THESIS

KEY COMPLEX ISSUES IMPACTING PUBLIC PRIVATE PARTNERSHIPS FOR TRANSPORTATION RENEWAL PROJECTS IN THE UNITED STATES

Submitted by

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ABSTRACT

KEY COMPLEX ISSUES IMPACTING PUBLIC PRIVATE PARTNERSHIPS FOR TRANSPORTATION RENEWAL PROJECTS IN THE UNITED STATES

Highways have become a symbol of modern America (Levinson, 2004), and infrastructure investment plays a pivotal role both in short-term and long-term economic growth and in job creation. In the US, it represents 16% of the gross national product, and every dollar of public investment in highways has a net rate of return of 22 cents, and every billion dollars of federal highway investment generates 47,500 jobs (AASHTO 2003). In response to the inabilities to raise government revenues in the US, aging infrastructure systems, and high construction and O/M costs, infrastructure development has steadily become a collaboration work between the public and private sector. In liberalized infrastructure markets, various governance structures are being tested for application of public-private partnerships (PPPs or P3s) strategies in infrastructure development (Estache, 2004).

This thesis aims to review the key complex PPP issues in transportation renewal projects in the US that adopt PPPs. While PPPs can be applied to a range of agreements, the PPP projects to be studied and analyzed in this paper will be limited to those involving complex financing, design, construction and long-term operation and maintenance of transportation infrastructure of at least 10 years. These issues are examined in the context of six case studies in six different state across the US by means of interview and archival record. Findings resulting from this work suggested that PPPs have been increasingly implemented by departments of transportation in the US as a mean to tape into private resources. In addition, this research identified four key complex PPP issues in transportation projects as such Economic issue, Procurement issue, Risk

Issue, and Governance issue. States have established a dedicated organizational unit to facilitate the use of PPPs, for example High Performance Enterprise (HPTE) in Colorado and Innovative Project Delivery Division in Virginia, but there exist no standards or best practices in the United States for procurement, concession terms, or risk-sharing.

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I feel truly grateful to study at the Department of Construction Management, CSU and to be a member of CSU RAMs family because I have met the best professors, faculties, and staff one could ever ask for. Go RAMS!

DEDICATION

First and foremost, to my beloved Family, Kimphal Suon (Mother), Thary Lor (Godmother), Sam Oeurn Ek (Father), Sam Olyda Hay (Brother), and Mealea Phlek (my loved one), who always love, care, and support me unconditionally. My American family the Thomas that always make me “Home away from Home.” I offer them nonetheless a heartfelt THANK YOU.

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CHAPTER 1: INTRODUCTION

1. Background

Highways have become a symbol of modern America (Levinson, 2004), and infrastructure investment plays a pivotal role both in short-term and long-term economic growth and in job creation. It brings greater economic returns on investment than many other forms of capital expenditure. For example, for every one Euro invested, a 10-Euro return will be generated (Core Cities 2010). In the U.S., it represents 16% of the gross national product, and every dollar of public investment in highways has a net rate of return of 22 cents, and every billion dollars of federal highway investment generates 47,500 jobs (AASHTO 2003). On February 13, 2009, in direct response to the economic crisis in the US, the American Recovery and Reinvestment Act (ARRA), known as the 'Stimulus' or the 'Stimulus package,' was passed by congress. More than 12,000 road, highway and bridge projects across the nation benefited from the $26.6 billion stimulus plan. As part of the Recovery Act, the US Department of Transportation also awarded 51 Transportation Investment Generating Economic Recovery (TIGER) grants for creative projects intended to redefine the future of the US diverse transportation system - everything from regional bicycle networks, to intermodal centers, to commuter rail, to safer highways (FHWA 2012a). An additional amount of $1,500,000,000 remained available through September 30, 2011 for capital investments in surface transportation infrastructure (The Recovery Act, 2011). By Fiscal Year (FY) 2014 US Congress dedicated more than $4.1 billion to the TIGER program: $1.5 billion for TIGER I, $600 million for TIGER II, $526.944 million for FY 2011, $500 million for FY 2012, $473.847 million for FY 2013, and $600 million for the FY 2014 (United States Department of Transportation, 2014). The Recovery

Act was instrumental in enhancing the quality of infrastructure system in addition to restoring US economic performance and improving the quality of communities.

In 2011, US highway infrastructure assets totaled 4,077,756 miles and 605,087 bridges (Bureau of Transportation Statistics, 2013). According to 2013 Report Card for America's Infrastructure over 200 million trips are taken daily across deficient bridges in the nation's 102 largest metropolitan regions. In total, one in nine of the nation's bridges are rated as structurally deficient, while the average age of the nation's 607,380 bridges is currently 42 years. According to the Global Competitiveness Report 2012-2013, global quality of overall U.S. infrastructure and roads were ranked 25th and 20th out of 144 countries in the world respectively (Mundial, 2013). The Federal Highway Administration (FHWA) estimates that to eliminate the nation's deficient bridge backlog by 2028, the country would need to invest $20.5 billion annually, while only $12.8 billion is being spent currently. The challenge for federal, state, and local governments is to increase bridge investments by $8 billion annually to address the identified $76 billion in needs for deficient bridges across the United States. Regarding highway condition, the report card revealed that forty-two percent of America's major urban highways remain congested, costing the economy an estimated $101 billion in wasted time and fuel annually. By 2055, the US population will grow from 300 million to 435 million and Vehicle Miles Traveled may increase twofold from 3 trillion to as much as 7 trillion (AASHTO, 2007). While the conditions have improved in the near term, and federal, state, and local capital investments increased to $91 billion annually, but that level of investment is insufficient and still projected to result in a decline in conditions and performance in the long term. Currently, the FHWA estimates that $170 billion in capital investment would be needed on an annual basis to significantly improve transportation infrastructure conditions and performance (ASCE 2013).

According to the Organization for Economic Co-operation and Development (OECD), America's gasoline taxes are among the lowest in the developed world. US federal gas taxes for gasoline have remained 18.4 cents for gasoline/gasohol and 24.4 cents for diesel since 1993. Similarly average state taxes for gasoline have remained 22.68 cents for gasoline, 23.18 cents for diesel, and 22.62 cents for gasohol. Table 2 shows Federal and State Motor Fuel Taxes in the US. These excise taxes were fixed as a percentage of gas prices. Conversely in 1993 the United Kingdom (UK) Conservative government introduced a fuel duty escalator that increased fuel tax rates by first 3% and later 5% a year in real terms. That policy ended in 2000; when tax had reached 98 cents a liter, more than twice the 1990 level of 45 cents (which at the time was one of the lowest in Europe) (T&E, 2011). Figure 1 shows real fuel tax for the UK from 1980-2010. As shown in Table 1 from 2011 to present, Fuel Excise Duty (FED) has been 58p per liter for petrol and diesel or 2.19 pound per gallon without Value Added Tax (VAT)/Sale Tax of about 20 to 25p per liter depending on price. Likewise in Germany, as shown in Figure 2 fuel tax and value added taxes come to around 1.55 Euros (USD 2.09) per gallon for gas and 1.42 Euros (USD1.92) for diesel respectively.

Were the tax properly evaluated annually in a manner that reflects the prices, inflation, and fuel efficiency, Highway Trust Fund (HTF) would have been more abundant to rebuild the backlog of surface transportation infrastructure repairs/maintenances and to fund new infrastructure projects in order to cope with the ever-increasing transportation demand. Figure 3 shows the status of HTF from 2010-2014. Figure 4 shows comparable fuel taxes in 16 countries including the U.S.

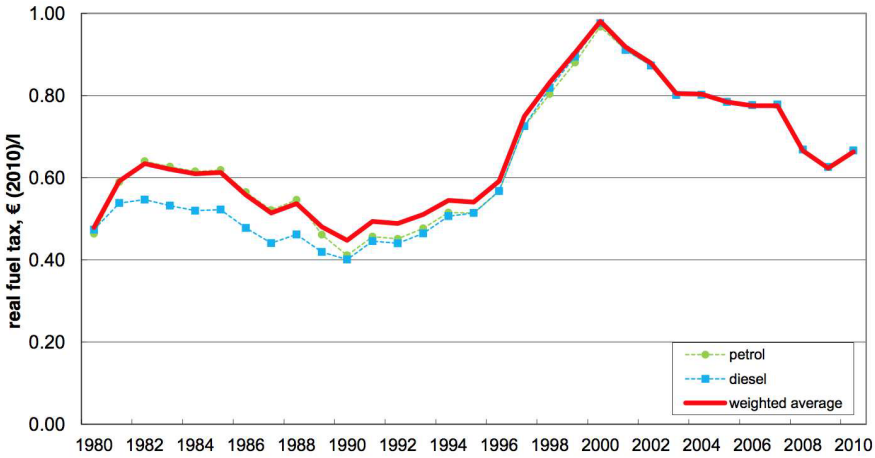

Figure 1: Real Fuel Taxes for UK 1980-2010 (T&E, 2011)

Table 1: UK Fuel Excise Duty rates

Fuel type	Fuel duty (from Jan 2011)	Fuel duty (from 23 Mar 2011)	Fuel duty now (from 01 Jan 2012)	Fuel duty (from 01 Sept 2013)
Ultra-Low Sulphur Petrol	59.0 p/litre	58.0 p/litre	58.0 p/litre	58.0 p/litre
Ultra-Low Sulphur Diesel	59.0 p/litre	58.0 p/litre	58.0 p/litre	58.0 p/litre
Biodiesel used as a road fuel	59.0 p/litre	58.0 p/litre	58.0 p/litre	58.0 p/litre
Bioethanol used as a road fuel	59.0 p/litre	58.0 p/litre	58.0 p/litre	58.0 p/litre
LPG used as a road fuel	33.0 p/kg	31.6 p/kg	31.6 p/kg	To be confirmed
Natural gas used as a road fuel	26.2 p/kg	24.7 p/kg	24.7 p/kg	Zero
Electricity	Zero	Zero	Zero	Zero

Source: DirectGov & Budget 2012, Autumn Statement 2012, Budget 2013 Read more at http://www.nextgreencar.com/car-tax/fuel-duty.php#1zyAxX5z3EkYy2EU.99

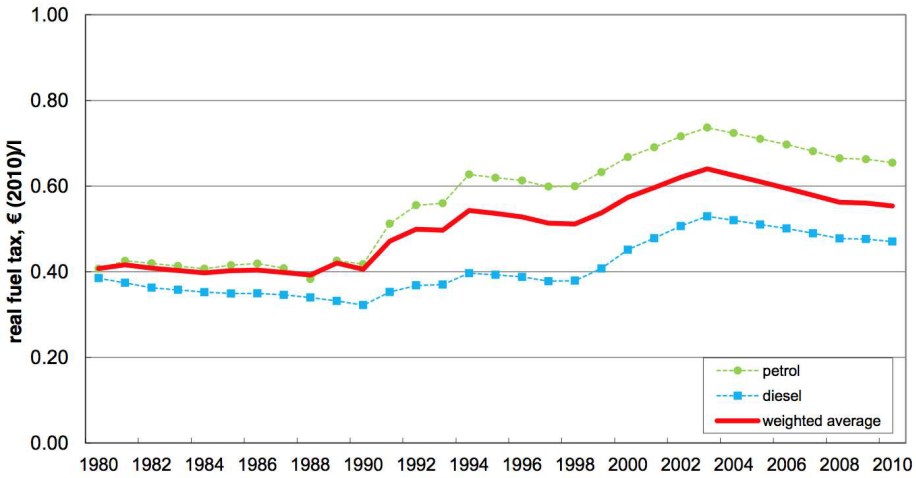

Figure 2: Real Fuel Taxes for Germany 1980-2010 (T&E, 2011)

Table 2: Federal and State Motor Fuel Taxes in the US (EIA, 2009)

Table EN1. Federal and State Motor Fuels Taxes[1] (Cents per Gallon)

	Motor Gasoline	Diesel Fuel	Gasohol		Motor Gasoline	Diesel Fuel	Gasohol
Federal[2]	18.40	24.40	18.40	Mississippi[4]	18.00	18.00	18.00
Average State Tax	22.68	23.18	22.62	Missouri[4]	17.00	17.00	17.00
				Montana[4]	27.00	27.75	27.00
Alabama[4]	18.00	19.00	18.00	Nebraska	26.30	26.30	26.30
Alaska[5]	8.00	8.00	8.00	Nevada[4]	23.00	27.00	23.00
Arizona	18.00	18.00	18.00	New Hampshire	19.63	19.63	19.63
Arkansas	21.50	22.50	21.50	New Jersey[3]	10.50	13.50	10.50
California[3,4]	35.70	13.00	35.70	New Mexico	18.90	22.90	18.90
Colorado	22.00	20.50	22.00	New York[3,4]	25.05	23.25	25.05
Connecticut[3]	25.00	46.20	25.00	North Carolina	35.00	35.00	35.00
Delaware	23.00	22.00	23.00	North Dakota	23.00	23.00	23.00
District of Columbia	23.50	23.50	23.50	Ohio	28.00	28.00	28.00
Florida[4]	16.20	29.60	16.20	Oklahoma	17.00	14.00	17.00
Georgia[3,4]	7.50	7.50	7.50	Oregon[4]	30.00	30.00	30.00
Hawaii[3,4]	17.00	17.00	17.00	Pennsylvania	31.20	38.10	31.20
Idaho	25.00	25.00	25.00	Rhode Island	32.00	32.00	32.00
Illinois[3,4]	19.00	21.50	19.00	South Carolina[4]	16.00	16.00	16.00
Indiana[3]	18.00	16.00	18.00	South Dakota	24.00	24.00	22.60
Iowa[3]	21.00	22.50	19.00	Tennessee	21.40	18.40	21.40
Kansas	24.00	26.00	24.00	Texas	20.00	20.00	20.00
Kentucky	26.40	23.40	26.40	Utah	24.50	24.50	24.50
Louisiana	20.00	20.00	20.00	Vermont[3]	25.00	29.00	25.00
Maine	30.00	31.20	30.00	Virginia[3]	17.50	17.50	17.50
Maryland	23.50	24.25	23.50	Washington[4]	37.50	37.50	37.50
Massachusetts	21.00	21.00	21.00	West Virginia	32.20	32.20	32.20
Michigan[3]	19.00	15.00	19.00	Wisconsin	32.90	32.90	32.90
Minnesota	28.00	28.00	28.00	Wyoming	14.00	14.00	14.00

[1] This figure lists rates of general application (including, but not limited to, excise taxes, environmental taxes, special taxes, and inspection fees), exclusive of county and local taxes. Rates are also exclusive of any State taxes based on gross or net receipts. The State rates are effective July 1, 2011.

[2] The Federal tax on motor gasoline and diesel fuel increased to 18.4 and 24.4 cents, respectively, on October 1, 1997. The Federal tax on gasohol increased to 18.4 cents on January 1, 2005.

[3] Additional State taxes are levied as follows: California: 2.25 percent sales tax on gasoline, 9.12 percent sales tax on diesel fuel; Connecticut: 7.0 percent gross earnings tax; Georgia:4 percent Prepaid State Tax; Hawaii: 4 percent gross income tax, $1.05 per barrel Environmental Response, Energy, and Food Security Tax; Illinois: 6.25 percent sales tax (suspended for the period beginning July 1, 2000, and ending December 31, 2000); Indiana: 7 percent sales tax (suspended for the period between July 1, 2000 and September 15, 2000); Iowa: 1.0 cent per gallon Environmental Protection Charge; Michigan: 6 percent sales tax; New Jersey: gross receipts tax of 4 cents per gallon for on-highway use fuels; New York: 8.0 cents per gallon State sales tax in addition to local sales taxes; Virginia: 2 percent sales tax in areas where mass transit systems exist; Vermont: Motor Fuels Transportation Infrastructure Assessment Fee (subject to change on a quarterly basis for gasoline and 3.0 cents per gallon on diesel fuel).

[4] Local option taxes (LOTS) are allowed. In Florida, the State assesses a State Comprehensive Enhanced Transportation System (SCETS) tax on gasoline which is two-thirds of each county's rate. In addition, the State collects a "ninth cent tax" and a second local tax. These taxes add an unweighted average of 15.2 cents to the gasoline State tax. In Hawaii, LOTS are as follows: Honolulu: 16.5 cents per gallon; Maui: 16.0 cents per gallon; Hawaii: 8.8 cents per gallon; Kauai: 13.0 cents per gallon. In Nevada, additional county taxes on gasoline range from 5 to 10 cents per gallon.

[5] The State of Alaska suspended its motor fuels taxes on all fuel types and uses for a period of one year beginning September 1, 2008 and ending August 31, 2009.

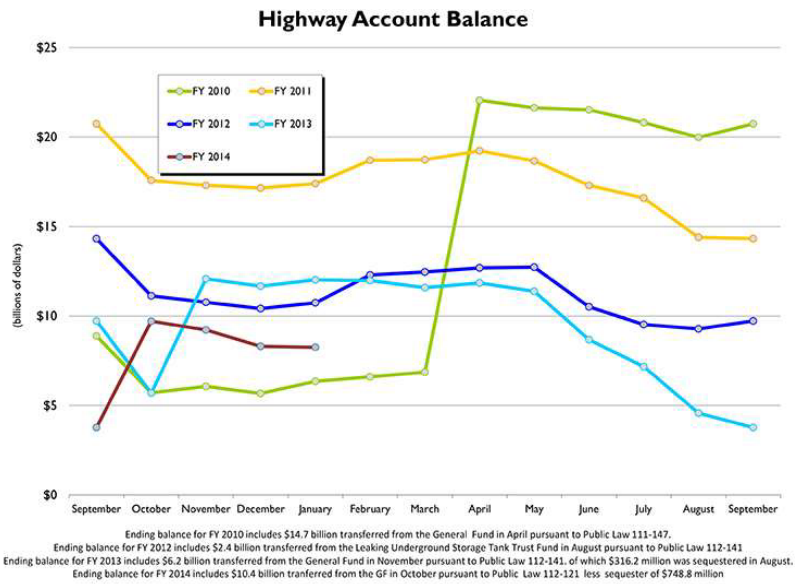

Figure 3: Status of the Highway Trust Fund (FHWA, 2014)

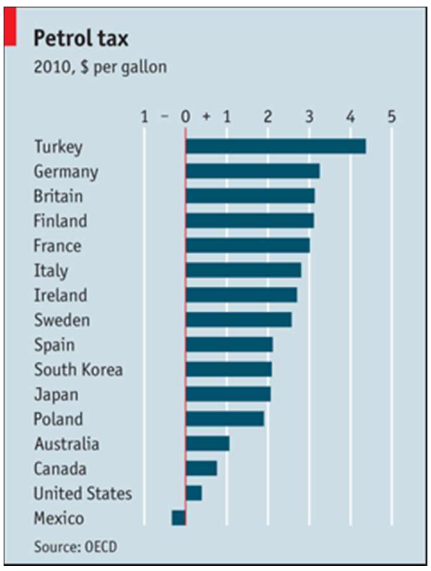

Figure 4: Fuel taxes (Economist)

In response to the inability to raise government revenues in the US, infrastructure development has steadily become a collaboration work between the public and private sector. In liberalized infrastructure markets, various governance structures are being tested for application of public-private partnerships (PPPs) strategies in infrastructure development (Estache, 2004). PPPs are contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery and financing of transportation projects (FHWA 2013a). PPP policies and practices have evolved in other world regions. For example, in the global PPP market there were 1,376 PPP projects that achieved financial close from 2005-2012 totaling a combined capital value of about USD 485 billion. Transport is the dominant form of infrastructure procured through partnership based procurement internationally, accounting for more than 63% (USD 307.2 billion) of deals achieving financial close (Infrastructure Journal as cited by Haran et al., 2013). In the U.K. since PPPs were first introduced in 1997 (Ke, Wang, Chan, & Cheung, 2009), they have been recognized as an effective way of delivering value for money in public infrastructure and services and now

account for about 15% and 8% of money spent on infrastructure in the U.K. and Australia respectively (Banks, 2005). The United States remains a relatively slow mover, for example tolled roads and bridges in the nation constituted only 5062 miles of roadway and 136 bridges (Bureau of Transportation Statistics, 2011).

In short in order to raise the capital needed to rebuild the highway infrastructure in the U.S., private capital will likely be required in the form of public-private partnerships supported by toll revenue due to:

- Importance of transportation to the economy and job creation
- Aging infrastructure systems
- Government's general reluctance to augment taxes
- Need to tap new source of transportation funds
- Decrease in HTF
- Successful experiences of international counterparts.

2. Research Objective

This thesis aims to review complex PPP issues in transportation renewal projects in the US that adopt public private partnerships (PPPs). While PPPs can be applied to a range of agreements, the PPP projects to be studied and analyzed in this paper will be limited to those involving complex financing, design, construction and long-term operation and maintenance of transportation infrastructure of at least 10 years. The research attempts to answer the following three central research questions in detail.

Question: What are the complex key issues in PPP transportation renewal projects in the U.S.?

CHAPTER 2: LITERATURE REVIEW

1. Public Private Partnerships (PPPs)

Public private partnership (PPP or P3) strategies were first introduced in the U.K. in 1997, and they have been recognized as an effective way of delivering value for money (VfM) for public infrastructure and services (Ke et al., 2009). In the US, the Federal Highway Administration (FHWA) established the Office of Innovative Program Delivery (IPD) in 2008 to provide resources to the transportation community to implement such innovative strategies as PPPs in their complex infrastructure projects costing $500 million or more. Currently, the office of IPD provides five main programs including Project Delivery, Project Finance, PPPs, Transportation Infrastructure Finance and Innovation Act (TIFIA), and Revenue. According to the office, public private partnerships (P3s) are contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery and financing of transportation projects. Similarly, the Canadian Council for Public Private Partnerships (CCPPP) defines PPPs as cooperative ventures between the public and private sectors, built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards (CCPPP, 2013). The following are other definitions of PPPs:

- A public private partnership is a legally binding contract between government and business for the provision of assets and the delivery of services that allocates responsibilities and business risks among the various partners. In a P3 arrangement, government remains actively involved throughout the project's life cycle while the private sector is responsible for the more commercial functions such as project design, construction, finance and operations (Partnerships British-Colombia, 2003).
- A PPP is a long-term contract between the public and private sectors where government pays the private sector to deliver infrastructure and related services on behalf, or in support, of government's broader service responsibilities. PPPs

typically make the private sector parties who build infrastructure responsible for its condition and performance on a whole-of-life basis (Infrastructure Australia, 2008).

- An agreement between the government and one or more private partners according to which the private partners (which may include the operators and the financers) deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners (OECD, 2008)
- Public private partnerships are arrangements typified by joint working between the public and private sector. In the broadest sense, PPPs can cover all types of collaboration across the interface between the public and private sectors to deliver policies, services and infrastructure. (HM Treasury, 2009).

There are several potential advantages in engaging with the private sector for infrastructure procurement such as additional resource capability and capacity; accelerated project delivery; reduced costs and increased efficiency; risk transfer or sharing with private provider team; quicker access to new technology and innovative techniques; and increased project team accountabilities (FHWA, 2007). For example, by partnering with private concessionaire California Private Transportation Company (CPTC) that invested in the 91 Express Lanes project in Orange County, California managed to save not only the initial $130 million capital cost savings to the state by private development and construction but also $120 million in California Highway Patrol (CHP), operations and maintenance expenses over the 35-year concession. The State Route 91 is America's first toll road to employ variable congestion pricing and the world's first fully automated toll road utilizing electronic transponders to collect tolls (Caltrans). A study of 54 PPP and traditional projects in Australia, 7 and 16 of which were PPP and traditional transportation projects respectively, showed that PPPs were much more likely to be completed on budget and on time. Regarding cost efficiency PPPs shows a superior outcome over traditional projects ranging from 30.8 percent when measured from project inception, to 11.4 percent when measured from contractual commitment to the final completion.

In term of time, PPPs were found to be completed 3.4 percent ahead of time on average, while traditional projects were completed 23.5 percent behind time (Duffield & Raisbeck, 2007). Figure 5 shows cost efficiency dimension of PPP against traditional projects. Table 3 shows a comparison of other dimensions of efficiency between PPP and traditional projects. Finally, unlike privatization where a public asset is fully sold to private sector, transportation infrastructure under PPPs will eventually revert to the public sector once a concession ends or government buys back the asset.

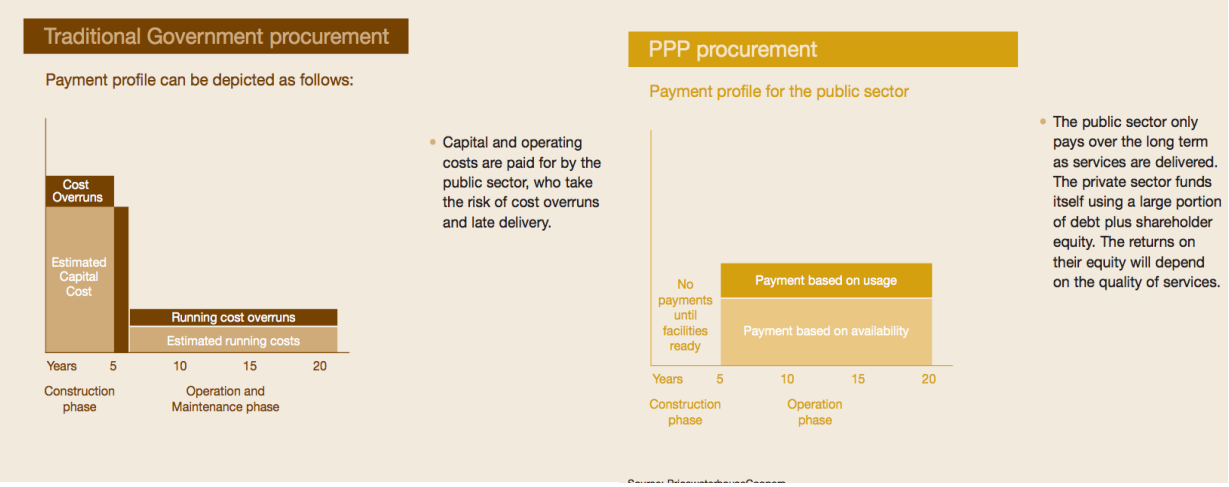

Figure 5: Payment Profiles of Traditional & PPP Procurement (Davies & Eustice, 2005)

Table 3: PPP Vs. Traditional Procurement (Graham, 2010)

		Traditional Procurement			
	PPP	Design & Construct	Alliance/Partnering	Design, Construct, Maintenance	Managing Contractor
Time taken to Award Contract	✓	✓✓	✓✓✓	✓✓	✓✓✓
Time to deliver the asset	✓✓✓	✓	✓✓	✓✓	✓✓
Transaction costs	✓	✓✓	✓✓✓	✓✓	✓✓✓
Cost Certainty	✓✓✓	✓	✓	✓✓✓	✓
Whole of Life Maintenance	✓✓✓	×	×	✓✓✓	×
Budget Certainty	✓✓✓			✓✓	
Project Due diligence	✓✓✓	✓	✓	✓✓	✓
Environmental Approvals	✓✓	✓✓✓	✓	✓✓	✓
Change in performance requirements	✓	×	×	✓	×
Design Innovation	✓✓✓	✓	✓✓	✓✓	✓✓✓
Construction Innovation	✓✓✓	✓✓	✓✓	✓✓✓	✓✓
Commissioning/Decanting	✓✓✓	✓	✓	✓✓✓	✓✓

✓ Poor ✓✓✓ Good × Not Covered

Many different types of PPPs have been adopted in infrastructure development around the world Depending on the extent of involvement, risks and responsibilities of the private sector in a project, PPPs can take the following forms (Rebeiz, 2012):

- Procurement: The government outsources procurement activities to the private sector. However, the overall management control of the infrastructure remains under the jurisdiction of the government.
- Management: This arrangement is similar to the previously discussed procurement arrangement. The difference is that the government relinquishes some aspect of control and operation of the asset to the private sector.
- Lease: The private sponsor leases or rents the infrastructure from the government for a specified time period. The private sector has the right to cash flow resulting from the operation of the infrastructure.
- Concession: The government gives the private sector the right to finance, build, and operate an infrastructure project. The private sector has the right to cash flow for operating the infrastructure over the concession period. At the expiration of the concession period, the private sponsor transfers the control and assets' ownership back to the government. At that point, the government could either decide to operate the plant itself or put the operation up for another round of bidding. Popular forms of concession agreements include Build-Own-Operate-Transfer (BOOT), Build-Operate-Transfer (BOT), and Build-Lease-Transfer (BLT).
- Divesture: The government fully transfers the ownership and control of the assets to the private sector. A Build-Own-Operate (BOO) falls under this category as it

permits the private sponsor to retain ownership of the project indefinitely with no obligations to return it to return it to the government.

In the US, PPPs options are categorized into two main categories based on the nature of a project, i.e. New Build Facilities and Existing Facilities. For the New Build Facilities, PPP options can be Private Contract Fee Service, Design Build (DB), Design Build Operate Maintain (DBOM), Design Build Finance (DBF), and Design Build Finance Operate Maintain (DBFOM). For the Existing Facilities, the options are limited to only Operations and Maintenance (O&M) Concessions and Long Term Lease Concession. These arrangements are summarized in Figure 6.

Three main types of PPPs that have been used for highway projects in the United States include (FHWA, 2012d):

- DB: projects are set up as fixed-price contracts between a private entity and a public agency to jointly manage the design and construction of a new roadway facility.
- DBF: the private partner provides the necessary up-front capital and is generally repaid by a state or local government in a series of installments funded by taxes, fees, or tolls,
- DBFOM: the private partner additionally agrees to perform operations and carry out maintenance on the highway for a specific period.

