportation
WSDOT	Washington State Department of Transportation
WVDOT	West Virginia Department of Transportation

APPENDIX C - BIBLIOGRAPHY

The following pages contain an extensive bibliography on the use of public-private partnerships for surface transportation projects. This includes both domestic and international source material on PPPs. It should be emphasized that there is large reservoir of studies, reports, articles, and web sites devoted to the subject of transportation-related PPPs. In many cases, the web-site links to data on specific PPP projects provided to be the most robust and useful source of information on the description, development, financing, partnership arrangements, and results of projects selected for this report. Therefore this bibliography also includes a listing of the key web sites that focus on PPPs, including domestic and international sites.

KEY LITERATURE SOURCES ON TRANSPORTATION-RELATED PPPS

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- Canadian Highway Infrastructure Website: <http://www.chichwys.com>
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