AN ANALYTICAL REVIEW ON TRANSPORTATION PUBLIC PRIVATE PARTNERSHIPS FAILURES

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ABSTRACT

Governments around the globe are embracing Public Private Partnerships (PPPs) to overcome financial and technical deficit and to provide public infrastructure on faster pace. However, PPPs are complex institutional arrangements involving many players from diversified fields and thus bringing more risk to the project. Numerous researches had been conducted to investigate potential risks and success factors for establishing PPPs. But, as appetite for transportation PPPs is increasing around the globe, more problems and partnership failures are being witnessed. Existence of such failures and faults, despite of the availability of scientific protocols, motivate the authors to investigate transportation PPPs failures in past two decades. The investigation led to the identification of forty eight potential failure reasons, responsible for transportation PPPs. The identification of "potential failure reasons" was made possible through thirty five transportation PPPs case studies. The investigation through case studies reveals that the adoption of PPPs in different regions was motivated by specific reasons besides fundamental financial and technical concerns. These specific reasons had played important roles in the project success and failure. This paper discusses the global trend of transportation PPPs in different economies with evidence of potential failure reasons and their causal relationships.

Keywords: *Transportation, public private partnerships, failure drivers*

1.0 INTRODUCTION

Public Private Partnerships (PPPs) have been accepted worldwide as an alternative form of public infrastructure delivery. In a typical PPP, the private sector brings their capital and technical capabilities to accomplish specific public sector infrastructure project in association with related public sector agencies, thus sharing the project risks and benefits. The benefits for the private sector are usually in the form of toll collected from users of furnished facilities or in the form of payments directly from the government or public sector client. The vast global adoption of PPPs proven to be an alternative for budgetary constrained governments to acquire necessary public infrastructure by exploiting national and international private capitals. Despite of many proven successes, the practical experience has shown that establishing PPPs is not as easy as it was considered by many governments and thus history is full of hundreds of failure cases representing almost every nation and every sector. PPPs are complex institutional arrangements and public and private sectors are not the only stakeholders in real. In a typical PPP, the private sector partner is backed by financers, usually reputed local or international financial institutes. These financers are the main source of capital during facility construction and therefore have quite influence on the organizational structure of the project. In most cases, financers reserve the "step in" rights in case of private partner's failure of completion of jobs. Besides financers, the private partner is also supported by a bunch of shareholders who provide some share of finance through their equity injection. On the other hand, the public partner is also responsible to many other government agencies and regulators. For example, in a typical railway PPP project, the public sector may be

responsible to the Ministry of Finance for formal approval of the concession scheme, then it comes to the local governments for allocation of right of way, and after that it may be the approval of designs by a railways regulation authority. Therefore for any government, dealing with a PPP project requires a firm institutional capacity in its public sector agencies. That is the reason many nations have established independent PPP Units to facilitate and educate public sector officials.

Since the adoption of PPPs as a tool for providing public infrastructure, researchers had strived hard to work out rules of conduct for private activities in public business. Ref [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 [2] by broadening the scope to other forms of PPPs. Ref [2] identified five CSFs, with sets of sub success factors, for infrastructure development PPPs. The five CSFs are (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. Ref [4] identified CSFs for PFI projects in United Kingdom. Besides the CSFs approach, massive research had been conducted on other PPP issues. For example, [3] worked out methods and criteria for selection of concessionaire, [5] presented a knowledge based approach for PPP stakeholder management, and [6] applied alliance principals for better outputs of PPP projects. In spite of many successful PPPs in the past two decades, the real practice has witnessed a number of flawed and failed PPPs. Even developed economies like UK, USA and Canada has a bitter history of bad PPP deals. The existence of such failures motivates the authors to investigate PPP failures in the past two decades around the globe in order to identify specific reasons driving PPPs towards failure. However, this research is limited to transportation PPPs only. The authors identified a set of such potential reasons. During the research it was also disclosed that such reasons may not have significant impact unless they occur in a causal relationship with each other. This paper discusses the global trend of transportation PPPs in different economies with evidence of potential failure reasons and their causal relationships.