Figure 6: Types of P3 (FHWA, 2013a)

In the European Union, PPPs are classified into institutionalized PPPs (mixed companies) and purely contractual PPPs (European Commission, 2004). With various options available for structuring PPPs, guaranteeing the benefits from PPPs requires recognition of the relative

strengths and weaknesses of each type of structure, the aims and objectives of each party, and how to integrate these factors into project design (European Commission, 2003). Figure 7 summarized types of PPPs according to the involvement of the private sector.

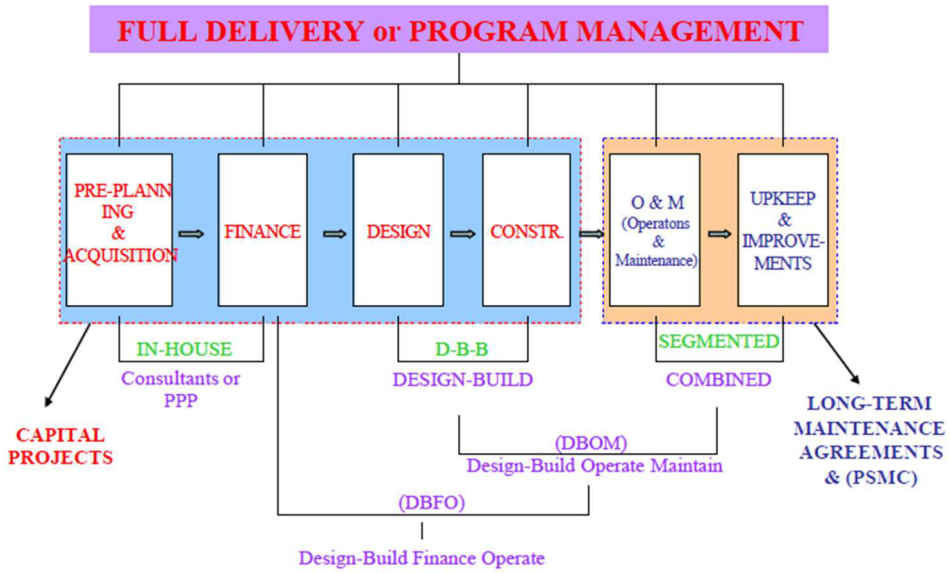

Figure 7: Innovative Procurement Methods (Pakkala, 2002, p. 32)

PPP arrangements require revenue sources or rights to support their capital, operating, financing, and transaction expenses and to provide a return on equity investments (Brown et al., 2009). The most frequent compensation mechanisms in PPP transportation infrastructure include (FHWA, 2012b):

- Real tolls: concessionaire keeps the toll revenue and other fees from users. The toll rate structure and future toll rate increases are typically set in the concession agreement to provide greater predictability to the concessionaire and assurance to the public that the concessionaire will not charge excessive tolls. If facility demand is less than expected, the private concessionaire may face losses, while it could reap windfall profits if demand is higher than expected. US transportation projects using real tolls include, Capital Beltway I-495 HOT Lanes, VA (80 year lease, $2,006 million total cost); North Tarrant Express, TX (52 year lease, $2,047 million total cost); and South Bay Expressway, CA (35 year lease, $774 million total cost)
- Shadow tolls: a public agency compensates the concessionaire based on the amount of traffic using the facility, but the drivers do not pay the tolls themselves. This allows the agency to mitigate the technical risks associated with a tolled road while transferring most or all of the traffic risk to the concessionaire. This method

of compensation has been used in PPPs in the UK and Spain, but it has not been applied in the United States. Internationally, there is a trend away from shadow tolling because it may not effectively align private sector incentives with the public sector goal of managing mobility across the transportation network. For example, if a concessionaire's compensation is purely based on the amount of traffic, the concessionaire has less incentive to reduce congestion. Also, the public sector ends up paying a premium for the concessionaire to take on traffic risk, but the concessionaire may have little ability to influence the amount of traffic that is drawn to the facility. Instead, traffic levels are more likely to be affected by external, macroeconomic factors, such as job and housing trends and resulting regional traffic flows.

- Availability payments mechanisms: The concessionaire is compensated based on its ability to operate and maintain the road to standards specified in the contract. This allows the agency to choose whether or not to use tolls to finance the project and to keep more control over toll setting if it does use tolls. It also avoids the perception that the concessionaire is setting excessive tolls. Examples of US transportation projects using this availability payment are I-595 Managed Lanes, FL (35 year lease, $1,834 million total cost) and Port of Miami Tunnel- FL (35 year lease, $1,073 million total cost).
- Flexible-term concession: once specified gross revenue has been reached, the contract is terminated. Firms can bid the level of present value of project revenues at which the contract would terminate. This arrangement limits downside revenue risks to the concessionaire while continuing to provide strong performance incentives. This model has not been used in the United States, but it has been used in Portugal, the UK, and Chile.

2. Key Complex Issues in PPP Projects

The argument that the private sector is more efficient, will complete projects faster and better maintain the assets over the concession period is premised on a number of assumptions: competitive markets, effective identification, pricing and transfer of project risks, and the ability to write comprehensive contracts (OECD, 2010). An exhaustive literature review revealed four key complex issues that affect the efficiency of PPPs in transportation projects: Economic, Procurement, Risk, and Governance. Complex issues are defined as those issues which are not easily managed by traditional agency structures, processes, or systems, and therefore require innovative strategies for project success (Shane et al., 2010).

2.1 Economic

Though with a profound economic growth and social benefits, transportation investment normally requires a large capital investment upfront, for instance the $2,068 million I-495 Capital Beltway High Occupancy Toll (HOT) Lanes. Public sector in the US used to rely greatly on fuel taxes to build and maintain their transportation infrastructure to support traffic demand. However, this source of funding has been declining in real dollars over the last two decades relative to economic fluctuation and inflation rate. While relatively new in the United States, leveraging private resources to obtain highway infrastructure is more common abroad. For example since the 1960s Spain has been active in highway PPPs using about 22 toll highway concessions to construct its 3,000 km national roads at little cost to the government (GAO, 2008). Thus a need for new sources of capital, i.e. public/private tolling, expanded private equity has always been one of the prime motivation for public agencies to adopt PPPs. In PPPs concession companies normally create a joint venture between private firms known as Special Purpose Vehicles (SPVs) to assemble finance and resources to bid on a public project. The concessionaires will use their own capital in combination with loans from equity investors, commercial banks, or bondholders to pay project costs. Once the projects are completed, they hope to use project income to payback their lenders. For example, in 2007 the Northwest Parkway Public Highway Authority (NWPPHA) entered into a $603M 99-year lease concession agreement with Brisa/CCR joint venture. The agreement released NWPPHA from all outstanding bonds while providing funds for the authority; payment of pre-existing obligations; financial and operational risks and committed funding for a 2.3 mile US36 extension (Samuel, 2007).

Private sector partners can have higher total debt capacity than the public counterpart that has to abide by legal limits on the amount of debt issued. It can also access more asset pools that

are suited for transportation, particularly pension funds. A study of nine PPP deals achieving financial close from 2005-2007 showed that an average financial structure comprising 96% debt and 4% equity financing (Haran et al., 2013). Relatively higher private financial leverage (Debt/Equity ratio) for private partners has both benefit and risk. The upside is that the private partner can increase up-front financing for projects because it may be comfortable with longer-term borrowings or may count on operational or construction cost savings that will increase the amount of value that can be delivered for a given level of revenue (FHWA, 2010). The downside is that it has a higher cost of raising capital compared to tax-exempt and lower interest loans available for the public sector and a higher chance of bankruptcy due to unforeseen risks or unrealistic revenue projections used to pay off the debt. In case of bankruptcy, projects and their provision of transportation service might be jeopardized affecting public perceptions about PPPs. Overall the Global Infrastructure Challenge stressed that PPP model in the US remained an incremental and vastly underutilized resource for infrastructure provision as no PPP deals achieved financial close in 2011 (Haran et al., 2013).

Given the scale and challenges of the capital investment, robust financing instruments are required to find an optimal financing structure between public and private sectors in PPP transportation projects. United States Department of Transportation (USDOT) has developed various innovative finance tools and programs to assist project sponsors in improving the effectiveness of grant management techniques and bridging investment gaps between available resources and infrastructure needs as follows (FHWA, 2013c):

- Federal-Aid Fund Management Tools- ease of restriction on the timing of obligations and reimbursements; broader range of options to meet requirements; 20 percent of the funding from state and local governments. The tools include: Advance Construction (AC) and Partial Conversion of Advance Construction

(PCA); Federal-aid Matching Strategies (Federal funds as a match, third party donations); and other Federal tools (Availability payments, Pass-through tolls).

- Federal Debt Financing Tools- borrowings (bonds), large projects where costs exceed available current grant funding and tax receipts. The tools include: Grant Anticipation Revenue Vehicles (GARVEEs); Private Activity Bonds (PABs); and other Bonding and Debt Instruments (Build America Bonds- BABs)
- Federal Credit Assistance Tools- loans or credit enhancements from State DOT or Federal government. The tools include: Transportation Infrastructure Finance and Innovation Act (TIFIA), State Infrastructure Banks (SIBs), and Section 129 Loans.

While these innovative finance programs facilitate the delivery of projects, some states still lack revenue sources to successfully realize PPP projects, for example the $2.5 billion 99-year lease proposal for the Chicago Midway Airport project in 2008 was canceled because a consortium consisting of Citi Infrastructure Investors, YVR Airport Services Ltd., and John Hancock Life Insurance Company, could not secure financing. The 78-mile Gator Alley (Alligator Alley) toll road project for operation and maintenance in Florida didn't have any bids though four major international groups, including Brisa, CCR, and a JPMorgan joint venture known as A2 Transportation Partners (A2TP) were registered and qualified to bid.

2.2 Procurement

Concession in infrastructure sometimes opens up to opportunistic behaviors from both private and public sectors and generally requires large specific sunk costs- costs that cannot easily be recouped if economic conditions deteriorate or if the operator discontinues operations. The assets are specific, meaning that they cannot be used for other activities (Guasch, 2004; Ubbels & Verhoef, 2008; Whittington, 2012; Williamson, 1976). In his study of more than 1,000 concessions in infrastructure in Latin America and the Caribbean from 1985-2000, Guasch (2004) found that such high sunk costs had tempted government to behave opportunistically, taking regulatory actions that expropriate rents once costs are sunk, such as compulsory or unilateral renegotiations of agreed-upon contract terms. Typical scenarios, as he further

elaborated, include either a government seeking to secure popular support during a reelection campaign by cutting tariffs or not honoring agreed-upon tariff increases. In case a new administration is elected, it may either decide not to honor tariff increases agreed to in a contract granted by a previous administration or pursue different priorities that require a different action plan. On the other hand, a concessionaire may be able to "hold up" the government, for example, by insisting on renegotiating the contract, seeking more favorable terms, or using regulatory capture given the enterprise's extensive information advantage over government (and over other potential operators) as a leverage. It may also reopen other issues to its benefit (R. C. Marques & Berg, 2011) because there isn't any competition once the concession contract is awarded and the private operators have a stronger bargaining position (P Bajari, 2006). This circumstance by itself promotes opportunistic behavior, including optimistic bidding at the public-tender stage; so the winner's curse becomes a winner's blessing (R. Marques & Berg, 2010). These renegotiations imply a lack of compliance with agreed-upon terms and were especially common in transportation concessions representing 55 percent (of more than 1,000 concessions) and an average of just 3.1 years between concession awards and renegotiations (Guasch, 2004).

Nonetheless where direct competition does not exist, private sector participation has been achieved through competition managed through contractual arrangements, ranging from simple contracts for specific services to long-term concessions that require operation, maintenance and facility expansion (Devapriya, 2006). The sole purpose of these contractual relationships is to delineate a framework guiding longer-term relations and allowing for flexibility and cooperation while maintaining performance incentives and punishment (Torrance, 2007). In this sense a limited form of competition is introduced where firms compete to be selected as the private partner, but once selected there is no competition in the provision of service to the public at large

(Matti Siemiatycki & Farooqi, 2012). In various possible scenarios, as detailed in the previous paragraph, each party will seek terms that favor their own organization (Williamson, 1976); one dollar to the firm is one less dollar in public funds, and vice versa (Whittington, 2012). For example, in Highway 407 toll road north of Toronto, one of the major PPPs in Ontario that sought to transfer revenue risk to the private sector, the incoming Liberal government in 2002 undertook lengthy and ultimately unsuccessful legal action to restructure the toll agreement on the 99-year highway lease that enabled the private partner to realize very high profits. The public has also complained bitterly about aggressive toll collection tactics that are permitted within the concession agreement (Matti Siemiatycki & Farooqi, 2012).

However, crafting a perfect contract is believed to be impossible and as a result costly conflicts between the partners are common, often leading to contract renegotiations and sometimes early termination of the concession (M. Siemiatycki, 2009; Vining & Boardman, 2008). In an attempt to write a complete contract, PPP infrastructure contracts in the UK could run for more than 15,000 pages of legal script; and there was no guarantee that they were perfect, hidden interests in obscure detail, and unforeseen conditions (Clark & Evans, 1998).

Highway public-private partnerships also potentially require additional costs to the public sector compared with traditional public procurement due to cost associated with (1) required financial and legal advisors, and (2) private sector financing compared with public sector financing (GAO, 2008). These relatively higher transaction cost have been viewed as one of the main reasons for the incomplete nature of concession contracts, for example transaction cost of Infrastructure Ontario's portfolio of PPPs accounted for $228 million (Matti Siemiatycki & Farooqi, 2012). Three basic issues are involved here (Guasch, 2004):

- First, contracting parties cannot define ex ante the contingencies that may occur after the signing of a contract. Thus the contracting parties may face unforeseen contingencies.
- Second, even if one could foresee all contingencies, they might be so numerous that describing them in a contract would be too costly, and the cost of writing contracts may lead to incompleteness.
- Third, courts must perfectly understand the terms of a contract and be able to verify all actions under all contingencies to enforce it. If they do not satisfy some of these criteria, enforcing a contract will generate a cost.

2.3 Risks

In mature market conditions, private financing in infrastructure has led to an effective diversification of asset-specific investment risk for infrastructure firms in the capital market (Devapriya, 2006). With a typical contract length ranging from 35 to 40 years, or in some cases as long as 99 years, PPP projects in transportation infrastructure are more exposed to numerous challenges and risks that can compromise project performance (de Lemos, Eaton, Betts, & de Almeida, 2004; FHWA 2012c). The ISO 31000:2009 standard on risk management defines risk as the effect of uncertainty on objectives. Construction projects worldwide manifest more risks than do other industries (Seung Heon & Diekmann, 2004); a BOOT project is recognized as one of the most risky project delivery schemes (Prasanta K. Dey, 2004). In infrastructure there are two primary types of risks- global risk (political, legal, commercial, and environmental) and elemental or project risk (technical, construction, operation, finance, and revenue) (Grimsey & Lewis, 2002, 2004). Table 4 summarizes 21 major types of risks associated with transportation PPPs based on FHWA's PPP guidebook.

The traffic and revenue risks are often problematic in PPP arrangements because forecasting traffic volumes ex ante involves multiple factors such as expected economic growth, user behavior, price elasticity, and substitute or parallel facilities (Garvin, 2009). In some highway PPP projects, traffic and revenues have been low, imposing costs on the private sector.

For example, the 2004 Pocahontas Parkway's traffic was only about 400,000 transactions per month (about $630,000 in revenue) comparing to the 2003 projection of about 840,000 transactions per month (about $1.4 million in revenue). In June 2006, under an amended and restated development agreement, a private concessionaire that believed the road was a good long-term investment assumed responsibility for the road for a period of 99 years (GAO, 2008). Table 5 summarizes the most common major private sector risks and responsibilities under different PPP approaches.

Table 4: Responsibilities & Risks of Private Sector by PPP Approach (FHWA, 2007)

ALTERNATIVE PPP APPROACHES	FUNCTIONAL RESPONSIBILITIES AND PROJECT RISKS FULLY OR PARTIALLY TRANSFERRED TO THE PRIVATE SECTOR UNDER ALTERNATIVE PPP APPROACHES[1]												
	Planning	Environmental Clearance	Land Acquisition	Finance	Preliminary Design	Final Design	Construction	Construction Inspection	Maintenance	Operations	Long-term Preservation[2]	Traffic Revenue	Asset Ownership
Asset Sale				✓					✓	✓	✓	✓	✓
Greenfield Concession or Long Term Lease				✓		✓	✓	✓	✓	✓	✓	✓	
Brownfield Concession or Long-Term Lease				✓					✓	✓	✓	✓	
Multimodal Agreement (PPP)				✓		✓	✓	✓	✓	✓	✓	✓	
Joint Development Agreement (JDA-pre-development)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Transit-Orientated Development (TOD-post-Development) [3]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Design-Own-Operate (BOO)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Design-Own-Operate-Transfer (BOOT)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Build-Transfer-Operate (BTO)				✓	✓	✓	✓	✓	✓	✓	✓	✓	
Build-Operate-Transfer (BOT)				✓	✓	✓	✓	✓	✓	✓	✓	✓	
Design-Build-Finance-Operate (DBFO)				✓		✓	✓	✓	✓	✓		✓	
Design-Build-Operate-Maintenance (DBOM)				✓		✓	✓	✓	✓	✓		✓	
Design-Build with Warranty (DB-W)						✓	✓	✓			✓		
Design-Build (DB)						✓	✓	✓					
Construction Manager at Risk (CM@Risk)					✓	✓	✓	✓					
Contract Maintenance									✓	✓			
Traditional Design-Bid-Build (DBB)						✓	✓						

[1] Functional responsibilities and risks noted with ✓ may be transferred in whole to the private partner or shared with the public sponsor, depending on the contract

[2] Refers to long-term risk of asset failure or physical obsolescence

[3] Refer to private developer portion of infrastructure

Table 5: Private Sector Risks & Responsibilities by Different PPP Approach (FHWA, 2007)

Major Risks Associated with Transportation PPPs		
- Public acceptance	- Environmental/archeological	- Payment structure/mechanism
- Control of assets	- Right-of-way costs	- Transaction cost
- Protectionism	- Construction cost	- Changes of law
- Political stability	- Maintenance cost	- Compensation/termination
- Moral hazard	- Liability/latent defects	- Economic shifts
- Revenue	- Regulatory/contractual	- Currency/foreign exchange
- Taxation constraints	- Demand/volume	- Life-cycle cost

An inappropriate allocation of these risks between the public and private actors might reduce the number of bidders which can eventually foster opportunistic behavior (Zitron, 2006) and lead to higher-than-necessary prices (ADB, 2000).

> Inappropriate assumptions in aggressive bidding strategies including excessively optimistic population growth estimates and unrealistic forecasts of demand of consumption per customer, can lead less well-equipped firms to win bids, which harms the public sector because a bidder with realistic assumptions loses, and the winner will seek to renegotiate the contract when the assumptions prove false (R. C. Marques & Berg, 2011).

For instance, private toll-road operators in Spain unexpectedly called 2.7 billion USD of exchange rate guarantees in the 1970s and 1980s (Leruth, 2012). Risks usually assumed by the private sector include those associated with the phases of the project with which it will be involved, such as those related to uncertainties in construction cost, schedule, operations and maintenance and, in some cases, traffic and revenue. The public sector tends to retain risks related to uncertainties in environmental permitting and clearance, right-of-way acquisition and changes in applicable law and environmental while force majeure risks may be shared (GAO,

2008; Rall, Reed, & Farber, 2010). According to Garvin (2009), in the European Union, Eurostat requires the private sector in PPPs to bear at least two of the following three risks: construction risk, demand risk, and/or availability risk. In Spain, the government created a demand-risk sharing scheme as such the 130% and 70% threshold value wherein as long as the actual annual gross revenue falls within this range there will be no change to the contract. In Australia, New South Wales, Victoria, and Queensland share the philosophy that private investors in these deals, both equity and debt holders, must bear the downside market risks.

The ability of the public sector to construct or enhance parallel transportation infrastructures, the so called competing facilities, as part of future public policies to expand transportation capacity or to alleviate worsening traffic congestion can endanger the traffic demand of PPP facilities and vice versa. Non-compete or limited non-compete clauses have been usually used in PPP agreements to limit and/or elicit compensation for highways or other transportation facilities that may draw traffic from a leased toll road (Rall et al., 2010). In the US, there has not been a uniform guideline about whether to include a non-compete clause in PPP agreements. For example some states such as Arizona, California, Colorado, Florida, Mississippi, North Carolina and Texas prohibit non-compete clauses by statute (Fishman, 2009; Rall et al., 2010). In California, the 91 Express Lanes project agreement contained a non-competition clause that precluded the state from building unplanned facilities along thirty miles of the Riverside Freeway. When Caltrans, the California DOT, sought to expand a facility due to congestion, the concessionaire filed a lawsuit to stop the expansion, and after failing to nullify the non-competition clauses in 2003, OCTA bought the express lanes for $207 million (FHWA, 2012c). Similarly the Indiana Toll Road lease also contains a noncompete clause that proscribes

the State of Indiana from funding the construction or improvement of any limited access highway within a 10-mile radius of the Indiana Toll Road (Fishman, 2009).

These noncompete clauses have impact on the toll rates in two ways as the following (GAO, 2008).

- First if there aren't any untolled public roadways or other transportation modes (e.g., bus or rail) that are viable travel alternative to the toll road, these competing alternatives may act to constrain toll rates.
- Second, where there are no other viable parallel facilities to toll roads, private concession companies may have substantial market power in increasing toll rates that exceed the costs of the toll road, including a reasonable rate of return, as long as those toll rates are below the maximum rates allowed by the concession agreement.

For example, Chicago Skyway (Figure 8) and Indiana Toll Road, generally set maximum tolls in accordance with concession agreements. In contrast , public sector practices had not historically increased its tolls unless required by law and allowable toll increases that can be frequent and automatic with a minimum of 2 percent and a maximum of the annual change of either the CPI or per capita US nominal gross domestic product (GDP), whichever is higher (GAO, 2008).

Risk presents itself as both threats and opportunities (Froud, 2003) depending on how capable relevant stakeholders are in handling it. Therefore the claim that PPPs are an effective means of risk-sharing needs more hard evidence rather than assertion (Haran et al., 2013); the knowledge and experiences in transferring or sharing risk between the public sector and private consortia will contribute to the success or failure of a PPP infrastructure agreement.

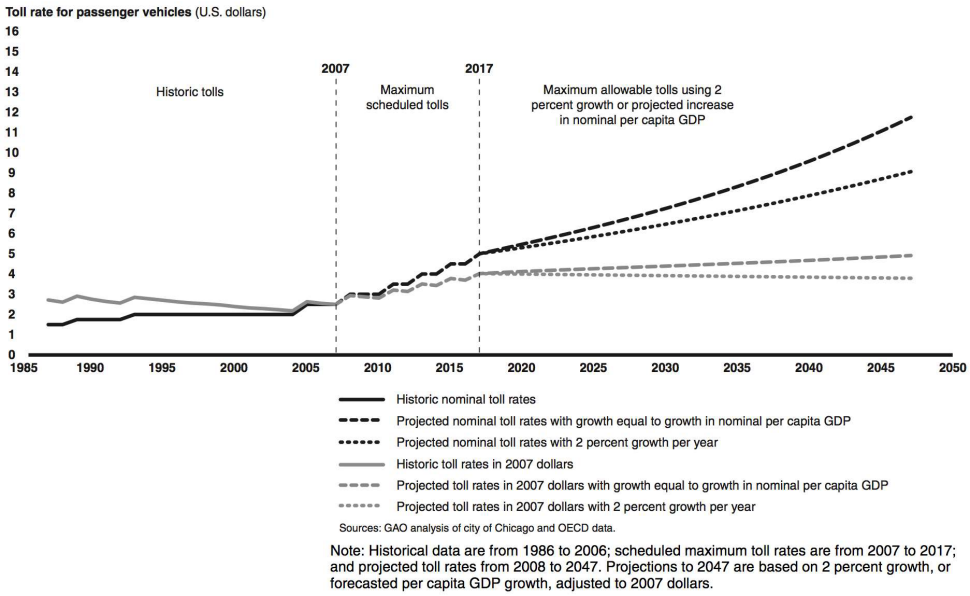

Figure 8: Change in Chicago Skyway Tolls, 1967-2047 (GAO, 2008)

2.4 Governance

Mahalingam (2009) argued that to maximize the effectiveness of PPPs in delivering urban infrastructure services, the roles of coordination agencies and regulators must be clarified. Given the high risk and immensely complicated nature of PPP projects, a recent trend in many developed and developing countries is the establishment of national PPP units. Some major PPP units include Treasury PPP Taskforce and Partnerships UK in the United Kingdom, Partnership Victoria in Victoria, Australia, and National Treasury PPP Unit in South Africa.

> Dedicated PPP units include any organization set up with full or partial aid of the government to ensure that necessary capacity to create, support and evaluate multiple public-private partnership agreements are made available and reside in government (OECD, 2010).
>
> The Public Private Infrastructure Advisory Facility (PPIAF 2007) adopted a fairly inclusive definition of PPP Units, to include any organization designed to:
> - Promote or improve number and quality of PPPs by trying to attract more PPPs, or trying to ensure that the PPPs meet specific quality criteria such as affordability, value for money, and appropriate risk transfer.
> - Has a lasting mandate to manage multiple PPP transactions, often in multiple sectors, i.e. such ad hoc PPP versa PPP teams working within a single ministry, or committees assembled only to work on specific transactions

Organization for Economic Co-operation and Development (OECD) provides several reasons to support the creation of a dedicated PPP unit as follows (2008):

- To ensure that departments deal properly with PPPs in terms of their budgets and do not succumb to the fallacy that PPPs increase the ability of the government to spend more;
- To ensure that government departments do not engage in "free rider" behavior whereby they commit the government as a whole to honor future payment obligations that the individual departments know they cannot honor through their own expected future budget allocations;
- To provide a knowledge center that government departments and other government entities can use when they set up and contract for PPPs;
- To regulate the creation of PPPs by government departments and other government entities to ensure that they fulfill all requirements regarding affordability, value for money and risk transfer;
- To separate PPP practice and policy.

The Public Private Infrastructure Advisory Facility further outlines the main functions of the unit: (a) Set PPP Policy & Strategy, (b) Project Origination, (c) Analysis of Individual Projects, (d) Transaction Management, and (e) Contract Management, Monitoring, and Enforcement. Puerto Rico has designated a new public entity, the Public-Private Partnerships Authority, with broad authority to identify, evaluate and implement PPP projects. To facilitate the PPPs, relevant authorities have actively introduced a series of policies relating to the provision of public services by the private sector, such as the Opinions on Acceleration of Privatization Process of Public Facilities (Wang, 2013). In the U.K., the Department's Representative (DR) is one dedicated PPP office that is responsible for performance monitoring, financial monitoring, and contract administration (Garvin, 2009). In Australia, Partnerships Victoria provides the overall policy framework for the Victoria state government in the provision of public services through public-private partnerships with a focus on whole-of-life costing, full consideration of project risks, optimal risk allocation, and value for money assessment to protect the public interest (Department of Treasury and Finance, 2014). In this sense, there's a

consistency and stability in procurement, contracting processes, and risk management for the market across these nations.

Nevertheless this is not the case in United States, for example the Pennsylvania Turnpike deal collapsed since 'no existing authority' was empowered to approve the governor's plan (Haran et al., 2013). Legislation in some states may designate entities other than the public sponsor such as the governor's office, the legislative body, a state agency, or a special commission, with the power to review, approve, or veto PPP agreements (FHWA, 2012b). These are three examples of this practice in three different states in the US (FHWA, 2012b). In Delaware to protect the public interest, the relevant Metropolitan Planning Organization is required to approve the project. In California, to ensure that such arrangements are in the public interest, a proposed agreement must be reviewed by the state legislature and the Public Infrastructure Advisory Commission at least 60 days before Caltrans or the relevant regional transportation agency signs the agreement. Lastly in Washington, the Washington State Transportation Commission is statutorily responsible for reviewing and approving public-private partnership agreements developed under the Transportation Innovative Partnership Program. While autonomy among the states has certain advantages, the nation cannot have 50 unique markets for PPPs; this would deter private participation and drive up transaction costs (Garvin, 2009). Stakeholders within the US institutional investment community advocated the setting up of a centralized PPP agency – similar to the system in Canada – in order to de-politicize risk, to build investor confidence, and to ease the deal flow (Haran et al., 2013). Table 6 shows the number of national public private partnership units in OECD member countries. Table 7 showed PPP Institutional Development in across Europe.

Table 6: OECD Member Countries' National PPP Unit by 2010 (OECD, 2010)

	Number of Countries	Countries[1]
Yes	17	Australia, Belgium, Canada, Czech Republic, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Netherlands, Portugal, United Kingdom.
No	12	Austria, Finland, Iceland, Luxembourg, Mexico, New Zealand, Norway, Slovak Republican, Spain, Sweden, Switzerland, United States.

1. No data for Turkey.

Table 7: Summary of PPP Institutional Development (Davies & Eustice, 2005)

Key

▲ Need for PPP unit identified and some action taken (or only a regional PPP unit existing)

▲▲ PPP unit in progress (or existing but in a purely consultative capacity)

▲▲▲ PPP unit existing (actively involved in PPP promotion)

■ Legislation being proposed

■■ Comprehensive legislation being drafted / some sector specific legislation in place

■■■ Comprehensive legislation in place

	PPP Unit	PPP Law
Member States		
Austria	▲▲▲	–
Belgium	▲	■■
Denmark	▲▲	–
Finland	–	■
France	▲▲	■■
Germany	▲▲	–
Greece	▲	■■
Ireland	▲▲▲	■■■
Italy	▲▲	■
Luxembourg	–	–
Netherlands	▲▲▲	–
Norway (not EU)	▲	–
Portugal	▲▲	■■
Spain	–	■■■
Sweden	–	–
UK	▲▲▲	–

	PPP Unit	PPP Law
New Member States		
Cyprus	▲▲	–
Czech Republic	▲▲	■■
Estonia	–	■
Hungary	▲▲	■
Latvia	▲▲	■■
Lithuania	▲▲	■
Malta	▲▲	–
Poland	▲▲	■■■
Slovakia	–	–
Slovenia	▲	■
Acceding and Candidate Countries		
Bulgaria	▲	■
Romania	▲▲	■■
Turkey	▲	■■■

Source: PricewaterhouseCoopers October 2005

In the past two decades, fewer than two dozen toll highway PPP concessions have occurred in the US due to enabling jurisdiction (FHWA, 2010).

