Failure Links between Public and Private Sector Partners in Transportation Public Private Partnerships Failures

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***Abstract*—In spite of increased popularity of Public Private Partnerships (PPPs) models for delivering public transportation infrastructures, the international experiences in recent past have shown massive problems and partnership failures. Motivated by such failures, the authors undertook case studies of thirty five failed transportation PPP projects in last two decades from developed and developing nations to evaluate root causes that drove transportation PPPs to the status rated as failure. The results of case studies yield a set of failure drivers caused transportation PPPs failures. The case studies also reveal the tendency of failure drivers to trigger new failure drivers, therefore confirming the causal relationships among failure drives. A causal relationship between two failure drivers is then termed as failure link. The identification of failure links not only reveals the causal relationships between failure drivers but also portrays the impact of actions of one partner on other project partners and on overall project progress. Following this identification, this paper discusses the failure links between public and private sectors; and explains that how the two primary partners in transportation PPPs create problems for each other.**

***Index Terms*—Transportation, public private partnerships, failure drivers, failure links**

I. Introduction

Public Private Partnerships (PPPs) have been adopted world wide as an alternative form of public infrastructure delivery. In a typical PPP setup, the private sector partner is invited to bring his capital and technical capabilities to accomplish specific public sector infrastructure project in association with related public sector agencies. Consequently, the public and private partners share the project risks and benefits. The benefits for the private sector partner are usually in the form of toll collection from users of facilities developed via PPP framework or in the form of payments directly from the government or public sector client. The benefits for public sector partners are achieved in the form of developing public infrastructure facilities and gaining extended value for money (VFM) in comparison to the conventional procurement systems commonly adopted by the public sector agencies for procuring public infrastructure. Public Private Partnerships (PPPs) models are becoming a vital toll for governments around the world, especially in developing countries, to enhance, develop and manage urban and national transportation networks. The World Bank's database for Private Participation in Infrastructure (PPI) indicates total US$273,596 million of investments in transportations sector in developing nations since 1990. The figure of US$273,596 million indicates total investment commitments made in last three decades, excluding cancelled and distressed transportation PPP projects. Figure 1 shows the regional distribution of total investments, excluding cancelled and distressed transportation PPP projects, reflected by PPI database.

The proven success and VFM delivered by the PPPs in last three decades have attracted many researchers to workout code of conduct for private business in public infrastructure. In pursuit of successful implementation of PPPs, numerous fundamental researches have been published; among them most highlighted success factor research publications are as follows;

Tiong [1] identified six critical success factors (CSFs) in winning BOT contracts: (1) entrepreneurship and leadership, (2) right project identification, (3) strength of the consortium, (4) technical solution advantage, (5) financial package differentiation, and (6) differentiation in guarantees. This approach of identification of potential success factors was succeeded by Zhang [2] by broadening the scope to other forms of PPPs. Zhang [2] identified five CSFs, with sets of sub success factors, for infrastructure development PPPs; and those CSFs were (1) favorable investment environment, (2) economic viability (3) reliable concessionaire with strong technical strength (4) sound financial package and (5) appropriate risk allocation via reliable contractual arrangements. Li et al. [3] identified CSFs for PFI projects in United Kingdom. Besides the CSFs approach, massive research had been conducted on other issues associated with PPPs. Such issues included concessionaire selection, stakeholder management, risk allocation and management, concession contract design, conflict resolution etc.

Despite the exploration of vast variety of success factors for implementing PPPs, past experiences with transportation PPPs have shown numerous problems and

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failures that caused losses to both public and private partners. Even developed economies like USA, UK and Canada have bitter history of transportation PPP failures. The World Bank's PPI database reflects worth US$93,740 million of failure transportation PPP projects since 1990; and this figure does not contains failure projects in developed nations and the projects which were completed but did not yield any VFM to the public. Existence of such massive failures motivated authors to investigate failure scenarios in transportation PPPs and to explore the hidden relationships among different PPP project partners causing partnership failures and loosing VFM. Following the investigation of failure projects, this paper discusses failure scenarios caused and shared by public and private partners, i.e. the two main ingredients of a PPP model of project delivery.