Table 1: Types of transportation PPPs failures

No.	Type of failure	Definition
1.	Value for Money not achieved	The public sector was unable to achieve Value for money and tax payers suffered losses.
2.	Concession cancelled	The concession contract is cancelled by the government and new tendering process is launched.
3.	Concession tender cancelled	The concession tender call off at initial stages (i.e. before signing agreement) due to poor financial viability of project or other reason.
4.	Project nationalization	The government nationalizes the project i.e. the project comes under public ownership.
5.	Project Halted	The project halts for a long time due to some conflicts, legal proceedings or any technical fault.
6.	Contract suspension	The government temporary suspends the concession rights of concessionaire.

2.0 WHICH PARTNERSHIP COULD BE RATED AS “FAILURE”?

Before discussing phenomena of partnership failure, it is necessary to understand the reason for which private parties are invited to deliver public infrastructure and associated services. The

budgetary constraints faced by governments and demands of increased productivity are the basic motivations for public sector agencies to invite private parties to form such partnerships. Or simply, the anticipation of increased value for money to the tax payer is the reason for adopting PPPs. Therefore, it can be concluded that any PPP not delivering value for money can be rated as a failed partnership. This paper considers a total of six types of failure, details of which are provided in Table 1. A PPP project may fall into more than one type of failure. Table 2 shows the frequencies of each failure type observed.

Table 2: Types of failure observed in case study samples

No.	Failure Type	Africa	Asia	Canada	CEE	UK	USA	South America	Total
1	Concession cancelled	2	3	0	4	0	0	1	10
2	Concession tender cancelled	0	0	0	5	0	0	0	5
3	Contract suspension	0	0	0	0	0	0	1	1
4	Nationalization of project	1	2	0	2	4	2	0	11
5	Project halted	0	0	0	1	0	0	0	1
6	Value for money not achieved	0	0	2	1	5	0	0	8

3.0 SAMPLE PPP FAILURE CASES

3.1. APPROACH TO COLLECTING EVIDENCES FOR CASE STUDIES

Ref [7] defined six basic sources of evidences for conducting case studies: (1) documentation, (2) archival records, (3) interviews, (4) direct observations, (5) participant observation, and (6) physical artifacts. Typically, PPPs are complex organizational structures involving multiple parties and consisting of long spans. It was impossible to perform direct or participant observations, and physical artifacts have no application in a PPP process. Therefore, the authors majorly had to rely on documentations and archival records. One interview was also conducted to collect case information in Pakistan. In collecting evidences, the following types of documents and archival records were utilized:

(1) Administrative documents – proposals, progress reports, publically released information
(2) Formal studies – research papers, evaluation studies, institution released documents, audit reports
(3) Newspaper clippings and other articles appeared in mass media communications
(4) Organizational records

The details of PPP deals are usually kept secret by government officials due to the commercial confidentiality; thus all available documents and archival records associated with particular projects were lacking of much information. It was rare that one source of evidence could provide all necessary information. As PPP details are a matter of confidentiality, it was also common that two different documents about one project could illustrate a contradiction in information. In this situation the reliance was made upon the source of document information.

3.2. PREPARATION OF SAMPLE CASES

The failure case search was initiated from World Bank's PPI database. The PPI database search returned 92 cancelled transportation projects in developing nations. It is the limitation of

PPI database that it only keeps record of private activity in developing nations and also has no record for projects not delivered value for money. The PPI database also doesn't keeps record of project details that how exactly project went fail. The search for failure cases was extended to available literature on web tagged with transportation PPPs. The web search returned with thousands of documents. These documents included research papers, evaluation studies made by public sector authorities and international financial institute, audit reports and reports by nonprofit organizations. Through the piles of documents, thirty five failure cases were finalized for further analysis. The selection of each failure case was made after passing each case through the failure criteria established above, and availability of firm and reliable documentary proof. The finalized failure cases represented many developed and developing nations around the globe. Table 3 illustrates projects considered for case studies.

