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Building a Sustainable Transportation Infrastructure for Long-Term Economic Growth

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Chapter 8

Reducing Risk in Public–Private Partnership Contracts: Two Examples From Highway Tolling Projects

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ABSTRACT

In an effort to address financial constraints and environmental concerns states have increasingly turned to a combination of un-tolled (HOV) and tolled (HOT) lanes. Public-private partnerships (3Ps) are a popular mechanism for this more sustainable approach to highway infrastructure that couples environmental sustainability (efficient utilization of existing lanes, less congestion) with financial sustainability (private investment). This chapter offers an approach to 3P contract writing for HOV/HOT facilities that is structured by a stakeholder analysis of actors in the project accountability environment. By analyzing two Virginia 3P highway projects, the chapter shows it is possible to build into a contract a set of terms and conditions to enhance the likelihood of meeting the goals of multiple stakeholders. By necessity, such contracts cannot specify precise monetary returns and other stakeholder benefits, but they can be written to include trade-offs to minimize losses to one party at the expense of another.

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INTRODUCTION

Financial constraints and environmental concerns are promoting the development of tolled highway projects that encourage less driving with a combination of (untolled) high occupancy vehicle (HOV) lanes and high occupancy toll (HOT) lanes. HOV/HOT projects are financially sustainable when the private sector is a partner who invests money in the project. The projects are environmentally sustainable when they add fewer lane miles of pavement than a traditional roadway expansion, consume less land, and offer drivers a choice between un-tolled lanes and a tolled lane that is faster and less congested.

Public-private partnerships (3Ps) are a popular mechanism for this more sustainable approach to new highway infrastructure. However, many 3Ps are risk-prone due to their complexity and the unpredictable nature of the revenue streams they frequently create (Urban Land Institute, 2013). The risks and uncertainties challenge accountability. This is especially the case when public infrastructure investments assume adequate returns to the parties over an extended time horizon (Hodge, 2004). Given the ambiguity of future events, it is impossible to specify all the desired results in the contract. Thus, it is difficult for the parties to hold each accountable for any failure to deliver. In this regard, 3Ps to build tolled facilities can subvert the conventional approach to accountability and fail to generate the expected financial and environmental benefits.

Public and private sector actors thus may face the prospect of a failed project. Farmer (2018) provides a classic example of a local government suffering a substantial loss from a poorly designed contract with the private sector. The City of St. Louis lost money when its NFL team, the Rams, moved to Los Angeles. The Rams owners used a loophole in their contract with the St. Louis Regional Convention and Sports Complex Authority to avoid paying the rest of the Rams’ share of the $259 million, 30-year bond used to finance the construction of a football stadium (Farmer, 2018).

The Rams were able to leave the taxpayers on the hook for the remaining financial obligation because in its leasing agreement with the team, St. Louis officials agreed that the new stadium would remain rated in the top 25 percent of all NFL stadiums. When the financially-strapped city refused to make the stadium upgrades to keep it in the top 25 percent, the team’s lease was not renewed. St. Louis officials made a simple error—they did not stipulate in the contract that the team must continue to lease the stadium so long as any of the debt remained outstanding.

This chapter offers an approach to 3P contract writing for HOV/HOT facilities that is structured by a stakeholder analysis of the interests of all the actors in the accountability environment surrounding a project’s field. Rather than specifying precise outcomes of the highway projects, the contracts analyzed were strategically
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designed to reduce risk by setting up a range of potential outcomes to increase the likelihood that all stakeholders in the project’s field benefit. This can be viewed as a type of emergent accountability in that the contract contains mechanisms that adjust outcomes to minimize the prospect of extreme gains and losses by the interested parties.

The objective of this chapter is to show that it is possible to build into a 3P contract a set of terms and conditions to enhance the likelihood of meeting the goals of multiple stakeholders. By necessity, such contracts cannot specify precise monetary returns and other stakeholder benefits. They can, however, be written to include trade-offs to minimize losses to one party at the expense of another. This can be done, in part, by taking into account conditions that could lead to a one-sided distribution of outcomes.

The chapter begins by discussing advantages of a stakeholder approach to devising contracts for multi-sectoral public-private partnerships. This is followed by a description of the frequent elements of two common accountability environments. The authors then describe two Virginia highway projects, highlighting the risks involved. The contracts are then analyzed with a focus on the techniques deployed to foster accountability to all stakeholders when the ultimate distribution of gains and losses from tolling is unpredictable.

BACKGROUND

State Transportation Agencies, Privatization, and Public-Private Partnerships

As Yusuf and O’Connell (2014) note, local and state governments are increasingly forming partnerships with the private sector to provide transportation infrastructure in an effort to address expanding needs under the constraint of limited public resources. In the transportation arena, growing privatization has many roots, including shortages of government personnel and the resulting lack of expertise in the public sector, expansion of demand for transportation services and infrastructure, and pressures to reduce costs and improve quality (Gen & Kingsley, 2007; Ponomariov & Kingsley, 2008; Warne, 2003; Yusuf & O’Connell, 2014).

As of 2016, 34 states, the District of Columbia and Puerto Rico had enabling legislation allowing them to enter into 3Ps (Slone, 2016). From the late 1980s through 2013, the number of transportation-related 3Ps has steadily grown (Z. Chen, Daito, & Gifford, 2014). The popularity of 3Ps can be attributed to many factors, including innovation and new technology emanating from the private sector, the
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need for private sector expertise, and especially the potential for private funding for transportation infrastructure and services.