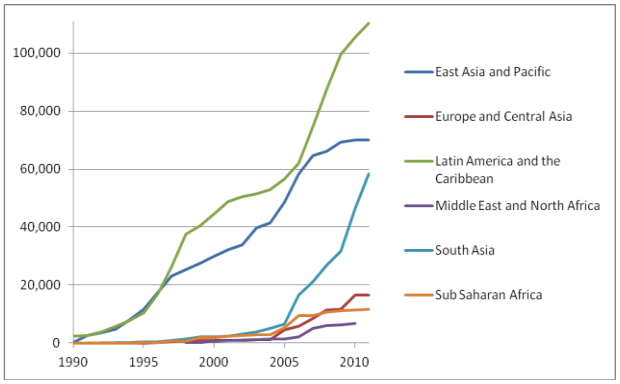

Figure 1. Regional distribution of total PPP investments in transportation sector reflected by PPI database

II. Case Studies

In search of failed transportation PPPs, the basic reliance is made upon the World Bank's PPI database. However, due to the absence of detailed project information and no account for PPP projects did not yield VFM in PPI database, the search for failure cases and for the supporting information for cases found from PPI database is extended to the all literature available online tagged with transportation PPPs. Among thousands of documents found from World Wide Web are included research papers, evaluation studies made by public sector organizations and other international financial institute, audit reports and reports by nonprofit organizations. All failure cases found from those documents are then passed systematically from three consecutive phases to assure the failure status of projects and to assess their suitability to perform case studies. The three phases are (1) projects must satisfy failure criteria (i.e. failure types depict in table 1) (2) availability of reliable documents citing project events and (3) validity of available documents. The third phase is applied only to the failure cases found not delivered VFM. All failed transportation PPPs cases not fulfilling the requirements of the three consecutive phases assessing failure status were ignored; and finally 35 projects were finalized to proceed with further case studies analysis. These 35 projects are representing both developed and developing countries. Table 1 illustrates the failed transportation PPP projects considered for this study and their type of failure. For detailed review of case studies conducted for this research, the reader can refer to Soomro and Zhang's [5] article titled "An Analytical Review on Transportation PPPs Failures".

III. Failure Drivers in Transportation PPPs

Failure drivers are the reasons, factors and events responsible for PPP failures. The case studies have identified that failure drivers are spread over whole PPP project lifecycle; and mostly initiate by the main project players, i.e. the public and private partners.

The case studies have found that a failure driver set off by a partner in transportation PPP project influences the performance of other project partners; and therefore those other partners are compel to take necessary actions to tackle down worse impacts of failure driver. It is also interesting to identify that neither public nor private sector partner directly causes problems for each other, but their actions does cause new failure drivers whose responsibility is mutually shared between them; thou the level of responsibility sharing may vary from project to project.

The PPPs are the partnerships in which losses and profits are shared between public and private sector partners; therefore all failure drivers may be considered as a mutual responsibility of both partners unless they are allocated to any of the partners under concession agreement. In a typical transportation PPP project, the level of responsibility sharing is defined in a concession agreement. Therefore it is quite possible that during the final negotiations with preferred bidder prior award of concession, the public client may completely transfer such shared responsibilities to the private partner. The process of transferring such responsibilities is typically known as the risk allocation. As all identified failure drivers also inherent the characteristics of potential risks and therefore the responsibilities of failure driver are also allocated between PPP project partners. Figure 2 illustrates the identified failure drivers, and their causal relationships, initiated and shared by public and private partners.

IV. Failure Links Between Public and Private Sectors Partners

A failure link is a causal relationship between two failure drivers, indicating flow of a failure scenario. Following this definition, a failure link between public and private partners is a cause and effect relationship between two failure drivers that are set off by public and private sector partners; and defines how exactly improper action of one partner impacts the performance of other partner. However, as it is discussed earlier that neither public nor private sector partner directly causes problems for each other, but their actions does cause new failure drivers whose responsibility is mutually shared between them; therefore the failure links between public and private partners are discussed in terms of occurrence of such shared failure drivers in transportation PPPs.