Table 3: Projects considered for case studies

No.	Project Name & Country of origin	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, Hungry	Concession tender cancelled
13	M7 Toll Road, Hungary	Concession tender cancelled
14	M9 Danube Toll Bridge at Szekszárd, Hungry	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, Unites States of America	Project nationalization
19	Camino Colombia Toll Road, Unites States of America	Project nationalization
20	London Underground – Metronet, United Kingdom	Project nationalization
21	London Underground - Tubelines, United Kingdom	Project nationalization
22	M1/M15 Toll Road, Hungry	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, Crotia	Project nationalization
28	Channel Tunnel, United Kingdom	Value for Money not achieved
29	Channel Tunnel Rail Ling (CTRL), United Kingdom	Value for Money not achieved
30	Confederation Bridge, Canada	Value for Money not achieved
31	Highway 407, Canada	Value for Money not achieved

32	Railfreight Distribution, United Kingdom	Value for Money not achieved
33	Rolling Stock Leasing Companies (ROSCO), United Kingdom	Value for Money not achieved
34	Royal Dockyards (at Davenport and Rosyth), United Kingdom	Value for Money not achieved
35	Wijkertunnel Randstad, Netherlands	Value for Money not achieved

4.0 IDENTIFICATION OF POTENTIAL FAILURE REASONS

Throughout the case studies analysis it has been evident that neither one factor nor event leads towards success or failure. There has to be a series of simultaneous and/or consequent events and reasons that ultimately result in a situation of success or failure. Therefore, finding such events and reasons is necessary to understand failure phenomena in transportation PPPs.

5.0 ANALYSIS OF OBSERVED FAILURES

5.1. SUB-SAHARAN AFRICA

The African continent is the least developed compared to other global regions, and in dire need to develop infrastructure to uplift the economic situation and alleviate poverty. African governments do not possess the massive financial resources required to renew and expand their infrastructure networks. Twenty percent of the total road network in Sub-Saharan Africa is paved, compared to twenty five percent in Latin America and over forty percent in South Asia [8]. Contrary to the utmost requirements, much less private investment in the past was made in Sub-Saharan countries. Between 1990 and 2009, Sub-Saharan countries attracted US$95.04 billion in investment commitments. This amount represents only 7.87% of the cumulative investment in developing countries during same time period. The share of the transport sector was US$ 11.81 billion; out of this 21.1% went to toll roads, 40.3% to railroads, 4.2% to Airports and 34.3% to Seaports. Most of this private sector involvement was limited to operating contracts yielding no equity investment [9].

The political risks were found more active compared to other typical PPP risks. In African countries, traditional political risks such as nationalization of PPP/private projects either still persists or in decline; however, recently, problems for projects are from range of sub-state and transitional actors [10]. The failure of Transgabonais railway PPP at Gabon was mainly followed by those transnational and sub state actors. The Transgabonais carried both general freight and passengers. However, its primary traffics (also a main source of revenue) were manganese ore (65 percent) which were mined by Comilog, a consortium 70% owned by the French private investor and 30% by the Gabon state. The very first fault in privatizing Transgabonias was that the public officials were unable to organize a competitive bid competition. There were only two bidders to bid for the project [11]; one was Transgabonais, a consortium led by the Gabonese National Timber Company, the main shipper of timber products, while the second (Gabonrail) was led by Comilog. This situation, together with the condition that the selected bidder should have to reach agreement on access charges with the rival bidder was a potential problem. In the end, Comilog decided not to submit a financial offer; i.e. withdrawing from the bid competition. Being an old business entity, Comilog was in a strong position to negotiate the realistic access charges. Moreover, Comilog also had strong political links due to the fact that it was co-owned by the state [11]. Besides conflict with the main customer, Transgabonais also faced a financing problem, and hence was not able to make promised investments in existing infrastructure and rolling stock [12]. The same was stated as the reason for terminating the concession. Quite similar problems were observed in Sizarail at Congo. The difference was that political problems were triggered by an

invocation of civil war; and the new governing alliance showed a negative attitude towards privatization and laterally cancelled the contract [11].

