New Trends and Issues Proceedings on Humanities and Social Sciences

Issue 4 (2017) 175-181

ISSN 2421-8030
www.prosoc.eu
Selected paper of 5th World Conference on Business, Economics and Management (BEM-2016) , 12 – 14 May 2016, Istanbul Limak Limra Hotel & Resort, Convention Center Kemer, Antalya-Turkey

Risk transfer in PPP projects: analysis of managed lanes in North Texas

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Suggested Citation:
Carpintero S. (2017). Risk transfer in PPP projects: analysis of managed lanes in North Texas. *New Trends and Issues Proceedings on Humanities and Social Sciences*. [Online]. 04, pp 175-181. Available from: www.prosoc.eu

Selection and peer review under responsibility of Prof. Dr. Çetin Bektaş, Gaziosmanpasa University, Turkey.

Abstract

Risk transfer is at the core of PPP projects, and it becomes particularly relevant when the demand risk is transferred to the concessionaire. The main purpose of this research is to analyze this topic using managed lane projects in North Texas as case studies. The research focuses on analyzing which risks have been transferred to the concessionaire in these projects, how they have performed over the years, and what can be learned from this experience.

Keywords: PPP; managed lanes; motorways; BOT;

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1. Introduction

In the early 2000s, the state of Texas (USA) faced a double challenge in terms of road transportation. On the one hand, it had to increase its investment in the infrastructure for the following reasons: 1) the traffic was increasing because the population and the economy were growing; 2) the air quality was deteriorating and was about to reach unacceptable levels; 3) and the prospects indicated that the congestion would continue to increase unless the investment in the infrastructure increased significantly during the following decade. On the other hand, the federal funds available for building infrastructure were decreasing and an increase in the gasoline tax was not an option for political reasons (that tax had not increased since 1990).

In that context, in the early 2000s, the state government started to consider the possibility of leasing to the private sector the high-occupancy vehicle (HOV) lanes that existed on many roads and that were underutilized. The HOV lanes had been introduced as a way of reducing congestion by means of fostering the sharing of cars. Vehicles carrying two or more people were allowed to drive in those lanes, in which the traffic was more fluid than in the normal lanes. For the most part, the initiative did not work because most people preferred to drive their own cars rather than sharing them (or using public transportation).

The idea was to involve the private sector in refurbishing (or building), operating, and maintaining these so-called 'managed lanes' through public–private partnerships (PPPs). The users of those lanes were tolled using dynamic pricing, which means that the toll charged for driving in those lanes was dependent on the demand: the higher the number of vehicles wanting to use them, the higher the toll was. In this way the traffic in those lanes was kept fluid at all times. The private consortium in charge of the lanes has to offer a speed of at least 50 miles per hour.

The idea of these managed lanes was seen as an efficient way of solving the problem of congestion on the roads of the state. The users who were willing to pay had access to reserved lanes in which fluid traffic was guaranteed. The other users had less traffic in their lanes because some of the cars were driving in the managed lanes. Furthermore, the state government managed to leverage its capacity to invest in the road transportation infrastructure by bringing private resources into those investments, both equity provided by private concessionaires and debt provided by banks (or bond holders).

The managed lanes, however, also had some aspects that many people in Texas did not like. One of them was the uncertainty faced by the users willing to pay to drive in the managed lanes: they only knew the price when they were driving on the motorway and had to decide whether or not to enter the managed lanes. Another negative aspect for many people was the involvement of private companies, particularly when they were foreign companies, in 'owning' and operating roads. Feelings related to public property are very strong in Texas, and people are very sensitive about this issue.

This paper analyzes the experience of managed lanes in Texas, focusing on those projects that have been procured through public–private partnerships. This research draws primarily on a field trip undertaken by the author in January 2016 to Dallas and Austin (Texas), where he interviewed representatives of the state government, representatives of the metropolitan organization in charge of transportation planning, managers of some of the PPP projects, former public officials in charge of the projects, and representatives of some private contractors.

2. Managed lanes in North Texas

North Texas has a population of around 7 million inhabitants, most of them living in the metropolitan area of Dallas–Fort Worth. North Texas represents an interesting setting in which to analyze this kind of project for a number of reasons: 1) there are six projects in that region; 2) there are both publicly funded projects and PPP projects; 3) within the publicly funded projects there are a variety of approaches: design–build (DB), design–build–operate–maintain (DBOM), and conventionally procured (designed by the Texas Department of Transportation and built by a private contractor) (see Table 1).

There are seven managed lane projects in North Texas (see Figure 1). All of them have dynamic pricing and the same maximum toll that can be charged. In all the projects, the tolls are collected by the North Texas Tolling Authority (NTTA) on behalf of the Texas Department of Transportation or the private concessionaires.