> Private participation is often preceded by sector restructuring and by new laws and regulations to protect investors from politically motivated government intervention to protect users from the abuse of monopoly or dominant positions by new private operators, and to ensure competition between new entrants and dominant incumbent operators when feasible (Guasch, 2004).

In the US, federal legislation generally provides guidelines for PPP implementation, but leaves it to officials in each state to decide whether it wants to allow PPP projects and how to govern their implementation. As a result, PPP legislation varies widely from state to state (Iseki,

Eckert, Uchida, Dunn, & Taylor, 2009). Some states still lack the legal authority to enter into PPPs, or the legal authority is too restrictive to be used effectively, for example the Ohio River Bridges Project has been split into two parts: the Commonwealth of Kentucky will utilize a design–build-contract for the Downtown Crossing, whereas Indiana will utilize an availability payment concession to deliver the East End Crossing (FHWA, 2010).

In the US there are currently 33 states and one US territory that have enacted statues enabling the use of various PPP approaches for the development of transportation infrastructure (FHWA 2013b). Some states, such as Virginia, have laid out explicit regulations and standards for PPP facilities while others, like Minnesota, have only minimal statutes or provide for only a few types of projects, leaving a lot of discretion to the parties crafting the agreement between the public and private entities (Iseki et al., 2009). Often, enabling legislation also prescribes a role for the legislature in appointing committees or boards responsible for approving agreements, such as in Alaska and Puerto Rico (FHWA, 2012b). For example, regarding noncompete clauses the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) section 1604(c) prohibits public authorities participating in the State Infrastructure Bank (SIB) from entering into a noncompete agreement with the private sector that would preclude the improvement of adjacent public roads to accommodate diverted traffic (Fishman, 2009). While FHWA has made efforts to produce model enabling legislation and PPP program guidelines, more work is needed to ensure that policy framework will not only streamline the PPP enabling legislation, regulation, procurement processes but also create other elements supportive of good public governance such as integrity and ex post facto controls, audit and reporting (Garvin, 2009; OECD, 2008). High-quality regulation, transparency, access to information, competition, legal framework, proper compliance and enforcement, and adequate

appeal procedures are important for the success PPPs from a public policy view (OECD, 2008). Table 8 shows the five general categories of PPP statutes in the U.S. Table 9 shows PPP markets by Sector and Country inside and outside Europe.

Table 8: Five Categories of State Legislation (Iseki et al., 2009)

<table>
<tr><th colspan="2">State Legislation in the US</th></tr>
<tr><td>1. Project Selection and Approval
- Allows for Unsolicited Proposals
- Limits Number of Projects
- Restricts Geographic Location
- Restricts Mode of Transportation
- Allows for Conversions of Existing Roads
- Prior Legislative Approval Required
- Subject to Local Veto
- Restricts PPP Authority to State Agencies
- Design-Build Readily Allowed?
- HOT Lane Projects?
- Number of Major PPP Highway Projects Since 1991</td><td>2. Procurement and Project Management
- Allows Public Agency to Hire Own Consultants
- Allows Payments to Unsuccessful Bidders
- Requires Application Fees
- Requires Time for Public Review
- Specifies Evaluation Criteria
- Structures Proposal Review Process
- Protects Confidentiality of Proposals</td></tr>
<tr><td>3. Proposal Review Process
- Allows State and Federal Funds
- Allows TIFIA Funds
- Restricts Toll Revenues from General Fund
- Allows Public Sector to Issue Revenue Bonds
- Allows Public Sector to Form Nonprofits and
- Issue Debt</td><td>4. Funding Requirements and Restrictions
- Allows for Multiple Types of Project Delivery
- Exempts PPP Projects from State Procurement
- Laws
- Allows for Outsourcing of Operations and
- Management
- Requires Public to Maintain Comparable Non-
- Toll Routes
- Requires Non-Compete Clauses
- Allows for Long-Term Leases to Private Sector</td></tr>
<tr><td colspan="2">5. Toll Management
- Rate-Setting Control Set in Agreement - Requires Removal of Tolls After Payment of Debt</td></tr>
</table>

Table 9: PPPs Markets (Davies & Eustice, 2005)

	Central Accommodation	Airports	Defence	Housing	Health & Hospitals	IT	Ports	Prisons	Heavy Railway	Light Railway	Roads	Schools	Sports & Leisure	Water & Wastewater (incl solid waste)
Member States														
Austria	○	○			◔	○		○	◔		◔	○		○
Belgium		◔		◔					◔	○	◔	○		◔
Denmark	◔							○		○	○	◔	○	
Finland			○		○				○	○	◔	◔		○
France	◔	○	○		◑		○	◔	◑	◑[†]	●[†]		◔	●[†]
Germany	◑	○	◑		◔	◔		◑	○	○	◑	◕	◔	◑
Greece	◔	●			○						◕	○	◑	
Ireland	○			◑	◔			○		◔	◕	◑		◕
Italy	◑	◔		◔	◕		◔	○		◑	◕		◔	◕
Luxembourg		○				◔								
Netherlands	◔		◔	○	○		○	◔	◑		◑	◑		◑
Norway (not EU)	○		○		◔			○			◑	◔	○	
Portugal	○	○		○	◔	◔	◑	○	○	◑	●	○	◕	●
Spain	◔	◔			◑		●	◔	○	◔	●	○	○	◕
Sweden			○		○				○	◑	○			
UK	●	●	●	●	●	●		●		●	●	●	●	●
New Member States														
Cyprus		◔					◔				◔			◔
Czech Republic		○	◔	○	○			○	○	○	◔	○	○	◔
Estonia			○	◔	○	○				○	○	◔		
Hungary	○	○		◑	◔	◔		◔		○	◑	◑	◔	
Latvia	○			○	○			○			○	○		○
Lithuania					○				○	○		○	◔	
Malta				○	◔	◔	○				◔	○	◔	
Poland	○	○		○			◔		○	○	◑		○	◑
Slovakia		○									○			○
Slovenia														◑
Acceding and Candidate Countries														
Bulgaria		◔[†]					◔[†]				◔			◔
Romania		○		◔	◔						◑		◔	◔
Turkey		◑		○	○				○	○	○			◑
Country														
Australia	◔	●	◔	◔	◑	◑	●	◕	◕	◔	●	◔	◑	◕
Canada	◔				◑			○		◔	◑	◔	◔	◔
Japan	◕	◔	○	◔	◑	○	◔	◔	○	○	○	◕	◑	◑
Mexico		◔			◔			○		◔	◔	◔		○
Singapore	○		◔		○						○	◔	◔	◔
South Africa	◔	○			◑	○		◔	◔		◑	○	◔	○
United States		○	○	○	○		○	◔	○	◔	◔	○	○	◔

Legend

- ○ Discussions ongoing
- ◔ Projects in procurement
- ◑ Many procured projects, some projects closed
- ◕ Substantial number of closed projects
- ● Substantial number of closed projects, majority of them in operation

[†] *Procurement activity in these sectors relates to traditional style concession contracts*

General concerns also exist about whether executive agencies have sufficient capacity to successfully develop, procure, manage, supervise these PPP projects as needed in order to protect the public interest because PPPs have different preparation, tender and post award management requirements (Fishman, 2009; OECD, 2010). In this respect the public sector needs to further develop capacity in terms of the skills, capabilities, expertise of procurers, and communication to be able to allocate risk appropriately as well as developing a deeper appreciation of the commercial outcomes of risk retention and risk transfer (Haran et al., 2013).

Consequently, the theoretical proposition underlying this thesis is: "Since PPP projects involve higher levels of uncertainty, greater need for precise market timing in acquisition of funding, and more chances for opportunism, project agreements will rely more on relational governance than contracting, which is found in more traditional state highway agency projects."

CHAPTER 3: METHODOLOGY

The research objectives were to review and map key issues in transportation renewal projects in the US that adopt public private partnerships (PPPs). This chapter outlined research methods to achieve these objectives including research questions and research design.

1. Research Questions

To investigate key issues in transportation projects in the US that adopt public private partnerships the following central research questions were addressed:

Question: What are the key issues in PPP transportation renewal projects in the US?

2. Research Design

In social science research, a research design is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Selltiz et al., 1976). It's the logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of the study (Yin, 2009). To answer the above-mentioned questions, a research approach was adopted from the "Case Study Evaluations," 1990 by the Government Accountability Office (GAO) and "Case Study Research Design and Methods," 4th edition by Robert K. Yin as guiding principles for the research design.

2.1 Data Collection

According to Yin (2009), data collection for case studies should follow three principles:

a) Multiple sources of evidence- evidence from two or more sources, converging on the same facts or finding. The six sources of evidence include: documents, archival records, interviews direct observation, participant-observation and physical artifacts

b) A case study database- a formal assembly of evidence distinct from the final case study report
c) A chain of evidence- explicit links among the questions asked, the data collected, and the conclusions drawn.

2.1.1 Secondary Data Collection

Documents in the form of research papers, academic articles from prominent journals, periodicals, trade publications, transportation research technical reports, government guidelines and primers etc. that were relevant to PPP transportation projects of different size and nature in different countries were reviewed, summarized and organized into a Literature Review (Chapter 2). The objectives were to build the existing body of knowledge of public private partnerships and to develop a rich theoretical proposition for the research regarding the key issues of implementing PPPs in transportation projects in both the US and foreign countries. Moreover archival records review using online PPP transportation project databases of FHWA, State Department of Transportation, and individual project's websites allowed the research to include more insights into PPP transportation project implementation status and experiences. When the archival evidence is deemed relevant, it must be further ascertained in term of the conditions they were produced and their accuracy for numbers alone should not automatically be considered an accuracy (Yin, 2009). The four most common key complex issues have been identified and detailed in Chapter 2: Economic, Procurement, Risks, and Governance.

2.1.2 Primary Data

Once the research proposition was identified, case study methodology was utilized to look in-depth at a case to focus on attitudes, behaviors, meanings, and experiences by obtaining information from a number of different sources related to a project (Shane et al., 2010). A case study is a method for learning about a complex instance, based on a comprehensive understanding of that instance obtained by extensive description and analysis of that instance

taken as a whole and in its context (GAO, 1990). More precisely Yin (2009) defines a case study as a twofold process:

> Part 1: A case study is an empirical inquiry that:
> - Investigates a contemporary phenomenon in depth and within its real-life context, especially when
> - The boundaries between the phenomenon and context are not clearly evident.
>
> Part 2: The case study inquiry
> - Copes with the technically distinctive situation in which there will be many more variables of interest than data points, and
> - Relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and
> - Benefits from the prior development of theoretical propositions to guide data collection and analysis.

While in construction engineering and management (CEM), the number of case study research studies over the past decade has increased substantially, criticisms have been raised whether case studies are being performed with sufficient sample size, validity, reliability, and standard procedures to maximize the extent to which the findings can be generalized (Flyvbjerg, 2006; Taylor et al., 2009; Yin, 2009).

Researchers are also challenged by 1) access to projects for observation and data collection, 2) access to personnel in the office and field, and 3) access to information that is often considered proprietary or confidential (Taylor et al., 2009). These concerns are especially noticeable in PPP transportation projects because of the magnitude of complexity, unique nature of the projects, diverse groups of experts, and multiple stakeholders.

Concerning the sample size and statistical significance in case study research, Platt (1992) argued case studies should be selected on the basis of the degree of intellectual fit between them and should be accounted for theoretically, focusing on theoretical explanation of the whole range of variation rather than proportional representation of the numbers in the population. In simple terms, Taylor (2009) suggested that case studies should be selected for

their ability to support analytic generalization as opposed to statistical generalization. He also pointed out that the number of variables that determine the success or failure of projects and the unique nature of construction activities are one of the biggest challenges of statistical studies in CEM research. To deal with these concerns, multiple PPP case studies with different transportation project types and status that met pre-determined PPP criteria were selected to justify the robustness of the evidence, the construct validity and eventually the analytic generalization of the study. The first criteria was that projects had to include complex financing method, and the partnership between public and private sectors had to extend beyond the design/build phases to post construction phases that would last at least 10 years, i.e. operation, maintenance and transfer. Second, cases being studied had to be at various political divisions (State, County, and City) and in different states throughout the US to avoid geographical concentration and biases. As a result, six cases were carefully selected: US Highway 36, Colorado; Intercounty Connector (ICC), Maryland; I-495 Capital Beltway HOT lanes, Virginia; Hudson-Bergen Light Rail, New Jersey; I-77, North Carolina; and I-595 Corridor Roadway Improvements, Florida. Table 10 lists and summarizes the six PPP transportation case studies.

In the next step, each case study was assessed through available archival records, data mining and phone interviews with relevant project participants that were involved with the case study projects. Project participants were contacted via phone call and email to discuss the research objectives, their potential contribution, and their participation in this study. Prospective interviewees received a series of questions to be discussed in advance so that they could prepare themselves for the interview. The sole purpose of working with such a diverse groups of people is to minimize informants' personal biases toward any project under scrutiny since everyone's

idea, experiences, lessons learned, and recommendations would be recorded, and analyzed with the same level of importance.

Table 10: Case Study Selection

(Drawn from Innovative Program Delivery website at http://www.fhwa.dot.gov/ipd/p3/project_profiles/)

No	Project Title	Location	Year Approved	Mode/Delivery	Cost Million	Funding	Duration/ Status
1	US Highway 36: Phase 2	Denver Metro Area, Colorado	2014	- Highway / Managed Lanes; Bus Rapid Transit; - Toll, - Private partner - DBFOM	$208.4	- Plenary Funding: HPTE capital payment, TIFIA, PABs, Equity, Subordinated debt, I-25/US36 toll, other. - HPTE/CDOT funding: State, Federal, Local.	- DBFOM awarded in April 2013 - Construction will start in 2014 and is scheduled to be completed in Dec 2015. The duration of the PPP concession is 50 years.
2	Intercounty Connector (ICC)	Montgomery and Prince George's County, Maryland	2009	- Toll Highway - Public - DB	$2,399.1	- Federal funds (GARVEE, Special Federal funds), - State funds (MdTA Toll Revenue bonds & cash, TIFIA, State of Maryland Transportation Trust Fund, State of Maryland General Fund and General Obligation Bonds)	- Construction began in 2007 - A seven-mile initial section opened in Feb 2011 (Contract A). - The remaining mainline road (Contracts B & C) opened in Nov 2011. - Contracts D & E were combined and are expected to open in early 2014.
3	I-495 Capital Beltway HOT lanes	Fairfax County, Virginia	2008	- High Occupancy Toll (HOT) Road - Private partner - DBFOM	2,068	Private Activity Bonds; TIFIA; Commonwealth of Virginia grant, VDOT change-order funding; Interest income; Private Equity	- Construction began in spring 2008 and reached substantial completion on Nov 8, 2012. - Facility opened to traffic on Nov 17, 2012. - Concession is 85 years - five years of construction and 80 years of operation.
4	Hudson-Bergen Light Rail	Hudson and Bergen Counties, New Jersey	-	- Light Rail - Private partner - DBOM	$2,300	FTA New Starts Full Funding Grant Agreements; Grant Anticipation Notes (GANs) (backed by passenger fares); State Transportation Trust Fund (motor fuel tax receipts)	- The project's initial phase opened in 2000. - Seven other expansions have been completed as of Jan 2011.

Table 10: Case Study Selection- Continued

No	Project Title	Location	Year Approved	Mode/Delivery	Cost Million	Funding	Duration/ Status
5	I-77 High Occupancy/Toll (HOT) Lanes	North Carolina	2014	- HOT lanes, - Private partner - DBFOM,	$139.5	- State and Federal funding: toll revenues, NCDOT proposed funding/TIFIA & PABs - Cintra Infrastructure S.A equity	- Construction is expected to begin fall 2014, - The facility will be open to traffic late 2017.
6	I-595 Corridor Roadway Improvements	Broward County, Florida	2008	- Highway / Managed Lanes - Private partner - DBFOM	$1,833.6	- State and federal resources (Support FDOT's final acceptance payments, availability payments) - Concessionaire's financing sources for repayment (Senior bank debt, TIFIA, Equity, Revenues, FDOT qualifying development funds)	- Construction began in June 2009; - Expected completion Summer 2014

2.2 Data Analysis

Data analysis consists of examining, categorizing tabulating, testing, or otherwise combining evidence, to draw empirically based conclusions (Yin, 2009). Relying on the theoretical propositions detailed in Chapter 2, valuable interview responses, and archival data, each case study was analyzed and documented separately to identify key issues impacting the implementation of PPPs in US transportation projects and the corresponding empirical mitigation strategies. Each issue, strategy, and other factors raised by all interviewees would be checked and compared with one another both within their own case and with other cases to validate the conformity with or contradiction to the theoretical propositions. If the multiple-case studies produced similar results and patterns, the findings would be deemed as externally and internally valid respectively (Yin, 2009).

Case study summaries were summited to interview participants for member checking to independently verify, interpret, and cross check findings.

However, some of the limitations in this research included establishing the extent to which these findings could be generalizable especially given the magnitude of transportation infrastructure in the US. The case study data was analyzed using a pattern matrix to identify common factors relating to economic, procurement, risk, and governance issues on PPPs. The research process is summarized in Figure 9.

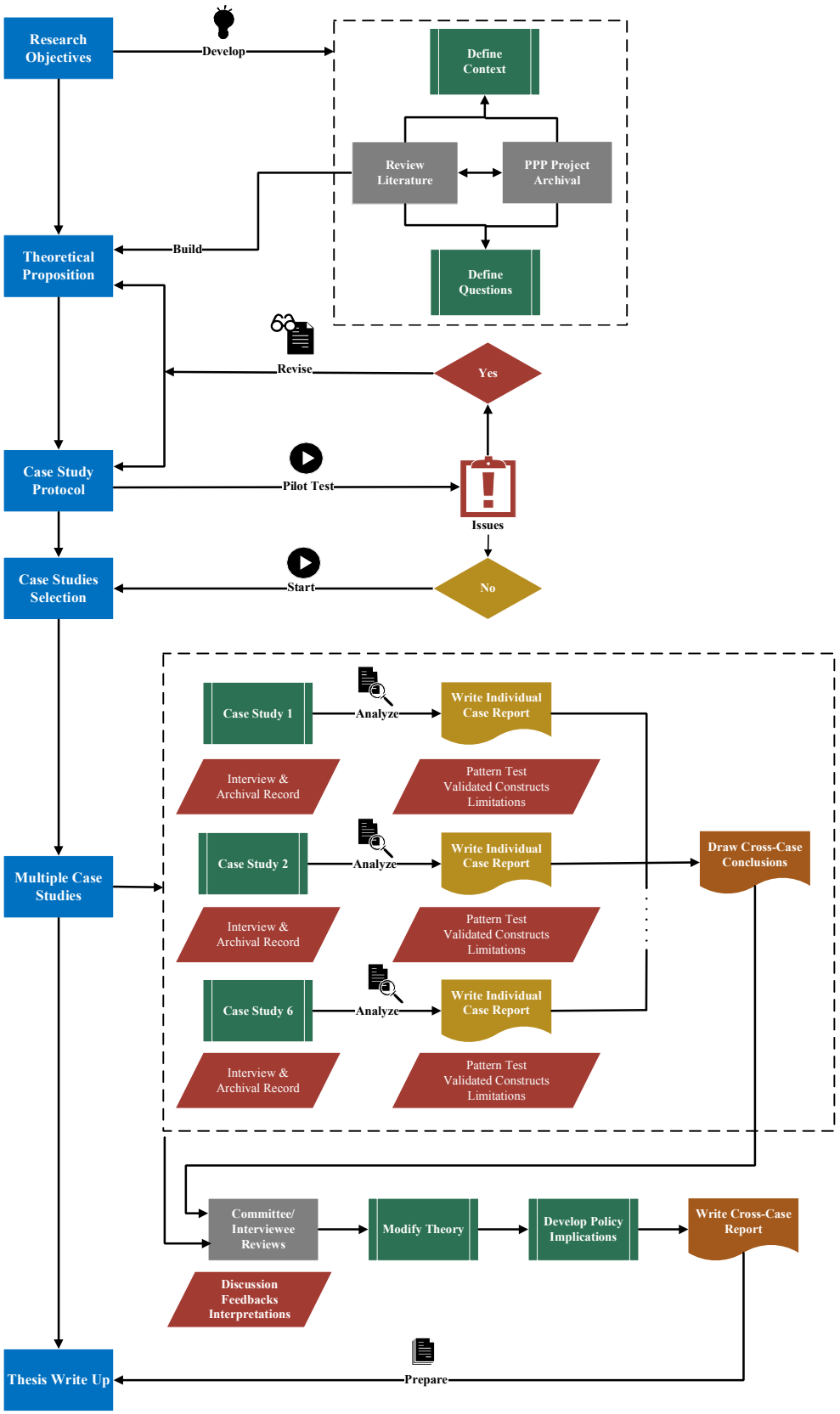

Figure 9: Research Process (Adapted from (Yin, 2009))

CHAPTER 4 CASE STUDY ANALYSIS

In this chapter, all data from interviews and archival records were analyzed based on the framework established in the previous chapter. From the beginning of the study, we planned to conduct six case studies on six different transportation projects in the US by means of telephone interviews and archival record research. Regarding the archival record research, data for all six cases were obtained and analyzed to identify common complex issues in implementing Public Private Partnership in transportation projects in the US. These cases were PPP transportation projects of different size, scope, and status in different states across the US (Colorado, Maryland, New Jersey, North Carolina, Florida, and Virginia).

For this research, case studies' data analysis consists of examining, categorizing tabulating, testing, or otherwise combining evidence, to draw empirically based conclusions (Yin, 2009). Relying on the theoretical propositions detailed in Chapter 2, valuable interview responses, and archival data, each case study was analyzed and documented separately to identify key issues impacting the implementation of PPPs in US transportation projects and the corresponding empirical mitigation strategies. Each issue, strategy, and other factors raised by all interviewees would be checked and compared with one another both within their own case and with other cases to validate the conformity with or contradiction to the theoretical propositions. If the multiple-case studies produced similar results and patterns, the findings would be deemed as externally and internally valid respectively (Yin, 2009). Table: 11, 12, 13, 14 summarize the key complex PPP issues, i.e. Economic, Procurement, Risk, and Governance respectively, in transportation projects in the US identified in the six case studies based on pattern analysis.

Table 11: Economic Issues

Economic Issue	US 36	ICC	HBLR	I-77	I-595	I-495
Funding shortage	✓		✓	✓	✓	✓
High cost	✓	✓	✓	✓	✓	✓
Increasing transportation demand	✓	✓	✓	✓	✓	✓
Aging transportation infrastructure	✓	✓			✓	✓
Interest rate	✓	✓	✓	✓		
Rate of inflation	✓	✓	✓	✓	✓	
Multiple funding sources	✓	✓	✓	✓		✓
Future federal spending or revenues		✓	✓	✓	✓	✓

Table 12: Procurement Issue

Procurement Issue	US 36	ICC	HBLR	I-77	I-595	I-495
Long term	✓	✓	✓	✓	✓	✓
Lengthier process	✓	✓	✓	✓	✓	✓
Performance measurement	✓	✓	✓	✓	✓	
The 1st PPP project	✓	✓	✓	✓	✓	✓
Learning process	✓	✓	✓			
No standardized process	✓		✓	✓	✓	
Tolling	✓			✓		
Strict MBE		✓				

Table 13: Risk Issue

Risks Issue	US 36	ICC	HBLR	I-77	I-595	I-495
O/M toll facilities	✓		✓	✓	✓	✓
Incorporating of adjacent assets	✓	✓				✓
Revenue	✓	✓	✓	✓	✓	✓
Traffic volume		✓	✓	✓	✓	✓
ROW		✓	✓	✓	✓	
EIS/NEPA	✓	✓			✓	✓
Utilities relocations	✓	✓			✓	
Financial		✓	✓	✓		
Rehabilitation	✓			✓		
Future Hand-Back concern	✓			✓	✓	
Warranty		✓				
Coordination/ Communication		✓	✓		✓	✓
Unknown Scope		✓	✓	✓		
Disruption: traffic/local business/ communities		✓				
Geotechnical		✓				
Budget	✓	✓	✓	✓		
Schedule		✓	✓	✓		✓
Design		✓	✓	✓		
Conflicts of interest		✓				
Litigation		✓				
Force majeure			✓			
Safety/Security			✓			
Construction	✓		✓	✓	✓	✓

Table 14: Governance Issue

Governance Issue	US 36	ICC	HBLR	I-77	I-595	I-495
Long term	✓		✓	✓	✓	✓
Public perception	✓	✓		✓		
Opposition: public/local/officials	✓	✓		✓	✓	
Enabling legislation		✓	✓			
Noncompete clauses				✓		
Lack of dedicated PPP unit	✓	✓	✓	✓		
Coordination/Communication	✓	✓	✓	✓	✓	✓
Shift of roles		✓	✓			

The key complex issues in implementing PPP in transportation projects in the US revealed in the six case studies included:

1. Economic
    - Funding shortage
    - High cost
    - Increasing transportation demand
    - Aging transportation infrastructure
    - Interest and Inflation rate
    - Multiple funding sources
    - Future federal spending or revenues.

2. Procurement Issue
    - Long term
    - Lengthier process
    - Performance measurement
    - The 1st PPP project
    - Learning process
    - No standardized process
    - Tolling.

3. Risk Issue
    - O/M toll facilities
    - Incorporating of adjacent assets
    - Revenue

- Traffic volume
- ROW
- EIS/NEPA
- Utilities relocations
- Financial
- Rehabilitation
- Future Hand-Back concern
- Coordination/ Communication
- Unknown scope
- Budget
- Schedule
- Design
- Conflicts of interest
- Construction.

4. Governance Issue
    - Long term
    - Public perception
    - Opposition: public/local/officials
    - Enabling
    - legislation
    - Noncompete clauses
    - Lack of dedicated PPP unit
    - Coordination/Communication.

CHAPTER 5: CONCLUSION

In the US, the Federal Highway Administration (FHWA) established the Office of Innovative Program Delivery (IPD) in 2008 to provide resources to the transportation community to implement such innovative strategies as Public Private Partnerships (PPPs) in the delivery of complex infrastructure projects. The argument that the private sector is more efficient, will complete projects faster and better maintain the assets over the concession period is premised on a number of assumptions: competitive markets, effective identification, pricing and transfer of project risks, and the ability to write comprehensive contracts (OECD, 2010).

The objective of this research is to review key issues in complex transportation renewal projects in the US that have utilized PPPs and to identify recurring lessons learned that can be used to improve the procurement and contracting for future PPPs. While PPPs can be applied to a range of agreements, the governance issues to be studied and analyzed in this paper will be limited to those involving complex financing, design, construction and long-term operation and maintenance of transportation infrastructure of at least 10 years.

1. Finding

The findings from the six case studies gave insight into the most common key complex issues in implementing PPP in transportation projects in the US. The interviews with case studies' project teams and relevant stakeholders in six different states and examination of records, in respect to the theoretical proposition built in Chapter 2, provided further evidence of the prevalence of these common complex PPP issues, i.e. Economic, Procurement, Risks, and Governance. The following section reviewed the key findings from each component of the study.

1.1 Economic Issues

Findings from case study interviews and archival records suggest that:

- There has been an increasing funding shortage for transportation projects in the each of the states where the case studies were performed,
- The costs of construction, repair, and rehabilitation of transportation facilities are very high, especially in urban corridors,
- The demand for a reliable transportation infrastructure has been growing,
- With the limitations on funding at all levels of government, new sources of funding and private partners have been identified and integrated into public transportation projects through innovative approaches such as PPPs,
- The nature of these different funding sources required different regulatory mandates, organizational processes, and procurement procedures, which, affected budget, schedule, and design decisions in all phases of the project life cycle,
- The unknown impact of potential future federal action on spending or revenues and the resulting impact on the economy and capital program is one of the greatest risks,

1.2 Procurement Issues

Findings from the case study interviews and archival records suggest that:

- Most of these states in the study implemented PPP in their transportation projects, especially DBOM by means of toll, for the first time,
- Long term DBOM, backed by toll revenue, has become more common in these states,
- It's widely accepted that PPP delivery would consume relatively more time, money, and resources in the procurement phase, but is worthwhile especially for complex projects,

- Implementing PPP was a learning process as relevant stakeholders got involved more and more with PPP,
- No standardized processes for implementing PPP have been developed. GEC, industry, elected officials, and key DOT staff were doing their best to apply PPP in their projects with some guidance from FHWA and industry input,
- The lack of standardized procurement processes, concession terms, contract forms, and even definitions create a need for prolonged, multi-agent negotiations. The lack of a well-understood procurement process also generated high administrative burden for responsible public agencies and private sector partners and increased the uncertainty of proposal preparation for concessionaires. These issues had to be resolved through ongoing face-to-face negotiations.

1.3 Risk Issues

Findings from case study interviews and archival records suggest that

- O/M risk of toll facilities was often transferred to private partners
- Frequently,, O/M responsibilities extended to the adjacent transportation assets such as general purpose lanes,
- Hand-back of assets at the end of the concession needed to be in a good and operable condition, with mutually agreed terms for condition and evaluation. Need for capital improvements (beyond standard maintenance) need to be clarified prior to execution of the PPP,
- Other risks that usually transferred to the concessionaires included: Revenue, traffic volume, utility relocations, financial, rehabilitation, coordination, construction, schedule, and cost

- Public sector partner tended to retain the following risks: political, environmental (abatement, EIS and NEPA), and ROW acquisition
- Shared risks typically included: permits/government approvals, utility coordination and identification, force majeure, and unforeseen scope changes.