While the opportunity for successful public-private partnerships is great, it is certainly not without risk (Urban Land Institute, 2013). Public officials are accountable to many stakeholders and 3Ps can exacerbate accountability challenges (Yusuf & Leavitt, 2014). Moreover, the accountability challenge is multidimensional, especially when the contract extends over many years (Hodge 2004; Grimsey and Lewis 2001). Roumboutsos and Pantelias (2015) note that 3Ps “are not actual ‘partnerships’, but strict legal transactions where all parties are contractually bound into delivering their own part in the project under detailed specifications and requirements” (p. 186). As such, contracts for long-term 3Ps must address a variety of potential risks, among them engineering and design failures, poor construction, expensive delays, maintenance failures, revenue shortfalls, funding risks, environmental issues, changes in government policies, and possible project default (Grimsey and Lewis 2001).

As contracts lengthen unforeseen challenges to project success can mount (Hodge 2004). This places a premium on the creation of contract terms that build in flexibility over the course of the contract and a willingness to negotiate changes in partner expectations for results. We view the willingness to negotiate these changes as an emergent form of accountability in which outcomes for partners can evolve with changing circumstances. In this regard, contracts assume good faith collaboration among partners who cooperate with each other to create mutually acceptable solutions to the problems that arise (Willems, Verhoest, Voets, Copperns, Van Dooren, and Van den Hurk 2016). Contracts can be structured in ways to encourage creative responses to potential contingencies. A degree of flexibility can be built into contracts, for instance, some contracts call for a resort to third parties to provide dispute resolution to enable adjustments in fees and revenue allocation. (Shrestha, Chan, Aibinu and Chen 2017). Awareness of the need to respond to changing conditions has led to the elimination from many contracts of the non-competition clauses that prevented governments from building new facilities in the same geographic area in subsequent years (Siemiatycki 2009).

For successful 3Ps, Little (2011) contends, the various project risks should be “transparently identified, equitably allocated, and costed appropriately” (p. 246). Political risks, which could include cancellation of the concession or the introduction of regulatory policies, should be borne by the state. The private partner should be expected to control construction risks (e.g., incorrect or inappropriate design, project delays, etc.) and operation and maintenance risks (e.g., physical condition of the facility, poor construction quality, etc.). If income risk or any risks that would reduce use or profitability is to be held by the private contractor, careful consideration of usage and revenue projections should be addressed in the contract (Little, 2011).
We focus on the terms in the contracts that facilitate negotiation and mutual adjustment. We show that the parties had to build terms into the HOV/HOT contracts that facilitated working together to reach the twin goals of maintaining a smooth traffic flow while providing a profitable revenue stream. The greatest risk for the state was a possible failure to maintain the desired level of traffic flow; for the private sector firm a failure to maintain a profitable income stream.

**Congestion and HOV/HOT Projects**

With rising vehicle ownership in the U.S., traffic congestion has become a major threat to the quality of urban life. According to the American Society of Civil Engineers (2017), more than 40% of the country’s major urban highways are congested, costing, in 2014, an estimated $160 billion in wasted time and fuel, 6.9 billion hours in traffic delays (42 hours per driver) and 3.1 billion gallons of gasoline. From 2013 to 2014, 95% of the 100 largest metropolitan areas in the U.S., had increased traffic congestion.

More lane miles are needed to reduce congestion but budgetary shortfalls persist. In response, states and localities have begun implementing creative strategies aimed at reducing congestion while simultaneously raising roadway funds. Policy makers are increasingly turning over the responsibilities for roadway management and upkeep to private companies even though this has produced mixed results (Boarnet & Dimento, 2004). Another common approach has been to increase the use of variable rate tolling on specifically designated HOV/HOT lanes (Copeland & Overberg, 2012). HOV/HOT lanes give drivers a choice. Drivers can car pool or pay a toll to use the less congested toll lane or they can avoid the toll by driving in the un-tolled lane(s).

HOV lanes are designed to encourage carpooling and, in turn, ease congestion and roadway stress, but the effectiveness of HOV lanes at addressing congestion has been limited. Research finds that HOV lanes are typically underused with little ameliorative impact on either congestion or the environment (Poole Jr & Orski, 2000; Safirova, Gillingham, Harrington, & Nelson, 2003).

As the questionable impact of HOV lanes has become increasingly clear, many states have started converting existing HOV lanes to HOT lanes (Poole Jr & Orski, 2000). HOT lanes can charge a set fee or charge variable fees based on congestion at a given time throughout the day. Variable fees maintain the smooth flow of traffic in the toll lanes by raising fees when traffic volumes increase and, conversely, lowering fees when traffic volumes decrease. (Copeland & Overberg, 2012). The basic premise of variable rate fees is that some people are willing to pay higher rates to avoid peak-time congestion.
In addition to controlling and limiting congestion, HOT lanes also generate higher toll revenues and often eliminate the need for new or additional roadway construction (Transcore, 2009). Perhaps, more importantly to drivers, HOT lanes typically offer the added peace of mind of predictable travel times (Harlow, 2013).

While many HOV lane structures have begun full conversions to HOT lanes, a significant number of federal roadways have begun incorporating both the HOT and HOV lanes together in unison (Perez, Batac, & Vovsha, 2012). One of the reasons for the combination is the federal government’s regulations regarding tolling on federal roadways. By combining HOT lanes with existing HOV lanes, the government is able to retain the integrity of the HOV system, while generating additional revenue through additional HOT lane use by toll paying single occupant drivers (Perez et al., 2012). The benefits to this approach are many. In addition to the much needed revenue generated by HOT lane users, the typically underutilized HOV lanes receive increased traffic and usage, which in turn decreases overall congestion for all roadway users (Safirova et al., 2003).