A. Shared Failure Drivers in Procurement and Tendering Stage of Project

Inappropriate risk allocation is the first mutually shared failure driver between public and private partners in a transportation PPP project life cycle. The optimal risk allocation between project partners is a primary value for money (VFM) driver; and failure to allocate risk efficiently to the parties involved in a transportation PPP project not only risks the VFM but also risks the successful completion of project construction. Therefore, improper risk allocation is equally harmful for both public and private sector partners in terms of achieving project goals.

TABLE I. FAILED TRANSPORTATION PPP PROJECTS, AND THEIR TYPE OF FAILURE, CONSIDERED FOR THIS STUDY

No.	Project name & hosting country	Type of failure
1	Blegrade Novisad Motorway, Czech Republic	Concession cancelled
2	D47 Motorway, Czech Republic	Concession cancelled
3	Horgos-Pozega Highway, Serbia	Concession cancelled
4	M9 Motorway, Pakistan	Concession cancelled
5	Mexico Toll Road Program, Mexico	Concession cancelled
6	Mumbasa container terminal, Kenya	Concession cancelled
7	Trakia Motorway Project, Bulgaria	Concession cancelled
8	Transgabonais, Gabon	Concession cancelled
9	Jakarta Outer Ring Road, Indonesia	Concession cancelled + Project nationalization
10	Bangkok Elevated Road and Track System, Thailand	Concession cancelled
11	D5 Motorway, Czech Republic	Concession tender cancelled
12	M3/M30 Toll Road, Hungary	Concession tender cancelled
13	M7 Toll Road, Hungary	Concession tender cancelled
14	M9 Danube Toll Bridge at Szekszárd, Hungary	Concession tender cancelled
15	Pitesti-Bucharest-Lehliu (140 km) First Phase, Romania	Concession tender cancelled
16	Argentina Toll road program (first generation), Argentina	Contract suspension
17	Beiras Litoral / Alta Shadow Toll Road, Portugal	Project Halted
18	91Express Lanes California, USA	Project nationalization
19	Camino Colombia Toll Road, USA	Project nationalization
20	London Underground – Metronet, UK	Project nationalization
21	London Underground - Tubelines, UK	Project nationalization
22	M1/M15 Toll Road, Hungary	Project nationalization
23	Railtrack,United Kingdom	Project nationalization
24	Siza Rail, Democratic Republic of Congo	Project nationalization
25	Skye bridge, United Kingdom	Project nationalization
26	Tha Ngone bridge project, Lao PDR	Project nationalization
27	Zagreb-Gorican Motorway, Croatia	Project nationalization
28	Channel Tunnel, United Kingdom	VFM not achieved
29	Channel Tunnel Rail Ling (CTRL), United Kingdom	VFM not achieved
30	Confederation Bridge, Canada	VFM not achieved
31	Highway 407, Canada	VFM not achieved
32	Railfreight Distribution, United Kingdom	VFM not achieved
33	Rolling Stock Leasing Companies (ROSCO), UK	VFM not achieved
34	Royal Dockyards (at Davenport and Rosyth), UK	VFM not achieved
35	Wijkertunnel Randstad, Netherlands	VFM not achieved

In a typical transportation PPP project basic risk allocation is decided by the public sector procuring agency while developing public sector benchmark (also known as Public Sector Comparator). The secondary and final stage of risk allocation is decided during the negotiations between public sector clients and preferred bidder takes place. This research identifies that failure links of inappropriate risk allocation traces back to public sector partner; first at the time of developing public sector benchmarking when public sector procuring personnel are unable to evaluate efficient risk allocation and second when public sector procuring agency is fail to organize a healthy bid competition, i.e. a non competitive tendering or direct award of contract. This research identifies that non competitive tendering puts preferred bidder in a strong position to negotiate on better terms for his profitability, as public sector client has less or no alternative choices but the same preferred bidder. In case of no or less alternate bidders, the preferred bidder also tends to demand for higher risk premium to retain risks or outright refused to take some risks and caused improper risk allocation.