1.4 Governance Issues

Findings from the case study interviews and archival records suggest that

- The concession term's is usually long (at least 30 years),
- All of the states being studied had PPP enabling legislation that allowed public agencies to enter into a PPP contracts with the private sector,
- Noncompete clauses did not pose a big risk for the public because they were broad and flexible,
- Dedicated PPP teams or even separate units had been formed to oversee the projects,
- Mega-projects presented serious potential organizational conflict issues that required attention throughout the project.
- Most states tended to form a dedicated office for innovative project delivery, for example High Performance Transportation Enterprise (HPTE) in Colorado, Innovative Project Delivery Division in Virginia, etc.
- Some opposition against PPP's in general (not project specific) frequently came from a small but vocal public group as well as some elected officials,
- Public education, industry forums, public hearings, and other outreach programs had been considered as essential and necessary to successful implementation of PPP's,
- Last, a relational governance approach is more effective than attempting to write a complete contract

2. Further Research

One area of future research involves examining the effectiveness of project management tools for use on PPP transportation projects. There have been a number of these tools being used in PPP projects in the US, such as Value of Money (VfM) analysis, which is used to compare financial impacts of PPP against conventional delivery methods. Another tool for establishing PPP agreements is T&R (Traffic and Revenue) analysis, as is corridor access planning. Each of these tools should be researched to identify how and when they impact the dynamic planning of PPP projects. An effort to accrue these project management tools and practices, in a well-organized set of best practices would prove useful for scholars and practitioners in the field of PPP transportation projects.

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APPENDIX 1: INTERVIEW PROTOCOL

We appreciate your participation in our research and for agreeing to a short telephone interview. We have provided a very brief introduction to the research followed by the questions that will be asked during the telephone interview.

Please note that participation is voluntary and you may terminate the phone interview at any time. All responses will be reported anonymously and findings will be summarized to the degree possible. We would appreciate your permission to record the interview to ensure accuracy. All tapes will be erased at the completion of the research. If you have any questions or concerns about this research or the telephone interview, please contact Kelly Strong at Kelly.strong@colostate.edu.

Thank you

Research Introduction

In the US, the Federal Highway Administration (FHWA) established the Office of Innovative Program Delivery (IPD) in 2008 to provide resources to the transportation community to implement such innovative strategies as Public Private Partnerships (PPPs) in the delivery of complex infrastructure projects. According to the IPD office, PPPs are contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery and financing of transportation projects. Due to the importance of transportation highway infrastructure in the United States along with, aging infrastructure assets and decreasing state and federal funding, increasing use of private capital will likely be required in the form of PPPs. The argument that the private sector is more efficient, will complete projects

faster and better maintain the assets over the concession period is premised on a number of assumptions: competitive markets, effective identification, pricing and transfer of project risks, and the ability to write comprehensive contracts[1]. The objective of this research is to review key issues in complex transportation renewal projects in the US that have utilized PPPs and to identify recurring lessons learned that can be used to improve the procurement and contracting for future PPPs.

Interview Questions

Case_____

This is a comprehensive list of interview questions for multiple case studies. In each interview, only relevant questions to interviewees, i.e. government officials, project team, owner representatives, consultants, will be asked.

General Information

1. What is your title? _____
2. How many years of experience do you have with highway transportation projects_____?
3. What role did your agency/company play in the formation of the PPP for this project_____?

Procurement

4. Could you briefly describe the key points of the procurement process utilized for this PPP?

[1] OECD. (2010). *Dedicated Public-Private Partnership Units*: Éditions OCDE.

5. What were the most difficult issues to address in the procurement process? _____How did you address these issues_____?

6. What were the main topics of negotiation in the order of importance

a_____

b_____

c_____

d_____

7. How was the concession term (length) determined?

8. How was the project delivery method determined, and by whom?

9. When preparing the Request for Proposal (RFP), what factors were most important to consider in attracting private investors?

10. Please describe briefly the process used to develop the Request for Proposal (RFP) for this project?

11. Do you have a standard of procurement for PPPs in your state?

12. Is your state considering the adoption of a standardized procurement process for PPPs?

Risks

13. What were the most important risk factors that were addressed during procurement or covered in the PPP agreement? How were those risks managed between the parties involved in the PPP?

Funding

14. How did the private sector party raise capital for the PPP on this project?

15. How did the public agency raise capital for this PPP project?

16. How useful were the available innovative financing tools of US Department of Transportation (e.g. Grant Anticipation Revenue Vehicles (GARVEES), State Infrastructure Banks (SIBS), Transportation Infrastructure Finance and Innovation Act (TIFIA), Credit Assistance, Private Activity Bonds (PABS), Section 129 Loans) in putting together the PPP for this project?

17. At what stage of the project did the public agency have a general idea about capital structure or financial plan for the project?

Revenue Stream

18. Are there state-backed guarantees for the projected traffic volume and/or revenue stream for the PPP?

19. Does the PPP contain a clause prohibiting the state from building additional highway capacity that could divert traffic from the PPP project?

20. What are the governance structures for renegotiating PPP terms in the future in light of travel modality uncertainties (electric cars, expanded rail and/or bus service, etc.)?

21. Who has authority over establishing or approving future tolling rates? Please describe the process for negotiating or renegotiating toll rate changes?

Legal Framework

22. Do you have broad PPP enabling legislative in your state or is PPP authorized on a project-by-project basis?

23. Has a special agency or authority been developed other than Department of Transportation (DOT) to manage PPPs in your state? If so, does it report to the DOT or to another state agency or commission?

24. There has been a general concern about whether executive agencies other than DOTs

have sufficient capacity to successfully develop, procure, manage, and supervise highway PPP projects. Do you share this concern?

Contract

25. A common theme in use of PPPs is that direct competition (low bid) is impractical, so private sector participation is achieved through "managed competition." Did your project utilize a "managed competition" process? If so, did it complicate writing a complete PPP contract?

26. How complete was the contract in terms of scope definition? Does the PPP contract include more "good faith and fair dealing" clauses than a typical General Contract, or Design-Build contract would typically utilize? In your opinion, is there a higher level of mutual trust on the PPP project than would exist if a General Contract or Design-Build contract had been utilized?

27. Is the PPP contract subject to future renegotiation? If so, what are the triggers to allow for such a renegotiation?

Lessons Learned and Recommendations

28. What do you think are the mutual benefits of using PPP on the project?

29. What are major lessons learned from the use of PPP on the project?

30. Does your agency/organization have a formal process for documenting and sharing the knowledge and experience gained from the PPP implementation on the project?

31. Do you anticipate changes in the procurement and contracting process for future PPPs in your state?

APPENDIX 2: CASE STUDY SUMMARIES

Case 1- US Highway 36- Colorado

1. Project Information

US 36 between Denver and Boulder opened as a toll road in 1951. The toll road bonds were paid off early and the tolling infrastructure was removed in 1968. When it was built, this four-lane road had only one interchange between Denver and Boulder. In response to rapid population growth, there are now 10 interchanges along US 36 between I-25 and Boulder. However, the number of main through-lanes has remained at four.

In December of 2009, the Colorado Department of Transportation completed an Environmental Impact Statement that described Preferred Alternative improvements to the corridor, which would be implemented in the future as funding became available. The main elements in the Preferred Alternative include one buffer-separated managed lane in each direction, Bus Rapid Transit (BRT) ramp stations, auxiliary lanes between most interchanges, and a bikeway.

1.1 US 36 Express Lanes Project Phase I

1.1.1 Overview

The US 36 Express Lanes Project is a multi-modal project led by the Colorado Department of Transportation (CDOT) and the Regional Transportation District (RTD) to expand and reconstruct US 36 from Federal Boulevard to 88th Street in Louisville/Superior. The highway currently experiences significant congestion and has been designated for improvements by the Colorado Department of Transportation (CDOT) since the late 1990s. The US 36 Managed Lane Project Phase I is an initial 10-mile project involving improvements along the

roadway between the two cities. CDOT selected the Ames Granite Joint Venture team as the design-build contractor for the approximately $317 million project, and they began construction in July 2012. The project will open to the public in 2015.

1.1.2 Project Details

This US 36 first phase is being delivered under a design-build contract and will include the following components:

- One express, high occupancy toll (HOT) lane in each direction from Federal Boulevard to 88th Street in Louisville/Superior (approximately 10 miles) and reconstruction of the general purpose lanes
- Replacement of the Wadsworth Parkway, Wadsworth Boulevard, Lowell Boulevard, and Sheridan Boulevard bridges and replacement of the US 36 bridge over the BNSF Railway
- BRT accommodations at stations located on ramps and adjacent park-n-rides, and bus bypass ramps at several interchanges (new and more frequent bus service will be provided)
- Bikeway along much of the corridor
- Intelligent transportation system (ITS) equipment, including for tolling, transit information, and incident management
- Improvement of RTD stations along the corridor
- This phase of the project is expected to be open to traffic by January 2015.

1.1.3 Partners

- CDOT is the owner through its tolling authority- the High Performance Transportation Enterprise (HPTE).

- Ames Granite Joint Venture team consisting of Ames Construction Inc., Granite Construction Company, HDR Engineering Inc., and Michael Baker Inc., as the design-build contractor

1.1.4 Funding

The total project cost updated as of February 25, 2014 is about $312.4 million ($305.9 million of Eligible Project Costs) consisting of:

- TIFIA loan - $54.0 million
- CDOT federal/state grant - $41.4 million
- CDOT Bridge Enterprise funds - $41.5 million
- Regional federal funds (Denver Region Council of Governments) - $46.6 million
- RTD sales tax revenue - $112.1 million
- TIGER Grant[2] - $4.8 million
- Local Funds - $5.5 million
- Other - $6.5 million

1.1.5 Project Timeline

2014 Winter Schedule

- Final completion work on Wadsworth Parkway
- Continue paving and grading throughout US 36 corridor
- Realign traffic onto new southbound Sheridan bridge, demolish old structure and reconstruct on-and off-ramps

[2] Net of TIFIA subsidy costs

- Complete noise wall installation on eastbound US 36 between Sheridan and Federal Boulevard
- Complete critical drainage installation on entire project
- Pour the deck on the US bridge over Lowell Boulevard

March 2014 to August 2014 McCaslin Boulevard Activities

- Barrier placement-Concrete removal
- Roadway removal
- Shifting traffic to the southbound side of McCaslin
- Temporary sign installations
- Asphalt paving

1.2 US 36 Express Lane Project Phase 2

1.2.1 Overview

The CDOT and the HPTE announced the selection of Plenary Roads Denver as the Concessionaire for Phase 2 of the US 36 Express Lanes Project between 88th Street and Table Mesa, which will complete improvements to the entire US 36 corridor between Denver and Boulder. The project is CDOT's first public-private partnership (PPP), an innovative project delivery method where the public and private sectors team together to provide transportation improvements and services to the traveling public. CDOT and HPTE have entered into a 50-year agreement with Plenary Roads Denver. About two-thirds of the Phase 2 Project costs are funded through private sector equity and non-recourse debt. The project delivers much-needed capacity, while shifting operations and maintenance and replacement obligations to the private sector for

the next 50 years. The PPP arrangement enables the project to be completed 20 years sooner than originally planned.

1.2.2 Project Details

Project elements include:

- Constructing an express lane in each direction of US 36 between 88th Street and Table Mesa for BRT,
- High Occupancy Vehicles (HOV) and tolled Single Occupancy Vehicles (SOV);
- Reconstructing two general purpose lanes in each direction between 88th Street and Table Mesa;
- Widening the highway to accommodate 12-foot-wide inside and outside shoulders;
- Replacing the Coal Creek bridge, rehabilitating and widening the South Boulder Creek bridge, and widening the McCaslin Boulevard bridge to accommodate a diverging diamond interchange;
- Adding BRT improvements including new electronic display signage at stations and bus priority improvements at ramps. The improvements also will allow buses to operate on the shoulders of US 36 between interchanges to decrease bus travel time;
- Installing Intelligent Transportation Systems (ITS) for tolling, transit and traveler information and incident management;
- Installing a separate commuter bikeway along the rest of the corridor; and
- Improving the RTD station at McCaslin Boulevard.
- Operate and maintain the entire US 36 corridor along with the I-25 Express Lanes between downtown Denver and US 36

1.2.3 Partners

Plenary Roads Denver is the concessionaire of US36 Express Lanes Phase 2. It's a consortium of:

- The Plenary Group – team lead and managing partner
- Ames Construction, Inc. – construction
- Granite Construction – construction
- HDR – engineering design
- Transfield Services Ltd– operation and maintenance provider
- Goldman Sachs – financial advisor

1.2.4 Funding[3]

The total project cost is about $208.4 million ($170.2 million of Eligible Project Costs)[4] consisting of:

- Plenary Funding:
  - HPTE Capital Payment - $49.7 million
  - TIFIA loan - $60.0 million
  - Private Activity Bonds (PABs) - $20.0 million
  - Equity - $20.6 million
  - Subordinated Debt - $20.6 million
  - I-25/US 36 Toll Revenues - $8.6 million
  - Other - $3.4 million
- HPTE/CDOT Funding:

[3] Numbers rounded.
[4] Includes $25.6 million in costs to be directly incurred by HPTE and CDOT that will funded with Federal, state, and local funds

- State Funds - $8.2 million
- Federal Funds - $2.6 million
- Local Funds - $14.8 million.

1.2.5 Project Timeline

- In March 2013, proposals were due.
- In April 2013, contractor was selected.
- In May 2013, commercial close of contract was reached
- In December 2013, financial close of contract was reached.
- In late 2013, pre-construction activities began.
- In early 2014, full construction begins.
- In early 2016, project will opens.

2. PPPs Key Issues

2.1 Findings from Interview on 05-27-2014

Case 01- US Highway 36 Phase 2, Colorado

1. **What is your title**?

Answer: Enterprise Specialist.

2. **How many years of experience do you have with highway transportation projects**?

Answer: 7 years

3. **Could you briefly describe the key points of the procurement process utilized for this PPP**?

Answer:

- Financing,

- Up-front public subsidy,
- Operation and Maintenance (O/M) risk/ snow removal.
- Concessionaire has: operations of all systems and services on all managed lanes; routine and lifecycle maintenance on the managed lanes; lifecycle maintenance on the US 36 GP lanes (HPTE will pay appropriate percentage); snow and ice removal on the US 36 Managed and GP lanes; and routine maintenance on the US 36 GP lanes.

4. **Please describe briefly the process used to develop the Request for Proposal (RFP) for this project?**

For your background information, we also looked at various repayment and risk sharing mechanisms like availability payment model, toll revenue model. The decision was made in December 2011 to use the revenue risk model. By the end of February 2012, when the Phase 1 procurement was completed, we released the RFQ for phase 2, and three proposers were shortlisted in April 2012. We released our draft RFP in July 2012. One-on-one meetings with the three short-listed proposers lasted until December 2012 when the final RFP and Concession Agreement on December 2012. There is a provision in the Concession Agreement that requires CDOT to give Plenary Roads Denver [operators] an annual routine maintenance fee for the general purpose lanes as well as a snow and ice removal fee. Both increase by the rate of inflation in the Denver Metro area. Risk on traffic volume was one of the things they wanted the state to keep however, in the end, HPTE did not retain it.

5. **What were the most difficult issues to address in the procurement process? How did you address these issues**?

Answer:

- Revenue risk was one of the biggest concerns.

- Availability payment was too big of a risk.
- What risks exactly that the concessionaire was supposed to take over.
- How we handle the Bus Rapid Transit portion of the contract.
- Tolling back office operation that is now run by E-470: all three potential firms actually raised concern about high operation cost. So ATC allowed the proposers to use their own office if needed.
- HOV2 wouldn't work as earlier planned; certainly we needed to work with the public and stakeholders to insure there were proper performance measurement mechanisms and fairness across the state. The stakeholders didn't want the US 36 to be the only HOV3 corridor in the state.
- Series of triggers, i.e. BRT lane bus feeds, vehicles in HOV and Hot Lanes), Triggers have a drop dead date of Jan. 1 2017.

6. How was the concession term (length) determined?

Answer: It's the affordability because one of our main goals was to minimize the up-front investment. We looked at 35, 40, and 50 years, and 50 years was the most preferable concession length. This period also helped with bonds and excess revenue sharing.

7. How was the project delivery method determined, and by whom?

Answer: CDOT and HPTE determined the delivery method.

8. How was the project funded?

Answer: Private debt/equity makes up only 1/3 of the overall project funding (Phase 1 and 2) and the remaining 2/3 came from the public. To break it down more precisely for US36 phase 2, the total project cost was about $179,500,000 and made up of:

- $18,500,000 USD from RTD

- 15,000,000 USD from DRCOG
- 15,000,000 USD from CDOT (including Bridge Enterprise)
- 120,000,000 USD from Plenary Debt & Equity (including TIFIA 1 & 2)
- 11,000,000 USD from Local Government.

9. **Public and industry get used to a very structure traditional procurement process where there are sets of documents, plans, specification, DOT procedures, and standard that everybody understand what those are and that everybody don't talk to each other before summiting their bids to you to make it's fair. However, given the complexity of PPPs, what do you think about this whole process, is it more of the relational contracting where you try to make sure everybody is bargaining in good faith with enough information they need?**

Answer: I actually agree with that. We've thought there was a lot of public involvement. We met with stakeholders, elected officials and their staff. However, as we found out when met with the broader public in January and February, we can do better. As new projects come online, you will start seeing more public involvement. You'll start seeing this soon with the I-70 East Project. Recently, the HPTE Board of Directors directed staff to abide by the transparency requirements set forth in Senate Bill 14-197, which requires the HPTE to hold at least three public meetings for members of the public to be educated on and ask questions pertaining to a public-private partnership for a surface transportation infrastructure project. Once financial close is reached HPTE is required to post on its website a summary of the essential terms of the agreement governing the public-private partnership.

10. **Does the PPP contain a clause prohibiting the state from building additional highway capacity that could divert traffic from the PPP project**?

Answer: Yes, but it's very broad. In our case, it still allowed us to modify things without incurring compensation events. Here is the full extract from the agreement (sent via email).

"Unplanned Revenue Impacting Facilities" means any limited access main lane of a highway that did not exist prior to the Contract Date, which CDOT, HPTE or the State or an entity pursuant to a contract with any of them or on behalf of any of them, builds within the Airspace which opens to traffic during the Contract Period, whether resulting from new construction or the upgrade of an existing non-limited access road excluding the following:

a) The Managed Lanes and the I-25 General Purpose Lanes and the US 36 General Purpose Lanes in the form that it is intended to construct those lanes as at the Contract Date including any work and improvements of the type defined in paragraph (e) of this definition;

b) All elements of the Combined Alternative Package (Preferred Alternative) described in the October 2009 US 36 Final Environmental Impact Study;

c) All work and improvements necessary for improved safety, maintenance or operational purposes;

d) Work, on any highway project required by environmental regulatory agencies;

e) Any work and improvements undertaken to increase traffic capacity by modifying highway projects in operation at the Contract Date through the installation of traffic sensors, metering devices, intelligent traffic management systems, through reconstructing existing lanes, through intersection grade separations, or localized operational improvements through the restriping of traffic lanes, medians and shoulders, but specifically not including restriping that adds lanes;

f) All projects referred to in the DRCOG 2012 – 2017 Transportation Improvement

Program plus Amendments as of May 15, 2013, and the 2035 DRCOG Metro Vision Transportation Plan;

g) The introduction of tolled managed lanes on I-25 north of its junction with US 36;

h) The introduction of tolled managed lanes on I-270; and

i) The introduction of an interchange or interchanges in the vicinity of where the Northwest Parkway terminates near US 36 directly related to a highway connection to Northwest Parkway on the north of US 36 and/or a highway connection south of US 36, including access ramps flyovers, and highways to, from and over US 36, and access to other tolled and non-tolled highways and roads related to such interchange, interchanges, or Northwest Parkway.

11. Do you have broad PPP enabling legislative in your state or is PPP authorized on a project-by-project basis?

Answer: Yes, HPTE is allowed to enter into P3's per C.R.S. § 43-4-806.

12. What are major lessons learned from the use of PPP on the project?

Answer: Be prepared to accept the fact that it will take longer than traditional procurement. There will be a lot of to learn and a big learning curve as well. Get out there and talk with the public as soon as possible.

2.2 Findings from Archival Record

2.2.1 Economic

- In 1991, most recent state gas tax increase (to $0.22/gallon) take effect
- In Colorado TABOR (Taxpayer Bill of Rights) enacted
- In 2007, General Fund Transfers to CDOT peak at $468 million. State Gas Tax revenue peak

- In 2008, general fund transfers to CDOT eliminated
- In 2009, FASTER (Funding Advancement for Surface Transportation and Economic Recovery act) enacted (creating HPTE, increasing vehicle registration fees, results in about $180 million per year for transportation projects).
- CDOT's budget has decreased approximately 30% since 2003. Within that same period, project costs have risen significantly. The total project cost of US-36 Highway / Managed Lanes; Bus Rapid Transit Phase 1, 2 came from multiple funding sources with a total of about $520.8 million (for more detail funding information, refer to 1.2.4.).
- PPP delivers project with lowest upfront public subsidy- 2/3 construction cost borne by private sector.
- In December, HPTE was granted a $100 million allocation of private activity bonds (PABs). This allocation is a capital source for construction of the Phase 2 project. HPTE will issue the bonds, which will be paid for by the Concessionaire with toll revenues.
- TIFIA Credit Assistance for Phase 2- Direct Loan: $60.0 million
    - The TIFIA Phase 2 loan is secured by a net pledge of revenues from the I-25 Express Lanes (existing) and the U.S. 36 Phase 1 (upon the transfer to Plenary) and Phase 2.managed lanes. Plenary will assume the TIFIA Phase 1 loan at substantial completion of Phase 1 when responsibility for that segment is transferred from HPTE to PRD.
    - The Phase 2 TIFIA loan will be subordinate to the Senior Lien Private Activity Bonds (PABs) and the Phase 1 Loan .Both TIFIA loans will have the benefit of debt service reserve funds in addition to a $6 million ramp up reserve. The TIFIA Phase 2 loan has been rated "BBB-" by Fitch Ratings.

- The TIFIA credit agreement was executed on February 25, 2014.
- Financial close of the Senior Lien PABs occurred on February 26, 2014.

2.2.2 Procurement

- US 36 Express Lane Project Phase 2 is the first public-private partnership of CDOT's.
- Phase 2 is being delivered as a design, build, finance, operate, and manage (DBFOM) public-private partnership (PPP). It's also one of the few availability payments contracting in the nation.
- PPP accelerated construction by 20 years. The US-36 is expected to be open to traffic in 2016 using PPP.
- Only one new lane in each direction on US-36 will be tolled and existing lanes remain free
- There haven't been any standardized P3 procurement process.
- In February, 2012, the HPTE Board of Directors authorized the PPP Concession model and the release of a Request for Qualifications (RFQ) to the industry. A shortlist of three proposing teams was selected in May, 2012.
- HPTE, with the assistance of its advisors and consultants, developed a draft Request for Proposals (RFP) and initiated three rounds of one-on-one meetings with the proposing teams in order to advance to a Final RFP. The Final RFP was released on December 14, 2012, and proposals are due on March 1, 2013. The chosen Concessionaire will design, build and finance and operate and maintain the US 36 facility (including the I-25 Express Lanes) in a 50-year operating agreement.

2.2.3 Risks

- Long term concession of 50 year.

- Minimize risk to the public sector:
    - Transfer construction cost risks to private sector
    - Transfer operating and maintenance risks to private sector
    - Transfer rehabilitation and reconstruction risks to private sector
    - Transfer revenue risk to private sector
- Transfer the risk of paying back debt to build project to concessionaire. Taxpayers are not responsible if revenue is less than projected
- Tie toll rates (with limits) to congestion measures. Tolls are likely to be closer to $5 to $6.
- There were a number of outreach programs
    - 6 public hearings about national environmental policy act
    - About 28 meetings with corridor elected officials and staff
    - About 10 presentations to stakeholder groups
    - About 7 presentations to DRCOG (Regional Transportation Planning Process)
    - Monthly public meetings with transportation commission and high performance transportation enterprise (HPTE)
    - 11 updates (JBC, TLRC, Joint Transportation Committee) in General assembly.

2.2.4 Governance

- The long-term nature of the concession
- The requirement to integrate rehabilitation of existing non-revenue lanes with new revenue generating managed lanes into a single design-build PPP.
- The intention to have the concessionaire take over 50-year operation, maintenance, and rehabilitation of both Phase I and Phase II projects, even though the concessionaire did not participate in the design or construction of Phase I.

- Decision-making authority over establishing tolls, penalties, and enforcement protocols for the managed lanes.
- The pass-through of a federal TIFIA loan to the concessionaire
- Does require a public, governor-appointed board to approve all toll rates
- Allow CDOT to make continued transportation improvement on adjacent corridors.
- Outline the service standard for maintenance and operations with penalties if they don't meet them.
- Require that concessionaire maintenance employees be paid the same as state employees. This means there aren't any state employees losing their jobs or pay reduction
- The HPTE was formed by CDOT to develop innovative and efficient financing, a governance mechanisms aimed at improving the delivery of safe, functional, an accessible highway infrastructure in Colorado while maintain effective cost and schedule performance.
- It has the responsibility to seek out, in partnership with local agencies, communities, and private industry, opportunities for innovative and efficient means of financing and delivering important surface transportation infrastructure projects in the State.
- It has the power, among others, to impose tolls and other user fees, to issue revenue bonds secured by those fees and to enter into contracts with public and private entities to facilitate public-private partnerships (PPPs). The law also introduced a new governance structure, creating an HPTE Board of Directors which includes a mix of State Transportation Commissioners and external stakeholders appointed by the Governor to make it better able to pursue PPPs and other creative financing mechanisms.

- The HPTE is an "enterprise" for purposes of section 20 of Article X of the State Constitution so long as it retains the authority to issue revenue bonds and receives less than 10 percent of its total revenues in grants from the State and local governments
- HPTE and CDOT worked together to clarify their respective roles and responsibilities in the delivery of surface transportation projects. HPTE and CDOT have identified the need to develop an operational agreement, in the form of a Memorandum of Understanding (MOU), to coordinate the planning, delivery and oversight of major projects. HPTE has contracted with HNTB (who helped develop the HPTE Strategic Plan in 2010) to assist with this endeavor. It is anticipated that the Operations MOU will be finalized at the end of June, 2013.
- In September, key staff from HPTE and CDOT travelled to the Commonwealth of Virginia to meet with the Office of Transportation Public Private Partnerships in a peer-to-peer exchange. Some of these findings are being incorporated into the Operations MOU.
- HPTE has embarked on a formal rule making process, whereby adopted toll enforcement and adjudication policies take the effect of law. In August, the Board approved updated policies that conform to the policies of E-470, which provides toll enforcement and adjudication services for HPTE. In September, CDOT's Rule Administrator provided public notice that HPTE is engaging in the rule making process, with the opening of rules in December. A public rule making hearing will be conducted by the Board in February.
- In May, the Board began discussing the eventuality of shifting to an HOV 3+ policy on tolled managed lanes. Feedback from FHWA, credit rating agencies and the industry indicates that an HOV 3+ policy will have a positive impact on the viability of the US 36

project, and future tolled managed lanes such as the I-25 North interim project. Preliminary analysis indicated an HOV 3+ policy will have minimal impact on congestion in the general purpose lanes, and significantly reduce the subsidy needed to initially finance tolled managed lanes projects and support the long term financial sustainability of these projects. In September, HPTE submitted a Long Range Plan amendment to the Denver Regional Council of Governments (DRCOG) to support the policy change for US 36. The HOV 3+ policy will be triggered by a "change event" relating to defined transit delays, degradation of average vehicle speed in the managed lanes, or HOV 2+ vehicle volumes exceeding a defined number of "passenger car equivalents" in peak periods. This triggering of HOV 3+ on any tolled managed lanes facility will then also become policy on all other such facilities.

- The US 36 P3 procurement is heavily front-end weighted with consulting costs to determine a financing delivery method and provide procurement templates for future transactions.
- An element of the HPTE's business plan is to market Colorado transportation projects to the P3 industry. The HPTE Director and others on staff made a number of presentations about the HPTE and potential projects in the state, including the Annual Transportation Research Board meeting in Washington DC, and the 4th North American Strategic Infra Leadership Forum in Denver. Communication and marketing of the HPTE have also been accomplished through peer-to-peer interactions with other departments of transportation, and through the P3 procurement process.
- In late February 2014, the legislature backed off its demands for additional oversight and approved the financial close of the PPP, essentially recognizing the Colorado

Transportation Commission and the HPTE were legally empowered to execute such a contract without legislative.

- This action came despite vehement objections from several groups led by taxpayer advocacy groups and clean energy activists opposed to capacity increases in general (not so much PPP's specifically) and a petition opposing the contract signed by 20,000 Colorado voters. One aspect of the PPP contract that drew particular ire of the opponents was clause mandating that CDOT is bound to act on behalf of the concessionaire to "remove all toll protesters and other trespassers from the project".
- The public hearings during the legislative session became very contentious, with several protesters physically removed from chambers and a general breakdown of order. One of the Colorado Transportation Commissioners noted that the situation was unfortunate as CDOT and HTPE believed they had given sufficient time to hear all points of view, but she went to acknowledge that in the future, the procurement and contracting process for PPP's would need to be more transparent.
- In short, the above-mentioned points are consistent with a move toward a more trust-based relational governance approach, where transparency is critical to the establishment of trust. Transaction costs are high when PPP's have several unique aspects.
- Moreover the lack of standardized procurement processes, concession terms, contract forms, and even definitions create a need for prolonged, multi-agent negotiations. The lack of a well-understood procurement process also generated high administrative burden for CDOT and HPTE personnel and increased the uncertainty of proposal preparation for concessionaires. These issues had to be resolved through ongoing face-to-face negotiations.