The Stakeholder Approach to Public-Private Partnerships and Accountability

The perspectives of different stakeholders are important in considering 3Ps, since 3Ps are generally long-term partnership between two stakeholder groups - the public agency and the private firm – with implications for a third category of stakeholders – users and the general public (Forrer, Kee, Newcomer, & Boyer, 2010; Grossi & Thomasson, 2015; Liyanage & Villalba-Romero, 2015).

For transportation agencies, accountability to the public is a critical aspect of 3Ps (Forrer et al., 2010; Wu, Liu, Jin, & Sing, 2016). The delegation of authority to nongovernmental entities (i.e., private firms) can lead to the potential loss of legitimacy, since the former government function is now accomplished indirectly and at arms’ length. However, while government agencies can transfer power to the private sector, they cannot transfer legitimacy and accountability in the same way. 3Ps change the venue within which transportation infrastructure and services are delivered; but they do not eliminate the transportation agency’s responsibility to the public. 3Ps can only work well if the government agency manages the partnership effectively and ensures continued private partner accountability (Hodge & Greve, 2017; Milward & Provan, 2003; Milward & Provan, 2000; Skelcher, 2010).

Kearns (1996) coined the term ‘accountability environment’ to capture the complex nature of the public’s search for accountable governance. Accountability frequently emerges from the interplay of the multiple actors who can be said to comprise the organizational environment or ‘field.’ Besides the focal organization,
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the field includes the external organizations and interested parties with a stake in the focal organization’s activities. In the transportation arena, state transportation agencies (i.e., state Departments of Transportation, DOTs) must manage complex stakeholder relations (O’Connell, Yusuf, & Hackbart, 2009; Yusuf, O’Connell, Hackbart, & Wallace, 2008) that have increasingly been marked by contracting and partnerships (Lockwood, 1998; Warne, 2003).

Accountability is a multidimensional product of the stakeholders operating in the accountability environment (Hill & Hupe, 2002; Hult & Walcott, 1990; O’Connell, 2005, 2006), and, therefore, as O’Connell et al. suggest, accountability in multiparty situations results “from negotiations between the parties that share powers” (2009, p. 410). When forging a contract for a 3P transportation project the stakeholders include, among others, the state DOT, the road builder, environmentalists, drivers, local residents, taxpayers, and elected officials.

A public-private partnership is a collaboration involving actors and/or funding from the public sector on the one hand and the private sector on the other. It is a contractual agreement between the public sector and a private partner “wherein the private sector, in exchange for compensation, agrees to deliver facilities and/or services that have been or could be provided by the public sector” (Little, 2011, p. 243). The private sector contributes resources and expertise, and has a fiscal incentive to maintain efficient management of the roadway (Krol, 2016; van Den Hurk & Verhoest, 2017). As a jointly developed endeavor, costs, risks, rewards, and resources can be shared in a variety of ways as stipulated in the contract that underpins the partnership. Table 1 compares the typical accountability environment under which public-private partnerships are constructed to that under which simple contracts are constructed. Accountability under a 3P is not necessarily the product of a hierarchical relationship in which the government agency can define the project results in advance and sanction the contractor (private partner) for any failure to reach the desired outcomes. When multiple actors with manifold ties to each other and different goals are in play, the degree and extent of accountability is best described as emerging from their multi-stranded interactions.

Simple contracting out works best when there is little inherent project or task uncertainty. The contract specifies the outcomes and obligations of each party. If a contractor fails to provide the agreed upon service in the stipulated manner, the government can sanction the contractor, who is accountable to the government agency and assumes all risk. The relationship between contractor and government is an exchange of fee for service, frequently formed after the submission of competitive bids with only a minimal amount of negotiation of the terms of the contract. Just as there is little or no sharing of risk, there is little or no sharing of property rights. Table 1 lists an example of a simple contract—a state government paying a firm to
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Table 1. A comparison of the accountability environment for simple contracting out and tolling public-private partnership

<table>
<thead>
<tr>
<th>Accountability Environment for Contract Development</th>
<th>Simple Contracting Out</th>
<th>Tolling Public-Private Partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of project certainty</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>Specificity of contractor outcomes and obligations</td>
<td>Higher</td>
<td>Combination of specified and unspecified</td>
</tr>
<tr>
<td>Relationship formation</td>
<td>Competitive bidding with minimal discussion</td>
<td>Discussion and negotiation prior to and post contract finalization</td>
</tr>
<tr>
<td>Ownership of property and/or income rights</td>
<td>Government</td>
<td>Shared property and/or income rights</td>
</tr>
<tr>
<td>Burden of risk for project failure</td>
<td>Contractor assumes majority of risks</td>
<td>Risk is shared with a range of acceptable outcomes for multiple parties</td>
</tr>
<tr>
<td>Type of accountability</td>
<td>Hierarchical</td>
<td>Emergent</td>
</tr>
<tr>
<td>Typical project</td>
<td>Contract for 2-inch overlay on state highway</td>
<td>Contract for toll road with partner rights to toll for specified number of years</td>
</tr>
</tbody>
</table>

lay a 2-inch overlay of asphalt on a highway. Employees of the state DOT routinely inspect the work to ensure compliance with the terms of the contract. If the contractor fails to make a profit or performs poorly, the contractor suffers the consequences. The contractor can rarely re-negotiate the terms or ask for more payment.