The transportation PPPs failures at Sub–Saharan Africa were majorly influenced by political conflicts, anti privatization attitude by the public sector officials and lower institutional capacity of public sector officials to establish efficient partnerships with private sector. The analysis of sample cases indicates that political and bureaucratic risks have catastrophe consequences over transportation PPPs; especially when public institutions have lower capacity to accommodate private activities in a public sector business. The case of Transgabonias also indicates the potential problems arising if one of the main customers has very strong market power and political links, with weak or no countervailing regulatory power. Therefore, based on identified evidences it could be concluded that Sub-Saharan African countries need well defined policies, strong regulators and capable public sector officials to successfully implement transportation PPPs.

5.2. ASIA

According to Private Participation for Infrastructure (PPI) database, From 1990 to 2009, the Asian share for transportation PPPs was 45.05% among global total in the same sector; i.e., the largest share compared to other regions defined above In Asian region, 53% of total transportation investment was made for greenfield projects. This appetite of greenfield projects indicates the shortage and need of new transportation infrastructure in Asian region. A study conducted by Asian Development Bank (ADB), Japan Bank for International Cooperation (JBIC) and World Bank estimated that infrastructure investment in 21 developing countries in east Asian countries would reach $200 billion per year over the next five years; and private sector was recognized as a potential financing source for meeting the need of Asian developing nations [13]. The need of private sector participation is also indispensible due to facts that low economic conditions left governments with very limited choice and tightly allocated budget for new and improved transportation infrastructure. Most Asian countries lie in low and middle income countries. The low income status compelled Asian governments to spend more on other basic needs like health and education, thus leaving very limited quota for development of new transportation infrastructure. Most of the time, Asian governments hardly suffice the operational cost for existing transportation infrastructure; and no maintenance is performed for a very long time. Therefore, in Asia a huge lag of infrastructure maintenance is present, which also itself restrict governments to undertake new infrastructure developments. That is the reason for appetite for greenfield projects via private finance in Asian countries.

Asia, being a continent of developing nations, contains many problematic issues along with brilliant opportunities for the private sector. In our sampled case studies, the main issues were “lack of capacity in public sector” dealing PPP projects and “political and bureaucratic conflicts”. Due to the lack of capacity in dealing with PPP projects, the public sector was unable to organize a firm bid competition. Among four sampled projects, three projects witnessed non competitive tendering and in two projects the same led to the selection of unsuitable concessionaires. Apart from non competitive tendering, incorrect technical assessment prior to issuing bid documents, weak scrutiny and selection procedures and ineffective project monitoring were the identified indicators in sampled projects reflecting lack of capacity in public sector agencies of Asian countries.

The Asian category in the sampled projects contains four projects, representing four different failure scenarios. The Bangkok Elevated Road and Track System (BERTS) was a greenfield project suffered since the award of the project. The concession was awarded without competitive tendering and conducting any feasibility studies. The concessionaire also did not consider it necessary to conduct any technical and feasibility studies and started construction work right away [14, 55]. The project was severely affected due to the non-availability of feasibility assessment, baffled progress, non- securing of right of way, and poor coordination with another parallel project. Another concession for a greenfield project of Don Muang tollway was awarded to a different company in almost similar time as BERTS. The construction of Don