Another interesting point is the variety of ways in which these projects have been funded, which are analyzed later in this paper: federal public subsidies, state public subsidies, public bonds, private loans, private bonds, and private equity.

Table 1. Managed Lane Projects in North Texas

Project	# in Fig. 1	# managed lanes (per direct.)	Length of managed lanes (miles)	Total invest. (U$ mill.)	Year of award	Kind	Status
North Tarrant Express	1	2	13.3	2.049	2009	DFBOM	In operation
LBJ Express	2	2–3	13.3	2,627	2009	DFBOM	In operation
DFW Connector	3	2	4	957	2009	DB	In operation
I-30	4	1			2012	B	In operation
I-35 E	5	1–2	30.0	1,439	2012	DBOM	Under construction
35-W	6	2	18.1	2,284	2012	DFBOM	Under construction
Midtown Express	7	1	n.a.	3,800	2014	DBOM	Under construction

Source: Elaborated by the author with data provided by the Texas Department of Transportation

Figure 1. Managed lane projects in North Texas

The analysis of the managed lane projects in North Texas reveals a variety of sources, both public and private, as shown in Table 3.

- Federal public subsidies: Funds provided by the federal government as a subsidy for the project.
- State public subsidies: Funds provided by the state government as a subsidy for the project.
- Private loan: Funds provided by a private financial institution as a loan.
- TIFIA loan: Funds provided by the federal government as a loan under the program 'Transportation Infrastructure Finance and Innovation Act (TIFIA).
- Private activity bonds (PABs): Tax-exempt bonds issued by or on behalf of the local or state government for the purpose of providing special financing benefits.
- Public bonds: Bonds issued by the state.

Private equity: Funds provided by private sponsors in the form of equity of the concessionaire

Table 2. Sources of Funding of the Managed Lane Projects in North Texas

Project	Federal public subsidy	State public subsidy	Private loan	TIFIA loan	Private activity bonds	Public bonds	Private equity
North Tarrant Express		573		650	400		426
LBJ Express		490		850	615		672
DFW Connector	261	696				176.2	
I-30							
I-35 E	460	979					
35-W		345	689	531	277		442
Midtown Express	680	n.a.				n.a.	

Source: Elaborated by the author with data provided by the Texas Department of Transportation

3. Risk analysis

Risk allocation is considered to be the most fundamental principle underlying the long-term infrastructure PPP model (Grimsey & Lewis, 2000; Marques & Berg, 2011). From the perspective of governments, users, and taxpayers, risk allocation is crucial because it incentivizes private partners to focus on the life cycle costs of constructing, operating, and maintaining the asset rather than the optimization of short-term profit (Grimsey & Lewis, 2000; Carpintero & Petersen, 2015). Finding the most appropriate risk allocation is therefore key to successful PPP implementation (Shen, Platten & Deng, 2006), and in the case of building and operating transportation infrastructure, the risks assume even greater importance because of the large fixed investments (Albalate, Bel & Geddes, 2013).

Addressing risk allocation from a theoretical perspective, Medda (2007) establishes that risks in PPPs should be borne by the partner that is best able to manage each specific risk or carries the risk at the lowest comparable cost. Arguably, these two principles are closely linked, because the allocation of risks to the partner that is best equipped to manage the specific risk in most cases also represents the lowest overall cost for the project. Liu and Wilkinson (2008) claim that governments should transfer the risks that private companies can directly affect by employing project management expertise but retain those that are beyond the control of the private sector. However, pricing and distributing all the risks efficiently between the partners in a PPP project is challenging. Ng and Loosemore (2007) argue that there is ample evidence showing that risk transfer is often handled poorly between parties in PPP contracts.

The key risks commonly discussed in the literature on infrastructure PPPs can be grouped into various categories (Medda, 2006; Albalate et al., 2013). Some of them are directly related to the

construction process, mainly cost overrun and delay in completion (also known as *construction risks*). Once the infrastructure has been built, two main categories of risks arise: *demand risk* and *operation and maintenance (O&M) risks* (Carpintero & Petersen, 2015). There are a number of factors that can affect the revenue of a PPP project: variation in the demand, changes in taxes or tariffs, and increases in input prices. The most relevant factors relating to O&M risks are operating cost overruns, delays or interruptions in the operation, and shortfalls in the service quality (Marques & Berg, 2011; Ng & Loosemore, 2007). In the following subsections, we analyze the risk allocation in the managed lane projects of North Texas.

3.1. Construction risk

The construction risk has been transferred to the private sector in all the projects analyzed in this paper, although with some differences among the projects. In some cases it has been transferred to the private concessionaire that is in charge of financing the project and building (or refurbishing) the infrastructure, as well as operating and maintaining it. This is the case of North Tarrant Express, LBJ, and 35-W (all of them awarded to Cintra).