In case of non competitive tendering the preferred bidder tends to demand for higher subsidies and guarantees. Demand for higher subsidies and guarantees by the concessionaire is second shared failure driver between public and private partners. This research finds that such demands by the concessionaire (i.e. Private sector partner) are root caused by the two possible facts. First, the motivation for achieving better profitability; second the financial problems with concessionaire at the early stages of project. Therefore, the failure links connecting demand of higher subsidies by the concessionaire are tracing back to both public and private partners. Case studies have shown that such problems could arise at early stages of the project when concessionaire is failed to acquire promised finance from financing institutes or failed to reach financial close. The failed PPP project of Zagreb Gorican highway in Croatia witnessed such scenario.

B. Shared Failure Drives in Project Construction Stage

Delayed acquisition of land is a main shared failure driver that may occur during construction stage of a transportation PPP project. As transportation projects are stretched across vast terrains; and therefore may require occupying land which is occupied by multiple owners. The devastating impacts of delayed acquisition of land are found in the projects of Bangkok Elevated Road and Train System (BERTS) in Thailand and in the first generation of Mexico Toll road program.

Acquisition of land is truly a shared responsibility, as it requires a vast range of activities from community consultations to setting land compensation price and resettling effected people. In case of non indigenous concessionaires, the higher portions of the land acquisition responsibilities fall upon the public sector partners because being a foreign entity the concessionaire may not be in an ideal situation to bargain with local land owner.