Muang tollway was completed before BERTS and constructed flyover for cross street intersections in such a way to make it difficult for BERTS project to proceed, as large parts of both projects were situated side by side [14]. Besides Don Mung tollway project, BERTS also had interfacing and site handover issues with Bangkok Skytrain project which had many stations positioned directly across the BERTS main route [15]. These all contribute BERTS with a progress slower than the planned schedule. Only 13% of the work was completed in the total stipulated construction time. Apart from these mentioned factors, the role of public sector was also questionable in terms of their support to sort out solutions for project problems. The case study of BERTS revels that the synchronization between public and private partners, that synergizes the motivation and leads towards project success, could not be established since the start of project. This factor was highly attributed to the rapid change of public officials responsible for project monitoring. Moreover, case study also identified that public sector officials did not contributed for project problem solutions, rather the concessionaire was continuously threatened to terminate the concession.

As discussed above, being a continent of developing nations Aisa dominates in certain kinds of risks. Norton Rose, an international law firm, surveyed Asian countries for potential risks in transportation PPPs and came up with a conclusion that the volume of opportunities in a country tends to be highly correlated to the degree of political risk in that country [16]. This conclusion was found evident in sampled projects at Pakistan and Indonesia. In Pakistan, the M9 motorway project was troubled massively between central and provincial governments over motorway land ownership and its privatization. In Pakistan, the motorways are being operated under a federal government agency named National Highway's Authority (NHA). The M9 motorway is also owned and operated by NHA. The proposed M9 motorway concession was passing through a major provincial industrial zone; and M9 was the only way through which one can reach that industrial zone. Therefore, provincial government showed their concerns over foreign ownership of only available route to major provincial industrial zone. Following conflict of interest between federal and provincial governments the concession was terminated. In an interview with a NHA official, it was also disclosed that the concession was awarded without any competitive tendering and the cancellation of the concession was also due to the concessionaire's inability to acquire finance for project.

The Jakarta Outer Ring Road (JORR) was most remarkable evidence of political and bureaucratic conflicts. The project was first impacted by the Asian financial crises of 1997 and consequently the concessionaires were unable to repay the debt. The concessionaires then surrendered the project to Indonesian Bank Restructuring Agency (IBRA) in exchange of bad debts of project company. IBRA and State highway agency of Indonesia then established a new company under the name PT Jalantol Lingkar Luar Jakarta (JLJ) to take care of the toll road project and take responsibility for settling its debts to IBRA [17]. Finding a strategic partner who could also finance the project was a priority of newly established company. A few attempts of rebidding were organized but selection of new partner could not be accomplished. In 2001, IBRA announced that a consortium company, DRBHICOM from Malaysia, had been selected as the preferred bidder for JORR [18]. However, in the same year, Parliament requested that the JORR project be retendered. The demand of retendering could be attributed to allegations of bribery in the selection of the preferred bidder. Soon after parliament's demand, the Malaysian Consortium had stated that it spent US$3 million on Indonesian senior officials to win the JORR project [17]. It became even more complex when conflicting views between two Ministers representing Jasa Marga and State Own Enterprises came to the surface, who felt that Malaysian consortium should take part in the JORR project (Tempo 2002). In a legal opinion in 2002 from the Attorney General ruled out that the Malaysian consortium did not have a right anymore over the JORR project [18]. Thus the private sector partner could not be selected and the project was completed by state owned company.

Ref [16] identified demand risk on a top ranking in Asian toll roads. This risk was witnessed in Tha Ngone bridge project in Laos where it failed to meet minimum demand requirements. The project concession was awarded to an Australian company without any competitive tendering. In spite of replacing existing ferry service [19], the project was unable to

attract sufficient demand. The tolls were increased to the point unaffordable to many users and eventually government decided to buy back the bridge.