In other cases, however, the construction risk has been transferred to a private contractor that is in charge of developing the design and building (or refurbishing) of the infrastructure, as well as operating and maintaining it. This is the case of I-35 E and Midtown Express (also known as SH-183). Finally, in two other cases, the construction risk was transferred to a private contractor that is only in charge of building (or refurbishing) the infrastructure. This is the case of DWF Connector and I-30 (in the case of DWF Connector, the contract also included developing the design).

According to some of the interviews conducted for this research, the differences between the various approaches existing in these projects have relevant consequences for the projects. When the same company is in charge of building the infrastructure and maintaining it, it will not have an incentive to make savings during the construction, which will affect the maintenance negatively and make it more expensive. In addition, when the company that builds the infrastructure assumes the demand risk, this company will try to improve the connectivity of the motorway as much as possible. However, when these two tasks are carried out by different companies, the one in charge of building the motorway will not have any incentive to improve the connectivity of the infrastructure.

Moreover, when the company that designs and builds the infrastructure has assumed the demand risk and provided the financing, it will have incentives (during the design period) to make relevant savings in the construction that will make the project cheaper without negatively affecting the quality of the service provided by the infrastructure. For example, the private concessionaire of LBJ (Cintra) suggested substituting a tunnel with an open-air underground motorway.

3.2. Demand risk

Three projects have been procured through public–private partnerships: North Tarrant Express, LBJ, and 35-W. In all of them, the demand risk has been fully transferred to the private concessionaire (see Table 3). In the other four projects, the demand risk has remained with the public sector. There is no availability payments in PPP projects in North Texas because the existing legislation does not allow this kind of PPP. Therefore, in the cases in which the demand risk was too high to be transferred to the private sector, they have been publicly funded.

One of the projects (Midtown Express) was initially planned as a PPP project with the demand risk transferred to the private concessionaire. However, there was only one bid, by Cintra, which had already been awarded three concessions in North Texas. For this reason, the Government decided to procure it as a DBOM project, in which the demand risk remains with the public sector but both the construction risk and the O&M risks are transferred to the private concessionaire.

According to some of the interviews conducted for this research, American companies have neither much experience nor much know-how about dealing with demand risk, mainly because of their lack of experience in this regard. However, Spanish companies have considerable experience in dealing with demand risk acquired both in their own country and abroad. In the case of managed lanes in North Texas, the three projects with demand risk have been awarded to the same Spanish company—Cintra.

3.3. Operation and maintenance (O&M) risks

Only in two of the projects have the O&M risks remained with the public sector. In the other five projects, they have been transferred to the private sector within a PPP contract. According to some of the interviews conducted for this research, there are some differences when the company in charge of O&M is the same one that has assumed the demand risk. In this case the company has incentives to take care of some aspects related to O&M that affect how much traffic drives on the managed lanes, for example adequate signaling, information provided to the drivers and potential drivers along the motorway, marketing, and so on.

Table 3. Risk Allocation in the Managed Lane Projects of North Texas

Project	Demand risk	Construction risk	O&M risks
North Tarrant Express	Private (Concessionaire)	Private (Concessionaire)	Private (Concessionaire)
LBJ Express	Private (Concessionaire)	Private (Concessionaire)	Private (Concessionaire)
DFW Connector	Public (TxDOT)	Private (Contractor)	Public (TxDOT)
I-30	Public (TxDOT)	Private (Contractor)	Public (TxDOT)
I-35 E	Public (TxDOT)	Private (Concessionaire)	Private (Concessionaire)
35-W	Private (Concessionaire)	Private (Concessionaire)	Private (Concessionaire)
Midtown Express	Public (TxDOT)	Private (Concessionaire)	Private (Concessionaire)

Source: Elaborated by the author with data provided by the Texas Department of Transportation

4. Concluding remarks

The analysis of the managed lane projects in North Texas constitutes an interesting case study because of the variety of approaches, in terms of risk allocation, to designing, financing, building, operating, and maintaining the transportation infrastructure. Our research reviews the various sources of funds—both public and private—that have been put in place to build and operate these projects and outlines the various approaches to risk allocation implemented. At the time of writing this paper (April 2016) four of the projects have been in operation only for around two years, and three of them were still under construction. The paper provides a preliminary assessment of the various risk allocation approaches identified in these projects. It shows that, in some respects, transferring the demand risk to the private sector seems to be more efficient.

Acknowledgments

The author gratefully acknowledges the support of 'Catedra Juan-Miguel Villar Mir in Business Administration' of the Polytechnic University of Madrid, which provided funding for this research. They also wish to express their gratitude to the officials of the Texas Department of Transportation

and other public agencies, as well as the managers of the projects, who were generous and patient enough to answer questions and supply data for this project.

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