Public-private partnerships, in contrast, tend to involve work that is less certain, producing effects that are unpredictable and sometimes undesirable, such as shortfalls in projected revenue streams. The loss of revenue can ultimately doom a project, as was the case in the recent bankruptcy of the State Highway 130 project in Texas. The project, noteworthy for its 85 mph speed limit, lasted just four years into a fifty-year pact before the concessionaire filed for bankruptcy citing traffic revenues and usage drastically less than initial projections (Wilson, 2017).

Such outcomes can produce losses for multiple stakeholders. When the government agency and the contractor enter a relationship, mutual trust, negotiation and discussion are necessary. In many cases, the relationship exists prior to the signing of the contract, as the objectives of the project and means used to attain them are jointly discussed. Often, there is sharing of property rights and income streams between the parties. Risk too is shared and the government, as in the case of the city of St. Louis and the runaway football Rams, can suffer financial losses.

3Ps often involve interdependent stakeholders from multiple sectors with diverse interests and goals (Gray, 1989; Liyanage & Villalba-Romero, 2015). Some goals are shared (Frey, Lohmeier, Lee, & Tollefson, 2006), but others diverge, which can increase the risks. Decision making tends to be shared between the parties and the
distribution of outcomes is a product of negotiation. Therefore, accountability in public-private partnerships tends to emerge over the duration of the contract as the parties respond to unforeseen circumstances. Consequently, it is necessary to build into the contract carefully crafted but flexible incentive structures—specifications that provide ample room for negotiation (Dewatripont & Legros, 2005; Engel, Fischer, & Galetovic, 2013).

Accountability tends to emerge through the give and take of negotiation or through the construction of more elaborate terms in the contract, which can enumerate different outcomes based on contingencies that may arise over time. Some toll road contracts, for instance, may reduce contractor risk by allowing the contractor to raise tolls in the future but with a limit on the absolute size of the toll or the contractor’s profit. Even with such provisions, forecasting accurate and realistic traffic projections remain critical to project success. Few cases illustrate the importance better than the failed 75-year agreement between the State of Indiana and the Indiana Toll Road Concession Company. With a nearly $4 billion upfront cost, it was estimated that the concessionaire would need roughly 11 million toll paying vehicles to travel the turnpike between Chicago and Ohio. Once complete, nearly half as many did so. The resulting bankruptcy and debt reconsolidation have only compounded the problems for all involved (Puentes, 2014).

This chapter’s analysis of accountability builds on Gray’s (1989) observation that collaboration between parties to a contract is needed when the stakeholders are interdependent and decision-making involves joint ownership, collective responsibility for future outcomes, and the ability to view accountability as emerging from negotiation in a constructive work environment. The analysis documents that the Virginia DOT devised 3P contracts that built in disclosure, feedback, and processes for collective voice that ensure each stakeholder is able to play a meaningful role in the lengthy life-cycle of the contract. Of course, the involvement of specific stakeholders can vary over time (El-Gohary, Osman, & El-Diraby, 2006).

One key to 3P success is the presence of a shared goal, which in this case of the two 3P projects analyzed in this chapter was the construction of toll lanes that Virginia drivers would pay to use in future years. Another key to successful 3Ps is contractual flexibility to ensure that incentives and risks remain balanced over the life of the contract. The explicit sharing of risk is a key aspect of 3P projects (Hodge & Greve, 2017), and flexibility in the contract helps to curb financial risk for both public and private stakeholders, while maximizing public benefit (Schank, 2011). The flexibility to undo a poorly written contract, “should such undoing become necessary,” is vitally important for all involved (Boarnet & Dimento, 2004, p. 30).

Prior to construction the parties established a number of agreed upon metrics which were designed to limit loss to the stakeholders under defined circumstances
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(Dewatripont & Legros, 2005). This creates an ongoing evaluation process that reassures partners that they can negotiate corrections to handle emergent contingencies (Ahadzi & Bowles, 2004). Indeed, the two 3P contracts analyzed were very detailed, containing numerous deadlines, oversight mechanisms, construction and maintenance standards, reporting requirements, and sanctions for failure to perform along with dispute resolution procedures including conditions for contract termination or restructuring.

TWO PUBLIC-PRIVATE PARTNERSHIP CASE STUDIES

The core of this chapter is two 3P case studies of HOV/HOT projects in Northern Virginia, outside of Washington, D.C. A summary of the two projects is provided in Table 2.

The Virginia DOT entered into two long-term contracts for the construction of toll lanes: one with Capital Beltway Express LLC for the I-495 HOT lanes project and the other with I-95 Express Lanes LLC for the I-95 HOV/HOT lanes project. The toll roads were managed over the term of the contracts by Fluor-Transurban Corporation, which paid for the bulk of the construction and was allowed to set and collect tolls over the long life of the contract—80 years for I-495 and 76 years for I-95. The private sector partner, referred to in the contracts as the concessionaire, agreed to design, build, finance, operate, and maintain the facility (a DBFOM contract) and do so according to the conditions laid out in the contracts. The public partner, VDOT, for its part, paid 20% of the construction cost for the I-495 project and 11% for the I-95 project. VDOT was not financially responsible for operation and maintenance after construction.