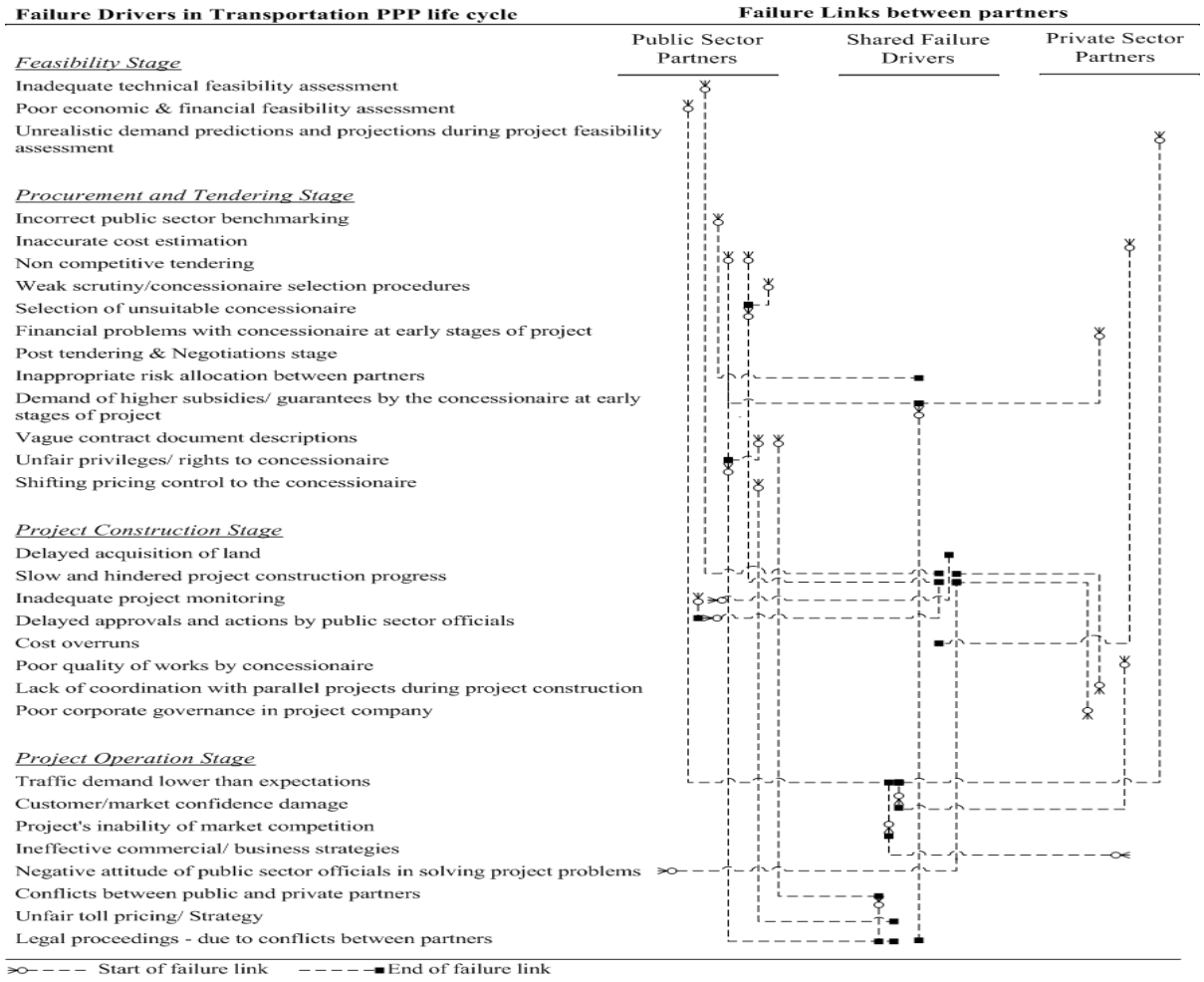

Figure 2. Failure drivers and failure links between public and private sector partners

The similar was the case with BERTS in Thailand, but continued negligence from public sector officials caused big delays [6] and consequently the project went filed; however this was not the only reason of project failure but it did played a vital role.

Slow and hindered project construction progress is another shared failure driver in project life cycle and is most complex in nature among other identified failure drivers. The slow and hindered project progress is a failure driver which impacts all project partners. The case studies have shown that slow project progress is very critical to the project success; and if problems causing hindrance in progressing project further are not solved in timely manner then this failure driver alone can cause project failure or entirely damages the value for both public and private partners.

In a real practice, the slow construction progress may cause by countless factors; however, case studies conducted for this research purpose have revealed certain failure drivers having relatively higher probability to cause slow and hindered construction progress. The failure drivers associated with public sector partner causing slow and hindered project progress are inadequate technical feasibility assessment, selection of unsuitable concessionaire, delayed approvals and actions and negative attitude in solving project problems. The technical feasibility assessment unveils the technical possibilities, requirements and constrains associated with project construction and operation; and consequently, it

discloses associated risks, constraints and regulations to be followed by the project developer. Therefore, failure to conduit rigorous technical assessment is highly probable to create issues causing slow and hindered project progress. The brutal failure of BERTS in Thailand is a good example for understanding the impacts of inadequate or no technical assessment. The BERTS project was awarded without conducting any technical feasibility study; moreover the concessionaire also didn't consider conducting feasibility study a necessary task [6]. Due to the unavailability of technical feasibility study many issues were not highlighted and impacted project progress badly. The issues which impacted BERTS badly included site handover and crossings construction issues with parallel projects, delay in developing final designs, land acquisitions etc.

Selection of an unsuitable concessionaire is also probable to cause slow and hindered project progress. The unsuitability of concessionaire refers to the situation where concessionaire is failed to deliver anticipated VFM. Such attribute of unsuitable concessionaire was witnessed in failed PPP projects of BERTS in Thailand, M9 Motorway in Pakistan and Blegrade Novisad Motorway in Czech Republic.

Delayed approvals/actions and negative attitude in solving project problems are the two main failure drivers associated with organizational setup of public sector authorities and can create a massive problems for private sector partners in terms of slowing down project progress. This research identifies that delayed approvals/actions by the public sector authorities are majorly due to the absence of defined authority hierarchy of public sector authority; while negative attitude of public sector authorities is usually caused by the perception of being client in minds of personnel working at public sector partner's office.

The slow and hindered project progress is not always due to the inappropriate actions of public sector partners, but sometimes it is also cause by the private sector partners and impacts the VFM anticipations of the public sector partners. The failure drivers associated with private sector partners causing slow and hindered project construction progress include lack of coordination with parallel projects during project construction and poor corporate governance in a project company. Lack of coordination with parallel project is a rare case and can be observed only when multiple projects are in progress in a same territory. However, it is also a responsibility of public sector authorities to develop a coordination management plans if such issues have been highlighted.