The four sampled failure cases reflect the lower institutional capacity of public sector officials to sort out better PPP deals. The failures of M9 motorway in Pakistan and JORR in Indonesia showed that public sector officials were first unable to identify the potential private partners and then political and bureaucratic conflicts severely distressed the project progress. The bribery issues also highlighted both of the cases. The case of study of BERTS also showed similar problems at the public sector's end; however the role of public sector is more questionable in this case. Fundamentally, the failure of BERTS was affected by the unforeseen factors which theoretically could be envisaged before the award of concession by conducting detailed feasibility study. Thai government initiated BERTS with another PPP project at the same time in same corridor, which created massive site interfacing problems. When problems started surfacing, instead of solving the problems the Thai public sector officials were reluctant to take part and international concessionaire was left alone to sort out the solutions. In spite of massive problems, it was quite possible for BERTS to be successful, if proper actions would have been taken at early stages by the public sector officials such as aiding the concessionaire with securing right of way and site interfacing issues with other concessionaires.

5.3. CANADA

Transportation PPPs at Canada have shown better outcomes compared to other regions. Both sampled case study projects from Canada are functioning, however their success in terms of delivering value for money (VFM) to the public is being debated and questionable. In our case studies, we have considered Canada different from the USA, as legal and regulatory system concerning PPP in Canada is much different. The PPP regulatory system in Canada is more similar to the Britain and Australia. For example, the USA doesn't follow strict public sector comparator (PSC) or value for money test procedures while Canadian PPP council describes a proper PSC procedure much more similar to Australian PSC practice. However, Canada does have acquired some American influence in Highways privatization. The privatization of Highway 407 under franchise of 99 year lease resembles to the sale of Chicago Skyway and Indiana toll way in the USA. Alike in the USA, the sale of Highway 407 was also opposed by many public organizations [20] but the Canadian government had a valid reason, to satisfy the parliament. The highway privatization was made politically favorable on the grounds to cover budget deficits and support weak financial position of the Ontario province due to recent financial crises [21]. The lease was awarded in $3.1 billion. In exchange, the Ontario government gave away toll settings and collection rights for Highway 407 [20].

Since privatization of Highway 407 in 1999, the tolls have been raised six times. This action of concessionaire caused congestion on adjacent roads. To overcome this, the government took legal action claiming that concessionaire breached the contract by not getting approval of toll increase from government. Nevertheless, the court decision went in favor of concessionaire. After failed attempt of legal action, the government approached concessionaire with $40 million "customer benefit" program, which was agreed by the concessionaire. According to this customer relief program, the tolls would be reduced up to 15 percent for 100,000 frequent users over the following four years and discounts were provided for truck drivers during evenings and weekends [21, 53].

Originally, Highway 407 was constructed through conventional (i.e. Design-Bid-Build) procurement, thus financial risks were born by the public sector. The highway was privatized soon after it became operational. In privatizing Highway 407, the Ontario provincial government moved faster and the long term public benefits were not kept in view. After two and a half years of privatization, Highway 407 was sold again in 6.3 million, double the original price paid to the government [21]. If government could have waited enough so the project could have reached a mature level to determine the correct market price the public could have more benefits. Moreover, shifting toll pricing power to the concessionaire impacted VFM. The 40 million customer benefit

program allows concessionaire to raise tolls once regular user rebate program takes place. In overall experience, the privatization of Highway 407 did not bring VFM to the public. Highway was sold at premature stage, yielding less financial benefits; and government lost its control on toll settings.

Another Canadian transportation PPP was Confederation Bridge connecting Prince Edward Island with Canadian mainland. Confederation Bridge PPP deal also demonstrated lapses in achieving planned VFM. The factors undermining anticipated VMF included the higher tolls, expensive financing costs, improper risk allocation and improper financial subsidy evaluations in Public Sector Comparator (PSC) calculations. Before construction of Confederation Bridge, the Prince Edward Island was connected through ferry service which was discontinued after the bridge became operational. The ferry service was subsidized by the government. The same amount of subsidy was given to the bridge concessionaire to subsidize the bridge tolls. The government also allowed concessionaire to increase the tolls (above the ferry charges) as much as $8 per car [22]. The Auditor General of Canada (1999) found that ferry subsidy was not properly accounted in the PSC of project, and financing arrangement cost $45 million more than it should have. Moreover the demand risk was also borne by the public by providing minimum revenue guarantee of $13.9 to the concessionaire, while no profit capping is described in concession agreement [22].