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Case 2- Intercounty Connector (ICC) - Maryland

1. Project Information

1.1 Overview

The Intercounty Connector (ICC) is a toll highway under construction in Maryland. The road will link existing and proposed development areas between the I-270/I-370 and I-95/US 1 corridors within central and eastern Montgomery County and northwestern Prince George's County. The ICC project will provide numerous benefits to the Washington and Baltimore metropolitan areas. It is intended to increase community mobility and safety; facilitate the movement between economic centers of people and goods; provide cost-effective transportation infrastructure to serve existing and future development which reflects local land use objectives; help restore the natural, human, and cultural environments changed by past development impacts; and enhance homeland security.

The finished highway will be approximately 18 miles in length, and have six lanes in total. The ICC was initially planned as a spur off of the region's proposed second Beltway. It has been the focus of various studies and debates since the 1950s and finally started construction in 2007. The finished highway will have a variable tolling structure based on peak and off-peak travel times. Toll collection will be fully electronic, allowing toll collection without significant traffic delays. The road is also expected to stimulate new transit growth through the creation of additional express bus routes along the corridor.

1.2 Project Details

- Contract A: extends approximately 7.2 miles from I-270/I-370 to east of MD 97 and includes interchanges at MD 355, Metro Access Road and MD 97.

- Contract B: extends approximately 7 miles from east of MD 97 to west of US 29 and includes interchanges at MD 182 and MD 650,
- Contract C: extends approximately 3.7 miles from west of US 29 to east of I-95 and includes major interchanges at US 29 and I-95 and a partial interchange at Briggs Chaney Road
- Contract D/E: consists of collector-distributor (CD) roads (also known as local lanes) along I-95 and will include the extension of the ICC from the eastern terminus of Contract C to a partial interchange at Virginia Manor Road and a new signalized intersection at US 1, near the Muirkirk MARC commuter rail station. I-95 will be resurfaced within the limits of the CD Road Construction.

1.3 Partners

- The Maryland Transportation Authority (the Authority or MdTA), is the owner and operator of the ICC, and is responsible for its financing.
- The ICC project team consists of
    - The United States Department of Transportation Federal Highway Administration (FHWA);
    - Maryland Department of Transportation (MDOT),
    - MdTA
    - The general engineering consultant for the project, ICC Corridor Partners;
    - Partners in Montgomery and Prince George's Counties.

1.4 Funding

The cost to complete per the 2011 financial plan was $2,399.1 million consisting of:

- Federal funds:
    - GARVEE bonds - $750.0 million (backed by future Federal aid receipts)
    - Special Federal funds - $19.3 million (National Corridor Planning and Border Infrastructure Program funding, SAFETEA-LU National Corridor Improvement Program and high priority project funding)
- State funds:
    - MdTA Toll Revenue bonds and cash - $668.9 million (backed by future MdTA system toll revenue)
    - TIFIA loan - $516.0 million (backed by future MdTA system toll revenue)
    - State of Maryland Transportation Trust Fund - $180.0 million (motor fuel tax receipts, motor vehicle excise taxes, motor vehicle fees, corporate income taxes, operating revenues)
    - State of Maryland General Fund and General Obligation Bonds - $264.9 million

1.5 Project Timeline

- In January 2006, the Final Environmental Impact Statement was approved
- In May 2006, record of Decision was issued.
- In mid-2007, construction began.
- In February 2011, a seven-mile initial section opened (Contract A).
- In November 2011, the remaining mainline road (Contracts B & C) opened to traffic.
- In early 2014, Contracts D & E were combined and modified and are expected to open.

2. PPPs Key Issues

2.1 Findings from Interviews on 06-03-2014 and on 06-05-2014

1. **What is your title?**

Answer:

- Director of Office of ICC for the Maryland federal highway administration (Owner)
- Consultant to the owner (MDOT)- Executive program manager for GEC (General Engineering Consultant), the so-called ICC partners
- Senior Policy Analysis at the Maryland Transportation Authority (MDTA).

2. **How many years of experience do you have with highway transportation projects?**

Answer:

- 37 years in total and about 30 of these were in management
- 41 years (And we've seen more innovative projects recently than the past)
- I started working in transportation 40 years ago, and I've been with MDOT/MDTA for about 31 years.

3. **What role did your agency/company play in the formation of the PPP for this project?**

Answer: In the way of background information, the state has two primary transportation agencies that are related to each other. One is the Maryland Department of Transportation (MDOT), which is the multi modal agency that includes the State Highway Administration (MdSHA), the Maryland Transit Administration, the Maryland Port Administration, Maryland Aviation Administration, etc. Second is the Maryland Transportation Authority (MDTA) that has the responsibility for toll roads, bridges, and tunnels in the state. MDTA owns and operates eight facilities including the ICC. The agencies are closely related; for example the Chairman of the MD Transportation Authority is the Secretary of Transportation; there is a lot of staff coordination between the two, and we use the same

personnel policies, etc.

The Maryland Transportation Authority was to own and finance the ICC project, whereas the State Highway Administration oversaw the project approvals, its design and construction. Also, SHA, being the "grant recipient" vis a vis FHWA, provided the link for use of a small amount of special federal discretionary funds as well as the use of federal highway funds to pay debt service on GARVEE bonds. MDTA issued GARVEE bonds, MDTA toll revenue bonds, and is the debt involved in the TIFIA loan. MDTA has contributed its cash resources as well. In total, the MDTA toll revenue related funding sources (MDTA cash, toll revenue bonds and TIFIA loan) constituted approximately 50% of the project costs. The remainder was GARVEE bonds, Maryland State Transportation Trust Funds, Maryland General Funds and G.O Bonds, and the small amount of federal funding.

Maryland Transportation Authority (MdTA) is both the quasi and tolling agency that own and operate the facility. Essentially in our organizational chart, the MDOT assigned the Maryland SHA (State Highway Administration) the implementation responsibility to design, construct this facility, and then they would turn it over to MdTA to own, operate and toll.

4. Could you briefly describe the key points of the procurement process utilized for this PPP?

Answer: It's the two-step process. The first one, basically, we qualified those teams that were interested in the project. There was a potential reduction in these teams to find the ones that were qualified and that we're interested in so that they could prescribe the numbers later for us. Then we started to go through the Request for Proposal (RFP) stage where we evaluated the technical and price proposals from each team. After that, we started ranking them.

For a background history, it's the governor's mandate to have a groundbreaking for the

Inter County Connectors before the end of his first term and the ribbon cutting ceremony before his second. He ran on an election campaign to build the ICC that had been in conversation for 50 years. So from day one when the Maryland State Highway Administration started the process to complete the NEPA effort, we could perceive that we're going to do design build (DB) because NEPA would consume pretty much his first term. Thus, we needed design and construction that would not consume more than his second term. Moreover, given that the owner, Maryland Transportation Authority, had a pool assets base of 7 toll facilities at that time, the idea to have somebody independently fund this project was not an option and this was the reason P3 was not an option. In short, we did two-step process that based on quality and our governor's schedule.

5. **Were there any other aspects of the procurement besides design and build in the contract like operation and maintenance?**

Answer: The only thing that we did differently than the one in state contract was the one-year warranty for everything and two-year warranty for landscaping that was a huge aspect of the project. The one-year warranty, which started from the date of final acceptance, could be extended based upon the magnitude of the repair and the effort that they put into it. This was a major issue too. Normal state highway has 100-year warranty with one year warranty for material. Thus to go with one-year warranty on everything if there were decks to be repaired then it would restarted the one-year clock.

6. **How was the concession term (length) determined?**

Answer: MdTA.

7. **How was the project delivery method determined, and by whom?**

Answer: MdTA (please refer to question 4 for more detail).

8. Please describe briefly the process used to develop the Request for Proposal (RFP) for this project?

Answer: We had a team that we put together. It included consultants with extensive DB experience throughout the country, experts in DB contract documents. We issued Request of information (RFI) on the half a million-dollar contract A. We did follow up with a number of industry forums. In the early inception of the project, we called a number of large and small contractors to quiz them about "Would you bid if" and contract packaging/sizing. Then we came to a conclusion that the sweet spot for contract package was about 400-600 million to encourage both local and national participation in the project. In this way, we could get the "big boys" (like Kiewit, Granite, Clark) to play while letting local sub-contractors to participate and to gain experiences in mega project like this.

9. How did the public agency raise capital for this PPP project?

Answer: Also as background information, at the time the original funding concept was developed, I was working at MDOT as Assistant Secretary at for Policy and Governmental Affairs; I was not at MDTA. In 2003, the new governor made a high priority to realize the ICC project. MDOT/SHA had been the party responsible for planning the ICC for the previous 50 years. Therefore, MDOT and MDTA came together to figure out the most logical way to move the project forward. It didn't take long for all the stakeholders, i.e. governor, State Highway Administrator (retained from the previous administration), the Executive Secretary of the Maryland Transportation Authority (also retained from the previous administration), etc., to arrive at a consensus that the project would be very expensive; that MDTA needed to be involved in the project; and the project would not be affordable if it were not a toll project. MDTA's funding sources could be brought to bear, for all intents and

purposes, only if the ICC were a toll highway. . It was also apparent that MDTA would need to use system wide toll revenues to finance this project; relying simply on ICC toll revenues would not be sufficient. So the pooled resources and system wide credit of the MDTA was important. We worked with the legislature in 2004-2005 to come up with a financial plan using a variety of funding sources that could spread financial burden. The end result was a package of multiple funding sources that included: GARVEE bonds, MDTA toll backed funding (toll revenue bonds, TIFIA loan and cash), Maryland State Transportation Trust Funds, Maryland General Funds and G.O Bonds, and the small amount of federal funding (financing details available on the project website). The principle amount of the TIFIA loan was $516.0 million. The package that we presented to TIFIA had little risks to them. TIFIA is generally set up to provide creative and substantial funding for projects that otherwise might not be financed on a standalone basis. TIFIA is used quite often as subordinated debt, but for ICC the TIFIA loan was parity debt, which made the process go much smoother. With the TIFIA loan being parity debt, TIFIA was assured that it would be paid back on the same risk level as our other bond holders; that its loan was not going to be subordinated to any others; that they were not at elevated risk, as we were treating them as a regular bond holder. Putting TIFIA on par was a conscious decision; it facilitated the negotiation of the agreement, and made the size of the loan relatively risk free.

For your information, though the MdTA was robust and the potential revenue stream coming from the project was optimistic, they could only cover half of the cost with the revenue bond. It was a very expensive project with tremendous environmental cost. Other funding sources included TIFIA ($516.0 million), federal funding (19-20 million), GARVEES ($750.0 million), and toll revenue bonds. By June 30, 2013, the total cost was

2.39 billion as shown in our financial plan on the project website.

10. Was there any discussion about using private equity?

Answer: Yes, but back in 2002-2003-2004 the interest in using PPP was not as elevated as it is now. There was at least one meeting with potential concessionaire at MDOT. They wanted to investigate the possibility of doing the project as a PPP. At that time, we were working on the environmental approval process. The fact that we could not guarantee approval of NEPA documents and a Record of Decision within a certain timeframe led them to conclude that they could probably not do the ICC any more efficiently or cheaper than MDOT/MDTA.

At that time, those involved within Maryland state government were confident that it made sense to have the State Highway Administration's administer the approval and implementation of the project. SHA knew the elected officials and community groups; they knew the "lay of the land" - they were very good at doing such a large project (they were finishing up the Woodrow Wilson bridge, they had rebuilt I-270), at overseeing the design process at a local setting; at breaking down the project into the right sized contracts, at administering the contracts, and at managing the mitigation process to get the project approved with some extent of local community consensus. In addition, we had the MDTA, a "cousin agency", which possessed a system-wide credit based on its toll facilities. MDTA could handle any variance of revenue streams if there were any unexpected events in the project. It was a credit-worthy and well-managed agency that could float the debt and could also wait patiently for the right time to bring in all the different funding sources at the best rates. For example, when we decided to go with TIFIA in late 2008, we managed to lock in a 35-year $516 million loan for 2.56% interest. This didn't have so much to do with our competence, but more so with our ability to wait until the right time to do it. In short, we

generally thought that it's not worth doing PPP at that time because we had two very capable agencies, and we didn't perceive the potential for significant savings in time and cost.

11. Regarding the toll revenue bonds that the authority issued, were they specifically for this project?

Answer: To answer this question, we first need to break our look in more detail at the types of "bonds" we issued. The TIFIA loan is essentially a revenue bonds - parity debt to match other bonds. It's to be paid by the collected revenue from all of our toll facilities, including that from the ICC. The $516 million TIFIA loan was issued specifically for the ICC.

The rest of the bonds that we issued in 2008, 2009, and 2010, - the Maryland Transportation Authority revenue bonds - were not issued solely for the ICC, but instead for a list of various projects, including the ICC.

The term for our toll revenue bonds can go up to 40 years. But typically we issued the debt for approximately 30 years, depending on the revenue start date and the way we handled interim financing. These bonds were undesignated in terms of use, but they're a system wide credit-backed, meaning the revenues from all of our facilities would be used to pay back the loans regardless of where the funds were spent.

12. Do you have broad PPP enabling legislative in your state or is PPP authorized on a project-by-project basis?

Answer: Yes, we have broad enabling legislation.

13. Do you have a standard of procurement for PPPs in your state?

Answer: State Highway Administration (SHA) has the innovative contracting office. The office has pretty much standardized and modified the procurement process over the time. It was in operation about 5 years before the ICC project started, their biggest project was

around 60-80 million ranges. Staff from the office were actively participating in preparing the RFP for ICC project. The ICC risks to the owners were substantially different than those the office had involved in because most of its projects were 30-30 million ranges. ICC was the big league. Institutionally this organization had successfully managed the Woodrow Wilson Bridge as the state modern era of mega projects began. Now we're looking into another delivery method Construction Management at Risk [or CMGC]. SHA just got their first contract using this delivery. The McHenry Tunnel was another mega project 30 years ago. At that time, a separate office was setup. The director of the office reported directly to SHA. Therefore, institutionally we had a good mechanism and organizational structure to deliver big projects, and another 5-6 years in implementing DB. Objectively speaking, the general and engineering consultant was the same package of the three firms that worked on the Woodrow Wilson Bridge. With these experiences, the governor had a full confidence that the office would be able to deliver ICC project.

14. **Public and industry get used to a very structured, traditional procurement process where there are sets of documents, plans, specification, DOT procedures, and standards and everybody understands what those are and there is limited discussion between parties before summiting their bids to make it fair. However, given the complexity of PPPs, what do you think about this whole process, is it more of the relational contracting where you try to make sure everybody is bargaining in good faith with enough information to prepare responsive proposals?**

Answer: We talked with various players in the industry about their thoughts concerning the project without getting into details or into exclusive information that were not available for any other future teams. We had what we called 'Open house and forum' where the

community as a whole was invited to hear about the project, how it would be procured, how it would be broken down into multiple contracts. In this way, we could get the words out with the industry and the public. To recall, this project had been in conversation for 50 years and years in court. We had multiple objectives from this industry forum. One was "It's real." As a result, we got the highest-ranking officials we could get to open the forum, i.e. governor Luther King, to convey the message that we're real. Secondly, when we issued the RFP, we worked with the industry to assure that there was an openness and exchange of information, and we're willing to change the RFP if needed be. The third attribute of the industry forum was the high MBE [Minority Business Enterprise] at Maryland, which was 25%. Thus, we created an opportunity in the afternoon for the primes to have their own tables so that sub-contractors could go around the rooms pitching their idea.

15. Does Maryland have open procurement that allows design build?

Answer: Yes, it's very open right now based upon the needs, and timeliness of the projects.

16. What were the most important risk factors that were addressed during procurement or covered in the PPP agreement? How were those risks managed between the parties involved in the PPP?

Answer: We covered:

- Environmental contamination: we considered hazardous material that could not be seen on the top of the ground on the account basis,
- Right-away acquisition: we did establish the right-away acquisition early on for the project like reserve corridor. We would work together with builders if they happened to need more. As I remember, we had very minimal right-away acquisition after the procurement,

- Utilities: this is a big area especially in the east coast. We would take the risk if the location of the utilities whether it's horizontal or vertical, that were not as shown on plans or couldn't be readily observed in the reviews. We set up perimeter for utilities also.
- Environmental degradation/impact and Community impact: these were the two main risks that could stop the project. We identified a series of strategies to deal with them, and we incentivized the contractors if they spent some money to reduce the impacts. We had environmental monitors watching after every storm, flood, etc. The same things went with community impact reduction, for example sound panels to reduce noise pollution.
- Delay: specifically the delay from the on-going litigation we were having at that time. We did have that clause in our first contract.
- Relocation risk: the basis for that was not the prior rights, who was there first. What we wanted was to get the work done and got out of there. We paid some pre award utility relocations like some major gas lines that we needed to get them moving in a timely manner,
- Legal,
- Commodity.

17. Who has authority over establishing or approving future tolling rates? Please describe the process for negotiating or renegotiating toll rate changes?

Answer: MdTA.

18. Has a special agency or authority been developed other than Department of Transportation (DOT) to manage PPPs in your state? If so, does it report to the

DOT or to another state agency or commission?

Answer: Yeah. We have MoTA and other designated offices with the assistant of GEC to manage day-to-day and to assist in other aspects. They are dedicated staff but minimum owner involvement.

19. What are major lessons learned from the use of PPP on the project?

Answer: You need to be considerate of future maintenance, access, and right to access to the facility. For example, we installed Intelligent Transpiration System components on this project for that far exceed the footprint of the actual facility to capture the adjacent roadways. One of the things we're struggling right now is to have the agreements put in place after the fact. Have the eyes toward the future regarding the operation and maintenance responsibilities; get those line up along with your other agreements with your local government, townships; and try to get all in one package for you don't want to work on them when you get into construction.

The institutional structure, the authority and the autonomy given to that organization to do the project are a requirement for the success as well. For instance, in the Woodrow Wilson Bridge project, the owner gained insight from the project that allow them to set up the autonomous institution with decision making power to that they could speed up the process like change order less than a certain amount of dollar, they didn't have to go back to the board as long as they were responsive and responsible for the actions. They had less bureaucracy in short. To give you more insight, for SHA it's the administrators who are the lead, the director work directly for the administrators. There're reports that directly go to the top with an expectation that the other senior managers within the agencies recognize and response as quickly as possible as if they response to the administrators. The director has

direct unrestricted access to the administrators. The governor and the secretary were constantly on the project and were wondering how the project [ICC] was going throughout the first four years. It happened that the governor didn't get elected for the second term, but the new govern came in and still embraced the project.

One of the keys for the success was the fact that the consolidated nature of our programs makes things easier. In Maryland, we don't have such a division of interests where you might have various interest groups block the allocation of funding for various modes. Instead, you have the Secretary of Transportation who oversees it all. You have a toll revenue organization that has a consolidated revenue pledge of revenues from diverse projects so that even in financially difficult times, a project that might not meet its projected revenue stream (for example in the first 10 years or so), can be financed relatively easily. This has been a key point- and it strikes me that – often when discussing transportation organizational structure at national conferences- staff from other states or relevant players have indicated this consolidation of funding and decision making is something they wish they had. This was the key aspect of the ICC's funding plan. We had statewide transportation organizations that could readjust the priorities, could allocate funds in a proper manner, could bring revenue authority in on an equal footing in a cooperative way, and could spread the burdens equitably across various stable funding sources. For example, MDTA has another 7 toll facilities that could accommodate the cash flow requirements of the ICC project during its early years, so if its tolls could not cover the cost of project, more than adequate revenues were there to fund it.

2.2 Findings from Archival Record

2.2.1 Economic

- The cost to complete per the 2011 financial plan was about $2,399.1 million.

- The project used multiple funding sources, i.e. GARVEE bonds, special federal funds, Maryland Transportation Authority bonds, Maryland general fund transfers, TIFIA and the Maryland Department of Transportation Pay-as-You-Go (PAYGO) (refer to 1.4. Funding for more detail).
- The nature of these different funding sources affected budget, schedule, and design decisions in all phases of the project life cycle.
- The TIFIA loan agreement signed on December 19, 2008. TIFIA interest payments are scheduled to begin in 2013 and principal payments will begin in 2018 with final repayment in 2046.
- Debt will be secured by revenues from tolls on the ICC and the seven other existing toll facilities operated by MdTA.

2.2.2 Procurement

- Public toll highway owned and operated by MdTA.
- The first mega design-build project
    - Performance specifications
    - Best value evaluation
    - Providing information to industry on project
- Process and Procedures Consistent with the Competitive Sealed Proposals (CSP) procurement method under the State Finance and Procurement Article of the Annotate Code of Maryland and the Code of Maryland Regulations (COMAR), Title 21, and
- Incorporates “Best Practices” of Design-Build Procurement from: Federal & State Public Agencies and FHWA Design-Build Regulations.
- Two step procurement

Step One

- Informational Meeting
- Request for Qualifications (RFQ)
- Submittal of Statement of Qualifications (SOQ)
- Reduced Candidate List (RCL) Notified

Step Two

- Share Draft RFP with RCL
- Issue Final RFP
- Alternate Technical Concepts Review
- Technical & Price Proposal Evaluations
- Discussions / Best & Final Offer (BAFO)
- Selection & Award
- Contract Execution / NTP

- Five different manageable contracts- A, B, C, D, and E. Contracts D & E were combined and modified and are expected to open in early 2014.
  - Contract A's worth $478.7M, and its joint venture included Granite, Corman and Wagman (with Parsons and Jacobs)
  - Contract B's worth $559.7M, and its joint venture included joint venture of Kiewit, Corman and Wagman (with Parsons)
  - Contract C's worth $513.9M A, and its joint venture included Shirley, Clark, Atkinson, Facchina, & Trumbull (with Dewberry)

- Contract's worth D/E Modified: C-D: ICC from I-95 to Virginia Manor Road (Contract base), $55M-$70M and ICC Virginia Manor Road to US 1 (Contract Option), $30M-$40M.

- Learning curve for DB payment process
- SHA is the Single Source of Information and Answers to Proposer Questions
- Includes a 25% financial MBE goal
- 60 Years of ICC History
    - 1950-1968: Outer Beltway proposed and later dropped by Montgomery County; however, ICC link retained
    - 1979-1987: First NEPA study; no final DEIS
    - 1992-1999: Second NEPA study; no final DEIS
    - 2002: ICC named State top transportation priority
    - 2003: U.S. DOT places ICC on project streamline list; Project planning started March 2003
    - 2004-2005: Public hearings held; alternatives narrowed
    - 2006: Final Environmental Impact Statement and Record of Decision (final approval) signed by FHWA; Two NEPA challenges filed in federal court
    - 2007: Favorable court ruling; First Notice to Proceed
    - 2011: ICC open to traffic from I-95 to I-270

2.2.3 Risks

- It has been the focus of various studies and debates since the 1950s and finally started construction in 2007
- Local opposition

- Revenue risk
- Utilities relocations
- Volume of construction activity in a compressed time frame
- Strict MBE (Minority Business Entrepreneur) of at least 25%.
- Financial risks
- Quality:
    - Focus on performance
    - Formal Quality Assurance Oversight Process
- Unknown scope and character of changes
- Developer Coordination.
- Potential risk from conflicts of interest
- Right-of-Way: SHA has cleared about 389 properties impacted by the ICC, and it had spent $251 million to possess these properties by 07/21/2009.
- Minimize disruptions to existing traffic and local businesses and communities, for example US 1.
- Cooperate with adjacent ICC Contracts on-going reconstruction.
- The unknown impact of potential future federal action on spending or revenues and the resulting impact on the economy and capital program is likely the greatest risk.
- NEPA (National Environmental Policy Act):
    - During the 1980s and 1990s, FHWA and the Maryland State Highway Administration (SHA) initiated two separate Draft EISs for the ICC, but neither study was completed. In both studies, the project encountered considerable opposition from resource agencies and organized groups.

- Concerns focused on two broad issues: (1) impacts to natural resources, including stream valley parks that would be crossed by the project, and (2) consideration of alternatives including requests to consider transit, land use, and local road improvements rather than constructing a new limited-access highway.
- The new EIS (Environmental Impact Statements) was prepared in approximately three years: it was initiated in early 2003, and the ROD (Record of Decision) was issued in May 2006.
- Several environmental groups remained opposed to the project, even with the additional mitigation and stewardship measures that had been incorporated as part of the new EIS. The groups raised a range of issues, including: that the purpose and need should have been defined more broadly; that the EIS should have included detailed study of alternatives involving land use, transit, and local road improvements; that the traffic modeling was flawed; and that the EIS and air quality conformity analysis did not properly analyze near-road air pollution.
- After the ROD was issued, two lawsuits were filed in federal court challenging FHWA's approval of the project. The lawsuits were filed in late 2006, and the administrative record was filed in spring 2007. In November 2007, the district court issued a decision in favor of FHWA on all issues. An appeal was filed in one of the lawsuits, but the appeal was resolved through a settlement. Construction of the project went forward immediately after the district court's decision.

- Environmental compliance:
  - Critical to success of the project
  - High standard for performance

- Commitment to agencies and public
- 14 separate federal, state, and local agencies
- Over 50 Design-Bid-Build contracts
- 70 project sites
- Construction contracts worth $97 Million, which included: wetlands creation/stream restoration, fish passage restoration, forest mitigation/tree planting, storm water management, water quality enhancements, community improvement (pedestrian/bicycle trails, new park facilities, sidewalks)
- Minimization of construction time, thermal discharges to streams, Erosion, etc. in Special Protection Area (SPA).
- Environmental Manager & Environmental Compliance Crews (crews dedicated to protecting the environment).
- A number of environmental permits for both SHA, and Contractors: U.S. Army Corps of Engineers - Section 404 Clean Water Act Permit, Maryland Department of the Environment (MDE) - Water Quality Certification, MDE - Nontidal Wetland and Waterways Permit, MDE - Coastal Zone Management Program Federal Consistency Determination, Maryland Department of Natural Resources (Maryland DNR) - Scenic and Wild Rivers Approval, Maryland DNR - Approved Forest Impacts and potential on-site reforestation locations, Maryland DNR – Permits for capturing / relocating fish and wildlife, State Board of Public Works - Priority Funding Areas law compliance, MDE - General Mineral Mining Permits (for batch plants), MDE - Water Appropriations Permits (for withdrawals from surface or groundwater), MDE - Erosion and Sediment Control Approval, MDE -

Storm water Management Approval, Maryland DNR - Roadside Tree Permit, National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI), etc.

- Geotechnical:
    - Contract-wide preliminary investigations to characterize the subsurface conditions along the corridor are in progress.
    - Supplemental subsurface investigations will be required of the D-B Team to complete design.
    - The D-B Team will be required to include an experienced geophysicist to review and interpret geophysical data and to plan and perform supplemental geophysical investigations.

2.2.4 Governance

- Public involvement:
    - 56 homeowner and community associations,
    - Plus other communities
    - Media involvement (Two major media
    - markets - DC and Baltimore)
    - Elected officials (38 legislators just in the ICC footprint)
- Agency and developer coordination
- Shift of roles - a first for State Highway Administration
    - Administration of design and construction
    - Design-Builder responsible for Quality Control
    - Environmental approvals,

    - Acquiring property,
    - ICC team responsible for Quality Assurance
- General Engineering Consultant (GEC), known as ICC Corridor Partners, was a joint venture of Rummel, Klepper and Kahl, LLP; URS, Inc.; and PB Americas, Inc. GEC assisted SHA / MdTA / FHWA in managing the design and construction of the ICC.
- Mega-projects present serious organizational conflict issues that require attention throughout the project
- The ability of project managers to meet the requirements of different financing sources.
- Project managers will need more administrative skills to properly manage and audit expenses and revenues attributable to different funding sources.

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Case 3- Hudson-Bergen Light Rail- New Jersey

1. Project Information

1.1 Overview

The Hudson-Bergen Light Rail (HBLR) is a light rail transit system encompassing 24 stations. It runs north south on the Hudson River waterfront in Hudson County, New Jersey for 20.6 miles. The HBLR is a vital light rail connection that links the growing cities of the Hudson River waterfront as it serves the high-density commercial and residential centers in Jersey City and Hoboken and connects to ferries, PATH, and commuter rail. Beginning in Bayonne, the operating corridor extends through some of the nation's most densely populated municipalities, a region noted for significant dependence on transit. New, 70 percent low-floor, electric-powered light rail vehicles are already serving the waterfront towns of Jersey City, Hoboken, Bayonne and Weehawken and will soon reach North Bergen and Union City. Traveling both on city streets and along separate rights of way, HBLR is the first public transit project in the nation to use the Design, Build, Operate and Maintain (DBOM) construction methodology. In September 2000, NJ TRANSIT was awarded the American Public Transportation Association's prestigious “Innovation Award” for use of the DBOM methodology.

1.2 Project Details

The project was implemented in the following phases.

- An initial minimum operable segment (MOS-I) was a $1.0 billion, 9.5-mile operating segment opened in 2000 with 16 stations, followed by several extensions completed later that year, with the final station opening in 2002.
- MOS-II was a $1.2 billion, 6-mile, 7-station project that opened in phases from 2002 through 2006. The line connects terminals at Tonnelle Avenue (North

Bergen), Hoboken Terminal (Hoboken), 22nd Street in Bayonne and West Side Avenue in Jersey City.

- MOS-III was completed at a cost of $100 million in January 2011 with an extension from the former southern terminus at 22nd street one mile to 8th Street in Bayonne.