Table 2. Summary of the 3P case studies

<table>
<thead>
<tr>
<th></th>
<th>I-495 HOV/HOT Project</th>
<th>I-95 HOV/HOT Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal year approved</td>
<td>2008</td>
<td>2012</td>
</tr>
<tr>
<td>Projected/total cost</td>
<td>$2.07 billion</td>
<td>$948 million</td>
</tr>
<tr>
<td>Percent of public investment</td>
<td>20%</td>
<td>11%</td>
</tr>
<tr>
<td>Miles covered</td>
<td>14</td>
<td>29.4</td>
</tr>
<tr>
<td>Contract duration</td>
<td>80 years</td>
<td>76 years</td>
</tr>
<tr>
<td>Competing proposals</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source(s): Amended And Restated Comprehensive Agreement Relating To The Route 495 Hot Lanes in Virginia Project, 2007; Comprehensive Agreement Relating To The I-95 HOV/HOT Lanes Project, 2012.
The contracts obligate the concessionaire to operate and maintain the facilities over the life of the contracts according to a set of standards. In each contract, there is an agreed upon performance point system that applies five years after the service commencement date. The Virginia DOT monitors performance and “If the Department determines any breach or failure...has occurred, the Department shall...deliver to the Concessionaire written notice thereof describing the breach or failure in reasonable detail” (section 8.16(iii)). The concessionaire must ‘cure’ the breach or failure within a specified period of time to remove points and/or avoid incurring new ones. The contract stipulates that the concessionaire can object to the determination of a breach and the awarding of points.

The non-compliance performance point system is used as an accountability tool, albeit, one that may provide a range of divergent outcomes. In either agreement, if the number of performance points continues to accumulate and/or breaches are not being cured in a timely manner, several actions may then be taken, starting with increased departmental monitoring and proceeding to the mandatory development of a remedial plan. Failure to meet the goals of the remedial plan can result in contract termination. But the non-compliance performance point system affords flexibility to each sector and recognizes the inevitability of breaches. Increased monitoring only occurs after the assessment of 135 performance points during any 365 day cycle and a remedial plan is only demanded after the assessment of 200 or more points during any 365 day cycle.

To discourage improper resort to contract termination, damages can be sought by both the concessionaire and the department depending on the circumstances. The power to seek damages prevents either party from using the non-compliance performance point system to void the contract without valid reason.

The I-495 Project

The contract for the I-495 project -- *Amended and restated comprehensive agreement relating to the route I-495 HOT lanes in Virginia project (2007)* -- was agreed to on December 19, 2007 between the Virginia Department of Transportation and Capital Beltway Express LLC, an entity formed by Fluor and Transurban to design, finance, construct, and ultimately operate new high-occupancy tolling lanes, designed to moderate and ease congestion around the nation’s capital.

The project called for the construction of two HOT express lanes in each direction along 14 miles of Virginia I-495. High Occupancy Vehicles would not pay a toll when using the HOT lanes. Single occupant vehicles in the toll lanes would pay a toll that varied by time of day and level of congestion. Thus, toll paying vehicles with...
only a driver and high occupancy vehicles with a driver and passenger(s) could use the same lanes. This can reduce overall highway congestion as well as congestion for those who use the un-tolled lanes (Safirova et al., 2003).

Sustainability Goals

This chapter’s focus is on the aspects of the contract that introduce an element of uncertainty and potential failure that the contract attempts to minimize. The foremost goal of the I-495 3P project was to provide drivers with a choice of toll lanes that would provide a free flow operating standard for travel on I-495. The un-tolled lanes did not have an operating standard and could be congested with bumper-to-bumper traffic. Free flow would be accomplished with electronic tolling (with video equipment, transponders, or other technology) and an absence of toll booths and plazas.

Achieving the project’s goal would also require variable toll fees to closely regulate driver use of the toll lane so as to meet the free flow standard. When the highway is congested and free flow is constrained, the toll rate would rise to a level high enough to divert drivers to the un-tolled lanes. The means to accomplish this are clearly stated in the contract: The Concessionaire can “establish, impose, charge, collect, use and enforce the collection and payment of Tolls” (Section 4.01). The ability to regulate the traffic speed is equally explicit in the contract: “The Concessionaire shall impose congestion pricing on the HOT Lanes, which may include dynamic tolling with potential toll rate changes at frequent intervals with a view to maintaining free flow conditions of traffic, and there shall be no restrictions on toll rates” (Section 4.04(a)).

Stakeholder Risk Reduction

In addition to HOVs, several other types of vehicles cannot be charged a toll for use of the HOT lanes. These include mass transit and commuter buses, school buses, and motorcycles. To reduce the Concessionaire’s revenue risk, the contract contains this provision regarding the volume of un-tolled HOVs in the HOT lane: “The department agrees to pay the Concessionaire… amounts equal to 70% of the Average Toll applicable to vehicles paying tolls for the number of High Occupancy Vehicles exceeding a threshold of 24% of total flow of all Permitted Vehicles that are using such toll section going in the same direction for the first 30 consecutive minutes during any day and any additional 15 consecutive minute periods” (Section 13.05(b)). The complex wording reflects the difficulty of ensuring both free flow (a government goal) and profitability (a contractor goal).
The ability to set rates does not assure a net profit for the concessionaire, as it must maintain a free flow condition and accept a large number of un-tolled vehicles. If toll prices are too low, it may not be able to maintain free flow. If it raises tolls too high to obtain free flow, too many drivers may avoid the toll lanes.