5.4. CENTER EASTERN EUROPEANAND OTHER EUROPEAN COUNTRIES

Center Eastern European (CEE) contributes major part of our samples of case studies, i.e. 13 projects. However, higher quantity of failure projects doesn't indicate these regions are not viable for transportation PPPs. CEE countries also had many successful examples of private participation in developing transportation infrastructures. The samples from CEE countries included in this study represent the projects undertaken in early 1990's, the time soon after the fall of the Soviet Union. During Soviet era, Central European countries were under the influence of communism. After the fall of communism at the beginning of 1990's, CEE countries began the process of transition to the market economies [23], that is, from communism to capitalism. The change to capitalism was immense to cater rapid economic growth and get synchronized with other central European countries. Soon after the fall of communism, the rapid growth was observed in transportation activities. The growth was evident by increase in the number of cars and trucks in CEE countries increased by 30% and 43% between 1993 and 1999 respectively (United Nations Economic Commission for European Database). The growth of transportation activities can be attributed to two main factors. First, the geographic position of CEE countries occupies the position of through-transit with in European transportation networks. Second, cross border traffic was very much restricted during Soviet era among CEE countries and other European countries. Soon after the fall of communism in early 1990's, the trade and other economic activities were increased on higher rate compared to pre 1990's.

Faced with pressing needs, CEE countries urgently needed to expand their transportation networks. As these countries were recently liberated from a bounded economic system, the financing constraint did not let them perform the transport network expansion from public money. The new transportation infrastructure investment plans by the CEE countries had to rely on private finance. Besides shortage of public funding, other main reasons for utilizing private finance were (1) the need to reduce both public deficit and debt in order to meet requirements for admission to the European Union and (2) the aim of increasing the role of the private sector in the economy [24].

The early transportation PPP failures at CEE and other European countries highlighted some key failure reasons. Among many failure reasons, non competitive tendering, lower feasibility for privatization and demands of higher subsides by preferred bidders and concessionaires are the most significant. Non competitive tendering and lower feasibility for privatization are the initiating reasons to trigger other failure reasons. The demand of higher subsidies by the concessionaire is a dependent reason majorly preceded by the non competitive

tendering and lower feasibility for privatization. Non-competitive tendering put selected concessionaire in a stronger position to negotiate for higher subsidies and other demands. This superiority of concessionaire was evident in PPP projects of D47 Motorway at Czech Republic [25], Pitesti-Bucharest-Lehliu Highway at Romania [23, 26] and Trakia motorway at Bulgaria [23, 25, 27]. In the case of Horgos-Pozega highway project, lower feasibility for privatization was also a reason for demand of higher subsidies by the concessionaire [27].

Lower feasibility of project for privatization was mainly due to the lower traffic demand on project corridors. The projects failed (i.e. concession tender cancelled) because of lower feasibility were D5 motorway in Czech Republic, Horgos-Pozega Highway in Serbia, and M3/M30 Toll Road, M7 Toll Road and Danube Toll Bridge in Hungary. The lower traffic demand in Hungary could be attributed to very high inflation rates and decline in real incomes during the early and mid 1990's [28]. The high inflation and decline in income resulted in decrease in economic activities and also in affordability of general public. Though at the same time, two highway projects, M1/M15 motorway and M5 motorway were successfully procured and completed due to the fact that they were providing through-transit to the international traffic between Central Europe via Austria and Southern Europe via Serbia. The M1/M15 motorway project was nationalized after 5 years of operation [29].