1.3 Partners

- Private partners: DBOM partner: 21st Century Rail Corporation - URS Washington Division (70%); Itochu Rail Car and Kinkisharo USA (30%)
- Project advisors: Parsons Brinckerhoff; Booz Allen Hamilton; Nossaman, Guthner, Knox & Elliott, LLP

1.4 Funding

The total project cost is $2.3 billion (MOS I, II, and III) consisting of:

- Federal Transit Administration (FTA) New Starts Full Funding Grant Agreements
- Grant Anticipation Notes (GANs) (backed by passenger fares)
- State Transportation Trust Fund (motor fuel tax receipts)

1.5 Project Timeline

- In April 2000, the first portion of MOS-I opened to Exchange Place and to Newport Mall in November 2000.
- In September 2002, MOS-I to Hoboken was completed.
- In November 2003, Bayonne's 22nd Street Station, the first of seven MOS2 stations, opened.
- In September of 2004, service to Lincoln Harbor in Weehawken opened.

- On February 25, 2006, MOS-II was completed to Tonnelle Avenue.
- As of January 2011, six other expansions have been completed.

2. PPPs Key Issues

2.1 Findings from Interview on 05-27-2014

Case 03- Hudson-Bergen Light Rail, New Jersey

1. What is your title?

Answer: Chief, Construction & Project Management.

2. How many years of experience do you have with highway transportation projects?

Answer: **25 years**.

3. What role did your agency/company play in the formation of the PPP for this project?

Answer: The New Jersey Transit Corporation was the quasi-public agency formed under NJ state statute. Our chairman of the board is the commissioner of transportation. This has a lot to do with state constitution that limits the number of state agencies. NJT is not part of/under the DOT. New Jersey created the corporation because the number of agencies was limited by the law/state constitution.

4. Could you briefly describe the key points of the procurement process utilized for this PPP?

Answer: Hudson Bergen light rail was Design Build Operate Maintain [DBOM]. I'm not 100% sure about whether the financing was an alternate or a required part of the proposal from the beginning. I do remember that the first change order we made was to remove financing from the contract. The decision to go with contractors' financing or the state bonds was driven by the interest rate. We could get about half the interest rate using the state

economic development agency's bonding capacity versus the interest rate proposed by the lowest bidder. We used the two-part bidding process. First it's the technical qualification, which was weighted about 40%, and the lump sum amount that included some O/M and discount rate, which was weighted about 60%. Concerning how to deal with the potential proposers or bidders, I could not tell you much specifically about the Hudson Bergen project. Let me give you a lengthy answer. New Jersey transit created an office called New Rail Construction, and we had a lot of projects, two of which were Hudson Bergen light rail and River Line light rail that was solely funded by the state. Both projects went at the same time, and I was on the River Line. We followed the procurement process of Hudson Bergen progress to some extent. We had about 5 or 6 review teams of with necessary disciplines to review the proposals, and to rate the proposals we got from the proposers. We wrote to them, and called them in to ask questions to get clarification about their proposals. We had a one-on-one confidential meeting with each proposer to ask and answer questions on the project. I don't remember if we had non-disclosure disclosure statement for this at that time, but we do have it now due to the concern about improper information exchange. We didn't put the ridership risk onto the contractors. We knew it was a risk we didn't want to pass on because we would have paid a lot for that. We wanted to keep it for ourselves. This helped a lot because it could have been a big issue for the proposers. What we substituted in the place of that was the system performance criteria that we tried to make as simple as possible like cleanness of stations, on-time performance, and percentages that they would meet or exceed to get an operating bonus or penalty. We think this motivated them to incentivize their practices whether it's operational policy or O/M expenditure to provide the level of service that would drive high ridership. If they did everything right but for some reasons the

development alongside the project didn't happen and the ridership didn't materialize, that would be our risk. Fortunately development skyrocketed and ridership has been growing steadily.

5. **What were the motivations to bundle everything together into a single design-build-operate-maintain contract like this?**

Answer: Schedule driven was the main reason. Hudson Bergen had been in planning for decades. Stakeholders decided that it's enough and let's put it in on the street and get it done. Secondly during that time the early 90s when the inflation was high, if we delayed, our construction cost would have gone up, and we would have not created any jobs for local people.

6. **How was the project delivery method determined, and by whom**?

Answer: Best for schedule; determined by the New Jersey Transit Corporation.

7. **Did the state economic development board underwrite or facilitate the sale of bonds under their authority specifically for this project or did they just sell a group of general bonds, some of which applied to this project**?

Answer: From my recollection, we had other separate people to do this. Actually they floated EDA [Economic Development Authority] bonds specifically for the project. I'm sure if they collateralized the construction to back the bond or just the state revenue to back the bonds.

8. **Were there any commitments to the bond purchasers that revenues from ridership [passengers' fare] would be used for at least a portion of the repayment sources?**

Answer: No, there weren't. We had COPs [Certificates of Participations] and Gains bonds, Grant anticipation note, which I think was EDA as well. The total HBLR MOS-1 funding split was Federal transit 60% and state 40%, which was made up by general transportation

trust fund, state funding sources, bond revenue, with toll credits as local match.

9. Who has authority over establishing or approving future tolling rates? Please describe the process for negotiating or renegotiating toll rate changes?

Answer: New Jersey Transit Corporation because we are an instrument of the state, reporting to the chairman of the board, who is the NJDOT commissioner. From the budget process, we need to go to the state house, governor office to find out whether we can increase the fare. We conduct public hearings and other state procedures related to budget process. For your information, we supply all the equipment like vending and validation machines, enforcement and security units, all of which are separated from the operator's obligations in O/M contract. For a light rail system, it's the point of contention when we put security in our original O/M contract. Through a lot of internal meetings, we came to a broader context of who provides the security and safety for the patrons. We determined that it should belong to the police department, and we fine-tuned our O/M contract to determine what those kinds of security were versus the physical security of the assets. We subsequently put in a number of CCTV not just because of those issues but also as a result of 9/11. If they followed all the asset security protocols and there's vandalism it's our liability.

10. What are major lessons learned from the use of PPP on the project?

Answer: One is to make sure you have a champion outside the agencies that will stand with the project and try to implement it regardless of a number of issues that come up, i.e. legal, legislative, public groups. Political leaders need to be standing by you to back up the agencies because if there's any hiccup, the press will jump all over it. From the technical standpoint, you need to try to develop your in-house capacity because it will be needed to implement the DBOM contract. We still need consultants but they can never own it like the persons from the

agencies. We also spent a good amount of money for forensic accounting at the end to prove our point regarding some claims.

2.2 Findings from Archival Record

2.2.1 Economic

- The System is estimated to cost $2 billion from multiple funding sources and will be constructed in three phases
- New Jersey Transit Corporation (NJT) reported that, as of June 30, 1999, it had paid over $613 million for the first phase of the System. NJT estimated that this phase will cost $950 million, $42.1 million less than the $992.1 million originally estimated in the October 1996 full funding grant agreement.
- Funds are scarce and a large investment in transportation must attract as many passengers as possible and take as many cars off the road as soon as possible.
- The economic geography of New Jersey continues to change. Geographic patterns of employment and residential areas are different from the time the rail lines were constructed. Access to commuter rail service and the services themselves need to accommodate the changing economic geography and demand for rail services. Conversely, certain areas of the state have lesser growth potential, but commuter rail services are still provided. Public benefits of rail service need to be commensurate with the costs necessary to provide these services.
- With the limitations on funding at all levels of government, new sources of monies to support investment and operations need to be identified or developed. An innovative funding framework is required that attracts resources from both the public and private sectors and allocates risks.

- Hudson–Bergen light rail uses a proof of payment (POP) fare-collection system that allows riders to quickly and easily board the cars and eliminates waiting lines and light rail car dwell times at stations.
- To obtain the funds to make the project feasible, Grant Anticipation Notes (GANS) and several bonds were issued, given that a Full Funding Grant Agreement (FFGA) pays according to a multi-year schedule.

2.2.2 Procurement

- HBLR is the first public transit project in the nation to use the Design, Build, Operate and Maintain (DBOM) delivery, the second most commonly used PPP delivery approach among U.S. transit capital projects since 2000.
- It's of five FTA turnkey transit demonstration projects, also known as "design/build."
- DBOM 15-year fixed price contract in 1996 to design and construct 9.5-mile MOS-I with a guaranteed completion date, provide a fleet of light rail vehicles, and operate and maintain the system for 15 years. This incremental construction and phased opening would have been very difficult without a "public private partnership" approach to the project.
- Initial contract only covered the first segment; however it was later renegotiated to include subsequent extensions.
- If traditional contracting processes had been employed, agency estimates are that the same portion of the light rail project could have taken another six years and an additional $435 million to complete.
- Long history of planning:

- Planning for the system began in 1984, when NJT recognized that the full development potential of the Hudson River waterfront could not be realized without better transportation access. In 1986 and 1987, NJT published studies that identified potential alignments and physical layouts for the waterfront corridor. After FTA approved NJT's application in November 1988, NJT examined nine transportation alternatives for the waterfront corridor as part of the original Environmental Impact Statement, which included seven build alternatives, a do-nothing alternative, and a low-cost alternative to expand and modify existing transportation systems.
- In February 1993, the NJT Board approved a light rail system, extending from Hudson County to Bergen County; however, the Board recommended that NJT staff perform additional analyses to expand the system into Bayonne and through Jersey City. In November 1995, FTA approved expanding the system into Bayonne and providing rail service through downtown Jersey City. In January 1996, the NJT Board approved a locally preferred alternative report, which recommended the construction of a light rail project that would run along the east side of Hoboken, and include 32 stations and a yard and shop facility.
- In October 1996, FTA awarded a full funding grant agreement for the first phase of the System, committing $604.1 million of New Start funds and identifying an additional $281.7 million in FTA funds. At the same time, NJT signed a contract with 21st Century Rail Corporation to design and build the first phase. In addition, 21st Century Rail will be responsible for commissioning, starting up, operating, and maintaining the entire system for 15 years before turning operations over to NJT.

- Construction of the first phase began in December 1996. In January 1997, at the request of the New Jersey Governor, the System's alignment was rerouted from the east side of Hoboken to the west side. Both the east side and the west side alignments were considered in the draft environmental impact statement that was developed between November 1988 and November 1992. FTA required that the impacts of the changed alignment, which primarily affects the System's second phase, be evaluated in an environmental assessment before it would approve the realignment. FTA also required NJT to perform the assessment because the Hoboken Terminal, including an adjacent area, is part of a historic waterfront district. NJT completed the environmental assessment for the alignment change in November 1998. After NJT received the necessary permits from the U. S. Army Corps of Engineers and approval from the State Historical Preservation Office, a Memorandum of Agreement was executed in April 1999 with the U. S. Department of Interior Advisory Council on Historic Preservation. On June 18, 1999, FTA issued a Finding of No Significant Impact approving the environmental assessment.

- Revisions to the design/build contract's price and the start of service date stemming from the change in alignment were being negotiated between NJT and 21st Century Rail. According to the NJT Project Director, rerouting the alignment will result in savings from reducing the need for track to be embedded into streets and from property acquisition. In addition, changes in project financing have reduced the project's current cost to complete below the estimate in the grant agreement. About $43.2 million in potential financing cost savings are already reflected in the June 1999 cost estimate for completing the project.

The alignment change, however, will delay the start of service. The alignment change and required value engineering may further reduce the project's costs.

- A contract with 21st Century Rail was awarded for the first phase of the System and includes additional costs that will be incurred after this phase is operating, and are not part of the full funding grant agreement. The contract includes costs associated with operating and maintaining the first and second phase of the System. The contract with 21st Century Rail estimated the costs at $412.6 million over 15 years. NJT will pay the costs from revenue generated by the System. If NJT is unable to cover the costs from the System itself, it will cover them with other funds, including FTA formula funds.
- The contract with 21st Century Rail had already been amended to reflect NJT's decision to incorporate bond financing. Expenses for the first phase will be paid from the proceeds of the bond sale until the full amount of FTA funds are received instead of having 21st Century Rail provide funds for the project, as originally planned. This decision reduced estimated financing costs by about $43.2 million. As a large public agency, NJT has a lower cost of capital than a private firm such as 21st Century Rail.

2.2.3 Risks

- NJ Transit will pay the Hudson-Bergen Light Rail project's DBOM consortium a guaranteed price in 1996 dollars for operation and maintenance of the line, subject to increases in the consumer price index (CPI) and other inflation indices for selected operating costs, including electricity. This insulates the agency from growth in operating costs for reasons other than inflation, and provides the operating consortium incentive to keep a lid on O&M cost escalation.

- The project was constructed in populated and built-up areas, which were challenging. Moreover, the length of the project contributed to the complexity, given that the number of municipalities the project had to go through was significant.
- Super storm Sandy, which struck New Jersey in late October 2012, demonstrated that rail operations and service are vulnerable to catastrophic weather conditions. The causes of disruptions include not only natural phenomenon such as storms, earthquakes, or even high winds but also everyday service and facilities, for example, regional power outages.
- There are seven major challenges include:
    - operational fragmentation,
    - trans-Hudson mobility,
    - state of good repair,
    - unfunded regulatory mandates and compliances,
    - addressing the changing locus of economic activity,
    - funding and appropriate investment models,
    - further exploiting technology.

- ROW (Right-Of-Way) acquisition
- Before the second phase can begin operations, NJT will need to comply with the requirements of the policy being developed by FTA and the Federal Railroad Administration (FRA) governing the shared use of railroad right-of-way and track by light rail transit systems and conventional rail operations. The proposed policy requires light rail operators that intend to share railroad right-of-way to comply with FRA safety rules. If a light rail system shares track with a railroad operator, it will either comply with FRA safety rules or obtain a waiver from the appropriate safety rules. Complying with the

requirements or obtaining a waiver could impact the completion schedule, cost, and train schedule.

- Under the full funding grant agreement, NJT agreed the entire first phase would begin service on or before July 2000. Service is scheduled to begin on an 8.1-mile segment, south of Exchange Place in Jersey City, by March 2000. Operations for the 1.2-mile portion north of Exchange Place to the Hoboken Terminal will be delayed until December 2001. The NJT Project Director attributed the delay to rerouting of the System and obtaining property easements through several properties between Exchange Place and 18th Street in Jersey City.
- On May 24, 1999, NJT requested that FTA revise the full funding grant agreement to incorporate the west side alignment through Hoboken, to change the first phase's ending station from the Hoboken Terminal to Exchange Place, and recognize that the first phase will not reach the Hoboken Terminal until December 2001. NJT also noted in its request that neither final design nor construction could proceed until FTA revises the full funding grant agreement. In addition, NJT stated that revised project budget estimates would not be provided until 21st Century Rail completes the final design for the alignment change. The FTA Director of Operations and Program Management, Region 2, stated that no revisions to the full funding grant agreement will be made until all outstanding issues are settled and revised budget estimates are reviewed.
- An issue that could affect operations relates to FTA and FRA coordination of safety oversight responsibilities when transit and freight operations share the same right of way and track. On the first phase of the System, light rail vehicles will operate on track that is within the same right of way as the Conrail successor's freight tracks. In addition, NJT's

plans for the second phase include the west side alignment operating on the same track as Conrail's successor, with freight operating at night and transit operating during the day.

- On May 25, 1999, FRA and FTA issued a Proposed Joint Statement of Policy Concerning Shared Use of the General Railroad System by Conventional Railroads and Light Rail Transit Systems. The proposed policy will affect both the first and second phase of the Hudson-Bergen system. It recognizes the potential for a collision between light rail and conventional railroad equipment, and describes the process FTA and FRA intend to follow for coordinating the use of their respective safety authorities, regarding rail transit systems that share right of way and tracks with freight equipment. In instances where a light rail system will operate on the same right of way as a conventional railroad and also share highway-rail grade crossings, FRA expects both systems to observe FRA rules on grade crossing signals. In addition, FRA and FTA will coordinate with transit agencies and railroads concerning safety measures.
- The proposed FRA and FTA policy also requires light rail operators, who intend to share use of the general railroad system with conventional railroads, to comply with FRA safety rules or obtain a waiver from the appropriate rules. The policy summarizes how to obtain waivers of FRA safety regulations, including when light rail operations and conventional rail operations occur at different times. FRA also proposes that where time separation exists between light rail and conventional operations, it anticipates granting waivers concerning safety rules related to design of the passenger equipment, although waivers in other safety areas may not be granted. FRA requests that light rail operators and all other affected railroads jointly file a Petition for Approval of Shared Use. FTA will assist FRA in reviewing waiver requests. Accordingly, NJT must determine whether it will comply

with FRA safety rules or obtain a waiver from the appropriate rules based on the finalized policy procedures for the planned shared track in the second phase. As of August 1999, NJT had not requested a waiver from FRA to operate the System on the general system railroad.

2.2.4 Governance

- NJ TRANSIT is unique in that it is New Jersey's statewide public transportation corporation and is the nation's third largest transit agency. NJ TRANSIT, a governmental agency, provides the majority of passenger rail travel in the state of New Jersey and operates eleven commuter rail lines serving over 77 million trips annually on its commuter rail network.
- The 21st Century Rail Corporation ("21st Century Rail") was created for the sole purpose of the HBLRT Project. After an extensive prequalification process and two-step evaluation process, 21st Century Rail was the selected Contractor to perform the DBOM contract. Washington Group International owns 70% of 21st Century Rail in partnership with a joint venture of Itochu Rail Cars Inc. and Kinkisharyo USA.
- From an operations standpoint, the private sector partner in a PPP should be given incentives to perform at or above the public agency's desired performance standards. NJ Transit discovered that its DBOM contract for the Hudson-Bergen LRT project did not adequately address the quality of service to the traveling public. While the consortium received a penalty or bonus for on-time performance, there were no incentives for station cleanliness or notification of customers of changes in service or other announcements, which became an issue. This experience highlights the need for detailed performance standards and proper incentives for performance.

- In March 1999, FTA notified NJT that it hired an accounting firm, Walker & Company, to perform a financial capacity assessment of NJT. Walker & Company will analyze specific financial issues to assess NJT's ability to perform under its full funding grant agreement with FTA. The firm's assessment will include a review of the financial condition of NJT and the reliability of its funding partners, and its financial capability to operate the System. The assessment will also track funding sources. According to the FTA Director of Operations and Program Management, Region 2, this assessment is being performed to comply with the FTA Administrator's fiscal year 1999 policy decision requiring financial capacity assessment for all recipients of full funding grants.
- The design of the Hudson-Bergen LRT MOS-1 was by a subcontractor, which created coordination and communication issues between the project's designer and operator. The lead for the DB consortium designed Hudson-Bergen LRT MOS-2 directly, and was more responsive to civil and system's needs, which achieved a better product more easily.
- In New Jersey, the Department of Transportation currently has a limited ability to enter into public/private partnerships (P3). The only major rail-related P3 projects involving the NJDOT or NJ TRANSIT stemmed from 1997 legislation that authorized a limited number of these initiatives to test the viability of the concept. In 2002, after the original five-year pilot period expired, the P3 legislation was not renewed.
- In 2010, the New Jersey Privatization Task Force's final report to Gov. Chris Christie endorsed the enactment of broad-based legislation that would allow both the state and local governments to enter into P3s without requiring state authorization for each individual project. It also recommended that a process be established to entertain unsolicited privatization proposals. The Commissioner of Transportation has the statutory

ability to plan, design, construct, equip, operate, improve and maintain, either directly or by contract with any public or private entity, a railroad, subway, street traction or electric railway, or connecting roadways and facilities for the purpose of carrying freight within the State or between New Jersey and other states.

- The Commissioner is also authorized to enter into agreements with public or private entities or consortia for the loan of federal funds appropriated by the NJDOT to finance all or a portion of the costs incurred for the planning, acquisition, engineering, construction, reconstruction, repair, and rehabilitation of a transportation project. Pending legislation (S510) would authorize the Commissioner of Transportation, in each state fiscal year to select any transportation project from the list of transportation projects for which monies have been appropriated in the annual appropriations act to serve as a public-private partnership project. The "public partner" could be the NJDOT or NJ TRANSIT.
- PPP projects could encompass the planning, designing, constructing, equipping, operating, financing, and/or maintenance. Projects would be evaluated on the basis of its overall benefit to the state; the qualifications and financial strength of the private partners and their responsiveness to the public partner's requirements; the total project cost to be incurred by the public partner; the nature of project financing; the revenues to be generated by the project on behalf of and in support of the state, and the impact of any direct or indirect user fees involved in the arrangement. Any financial participation by the NJDOT or NJ TRANSIT in a PPP project would be subject to legislative appropriation and the availability of funds.

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Case 4- I-77- North Carolina

1. Project Information

1.1 Overview

The North Carolina Department of Transportation (NCDOT), in partnership with the Federal Highway Administration (FHWA), is proposing improvements to 26 miles of I-77 from the Brookshire Freeway (Exit 11) in Mecklenburg County to N.C. 150 (Exit 36) in Iredell County with the inclusion of High Occupancy/Toll (HOT) lanes.

HOT lanes are managed lanes that allow free use for eligible carpoolers (three passengers or greater), buses, and motorcyclists, while allowing other drivers into the HOT lane for a fee. The number of cars using these lanes can be controlled by varying the fee to encourage free-flowing traffic in the HOT lanes at all times, including morning and evening rush hour. The price would be higher during peak periods when demand is greater, and lower during less congested periods. If a motorist doesn't want to pay the toll, they can still use the general purpose lanes at no cost. This project will not remove or add general purpose lanes.

This portion of the I-77 corridor currently experiences significant congestion; future traffic forecasts/projections show the congestion worsening if no improvements are implemented. Improvements to the corridor face physical, environmental, and financial constraints, requiring innovative solutions. The purpose of this project is to improve mobility and travel time reliability by managing the traffic flow along these critical portions of I-77. Objectives for this project include:

- Adding capacity through the corridor;
- Ensuring integration with other projects in the corridor;

- Using variable pricing to facilitate long term congestion management;
- Minimizing public contribution and financial burden;
- Bringing private capital to allow innovative financing approaches;
- Operating speed standards during morning and afternoon peak periods; and
- Achieving an average speed of 45 mph in HOT lanes, or 80 percent of current posted speed limit for general purpose/HOV lanes.

1.2 Project Details

- The proposed project is a conversion and expansion of the current High Occupancy Vehicle (HOT) facility, which will provide additional capacity to I-77.
- The Southern Section (I-3311-C) of the corridor extends from the Brookshire Freeway near Tryon Street onto I-77 North for approximately two miles and along I-277 from I-77 to N. Brevard Street in Uptown Charlotte..... This portion of the project requires right-of-way acquisition, along with current HOV lane conversion and new HOT lanes adjacent to the existing general purpose lanes. Initial concepts include a flyover bridge providing direct access from I-77 to I-277. In addition, the southbound lanes on I-77 that were narrowed during construction of the existing HOV lanes will be widened. A total of two HOT lanes will be provided in each direction.
- The Central Section (I-5405) of the corridor begins at the I-85 interchange (Exit 13) and continues approximately 15 miles to Catawba Avenue (Exit 28) in Cornelius. This section includes converting the existing HOV lanes to HOT lanes, providing two HOT lanes in each directions.

- The Northern Section (I-4750AA) of the corridor begins at the Catawba Avenue interchange and continues approximately 9 miles to N.C. 150 (Exit 36) in Iredell County. In this section, one HOT lane will be built in each directions.
- In addition to designing, financing and building new infrastructure, the concessionaire will be required to:
    - retain, repave and refurbish the existing general purpose lanes,
    - set up and operate an all-electronic toll system interoperable with 6B+ sticker tags and E-ZPass, and maintain specified traffic speeds with management of vehicle density using dynamic pricing

1.3 Partners

- This project is a state partnership initiative led by NCDOT, Mecklenburg-Union Metropolitan Planning Organization (MUMPO) and the Federal Highway Administration (FHWA).
- Private partners: Cintra Infraestructures S.A, a subsidiary of Spanish infrastructure developer Ferrovial, was selected to design, construct, finance, operate and maintain the I-77 HOT Lanes project. The other principal members of the Cintra team are Ferrovial Agroman (Ferrovial's construction subsidiary) and W.C. English Construction Company of Lynchburg, Virginia, the joint venture contractors, and The Louis Berger Group, Inc., lead designer, headquartered in Morristown, New Jersey.

1.4 Funding

- State and Federal funding: toll revenues, NCDOT Proposed Funding / TIFIA & PABs
- Private equity

- Revenues generated by the facility will defray the costs of construction, operations, maintenance, and financing first and deliver a reasonable rate of return to the private sector investors second.

1.5 Project Timeline

- In 2007, NCDOT partnered with the South Carolina DOT, City of Charlotte DOT and other regional agencies in the Fast Lanes study. This report analyzed existing and planned highways in ten counties to identify where HOT/HOV/truck-only facilities could help reduce congestion. The study identified the I-77 North corridor as a high priority.
- In 2009, a feasibility study was conducted to consider converting the existing HOV lanes on I-77 to HOT lanes, and to extend the converted lanes to Catawba Avenue (Exit 28) in Cornelius.
- In July 2011, the MUMPO amended their 2035 Long Range Transportation Plan (LRTP), with the inclusion of I-5405 (one HOT lane in each direction).
- In 2012, NCDOT began exploring the use of HOT lanes and variable tolling to address long term congestion management in the corridor, minimizing public contributions and utilizing private capital.
- In June 2012, the MUMPO amended its 2035 LRTP and 2012-2018 TIP to include converting the existing HOV lanes to HOT lanes, adding a second HOT lane between I-85 (Exit 13) and I-485 (Exit 19), and building two new HOT lanes between I-485 and Catawba Avenue.
- In May 2013, MUMPO again amended its 2035 LRTP and its 2012-2018 TIP to include I-3311C and I-4750AA to provide HOT lanes along I-77 from I-277 (Brookshire Freeway) in Mecklenburg County to NC 150 (Exit 36) in Iredell County.

- In July 2013, Environmental Assessment was completed.
- In October 16, 2013, FHWA approved the Finding of No Significant Impact document FONSI. The FONSI is the final document issued for this project. A FONSI is prepared when environmental analysis and interagency review determine a project has no significant impacts on the quality of the environment.
- Fall 2014, Construction is expected to begin.
- Late 2017, the facility will be open to traffic.

2. PPPs Key Issues

2.1 Findings from Interview on 05-27-2014

Case 04- I77, High Occupancy/Toll (HOT) Lanes, North Carolina

1. What is your title?

Answer: Technical Service Administrator.

2. How many years of experience do you have with highway transportation projects?

Answer: 22-23 years of experience.

3. What role did your agency play in the formation of the PPP for this project?

Answer: To give you a little of bit of my history, my previous position when the procurement of the project began, I was the designated authorized rep for the DOT on the procurement; so I was really involved in all the aspects, financial, commercial, technical, and legal. But my background is technical and contractual related.

4. Could you briefly describe the key points of the procurement process utilized for this PPP?

Answer: There were so many. The project is the first competitive PPP project DOT has ever undertaken so it's a lengthy procurement, and in fact the procurement is not technically

complete. It was lengthy because every piece of the RFP needed new policy decisions that we had to address seriously prior to the advertisement of the project. We had to revalidate our decision during the procurement whether we had to go with availability payment or revenue risk deal. We had decided to go with revenue risk procurement, and we maintained that position. But the bidders had difficulties with some of the public protections we put in place and other issues surrounding the revenue risk deal, we had to reconsider the availability payment. We did not go with that option ultimately. And we maintained revenue risk because on the financial side, we wanted to make sure that we had a share in upside revenue; we wanted to make sure that if there's a refinance of the deal, there would be a refinancing gain share available to us; we wanted, this is a big one, the cap that puts a maximum on funds available from the public side. This maximum amount of public funding was also a point of discussion. The cap was 170 million dollars, and the state will not contribute more than that, and which their bids will be limited to. We're also subsidizing every year a million dollar for maintenance of exiting assets. We also have some kinds of credit enhancement tools in place that allowed for additional funds to be available from the public sector in the event that their base case debt ratio falls below one to one because their capital is limited too.

Procurement also had to address issues like risk sharing, risk allocation, primarily dealing with interest rate, benchmark, credit protection between the time proposals are received and financial close anticipated. And other risk sharing mechanisms also were discussed during procurement. I think the risk allocation was a big factor in the decision to go with PPP. Another reason was that it's a brown field project that would be converting into HOV lanes and adding HOT lanes directly adjacent to general purpose lanes; we had to make some very big decisions about the split of operation and maintenance responsibility. Ultimately we

decided to have the operator operate and maintain the exiting general purpose lanes and all converted HOT lanes so that everything would be maintained at same standard.

5. **So did North Carolina DOT do a condition assessment (CA) of the exiting lanes that becomes a contract baseline for the state of the assets the concessionaire is taking over**?

Answer: The agreement provided for that kind of mechanism. We did not do a formal condition assessment prior to turning it over. However, we put in the contract that if it didn't meet the performance or maintenance standard then there's a lag period of time that they can get it up to standard. We don't expect from day one to improve the whole facility to contract standard. Moreover, even though there wasn't one document called baseline assessment, we do have a lot of asset inventory information for them, for example specifications, inspection reports, the latest seismic reports.

6. **What were the main topics of negotiation during procurement in the order of importance? What were the most important risk factors that were addressed during procurement or covered in the PPP agreement? How were those risks managed between the parties involved in the PPP**?

Answer:

a) Technical standpoint: O/M and Renewal work for capital improvement along the corridor throughout the term. For instance, we turned the maintenance of our general purpose lanes over to the proposers. And the question became "Well what if the existing pavements were deficient to the point where a capital improvement project like a million dollar mill and overlay operation, or a full depth replacement is required." Therefore we ended up committing that we'd do that at our cost,

where the routine maintenance, like pothole filling, painting and so forth would be theirs. If major rehab is required, we'd take that on to a limit according to the renewal cycle over the 50-year term and to third party inspections.

b) Instructions for the compensation events and release events in time: they were thorny simply because there were a lot of events that developers want to make compensation events that we're not willing to do. So just wrestling through which were our compensation events, which were on the developer's risk was a big issue commercially.

c) Competing facilities: there were a lot of discussion about that. It's broad and gives us quite a few options in the future.