The performance point system discussed above ensures a proper balance of interest between the Concessionaire and the Department. The point system can be likened to a scorecard, providing an accountability mechanism if the Concessionaire “breaches or fails to perform its obligations under the agreement”, the Department has the ability to assess performance points (Section 8.16). The point system measures Concessionaire performance across the agreed upon metrics of the contract; the accumulation of non-compliance performance points by the Concessionaire may further trigger remedies and provisions set forth including but not limited to greater oversight, additional monitoring, and financial penalty.

Profitability is constrained by two other requirements in the contract. First, maintenance standards were specified in the contract, which clearly states that the I-495 HOT lane cannot become a ‘federally degraded facility.’ Second, Fluor/Transurban had to pay for all aspects of electronic tolling, including administration and enforcement.

The I-95 Project

The contract for the I-95 HOV/HOT project -- Comprehensive agreement relating to the I-95 HOV/HOT lanes project (2012) -- was agreed to on July 31, 2012. The project called for the expansion and conversion of 14 miles of HOV lanes into three lanes of HOV/HOT lanes. It also extended 9 miles of existing HOV lanes, which would be tolled. However, as noted with the I-495 project, high occupancy vehicles would not pay a toll when using the HOT lanes. Single occupant vehicles in the toll lanes would pay a toll that varied by time of day and level of congestion. Thus, toll paying vehicles with only a driver and high occupancy vehicles with a driver and passenger(s) would use the same lanes.

Sustainability Goals

The foremost goal of the project was to provide drivers with a choice of lanes with an operating speed performance standard (OSPS) of 55 miles per hour. The un-tolled lanes did not have an operating standard and could be congested with slow-moving or bumper-to-bumper traffic. This would be accomplished with electronic tolling.

The project would also require variable toll fees to closely regulate driver use of the toll lane so as to maintain the 55 mph OSPS. When speeds fall below the
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OSPS, the toll rate would rise to a level high enough to divert drivers to the un-tolled lanes. The means to accomplish this are explicitly stated in the contract: “From and after the Service Commencement Date and continuing during the Term, the Concessionaire will have the exclusive right to establish, impose, charge, collect, use and enforce the collection and payment of the Toll revenues in accordance with the terms of this Agreement” (Section 5.01(a)). The ability to regulate the traffic speed is equally clear: “The Concessionaire will impose congestion pricing on the HOT Lanes, which may include dynamic tolling with potential toll rate changes at frequent intervals and there will be no restrictions on toll rates” (Section 502(a)). The agreement specifies that the pricing methodology must “be designed to assure that the Project will meet the OSPS” (Section 5.02 (a)(iii)).

Stakeholder Risk Reduction

While the Concessionaire is empowered to set tolls, it is not guaranteed a profit. Section 5.07(a) of the contract states: “The Department [of Transportation] will not have any risk or liability related to actual traffic volume and revenue, including but not limited to the risk that actual traffic volume is less than the traffic volume projected in the Base Case Financial Model.”

The Concessionaire’s revenue risk, however, is reduced by a specific contract provision regarding the volume of un-tolled HOVs in the toll lanes. The contract reads: “From the period beginning on the second anniversary of the Service Commencement Date to December 31, 2030 (the ‘First Measurement Period’), the department will pay the Concessionaire amounts equal to 70% of the Average Toll for the number of High Occupancy Vehicles exceeding a threshold of 35% of the total flow of all Permitted Vehicles in two consecutive Toll Sections that are then using such Toll Sections going in the same direction for any period of 15 consecutive minutes.” (Section 5.07(a)(i)). Similar provisions apply to the other two measurement periods that complete the 76-year term of the contract. How the 3P contracts analyzed in this chapter address other risks are discussed next.

In the highly congested Washington, D.C. area, the 55 mph OSPS may not be possible even with dynamic tolling with variable fee rates. The contract contains a process to address failures to meet the OSPS. Records of travel speeds are kept and a monthly report is mandated. The contract states: “the Concessionaire will notify the Department if the Concessionaire’s scheduled monthly report identifies any instance of the Project’s failure to meet the OSPS…The notice will describe such failure in reasonable detail. The Department will notify the Concessionaire within 30 days of its receipt of the Concessionaire’s report whether or not it requires an OSPS Improvement Plan” (Section 5.08(a)). The contract further makes clear
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that the plan “will be required to propose a strategy to address the specific reasons which the Concessionaire reasonably believes caused such failure as described in the Concessionaire’s report” Section 5.08(b). The state DOT then reviews the submitted plan and the Concessionaire is required to promptly implement the elements of the plan that are deemed to be within its control.

The contract does not automatically terminate if the OSPS is not met, but this may result in the accumulation of non-compliance points should the Department find the Concessionaire to be in breach of contract. In the event of a breach, the language calls for a good faith effort to reconcile or cure it; but recognizes the possibility of failure.

The first OSPS covers the initial 10 years of operation. Every 10 years a new one is negotiated; this includes the non-compliance performance point system. However, the contract stipulates that in a subsequent OSPS the 55 mph traffic flow requirement cannot be raised.

DISCUSSION

Provisions to Counter Risk

3Ps are inherently risky, primarily because of the many and varied interests of stakeholders. As Roumboutsos and Pantelias (2015) aptly summarize, the contract is the nexus that merges the multiple interests, and “Paramount in the determination of this balance of interests is the management of risks and their subsequent allocation among the various stakeholders” (p. 186).