Cost overrun is another shared failure driver between public and private partners in a transportation PPP project. In a typical transportation PPP project, the risk of cost overruns is typically transferred to the private sector partners to achieve maximum VFM for public. The case studies conducted for this research confirm that in major cases failure link connecting cost overrun is traced backed to the inappropriate cost estimation practiced by the concessionaire. As achieving cost efficiency is one of the prime motives of inducing private activity in public business, the transfer of risk of cost overrun to the private sector partner is a right practice; unless cost overrun is caused by the actions of public sector partners such as changing project scope, frequent change orders etc. However, irrespective of responsible partner and transfer of risk to the private sector partner, the cost overrun almost equally impacts the project progress. The cost overruns increase the probability of loosing revenue target and consequently project company fails to pay back the debt. This is to remember that failure of concessionaire to deal with allocated risk does not terminate the risk, rather ultimately risk itself and its consequences fall upon the public sector partners if concessionaire is unable to handle the allocated risk. Similarly, private sector partner's failure of debt repayment ultimately becomes the responsibility of the public sector partners.

C. Shared Failure Drivers in Project Operation Stage

Lower traffic demand is the most catastrophic shared failure that may observe during project operations and fatally damages the revenue generation capacity of a transportation PPP project. Alike cost overruns, the risk associated with this shared failure drives is typically allocated to the private sector partners; however the lower traffic demand also equally damages the anticipated VFM to the public sector partners. The failure links causing lower traffic demand emerge from both public and private partners. From public sector partner, the poor economic and feasibility assessment may cause the lower traffic demand. Project's inability of market competition and customer and market confidence damage are the failure drivers set off by the private sector whose failure links are also causing lower traffic demand. The damage of customer and market confidence is possibly caused by the two other failure drivers, i.e. poor quality of works and poor governance in a project company. The occurrence of damage of customer and market confidence was witnessed in the failure of Railtrack privatization and Channel Tunnel in UK. The project's inability of market competition is cause by adopting poor and ineffective business strategies; and the same was also witnessed in the project of Channel Tunnel in UK.

Enforcement of unfair toll pricing is another shared failure driver having high potency to impact transportation PPP projects badly. The term 'unfair toll pricing' refers to the toll price which is higher than its real social and market value or the price which is not affordable by the majority of general public. This research identifies that whenever private partner is solely authorize to set toll price, he enforces higher toll price to maximize his profit. The cases of Highway 407 in Canada, 91Express Lanes California in USA and M1/M15 toll road in Hungary are the examples of such exploitation of pricing power. Consequently the failure link causing unfair toll pricing is traced back to the public sector partners' decision to shift pricing power to the concessionaire.

The last shared failure driver observe by this research is legal proceedings due to the conflict between partners. It was interesting to find that in-spite of resolving

conflicts between partners, the legal proceedings are highly probable to vanish the VFM embedded in a PPP model of public project delivery; because such proceeding are not mean to find the optimized point called 'win win situation' but only to decide between claims made by the partners. Loss of VFM due to legal proceedings was witnessed in the case of 91Express Lanes California in USA, when claim for expansion of free lanes was rejected by the court of law in favor of concessionaire to keep right of no competition by declaring no completion right as commercial viability of project [7]; and then public sector had no other options but to buy back the infrastructure in a price more than it could cost if built with public money.

V. Lessons Learned and Conclusions

Throughout case studies analysis it was evident that neither public nor private sector partner directly causes problems for each other, but their actions does cause new failure drivers whose responsibility is mutually shared between them. This research identified such shared failure drivers and their consequences impacting project progress. It was also identified that failure drivers also inherit the characteristics of potential risks and therefore the responsibility of bearing such risk of failure drivers must be defined in concession agreement. Following this fact, it was also identified that failure of public sector personnel to evaluate rigorous risk allocation or failure to evaluate right risk premium increased the probability of occurrence of failure drivers in a transportation PPP project life cycle. The public sector partners also need to develop a firm monitoring framework to closely watch out the project activities; especially the pace of construction progress during project construction stage; as slow and hindered project progress is found as one of the most catastrophic failure driver that need to be dealt with greater priority.

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