7. How was the concession term (length) determined?

Answer: There were two main factors. Our current legislation said that it cannot be more than 50 years once full revenue begins so once the facility completes and opens to toll traffic, the 50-year term limit for the project kicks in. But even before that we're really balancing the financial viability of the project. Of course the developer wants it to be as long as possible because the payout really is encouraging at the end of the term versus the public perception of turning something over for 99 years. What we determined was that a 50-year term was a good break point to show the project, in our eyes, was viable, which could be handled from the public perception standpoint and the contract administration standpoint. Internally, we'd done a T&R [Traffic and Revenue] analysis, and we confirmed that we had a viable project for that 50-year length.

8. How was the project delivery method determined, and by whom?

Answer: North Carolina DOT using T&R analysis for instance.

9. Did you have small but vocal groups against the project or to the whole concept of PPPs?

Answer: Yes, for both the specific project and for the concept of PPP, the same group by and large. I'd characterized it as relatively small, vocal, and well organized opposition. It's beneficial that the statute of limitation for public action had expired under MAP 21. We had a number of public meetings just to address all of these concerns raised by the local citizen groups. Elected officials by and large and the metropolitan and planning organizations highly supported the project. Our financial close is scheduled later this year, and we need to wait and see what happens as that date gets closer.

10. How was this project funded?

Answer: In essence, the whole project was about a 650 million-dollar investment, which include overhead, bidding cost, and other things, but the infrastructure cost itself is 500-550 million dollars. Less than 100 million of this amount was actually bid, more like 90 or 98 million specifically, from the public fund amount. The rest was equity and debt under the responsibility of the private developers. We had a 170 million dollar cap, to which the proposers' bid would be limited. We were pleasantly surprise that if we excluded the public fund amount, the split between debt and equity [Debt to Equity ratio] was pretty balanced. We expected less equity and more debt, but the successful proposer put in almost as much as equity as debt. There's no public debt (revenue bond, general purpose bond, GARVEES fund, etc.). It's all our typical federal and state funding. We do anticipate TIFIA (Transportation Infrastructure Finance and Innovation Act) and PABS (Private Activity Bonds) as the debt, but that will be assumed by the developer's. I wouldn't say we just turned it [TIFIA] all over to the private developer because we did a lot work with TIFIA

office in advance and during the procurement. We eventually came to a term sheet that was conservative that bidders could use in formulating their bids. In addition, if they negotiated, as we anticipated, a better term in the final term sheet, we'd share the upside with them. I think it makes thing simpler in this way. The argument that we made in adopting PPPs was the fact that we can bring in a good expertise and innovation to the table with the hope that private partners may indeed more successful.

11. **Does the PPP contain a clause prohibiting the state from building additional highway capacity that could divert traffic from the PPP project**?

Answer: Yes. See earlier comments. It is very broad. The trend is away from restrictive non-compete clauses such as the ones used several years ago in California and Indiana.

12. **Do you have broad PPP enabling legislative in your state or is PPP authorized on a project-by-project basis**?

Answer: We actually passed the legislation in 2006 or 2007. There was a glitch in that legislation that we later fixed in 2008 and 2009. Currently, we are allowed to do three PPP projects. We'd expect that if I-77 is successful, there'd be a relaxed permitting legislation. Our design build program back in the late 90s and early 2000s was the same thing where they gave us authority to do three trial projects, and that quickly went to 25 per year. The legislation was changed four or five years ago to take all the limits off the design build procurement, and in fact there was legislation's requiring us to increase the use of design build. I think P3 for us is taking the design build track 10 year later.

13. **Public and industry get used to a very structured, traditional procurement process where there are sets of documents, plans, specification, DOT procedures, and standards and everybody understands what those are and there is limited discussion**

between parties before summiting their bids to make it fair. However, given the complexity of PPPs, what do you think about this whole process, is it more of the relational contracting where you try to make sure everybody is bargaining in good faith with enough information to prepare responsive proposals?

Answer: You're absolutely right. An owner needs to realize that the procurement does take a very different form; it's much more intense; and much more relational. We haven't had much concern from the public on this job or our legislature, or our local stakeholders. It's primarily because we have a pretty robust design build program. We had about 75 different one-on-one meetings or calls with three of our four bidders such as conversation, and Q&A sessions during the procurement and such. We're approaching about 5 billion dollar design build. So I think we're used to that. PPP is kind of design build on steroids.

14. **How complete was the contract in terms of scope definition? Does the PPP contract include more "good faith and fair dealing" clauses than a typical General Contract, or Design-Build contract would typically utilize? In your opinion, is there a higher level of mutual trust on the PPP project than would exist if a General Contract or Design-Build contract had been utilized?**

Answer: It's technically incomplete.

15. **What are major lessons learned from the use of PPP on the project**?

    Answer: Be prepared culturally and organizationally. Have a dedicated team for the project in place that knows how to meet the deadlines, the criticality of meeting those deadlines. For example, we have a team that includes our CFO [Chief of Finance Officer], myself, and my staff that would do all the writing and reviewing of technical specifications. We are the same group that would review the plans when they come in; we

are the same group that take the lead to get the NEPA [National Environmental Policy Act] work done. We staff up to the point that we could start NEPA, conclude NEPA, handle procurement, and at least a portion of design, permitting, and right-of-way acquisition. We're all under one roof. That really benefits us and the project. I think the old style or approach in government organization would not serve this kind of project. Again design build took a lead for us because we have design build group, the same folks that managed the procurement are the ones that are writing the RFP and are the same ones that reviews the plans. It's the cradle to crave process.

2.2 Findings from Archival Record

2.2.1 Economic

- The funds needed to improve and expand the highway infrastructure were inadequate. The NCDOT faced the quandary of not only doing more with less, but also each project was necessary to complement the others, yet two of the three were not slated to start until 2015, at the earliest.
- $53 B NCDOT funding Gap for 2018-22 ($63 B summited versa $10 B available)
- $6.3 B MUMPO-Highways funding Gap for 2035 Long Range Transportation Plan ($9.1 B needs vs $2.8B funded).
- $12 B gap funding gap for capital projects and maintenance in Mecklenburg County.
- Direct NCDOT funding of HOT lane (or GP equivalent) construction cost is not affordable under the current TIP funding and not available until 2030.
- Practice shows congestion relief is temporary.
- Fast Lanes Study Performed between 2007 and 2009
    - Presence of Traffic Congestion

  - Physical Conditions of Road
  - Evaluated all types of managed lanes (HOV, HOT, truck-only toll)
  - Co-managed by NCDOT and City of Charlotte
  - Analyzed 12 freeway and arterial corridors (340 miles in 10 counties) for Fast Lanes feasibility.

- Funding Issues
  - Federal-Aid: derived from federal fuel tax (18.4 cent gas tax, 24.4 cent diesel tax; annual formula-based apportionments to states, can pay for core programs, intrastate and secondary roads; subject to equity formula (NC); core programs have specific purposes, thus limited flexibility; flat long-term growth when considering inflation- disappointing results from federal reauthorization bill- obligation authority only 86 percent Reduced Federal Outlook.
  - Highway Fund: derived from state fuel tax (29.2 cents) and fees (inspections, license fees, registration, etc.); can pay for maintenance, Powell Bill, transit, bridges and operations; not subject to equity formula; not used for TIP highway projects; flat long-term growth when considering inflation – recent fee increases helped
  - Highway Trust Fund: derived from state fuel tax (9.7 cents); fees, and 3% Highway Use Tax, established in 1989; has specific statutory purposes; primarily for completion of 3600-mile intrastate system and construction of designated Urban Loops; intrastates subject to equity formula, but secondary roads, urban loops, and Powell Bill are not; positive long-term growth – Governor's budget

reduced General fund transfer from $250 M to $170 M but trust fund is restricted to projects mandated by the Legislature

- Funding sources:
    - NCDOT will cap HOT lane contribution up to $170 M.
    - NCDOT wishes to maximize the use of private project financing and toll revenues
    - NCDOT will pursue the availability and use of federal assistance programs.
    - NCDOT funding of HOT lanes can leverage private sector finance on 1:2 basis funded through estimated toll revenues.
    - Revenues generated by the facility will defray the costs of construction, operations, maintenance, and financing first and deliver a reasonable rate of return to the private sector investors second.
    - Public funding will be provided for operations and maintenance for General Purpose Lanes.
    - For developers, these are potential sources of financing: TIFIA and PABs. For example, the project currently has an invitation to apply for a TIFIA allocation of $57M. NCDOT is pursuing additional allocation for TIFIA through TIGER IV and/or notice of funding availability (NOFA).
- Strong forecast for economic and population growth in the region
    - City of Charlotte population is anticipated to grow approximately 70% between 2012 and 2030
    - Mecklenburg County population is anticipated to grow approximately 75% between 2012 and 2030

- Iredell County population is anticipated to grow approximately 19% between 2012 and 2030
- Metropolitan Statistical Area (MSA) is anticipated to grow approximately 250% between 2102 and 2030
- 6,873 new companies located between 2007 and 2012 have led to an increase of:
- 71,601 jobs
- $9 037 2 million investment
- Iredell is one of the five lowest tax rate of 100 NC counties.
- Mooresville-Statesville is ranked as the fastest growing micropolitan region in the US, 8th time in past 10 years.

2.2.2 Procurement

- I-77 project is a state partnership initiative led by NCDOT, MUMPO and the Federal Highway Administration. It's currently advertised by NCDOT as P3 project.
- The procurement involves a two-stage process: Request for Qualifications ("RFQ") followed by selection of a short list and draft/final Request for Proposals ("RFP").
    - The procurement will be aligned with environmental approvals for the South, Central, and North sections.
    - At minimum NCDOT anticipates a financially committed hard bid on the Central Section.
- Four potential bidders were shortlisted and participated in more than 70 intensive, one-on-one meetings with NCDOT. These meetings helped NCDOT produce several drafts of the final contract documents. These documents lay out the instructions for bidding, the design, construction, and maintenance performance requirements and the overarching

agreement. They reflect the minimum contract requirements and the public protections that we require (e.g. bonding, insurance, termination rights, revenue sharing, etc.)

- The apparent best value proposer was announced on April 11, 2014 as Cintra Infraestructures. Cintra proposed a total project investment of $655 million for a 50-year concession, of which only $88 million is the NCDOT contribution (less than the $170 million cap). The private partner will be responsible for managing the design, construction, finance, operation of the project as well as the maintenance (DBFOM) of the managed lanes and the existing general purpose lanes.
- Bids were due on March 31, 2014 and one bidder submitted a compliant technical proposal and financial proposal. The proposals were subjected to roughly 200 pass/fail criteria and further evaluation of the relative merits of their technical proposal.
- State law requires certain reporting to the Joint Legislative Transportation Oversight Committee. This report is being prepared now and should be provided to the committee members in the coming weeks. After a 60 day waiting period, the contract can be executed and the contracted design, permitting, and site investigation work can begin. Then the private partner's loans and private equity will be secured leading to "financial close." We anticipate that financial close will occur in the fourth quarter of 2014. After financial close, permits will be secured and construction can begin. Construction is expected to be entirely complete in 2018.

2.2.3 Risks

- All right of way (ROW) will be acquired for and in the name of NCDOT. Concessionaire performs ROW acquisition services.

- Concessionaire is responsible for acquiring permits; the handling and remediation of hazardous materials; and all cost and schedule risks, subject to certain exclusions.
- Design risk
- Construction risk- delivery to time and cost
- Concessionaire will be assessed liquidated damages for failing to achieve final acceptance of each Project Section and final completion of all Project Sections by the required deadlines. It will be assessed liquidated damages for lane closures outside of prescribed hours Operations, Maintenance and Renewal (OMR).
- Concessionaire is responsible for "fence-to-fence" OMR services based on prescribed performance specifications applicable at all times.
- Revenue risk taken by concessionaire.
- Concessionaire O&M Plan specifies operating procedures (including incident and emergency response), scheduled routine maintenance, Renewal Work, and planned lane closures. These O&M performance specifications linked to liquidated damages and contractual remedies in a way that:
    - NCDOT may increase oversight or perform condition assessment at concessionaire's cost
    - NCDOT may force concessionaire to change the O&M contractor
    - Severe and persistent noncompliance triggers NCDOT termination rights
- NCDOT may take back maintenance on GP Lanes and cancel the corresponding payment at any time.
- According to the contract, the private partner is required to hand the facility back to us in good condition at the end of the term.

- I-77 P3 Concession term:
    - Toll concession for 50 years post-construction
    - Toll revenue risk assumed by concessionaire
    - Revenue sharing agreement if toll revenue exceed forecasts
    - Fixed public contribution paid during the construction period on a pro rata basis with debt and equity
    - Fixed annual payments for maintenance of the General Purpose (GP) Lanes
    - Vehicles exempt from tolls include HOV 3+, motorcycles, CATS buses, emergency vehicles
    - Trucks with 3+ axles are precluded from using the HOT Lanes
    - Congestion management using dynamic pricing
    - All electronic toll facility interoperable with NC Quick Pass & EZ Pass, etc.
- Current agreements may provide for possible compensation to be paid to the private operator if the construction of facilities that were not planned when the agreement was executed results in a proven reduction in revenue for the partner. Private investors take into account everything that may be included in the region's long-term plans, whether currently funded or not, when making their traffic and revenue projections.
- NCDOT is working with FHWA and resource agencies to finalize timing for Environmental Approvals for the South and North sections (expedited within 12-14 months).
- Additional right of way will be required south of I-85 under Build Alternatives 1 and 2 (Alternative 2 is the preferred one), but not Build Alternative 3.
- Unplanned Revenue Impacting Facilities:

- NCDOT is not prohibited from constructing new transportation facilities within the ROW; concessionaire may be entitled to compensation for Unplanned Impacting Facilities.
- Unplanned Impacting Facilities means any limited access main lane of a highway that did not exist within the Project ROW prior to the Effective Date EXCLUDING the following: the HOT Lanes and GP Lanes part of the scope of work; a capacity improvement that the concessionaire builds or one for which NCDOT grants the concessionaire operating rights; all transportation projects included in any capital improvement plan or similar document that has been adopted by a Governmental Entity; all improvements necessary for improved safety, maintenance, or operation; all improvements to improve traffic capacity such as: 1/ localized operational improvements that add or reconstruct or restripe lanes, 2/ new or improved frontage roads, crossing streets, grade separation, 3/Technological improvements such as "smart vehicles," ITS, ramp metering, etc. and 4/ Passenger and freight rail projects or other transportation modes.

- Default, Remedies, and Termination
  - NCDOT may terminate the agreement for concessionaire default in the event the concessionaire and/or lender fails to cure within the applicable cure period
  - In no event under a termination for concessionaire default is equity repaid
  - NCDOT may terminate the agreement for convenience in NCDOT's sole discretion
  - The concessionaire is limited to recovering the amounts set forth in the contract
- Financing, Refinancing and Lender's Rights:

- NCDOT does not assume the risk of any private financing and assumes no liability under any financing agreements between the concessionaire and its lenders.
- Concessionaire must reach financial close by the specified deadline; otherwise, the concessionaire's $15 million financial close security will be subject to forfeiture.
- NCDOT will share in 50% of the gain for certain project refinancing.
- Lenders have the right to cure and step-in in the event of a default by the concessionaire.

2.2.4 Governance

- NCDOT would be the primary project Sponsor NCDOT/NCTA could likely run toll collection and account management.
- All local, state and federal agencies would be involved and have a stake in a successful outcome.
- NCDOT held citizen information workshops and industry forum.
- An extensive public outreach campaign is currently under development. First NCDOT have to identify alternatives that are financial feasible to attract private sector investors. The goal is to inform and educate the public regarding how HOT lanes will help address current and future congestion.
- The Cornelius Transportation Advisory Board on Thursday (01/03/2013) came out against proposed toll lanes for I-77 north of Charlotte and urged local leaders to push for alternatives for widening the congested highway. In a special meeting at Town Hall, the advisory board of local residents unanimously approved a resolution calling tolls a "financial burden" on Lake Norman area residents. The statement also argued that the state's toll-financed widening plan won't improve commuting times on I-77.

- Continue stakeholder collaboration, updates and input P3 legislative authority in North Carolina NCDOT is authorized to enter into P3 contracts with a private entity to design, build, finance, operate and maintain transportation infrastructure projects, and to finance these projects through tolls and other financing methods authorized by law. (N.C.G.S. 136-18(39).
- NCDOT is authorized to fix, revise, charge and collect tolls and fees on the I-77 project (N.C.G.S. 136-18(39a)c).
- NCDOT may assign its power to fix, revise, charge and collect tolls on the I-77 project to a private entity through a P3 contract (N.C.G.S. 136-18(39a)c).
- I-77 contractual documents
    - Instructions to Proposers (Vol. I)
    - Comprehensive Agreement (Vol. II, Book 1)
    - Technical Provisions (Vol. II, Book 2)
    - Specifications, Standards and Manuals (Vol. II, Book 3).
- Tolling has been accepted in North Carolina as a means to improve road infrastructure and address capacity needs.
- NCDOT anticipates the project will be tolled through a 100% all electronic tolling (including video) toll plaza-free open road system requiring no reduction in speed. It will utilize dynamic tolling set to meet, at minimum, SAFETEA-LU level of service of 45MPH.
- The Advisory Team is composed by the following:
    - Technical Review Committee - NCDOT, FHWA support
    - RayStrategies LLC – Strategic and Commercial Advisory

  - KPMG Corporate Finance LLC – Financial Advisory
  - Nossaman LLP – Legal Advisory
  - Parsons Brinckerhoff - Technical Advisory
  - Stantec – Technical Advisory
  - Atkins and RK&K – Technical Advisory
- NCDOT approves O&M Plan and performs oversight and audits.
- NCDOT retains responsibility for OMR of some overpasses and repaving of GP lanes.
- NCDOT oversees the design and construction work to ascertain that it is performed in accordance with the contract.
- Tolling Back Office and Interoperability
  - Proposers will choose the firm they wish to perform the services, but will maintain interoperability and compliance with the existing tolling systems and requirements
  - NCDOT may consider allowing the Developer to contract with the North Carolina Turnpike Authority to provide certain toll services, if it provides best value to the project
  - The concessionaire may provide tolling solutions to the project at their sole discretion
  - Proposers may not exclusively team with a toll integrator/operator during the RFQ phase
  - Leveraging finance for construction through tolling
- Concessionaire establishes a self-monitoring program to ensure a safe and reliable roadway system in accordance with the OMR standards
  - Cure Periods set to provide incentives for sound self-monitoring program.

    - No Cure Period available if NCDOT notifies Developer of noncompliance.
- Revenue over a pre-determined and agreed amount is to be shared with NCDOT on an increasing scale. The more revenue the developer earns, the larger the share of that revenue goes to the state to improve the area surrounding the corridor. This prevents the possibility of exorbitant profits for the partner.
- Renewal Work:
    - Concessionaire is responsible for performance of Renewal Work (i.e. reconstruction, rehabilitation, or replacement) for all project elements (but for some overpasses and repaving of GP lanes) to meet all OMR performance requirements for the duration of the contract.
    - Annual inspections of pavement and bridges performed by independent third party, jointly appointed by NCDOT and the concessionaire; Renewal Work programmed as part of annual O&M Plan updates Handback Requirements.
    - Handback Requirements specify asset conditions at the end of the contract including Residual Life
- Five year before the end of the contract, the concessionaire shall:
    - Establish and fund a reserve account ("Handback Requirements Reserve") held by a trustee or make available to NCDOT a letter of credit to fund Renewal Work necessary to meet Handback Requirements
    - Submit Renewal Work Plan five years before the end of the term that sets out how it will perform inspections and work to meet Handback Requirements and plan for transition

- NCDOT and concessionaire perform inspections to assess conditions and Residual Life of project elements, update Renewal Work Plan, plan Renewal Work needed before Handback, and adjust Handback Requirements Reserve
- Concessionaire must complete all Renewal Work to meet Handback Requirements prior to the end of the contract

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Case 5- I-595 Corridor Roadway Improvements- Florida

1. Project Information

1.1 Overview

The I-595 Corridor Roadway Improvements project consists of the reconstruction and widening of the I-595 mainline and all associated improvements to frontage roads and ramps from the I-75/Sawgrass Expressway interchange to the I-595/I-95 interchange, for a total project length of approximately 10.5 miles. The project passes through, or lies immediately adjacent to, six jurisdictions: City of Sunrise; Town of Davie; City of Plantation; City of Fort Lauderdale; Town of Dania; and unincorporated areas of Broward County. A major component of the project is the construction of three at-grade reversible express toll lanes to be known as 595Express, serving express traffic to/from the I-75/Sawgrass Expressway from/to east of SR 7, with a direct connection to the median of Florida's Turnpike. These lanes will be operated as managed lanes with variable tolls to optimize traffic flow, and will reverse directions in peak travel times (eastbound in the AM and westbound in the PM).

The project is being implemented as a public-private partnership between Florida Department of Transportation (FDOT) and a private concessionaire to design, build, finance, operate, and maintain the roadway for a 35-year term. FDOT will provide management oversight of the contract; will install, test, operate and maintain all tolling equipment for the express lanes; and will set the toll rates and retain the toll revenue.

1.2 Project Details

The Project is designed to expand the current corridor by adding improvements including[5]:

- Auxiliary freeway lanes to add traffic capacity
- 3 reversible managed toll lanes in the median, with variable toll rate set by FDOT to maintain free flow ("express lanes")
- Extension of the SR 84 to make a continuous frontage road which will allow some local traffic to avoid the mainline of I-595
- Redesign and reconstruction of interchange entry and exit ramps to reduce weaving conflicts and facilitate movements between I-595 and Florida's Turnpike
- Sound barriers and other environmental improvements.

1.3 Partners

- Concessionaire: I-595 Express, LLC (ACS Infrastructure Development and TIAA CREF (50/50 split of the equity portion on loan))
- Subcontractors/Sub consultants:
    - Dragados USA Inc. - Design-build contractor
    - AECOM Technical Services, Inc. - Lead engineering firm
    - HNTB Corp - Construction engineering and inspection
    - Roy Jorgensen Associates, Inc. - Operations & Maintenance
- Project Advisors / Consultants
    - To Sponsor:
        - Dewey & LeBoeuf LLP - legal

[5] FDOT also plans to deploy a Bus Rapid Transit ("BRT") service using the express lanes; however the cost of and responsibility for the BRT remain with FDOT and are outside of the scope of the concession contract. Transferring these responsibilities was never considered and is not part of the VfM analysis.

        - Macquarie Capital (USA) Inc. - financial
        - Scott Wilson, Plc. - technical
    - To Lender:
        - Simpson Thacher & Bartlett LLP - legal
    - To Authority:
        - Nossaman LLP - legal
        - Jeffrey A. Parker & Associates, Inc. - financial
        - Reynolds, Smith and Hills, Inc. - technical
        - The Corradino Group - construction oversight
    - To USDOT TIFIA JPO:
        - TIFIA Legal Advisor: Hawkins Delafield & Wood LLP
        - TIFIA Financial Advisor: Taylor-DeJongh

1.4 Funding

The total project cost is $1,833.6 million (present value in 2009 dollars, given a 5% discount rate) consisting of:

- State and federal resources
    - Support FDOT's final acceptance payments ($686 million YOE)
    - Availability payments ($65.9 million annual Maximum Availability Payment [MAP] in 2009 dollars) made to concessionaire (Federal aid receipts, state motor fuel tax receipts, toll receipts)
- Concessionaire's financing sources for repayment:
    - Senior bank debt - $781.1 million (backed by final acceptance/availability payments)

- TIFIA loan - $603 million + capitalized interest during construction (backed by final acceptance/availability payments)
- Equity - $207.7 million
- Revenues - $10.0 million
- FDOT qualifying development funds - $232 million

1.5 Project Timeline (Updated March 2014)

The I-595 Express Corridor Improvements Project has been divided into five construction segments, A through E, to help expedite the work.

- On March 3, 2009, FDOT signed a PPP agreement with I-595 Express, LLC as the concessionaire.
- In June 2009, construction began.
- In February 2010, roadway construction began in Segment C in the vicinity of Pine Island Road. Eastbound travel lanes on I-595 between Nob Hill Road and Davie Road were shifted in early June to their permanent location.
- In June 2010, construction in Segment D started.
- In November 2010, segments A and B officially got underway.
- In March 2011, the final segment of the project, Segment E on Florida's Turnpike, started with the construction of ground mounted sound barriers along Florida's Turnpike both north and south of I-595.
- In February 2014, the last bridge in the entire project to be constructed and opened was in the interchange.
- On Wednesday, April 9, 2014, FDOT began collecting tolls electronically on the 595 Express Lanes.

- Construction is expected to finish this summer 2014.

2. PPPs Key Issues

2.1 Findings from Interview on 05-27-2014

Case 05- I-595, Florida

1. What is your title?

Answer:

- Construction Project Manager,
- Project Finance Manager,
- Project Finance Officer,
- Manager of the Office of Strategic Initiatives (part of Florida DOT).

2. What role did the office of strategic initiative, which is a part of FDOT, play in the formation of the PPP for this project?

Answer: We are part of FDOT. This's actually a group of several staff in central office that can handle the innovative contracting P3. We have the financing group, procurement group, legal group, and typical engineering group. We have all of these groups working together on PPP's. We have probably 8 to 10 of people working on these initiatives for 6 or 7 years. But we are not a part of a formal office for P3. We all have our day job with other responsibilities in our areas of expertise. In other words, we don't have a dedicated P3 unit. We continue to think like the department; the fact that D. and I work for the Comptroller makes us think about the impact of P3 decision on, say, the department's finance plan or cash flow.

3. So how does your central office team, work with the Construction Project Manager, whom I assume is in a district office?

Answer: P is in a district office. We're a decentralized agency, so central office sets all the

policy and procedures to make sure that all districts are consistent with the applications of all of those. They provide a lot of high level technical supports we need, like L. and I putting all the work together to see if we can finance these types of projects. This I-595 is the first PPP project in the state that would incorporate design, build, operate, and maintenance. We've been doing design build projects, I believe, since around 1989, which at that time Federal highway administration considered as a type of PPPs. We have done design finance operate and maintain projects in the state of Florida, for example port of Miami tunnel and now we are in the procurement stage of Interstate 4 in Orlando. We've done a lot of design build finance P3 projects.

4. **Could you briefly describe the key points of the procurement process utilized for this PPP?**

Answer: We did an industry forum. One of the biggest things for the industry was the method of repayment. We'd looked at things like true toll, shadow toll, or availability payment. The predominant number of groups that come to speak with us have some kind of international component. Predominance of the groups preferred the availability repayment. This was very important to have the department get feedback from them.

In addition, we have a risk matrix. We had to discuss the allocation of different types of risks on the project, for example the right-of-way acquisition, the permitting process, utility relocation, and those types of things. Originally we're drawn in the thought that we'd shift all the risks to them, but then we listened to some of their feedback on what risks they could take, and one thing they said was "We can't insure against a hurricane in Florida." So we had to make a decision that we'd share that risk with them. Also we had some contamination on the project that we decided would be an area we'd share risk; there was a time element like

the permitting; if the permitting agency didn't turn the permit around in a reasonable amount of time. So that was the type of feedback we got from the industry. After that, we modified our risk matrix to share some risks that the industry felt they cannot take. The interaction with the industry during procurement process is important. We started out with the industry forum; we moved on to do Value of Money (VfM) analysis that we're required to give before we advertise. We issued an RFQ, which set threshold for contractors' experiences, their ability to reach financial close. We held a series of ATC, Alternative Technical Concept, meetings and a series of one-on-one meetings with the team. We helped finalize their TIFIA term sheet that's vital to this particular project. We issued the RFP. We used technical and financial scoring committees who reported to the final selection committee. We did the second VfM analysis, which is also statutorily required for pre award. We selected the best value proposal and concluded it with financial and commercial closes. Our P3 law, which your can find on our website, section 334.30 requires us to do cost and benefit, cost effectiveness analysis and public benefits. For our design build finance and operate and maintain P3 projects, we do VfM, which is typical in the industry.

5. **What were the most difficult issues to address in the procurement process? How did you address these issues?**

Answer: I can answer generally. I wasn't with the department at the time the decision was made to go with availability payment, but I know part of it had something to do with the encouragement the industry gave. Obviously, there were concessionaires that were interested in toll concession but the availability payment had a more competitive environment. Another big thing was that we made financial close in March of 2009 and we had market collapse in fall 2008. The concessionaire was originally going to go with PABs [Private Activity Bonds].

However because of the situation in the bond market, they needed to go with private banks, USDOT TIFIA loans, and their equity. The TIFIA loan is between the concessionaire and USDOT. We're not a part of it. Concerning TIFIA, we help get the ball rolling. We got the initial letter of interest, we didn't get between them, and we kind just help them along the process.

6. **How was the project delivery method determined, and by whom**?

Answer: FDOT determined the delivery method.

7. **Is your state considering the adoption of a standardized procurement process for PPPs**?

Answer: We are sensitive to the industry, listening to the industry that wants to have an efficient process, to have more deals in the pipeline, to see the overall betterment of transportation. I think the federal role is to share best practices not to prescribe because as you said every project is unique, each state has its own legislative authority and different statutes. It's hard to prescribe it nationally. It's really difficult to standardize the whole process.

8. **Given the procurement process you went through for I-595, are you reusing, fining tune, and getting better at this process for port of Miami Tunnel and I-4**?