Summing up, a number of stakeholder interests were addressed in the contracts but the exact outcomes are far from certain. Government officials and taxpayers benefit from the greatly reduced cost of construction, maintenance and operation. The expected reduction in congestion could save drivers time; it could also reduce air pollution and other environmental costs. Obviously, the drivers who paid the tolls or rode in high occupancy vehicles expect faster travel and less congestion. But, even those who choose not to pay the toll may experience some reduction in congestion when drivers switch to the toll lane. Of course, drivers can avoid the toll altogether and accept a slower drive. Alternatively, they can use local streets. Whatever their decision, all drivers benefit in their role as taxpayers, and they can choose to pay for the toll lane on occasion when time-pressured. The investors stand to make a reasonable profit so long as a sufficient number of drivers pay the requisite amount of toll.
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While the taxpayers will save money on construction, the contractor may fail to adequately maintain the facility over the long durations of the contracts—80 years for the I-495 project and 76 years for the I-95 project. Moreover, the added toll lanes may fail to significantly reduce congestion. One potential reason for such a failure is the fact that the contractor is allowed to set the fee for the toll. Excessively high fees would impose a high cost for toll lane access and could shunt an excessive number of drivers into the un-tolled lanes. With greater congestion in the tolled lanes, there will be little or no net improvement in congestion and therefore, few, if any, environmental benefits. Allowing single occupancy vehicles to utilize HOV/HOT lane might reduce the number of HOVs, if drivers abandon carpools and drive their own vehicles, thereby increasing the number of vehicles on the highway.

As with many 3P projects, the two HOV/HOT lane projects presented significant revenue-related risks to the private sector. These projects rely on user-based remuneration (i.e., tolls) which are subject to demand risk (Roumboutsos & Pantelias, 2015). Demand risk reflects the uncertainty in predicted demand, which in the two cases are associated with traffic volumes and free flow conditions. Addressing the revenue risk, such as by allowing the private sector flexibility in setting toll rates, is an important challenge to achieving optimal risk allocation, which is considered the cornerstone of any successful PPP arrangement (Roumboutsos & Pantelias, 2015).

Table 3 lists some of the provisions in the contracts that reduce risks to stakeholders arising from private sector’s right to set toll fees and other concerns. While taxpayers benefit from the substantial private sector investment and obligation to operate and maintain the toll lanes, poor construction and maintenance are a possibility along with little improvement in traffic flow. The contracts addressed these concerns with clear construction and maintenance standards and a system to address failures to create free-flow conditions on I-495 and a 55 mph OSPS on I-95. The contract also contains a very detailed, yet flexible, non-compliance performance point system.

The 3P projects offered the environmental benefit of consuming less land and encouraging free HOV and bus use. Faster travel and less congestion is more likely with the use of variable rate tolling, which allows for more effective traffic regulation. The absence of mandatory tolling benefits low income drivers. However, it is possible that private sector investors would not realize an adequate profit due to toll lanes failing to attract a sufficient number of toll-paying drivers. Several features of the contract offer some protection for the private partner—the foremost being the right to set toll fees and to vary them in response to traffic flow conditions. In addition, when HOV traffic reaches specified thresholds in the toll lanes, the government reimburses the concessionaire for HOV use.
Protection against demand risk also come in the form of restrictions to competition such as when the 3P project can be considered a natural monopoly or in cases where a quasi- or temporary monopoly is created through the contractual arrangement (Roumboutsos & Pantelias, 2015). However, this risk to the private sector can come at a cost to public stakeholders who are forced into fewer options. Furthermore, the public sector seeks to minimize the likelihood of opportunistic behavior of the private partner (van Den Hurk & Verhoest, 2017).

To protect the public interest, the state of Virginia retains the right to build a competing facility to handle traffic congestion in the region. In recognition of the potential impact of this on the concessionaire’s revenue, the contract states that the concessionaire can bid for the new highway project. This provision, which calls
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for fair treatment, is not unusual, as non-compete clauses have been phased out of recent 3P contracts due to their tendency to handcuff the public sector for the long term of the contract (Holeywell, 2013).

CONCLUSION

Public-private partnerships offer a way for resource-strapped government agencies to meet the needs of multiple stakeholders (Estache, Juan, & Trujillo, 2007). In this chapter, we focused on contract provisions related to partner risks and incentives, two aspects of 3P contracts identified by Dewatripont and Legros (2005) as most critical to 3P success. In optimal 3P agreements, the contract contains provisions to properly balance the risks and rewards for the public and private sectors, while attending (to the extent possible) to those of other stakeholders (Ahadzi & Bowles, 2004). With increasing frequency, 3Ps have been used to fund large-scale infrastructure projects (Bennett & Iossa, 2006; Grout, 1997). Frequently, 3Ps save money by ‘bundling’ service provision (Hart, 2003). Virginia DOT did so by tying construction, operation, and maintenance into each contract. With bundling, the public sector is able to limit budgetary strain (Engel et al., 2013).

However, electronic tolling technologies make it possible to pursue environmental benefits as well. Along with improvements in traffic flow, sustainable transportation projects can solve some of the social, financial, and ecological problems of urban community life. In this respect, sustainable transportation often focuses less on city growth and more on integrating transportation into current urban development, thereby consuming less land (Leuenberger, Bartle, & Chen, 2014). The 3Ps discussed in this chapter illustrate a more sustainable approach to congestion management by introducing HOV/HOT lanes and incorporating congestion pricing. The Virginia DOT avoided resorting to the traditional solution for traffic congestion—expanding traffic capacity through construction of many more additional lanes. In pursuit of sustainability, Virginia constructed fewer lanes, spent far less taxpayer money, and continued to encourage carpooling and bus transit.