Answer: What we used in I-595 was like the baseline for how Florida does the availability payment. But at the same time, we do have other entities out there in the market agreeing to do things and working off the I-595 model but then changing it to better fit their jurisdiction. Therefore we have to be aware of what's in the market place. The industry does a good job making us aware of what the precedents are.

9. **Is the TIFIA loan being assumed by the developer**?

Answer: Yes- see earlier comments. In addition, the concessionaire had about 208 million, shared 50/50 with TIAA-CREF. We had a concessionaire that set up a special purpose vehicle so that it's non-recourse to the corporation where that debt came from. We didn't issue bonds or anything to directly support the final acceptance payments that are scheduled for the short term or for the availability payments. The department issues bonds to support the trust fund overall, but nothing specific for the I-595 project. If you look at our obligation to make the payment, that'd be a different story. But in term of getting funding to support the project, no we haven't incurred extra debt for the project.

10. **Public and industry get used to a very structure traditional procurement process where there are sets of documents, plans, specification, DOT procedures, and standard that everybody understand what those are and that everybody don't talk to each other before summiting their bids to you to make it's fair. However, given the complexity of PPPs, what do you think about this whole process, is it more of the relational contracting where you try to make sure everybody is bargaining in good faith with enough information they need**?

Answer: We got push back on some of these issues, especially from special interest groups of people like smaller local contractors, the public didn't like the idea that foreign companies were taking over the alley. However we had to realize that this is the way to go with P3 projects. We have a very transparent process that is balanced in Florida, all the team tried to put together documents with all the best information that we had received and that the industry had at that time. That changed a lot over time. In our own thinking, we had some backlash about transparency. However the preferred method of delivery we had was pretty open. L.'s group did a great job in showing both the House and Senate and the governor's

office the value of the project, which took several months to be developed, in providing education to our upper management so that they could help explain to the public "Why we're doing P3."

11. Did you have small but vocal groups against the project or to the whole concept of PPPs?

Answer: I don't know if we had those small but vocal groups. We didn't have organized resistant against I-595. On some asset leases back in 2008, 2009, we had some local opposition in county areas.

11. What are major lessons learned from the use of PPP on the project?

Answer: You need to have a well-planned deal before going out there promoting it as a P3. Early work of our groups that went on internally and externally whether it's an industry forum or it's having the department that's open to free flowing discussions with the industry on how to deliver a project. You need to step up your effort to demonstrate why P3 is the best delivery mechanism with proven backup numbers. Moreover, you need to educate the public and elected officials when you're going through the process so that they see the benefits to their communities, people living there, the jobs creation, and why it's necessary to use P3 mechanism to advance major projects in term of timeframe like if you don't use procurement like this you may be working on a corridor for the next 10 or 15 years but with this delivery method it'd be completed in 5 years and what this means to their communities and business owners.

2.2 Findings from Archival Record

2.2.1 Economic

- Funding shortfall:

    - With current anticipated plan. Florida's projects 1 through 6 and 8 would be completed by 2017, and project 7, 9, 10, and 10A would remained unfunded from 2018-2024.
    - However, with PPPs, project 1 through 10A would be completed by mid-2014.
- One of the results of the change in the financial markets during the past two years is that the capital markets have become far more risk averse than they were prior to the near collapse of the financial system. Thus the emerging PPP structure seems to be favoring a long term commitment for O&M after delivering the project, coupled with a long term guaranteed payment with some incentives relating to availability and performance.
- Florida is better-positioned in infrastructure, but needs are increasing:
    - Florida has more than 19 million residents and will be the 3rd most populous state in a few years.
    - More than 91 million visitors in 2012.
- Challenge –gaps for new projects greater than potential bonding capacity, given conservative approach (level debt service, single project)
    - Takes time to generate revenues for system approach to bonding
    - Political hurdles with system approach -local stakeholders want to spend revenues in their county
    - Gas tax is unsustainable.
    - Federal government lacks long-term strategy
    - Aging infrastructure
- The $1,833.6 million design-build project is Florida's first P3, the largest construction project in the state, and the country's first availability-payment transportation project.

- A majority of the construction investment is going to needed improvements to the free, general purpose lanes adjacent to the HOT lanes.
- In March 2009, FDOT signed the agreement to implement the I-595 Corridor Improvements Project as the first large PPPs project in Florida using Availability Payments.
- 595 Express Lanes (tolling component) accounts for 1/3 project improvements.
- The I-595 Express, LLC, is the official borrower for the TIFIA loan. The interest rate on the TIFIA loan on this project is 3.64 % (the current TIFIA interest rate is 4.74% for a 35-year loan as of Thursday, April 15, 2010). The bank debt on this project has an interest rate of 6.58% and a 10-year maturity. There is an option to refinance these loans later through the life cycle of the project by new bank loans, bond issues, and/or Private Activity Bonds (PABs). If there is a gain due to refinancing the loans at a better interest rate, FDOT would take a share of the gains equal to 50% of the gain.
- Multiple sources of funding, TIFIA, bank loans, private equity, availability payment, revenue, FDOT.
- Key to the financial close was a $678-million (including $75 million in capitalized interest), 35-year TIFIA loan at favorable terms. ACS Infrastructure Development (ACSID), advised by Macquarie Bank, bid the project last September assuming it could issue $826 million in Private Activity Bonds. The collapse of the bond market forced it to restructure soon afterwards using a bank club. After defections and additions, a total of 12 banks plus TIFIA participated in the final deal. The TIFIA loans at the federal borrowing rate of 3.6% kept the borrowing cost within the bid budget. TIFIA disbursement was

made in March 2009, with the first interest payment due in June 2014.ACS equity is 12% of the financing at an IRR of 11.5%.

- In addition, a contingency fund of $9 million was allocated until six months after scheduled substantial completion to cover construction cost overruns and maintain minimum debt reserves.

2.2.2 Procurement

- The project is a Design-Build-Finance-Operate-Maintain (DBFOM) type PPP, with an availability payment concession model. This is the first time that an availability payment structure has been used in the United States for a highway project which allowed the public to retain control over toll rates and thereby address some of the public concerns associated with the 1st Generation PPP. FDOT will set the rates and retain all of the revenues, with Florida's Turnpike Enterprise handling electronic toll collections. Toll revenues collected from the tolled express lane system will be deposited into the State's Transportation Trust Fund (STTF).
- FDOT will take responsibility for toll setting and collection and traffic management, but finances, design, construction, 30-year O&M agreement operations & maintenance will be performed by the Concessionaire.
- Some issues of concern for proposer teams included risk allocation for delays or extra costs associated with utility relocation, hazardous materials, and permits. The parties used the pre-proposal industry review process to address legitimate concerns without losing the fundamental risk allocations that are a key to making PPP transactions work.
- Selection of Availability Payment method by FDOT

  - Payments made over 30 years with performance incentives to guarantee project performance
  - Payment is based on facility being available less deductions for specific contract requirements

- Florida Turnpike Enterprises will provide, install, operate and maintain the Electronic Tolling Equipment for the Express Toll Lanes and will manage tolling operations and maintenance.
- FDOT followed a best value procurement strategy for the project which lasted 15-month and was overseen by a Project Selection Committee, which selected the winning bid through a transparent ranking process. The various stages of the procurement process for I-595 which are common to most PPP procurements were as follows:
  - Issuing Request for Qualifications - In October 2007, FDOT issued a Request for Qualifications, inviting potential bidders to present a Statement of Qualifications (SoQ). By the closing date, six prospective bidders had submitted a SoQ for the project.
  - Issuing Request for Proposals – Next, requests for proposals were issued to the first four teams in the ranking process. Subsequently, two additional teams decided to drop out of the bidding process, thus bringing the number of final bidders to two.
  - Best Value Selection - The selection of the best value bidder was based on technical and financial merit, as per a ranking system.

- Experts Panel drafted pass/fail and evaluation criteria, used by the subcommittees to evaluate each proposal and assign scores. The PSC then consolidated these score reports to select the best value bid.
- Another basis for evaluation was a MAP score, where points were assigned to each proposer based on the Maximum Availability Payment (MAP). The results showed that ACS Dragados-Macquarie Partnership produced a design having an estimated project cost of $1.225 billion, with a MAP of close to $64 million. On the other hand, the second team had a project estimate of $2.012 billion, with MAPs reaching $145 million. ACS Dragados-Macquarie Partnership was selected as the concessionaire.

- The 595 team has worked to blend an availability system with FDOT's existing asset maintenance approach resulting in an approach that places significant weight on both:
  - Availability – measured continuously per hour per segment of roadway with unavailability resulting from: Closures - (full or partial blockage of the travel lanes on the corridor making the lanes unusable for the traveling public) that are not permitted; and/or Availability Faults - (failures to meet certain O&M performance requirements which directly affect safe travel on the facility and therefore constructively close lane(s) to traffic.)
  - O&M Violations – failures to meet FDOT requirements and tests (i.e. MRP) for the facility. Considered to be discreet violations which are measured per instance (and which in some cases recur if not cured within defined timeframes).
- Key Agreement Terms

- Starting from the commercial close period, the concessionaire was stipulated to receive a total of $685 million in the form of final acceptance payments spread over seven years. The acceptance payments would be issued by FDOT only after 100% completion of the corridor improvements according to mutually agreed standards. Possible incentives were available for early completion.
- ACSID will receive availability payments of $ 65.9 million a year (in 2009 dollars) over the 30 year operating period for maintaining the highway at mutually agreed levels of performance. FDOT held the right to deduct money from the annual availability payments should the corridor fail to meet performance standards. ACS could gain a maximum 12% return on its investment if it meets all the performance goals.
- FDOT will control the toll rates and collected the toll revenue. FDOT subcontracted the toll collection system to Florida's Turnpike Enterprise, which is responsible for installing, operating and maintaining the electronic tolling system.

2.2.3 Risks

- The risk-sharing mechanism developed for the project covered the collective movement (upwards or downwards) of the following items in the final financial model:
  - the credit spread, which was initially set at 300 basis points;
  - the loan establishment fee, set at 300 basis points; and
  - the LIBOR swap margin, set at 30 basis points.
- According to Tuyen Mai, a director at Jeffrey Parker & Associates, who served as the firm's lead staff member on the project, the credit spread protection applied to both

upward/downward movements, by way of a simultaneous increase/decrease to the MAP and a reduction/rise in the equity IRR.

- FDOT had the unilateral right to decide whether the credit spread assumptions in the initial bid (the basis for indexing) were reasonable.
- The movements were shared by FDOT and ACSID at the rate of 75% to FDOT and 25% to ACSID, up to a $2.5-million MAP adjustment. The adjustment was made at the concurrent commercial and financial close on Mar. 3. If upward movement exceeded $2.5 million, and FDOT elected to proceed with the project, then the excess movement would have been shared at the same 75%/25% ratio described above. If downward movement exceeded $2.5 million, then FDOT would have been entitled to 100% of the benefit of the excess downward movement. ACSID, which was forced to quickly shift from a Private Activity Bond structure to a bank group at the end of 2008, has relied on this risk-sharing mechanism throughout the financing structuring process. Initially crafted during the RFP stage, this protocol has been a key factor in delivering a successful financial close, says Mai.
- The I-595 Express Corridor Improvements Project has been divided into five construction segments, A through E, to help expedite the work. Each of the construction segments has up to seven major phases of work, generally starting from S.R. 84 north and south of I-595 and working toward the I-595 median. Each major phase of construction within a segment represents a traffic shift to accommodate construction activities.
- FDOT will retain the following risks: political, traffic & revenue that make up a small percentage of the availability payments, ROW, procurement, and change in law ROW acquisition of Project right-of-way has been very minimal and restricted to very narrow

confines. In accordance with the Contract Documents, FDOT has acquired all anticipated right-of-way takes and issued a ROW Certification letter to the Concessionaire on October 15, 2010. In its efforts to minimize right-of-way acquisition, the Department has secured drainage rights over 2 golf courses, and purchased 1 golf course along the corridor to satisfy the drainage requirements for the project. The golf course lake systems have been expanded to accept the additional drainage from I-595 to meet the permit requirements. This innovative drainage design avoids the need to purchase up to 60 acres of land along I-595 as originally anticipated. The purchased golf course, Arrowhead, was entirely redeveloped and subsequently sold to the Town of Davie in mid-March 2011. The Concessionaire will be responsible for securing any minor additional ROW it deems necessary or desirable for the Project, including temporary ROW needed for construction operations or off-site right-of way needed for operations and maintenance.

- Developer will retain the following risks: financial, construction, operation & maintenance, hand-back, and geotechnical. The private sector is assuming cost and schedule risk for completion; no public money will be paid to the concessionaire until the project is complete. The private sector also is assuming the risks associated with future operations, maintenance and resurfacing for over $1 billion in public infrastructure during a 35-year concession.
- Some issues for proposers included risk allocation for delays and extra costs related to utility relocation and hazardous materials.
- Shared risks include: permits/government approvals, utilities, force majeure, and contamination.
- Factors contributing to improved risk management include the following:

- The longer operating and maintenance period covers two capital renewal cycles. This encourages high quality construction at the outset and assures that the Facility will be carefully maintained right up to the moment the assets are "handed back" to FDOT.
- Full payment for construction of the Facility is not earned until after it is operational.
- Cost overruns for construction plus 30 years of operations and maintenance must be absorbed by the Concessionaire's equity contributors. This protects FDOT from excess costs for the entire Concession Term. This creates powerful incentives to complete the system within the budget and on time or ahead of schedule.
- Future Availability Payments are linked to service quality and Project performance. To the extent there are faults and deficiencies, the payments are reduced. If the reductions are serious enough, lenders and equity investors may step in and replace the operator, acting on FDOT's behalf as well as their own.

2.2.4 Governance

- Multidisciplinary Team Required:
  - FDOT has a Central Office, 7 District Offices and Florida's Turnpike Enterprise.
  - District Offices develop technical aspects and regularly procure design-build projects
  - Project finance, legal, & engineering expertise in Central Office
  - Tolling expertise based at Turnpike

    - External financial partners: Florida Division of Bond Finance, FDOT financial advisors, Traffic and Revenue providers
    - External legal and engineering FDOT advisors
- The State of Florida: a good Client
    - PPP law
    - FDOT funds for the Project are appropriated from the State of Florida
    - Florida Turnpike Enterprise is responsible for the management of Florida's Turnpike
    - System and the collection of tolls on 7 facilities owned and operated by FDOT
- Public Involvement for P3
- Industry feedback
- The entire interstate tolling debate, typically intertwined with P3s, was avoided because FDOT will set the rates and retain all of the revenues, with Florida's Turnpike Enterprise handling electronic toll collections— there is no private sector "upside" or downside from tolls and no private benefit from congestion.
- In the I-595 project, a task force composed of the owner and the management consultant was introduced at early planning stages to develop the scope and the work plan. At this stage all individual projects or work packages of the main project were planned. Furthermore, the organizational structure was introduced before construction started where roles and responsibilities were assigned to different managers in both organizations.
- The Concession Agreement clearly outlines the division of responsibilities between FDOT and the Concessionaire.

- Section 334.046, Florida Statutes, requires FDOT to protect the state's transportation infrastructure investment. Among other requirements set forth in the section, FDOT is required to ensure that a minimum of the 100 percent of the acceptable maintenance standard is achieved on the state highway system.
- P3 Statutory Requirements: s. 334.30, F.S. -Legal Framework Provides Flexibility
    - Broad authority accommodates different types of P3s: Short-Term Project Advancements (Design Build Finance and Build Finance); Concession; Agreements (Toll and Availability Payments)
    - Asset Leases
    - Term lengths
    - Innovative Finance
    - Solicited and Unsolicited Proposals
- Insurance, Bond & Security: Article 17 and Appendix 8 of the Concession Agreement identify the Insurance Policies the Concessionaire is required to procure and maintain. Article 17 also identifies the Performance Security, Payment Bond, and Operations and Maintenance Security the Concessionaire must obtain.
- Dispute Resolution - If the concessionaire objects to any FDOT decision, action or order, then the resulting dispute can be resolved in a three stage manner, as specified in the contract. The three stages are:
    - Negotiation: The parties will first try to resolve disputes through negotiation and if they couldn't, then it is referred to a Dispute Review Board.
    - Disputes Review Boards: Three neutral, non-binding board members are appointed to resolve disputes. After conducting hearings, the board presents a

non-binding ruling of the case, which can be used as evidence in any subsequent proceedings.

    - Litigation: For disputes that remain unresolved, litigation is the next step in dispute resolution.

- Handback Provisions- The contract states the concessionaire's responsibilities for the transfer of operations and maintenance of the toll road to FDOT upon completion of the concession period. This included handing back the asset in a good and operable condition and creating a capital replacement plan for equipment and systems.

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Case 6- I-495 Capital Beltway HOT Lanes- Virginia

1. Project Information

1.1 Overview

The Capital Beltway High Occupancy Toll (HOT) Lanes project (officially the 495 Express Lanes) is a public-private partnership between Virginia Department of Transportation (VDOT) and Capital Beltway Express, LLC (a joint venture of Fluor and Transurban) that opened in November 2012. The private proposal to develop HOT lanes was evaluated by an independent review panel and tested for its competitiveness through a formal appeal for competing proposals. The project limits are from the Springfield Interchange (south) to just north of the Dulles Toll Road (14 miles). The total length of the concession is 85 years - five years of construction and 80 years of operation. Previously, the Capital Beltway had four lanes in each direction. In addition to providing new travel choices, this project also made a significant contribution to the Beltway's 45-year-old infrastructure, replacing more than 50 aging bridges and overpasses, upgrading 10 interchanges and improving new bike and pedestrian access.

1.2 Project Details

Improvements included:

- 14 miles of two new lanes in each direction
- First time introduction of High Occupancy Vehicles (HOV) lanes to the Capital Beltway and reliable transit options to the Beltway and Tysons Corner, Virginia
- Congestion-free network for carpools, vanpools, transit and toll-paying motorists
- Replacement of more than $260 million of aging infrastructure, including more than 50 bridges and overpasses

- Construction of carpool ramps connecting I-95 with the Capital Beltway to create a seamless HOV network

1.3 Partners

- Concessionaire: Capital Beltway Express, LLC - Joint venture between Fluor and Transurban
- Project Advisors / Consultants:
    - Virginia Department of Rail and Public Transportation ATCS/CH2M Hill (GEC).
    - To USDOT TIFIA JPO: TIFIA Legal Advisor:
        - Nixon Peabody, Michael Vaccari and Virginia Wong;
        - TIFIA Financial Advisor: Infrastructure Management Group: Sasha Page

1.4 Funding

The total project cost is $2.068 billion consisting of:

- Private Activity Bonds - $589 million
- TIFIA Loan - $589 million
- Commonwealth of Virginia grant - $409 million
- VDOT change-order funding - $86 million
- Interest income - $47 million
- Private Equity - $348 million

1.5 Project Timeline

- In 1994, VDOT completes a Major Investment Study, concluding highway improvements promoting the use of HOV and bus travel would be the most effective strategy to serve current and future demand on the Beltway.

- In 1998, FHWA and VDOT initiate an Environmental Assessment of a variety of plans to improve the Beltway.
- In 2002, FHWA approves the EIS, including three HOV alternatives and 15 specific concepts to improve the Beltway.
- On April 18, 2005, FHWA signs the Final EIS and releases it for public comment.
- On June 29, 2006, FHWA releases its Record of Decision that selected the HOT lanes plan for the Capital Beltway.
- In 2007, FHWA releases a re-evaluation of the Record of Decision and determines project scope enhancements have no significant environmental impact.
- On December 21, 2007 VDOT and Fluor-Transurban sign final partnership agreement.
- Construction began July 2008
- On November 8, 2012, substantial completion was reached.
- On November 17, 2012, the facility opened to traffic.

2. PPPs Key Issues

2.1 Findings from Interview

There weren't any responses for our interview request from responsible agencies by 06/12/2014.

2.2 Findings from Archival Record

2.2.1 Economic

- Recognizing the amount of the existing federal apportionments to Virginia, the statewide need for those funds, and the existing level of state funding appropriations and allocations, it is clear that improvements planned with the 495 HOT lanes could not be achieved within a reasonable timeframe utilizing traditional methods.
- Change in land use and travel forecast (2002-2030)

  - 40% population growth
  - 45 employment increase
  - 42% transit trips
  - 48% vehicle trips
  - 45% Vehicle Miles Traveled (VMT)
  - 119% lane miles of congestion (morning rush hour)

- According to the 2005 final report from the FHWA and the Office of the Secretary of Transportation from the Partnerships in Transportation Workshops, interest in public-private partnerships (PPPs) in transportation has been growing in recent years, fueled by a convergence of issues including "the escalating costs of highway system preservation, the ever increasing need to improve the performance of transportation infrastructure, the slowing growth of fuel taxes and other traditional highway revenue sources, and the downsizing within state transportation agencies."
- The Capital Beltway HOT lanes improvement is a very large and complex project and the private sector has brought valuable project management ability and experience. The project is one of the largest design-build highway projects in the country and was the first major improvement to the Capital Beltway in more than 40 years.
- Project revenues from the I-495 Capital Beltway HOT lanes will be used by the project's private developer to repay its underlying debt of approximately $1.071 billion. The sources for the total project development cost of $1.929 billion include a $409 million grant from VDOT to support HOV use and major capital rehabilitation needs (approximately $349 million in equity from VDOT's private development partners); a $586 million private activity bond (PAB); and a $585 million TIFIA loan. In total, private

equity and debt were approximately $1.5 billion, more than $260 million went into the replacement of aging infrastructure.

- During rush hours, about six hours a day, the toll is expected to be roughly $1 a mile, or between $5 and $6 in average for the typical beltway trip. Average daily revenue for the HOT lanes is projected to be $335,000 in 2015. The average real revenue growth rate is predicted at 1.3% for five years and then 1.5% after that.

2.2.2 Procurement

- Given that the I-495 Capital Beltway HOT lanes is the first mega-project to be implemented through the Public-Private Transportation Act (PPTA), VDOT has had to establish a process for moving forward. VDOT appears poised to achieve success and will be able to apply that model to develop other large projects through the PPTA process.
- A Capital Beltway Improvement Study was conducted late in the 1990s, which led to an extended EIS effort completed early 2006. At the same time VDOT was reviewing unsolicited proposals from Flour-Transurban and Clarke Construction, the former of which was recommended by a senior VDOT panel. The FHWA ROD was received in June 2006. A preliminary Traffic and Revenue Study was completed. A subsequent Reevaluation of the Environmental Impacts was undertaken and was approved by FHWA in June 2007. A revised traffic and revenue study was completed in the summer of 2007.
- As part of defining the PPTA relationship between VDOT and the proposer (Fluor), Fluor is required to provide a preliminary schedule based on 30% design development documents. This schedule would cover the entire scope of the work, including design and construction, and be used to establish a working baseline for the overall timeframe to be met by Fluor. As part of negotiating the PPTA agreement, VDOT performed a validation

of this baseline schedule (BS00) to assess its reasonableness in forecasting the overall timeframe, proposed as five years from Notice to Proceed to Substantial Completion. VDOT hired an independent consultant to review the proposed Design-Build schedule and develop a separate Design-Bid-Build schedule (DBB) to verify that any perceived issues with the schedule would not result in added time required to complete the project.

- I-495 Capital Beltway HOT lanes:
    - Fluor-Transurban, later known as Capital Beltway Express, LLC, was awarded with design, construction, operation and maintenance contract.
    - The total length of the concession is 85 years - 5 years of construction and 80 years of operation.
    - Financial close expected in December 2007.
    - Construction began in spring 2008 and is anticipated to be complete in 2013.
    - No charge for HOV-3+ and transit; option for other drivers to pay a toll
    - First fully-electronic Toll Road in Virginia. Toll prices adjusted continuously based on real-time traffic volumes to keep the lanes free-flowing.

2.2.3 Risks

- Fluor-Transurban assumed debt risk, construction risks (Aggressive project Schedule, delays, etc.), Environmental Approvals, costs of operations and maintenance, Travel Demand Forecasting, Revenue, Ramp-up period assumptions for start-up toll projects, and other expenses of the HOT Lanes. These key risks transferred to private sector, away from taxpayers.
- Design approximately 30 Percent complete when the construction started.
- Involvement of Key Subcontractors.

- The private partners must share revenues with the Commonwealth for use in the corridor in any case where they refinance debt and/or reach a level of profit that exceeds a 7.95% return on investment. The percentage share grows if return on investment grows. The percentage share is based on gross revenue (before all expenses) not on the net available after expenses are paid.
- Outstanding Issues
    - Major Construction Project Coordination: Dulles Rail - Telegraph Road/Beltway Interchange; I-495 4th Lane - Fairfax County Parkway;
    - Future of Tyson's Corner Land Use
    - HOV Enforcement and Tolling Technology: Technology for enforcement and tolling is rapidly changing; Must always comply with federal and state standards; Must be E-Z Pass compatible
    - I-66 Interchange: Part of I-66 EIS (underway)
    - Joint Maryland/Virginia bridge studies.

- VDOT recognizes that project risks have to be identified and mitigated early in the process and that risk mitigation processes have to be included in the comprehensive agreement with the Design-Build consortium. An essential component of this risk mitigation strategy is to thoroughly review each element of the contractor's schedule and cost proposal while identifying and accounting for such risk elements as escalation, design contingency, and resource availability. The risk associated with this project was controlled to a large degree with the language within the ARCA. For instance, as documented in Article 6 of the ARCA, the financial risk is reduced to none except for the public financed portion. The Commonwealth, the Department, CTB or any other agency,

instrumentality or political subdivision of the Commonwealth shall not have any obligation to pay on Concessionaire Debt according to the ARCA.

2.2.4 Governance

- VDOT's roles:
  - State agency
  - Ownership
  - Oversight
  - Environmental review
  - Safety & design standards
- Capital Beltway Express LLC's roles:
  - Private partners
  - Publicly owned engineering, construction firm
  - Toll road developer, investor & operator
  - Funds for construction, operations and maintenance
  - Builder
  - Long-term operator
  - Ongoing, routine maintenance & incident response
- Legislation:
  - The Amended and Restated Comprehensive Agreement (ARCA) is the contracting vehicle for Capital Beltway Express, LLC (CBE) to develop, design, finance and construct the I-495 HOT Lanes in Virginia Project, and to manage, operate, maintain and collect tolls on the HOT Lanes Project pursuant to a long-

term concession arrangement granted to the Concessionaire by the Department by this Agreement.

- The Public-Private Transportation Act (PPTA) of 1995 is the legislative framework that enables the commonwealth and local governments to enter into agreements with private entities to acquire, build, improve, maintain, and/or operate qualifying transportation facilities. The act provides a unique mechanism for supplementing public funds available for transportation in the commonwealth.
- On March 25, 1995, the Governor of the Commonwealth of Virginia signed into law the PPTA, which was amended and re-enacted by Chapters 504 and 562 of the 2005 Acts of Assembly and signed into law by the Governor, effective July 1, 2005.
- In re-enacting the PPTA, the Virginia General Assembly found and declared, among other things, that:
    - There is a public need for timely development and/or operation of transportation facilities within the Commonwealth to address the needs identified by the appropriate state, regional, or local transportation plan by improving safety, reducing congestion, increasing capacity, and/or enhancing economic efficiency and that such public need may not be wholly satisfied by existing methods of procurement in which qualifying transportation facilities are developed and/or operated;
    - Such public need may not be wholly satisfied by existing ways in which transportation facilities are developed and operated; and

        - Authorizing private entities to acquire, construct, improve, maintain, and/or operate one or more transportation facilities may result in the availability of such transportation facilities to the public in a timelier or less costly fashion, thereby serving the public safety and welfare.
    - On July 1, 1995, the Virginia Department of Transportation (VDOT) adopted Implementation Guidelines developed by the Commissioner for the selection of solicited and unsolicited proposals for negotiation under the PPTA, which were revised in April 2001 and October 31, 2005.
    - On April 6, 2002, the Governor signed legislation (2002 Va. Acts Ch. 593) amending the PPTA to permit tolls to be levied on existing interstate highways that are reconstructed to provide for increased capacity.
- Virginia's Legal Commitments:
    - HOV-3 guaranteed – no HOV service on Capital Beltway today
    - Transit guaranteed – no bus or rapid transit service on Capital Beltway today
    - Any excess revenues must stay in corridor for transportation uses, particularly enhanced pedestrian and transit services.
- Public Affairs/communications:
    - VDOT has undertaken a thorough outreach and public involvement program as part of the 12-year effort in obtaining the required environmental approvals for the I-495 Capital Beltway HOT lane project.
    - This process involved numerous public meetings and hearing at which the public was invited to comment on the EIS process. Standard outreach materials were developed including a project newsletter and website.

  - It focused on community outreach and media relations to inform more than 1 million daily corridor travelers and over 800,000 directly impacted residents and businesses.
  - Audiences included: residents, motorists, businesses, elected Officials
  - Outreach Toolbox: Website/Electronic communications; Media: print, radio, television; Stakeholder meetings/events; Elected Official briefings; Direct impact door-to-door; Employer Solutions.
  - Flour-Transurban has established an outreach website for both the I-495 Capital Beltway and I-95/I-395 HOT lane project.
- Institutional Framework: the operations concepts for the Capital Beltway HOT lanes will be integrated with VDOT Northern Region Advanced Traffic Management System (ATMS); however, HOT lanes will be operated by Transurban, while the parallel general purpose lanes will be operated by VDOT.
- Institutional Structure: the Innovative Project Delivery Division of VDOT is responsible for developing a statewide program for project delivery via design-build, PPTA, and other contracting methods that expedite and improve project completion. The Division is also responsible for oversight of consultant procurement, policy establishment, compliance, and guidance. Program and project direction is in support of the Virginia Six-Year Improvement Program and in support of governor and General Assembly plans, with regard to high-level state and private sector partnership transportation initiatives.

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