Due to the array of stakeholder interests addressed in the 3P contracts and the unpredictability of long term returns from the tolling lanes, the exact outcome for each Virginia stakeholder is difficult to predict. To foster accountability, the contractual provisions promote discussion and negotiation over the course of the partnership. The Virginia 3Ps demonstrate that it is possible to build constraints into the contract to reduce losses and promote a range of acceptable outcomes. The non-compliance performance point system, for instance, attempts to provide recourse for the public
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in the event of a private sector breach of contract or failure to maintain desired performances. But it is accommodating, allowing for much discussion and creative negotiation within stated parameters, the hallmarks of emergent accountability.

Of course, many of the devices used in these contracts apply to simple contracts as well as to the more complex conditions associated with public-private partnerships for tolling. For example, the contract contained detailed specifications for the new toll lanes and technologies along with an oversight role for the DOT to ensure proper materials and desired construction quality. But many of the provisions laid out in the contract were less specific and were meant to balance the needs of various stakeholders in ways that implicitly accept a range of outcomes over the long term. Still, despite the uncertainties involved over the many years of the contracts, Virginia’s stakeholders appear to like this type of contract. Since the I-495 and I-95 HOV/HOT projects were begun, four additional HOT/HOV projects have been introduced, albeit not all are 3Ps.

Despite the positives of bundling service provision, leveraging private assets, and utilizing technology in a manner that promotes environmental sustainability, there are several reasons for caution. Given the scope of this research, examining two case studies within the same state, it is impossible to draw firm generalizable conclusions that may apply across the state and country. Each contract is unique, the needs of the locality and state vary from jurisdiction to jurisdiction; yet what the cases do reveal is how nuanced each situation and agreement is. The need for sustainable infrastructure, the contractual nuance that creates and maintains accountability, and the importance of shared risk all illustrate key provisions that can be studied and evaluated across contracts and jurisdictions.

Given their numerous benefits, we expect to see more HOV/HOT tolling projects in the future. In addition, to reducing reliance on state and local governments for the funding of new infrastructure, these projects add another layer of financial sustainability to transportation development by reducing reliance on the motor fuel tax, which in this era of fuel efficient and electric vehicles, is producing increasingly inadequate revenue for road building and maintenance (Chen, 2014). And they reduce the overall environmental harm of fossil fuel consumption by increasing the cost of driving, resulting in more use of transit and fewer miles driven in single occupancy vehicles (Bartle & Devan, 2006; Black, 2010; Leuenberger & Bartle, 2009; O’Connell & Yusuf, 2013; Wachs, 2003; Yusuf, O’Connell, & Abutabenjeh, 2011).
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REFERENCES


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**KEY TERMS AND DEFINITIONS**

**Capital Beltway Express LLC:** An entity formed by Fluor and Transurban to design, finance, construct, and ultimately operate the I-495 high-occupancy tolling lanes, designed to moderate and ease congestion around the nation’s capital.

**Contracting Out:** Is a means of delivering public services and/or performing public functions where the government provides compensation to an outside party in exchange for a defined set of services or functions. Also known as outsourcing.

**Emergent Accountability:** The flexible accountability mechanisms built into the contractual agreements to provide recourse and contingencies that ensure a fair and equitable process for all involved parties.

**Express Lanes:** Express Lanes are specially-designated highway lanes that allow drivers to choose to pay a toll to use the lanes and that are free to carpools, motorcycles, vanpools and other eligible vehicles during the designated hours of operation. Express lanes operate under the premise of reducing congestion by incenting and rewarding desired behaviors and/or those willing to pay a toll.

**Fluor-Transurban:** A principal parties in the I-495 and I-95 roadway projects. Fluor Corporation provides services on a global basis in the fields of engineering, procurement, construction, operations, maintenance and project management. Transurban Group is an international toll road investor and manager with more than 10 years of experience developing and operating complex toll road infrastructure.
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High Occupancy Toll (HOT) Lanes: Lanes accessed by vehicles with multiple occupants and charged a fee for use (especially at high traffic times) to encourage carpooling and a less congested route for the drivers while also reducing congestion on alternative routes. A form of transportation demand management that reduces congestion through dynamic tolling practices.

High Occupancy Vehicle (HOV) Lanes: HOV lanes refer to high occupancy vehicles. HOV lanes reduce congestion by promoting carpooling and ridesharing practices. Lanes accessed by vehicles with multiple occupants (especially at high traffic times) to encourage carpooling and ridesharing, and to reduce congestion. A form of transportation demand management.

I-95 Express Lanes LLC: An entity formed by Fluor and Transurban to design, finance, construct, and ultimately operate the I-95 high-occupancy tolling lanes, designed to moderate and ease congestion around the nation’s capital.

Public-Private Partnership (P3): A partnership between a government agency and the private sector in the delivery of goods or services to the public. P3s have been widely implemented in the U.S.A. and across the world for services and infrastructures related to transportation, social services, and waste disposal.

Tolling: A form of road pricing in which a fee is assessed for use of the tolled facility.

Virginia Department of Transportation (VDOT): The Virginia Department of Transportation is the state agency for the Commonwealth of Virginia (USA) with the primary responsibility for building, maintaining, and operating the roads, bridges, and tunnels in the state. For transportation-related P3s in the state, VDOT represents the interests of the Commonwealth.