Where non-competitive tendering made concessionaires demand for higher subsidies, it also resulted in selection of unsuitable concessionaires (e.g. Belgrade Novisad Motorway in Czech Republic and Zagreb-Gorican Motorway in Crotia). The Belgrade Novisad motorway was greatly suffered by the baffled project progress as only 10–15% of the originally planned works were carried out during the total planned construction time of 23 months [23]. Consequently, the concession was cancelled without paying any compensation and the project was completed from public funds.

Public protests were also observed in response to the non-competitive tendering in the case of D47 motorway in Czech Republic (McGrath et al. 2008). The toll charges were usually much higher than the affordability of general public. It was the similar case in M1/M15 toll road in Hungary, in which the concession agreement gave the concessionaire the right to adjust toll rates according to consumer price index and fluctuations in exchange rate based on the original proportions of different currencies used for the loans [23]. The revenue maximization policy by the concessionaire was based on the fact that there would be only one toll barrier between Austria-Hungary border and Budapest [30]. The revenue maximization policy was also based on the assumption that rich western European drivers would be prepared to pay a higher per kilometer toll than those applied in West European countries if calculated on the basis of the length of motorway. The traffic studies confirmed that mainly foreigners would use the motorway [29]. However enforced toll rates were deterrent to most of Hungarian drivers due to the lower affordability of Hungarian public. This resulted in strong public oppositions and legal petitions against concessionaire. The court procedure led indirectly to the capping of the toll tariffs [49]. Civil court ruled that according to the Civil Code the toll rates were unfair and extremely high, and that therefore the concessionaire had to pay back the excessive part of the toll [50]. The "excessive part of toll", as per court decision, amounted one third of total collected toll since start of concession [30]. This was not just an end, the project greatly suffered from less revenue generation due to court decision and lower traffic demand followed by economic crises in Hungary and increase of other attractions in other parts of Europe which diverted international traffic. Less revenue generation affected loan repayment and hence created distrust in project financers, while on the other hand public protests undermined the political support. This all led towards project nationalization.

The traffic lower than expectations at M1/M15 was not purely due to the economic crises. The basis of this fault lied in the unrealistic traffic predictions made based on pre-1989 partial historical data when international traffic between Hungary and Eastern Europe was severely restricted. The rapid growth of traffic on route during 1992 and 1993 strengthened the traffic increase predictions by the experts. The experts appointed by the lenders also agreed on aforementioned predictions during due diligence. Nevertheless experts were unable to realize that increased traffic volume was majorly contributed by the Hungarian drivers traveled to Austria to

buy stuff not available in Hungary, which would stopped once after conditions get better in Hungary (be reminded that Hungary was a part of the communist bloc until 1989. After the fall of communist bloc in the early1990's, the Hungarian economy was in transition). Another wrong speculation was made about the holiday traffic from former East Germany. At this point traffic experts were also failed to envisage that improvement in German GDP would also make other destination more affordable for Germans [30].

Apart from above mentioned failure reasons, there are some other observed faults. In Wijkertunnel in Netherlands, the improper benchmarking performed by the public sector resulted in ineffective risk transfer and ultimately substantial cost to tax payers [31]. The project partly transferred design and construction risk to the private party and demand risk was borne by the public party, which provided minimum traffic guarantee and capped maximum revenues. This non-effective risk transfer could be partially attributed to the lack of competition during the tendering process, as there was only one bidder for the project.

5.5. UNITED KINGDOM

In the UK, PPPs are also known as Private Finance Initiative (PFI). The PFI program was initiated in 1992 by the Conservatives' government of John Major [32]. The nature of the PFI program differs from typical PPPs in other countries. The aim of PFI is to bring the private sector's finance, management skills, and expertise into the provision of public sector facilities and services [33]. The other forms of PPPs focus on private sector ownership of state owned public infrastructure and services. In spite of a developed economy of the UK with fully capable public sector agencies, the early transportation PFI experience had witnessed problems associated with delivering anticipated value. In the total nine sampled projects from the UK, three were bought back by the government. The other six projects are still running under private provision but were declared a bad deal by the Auditor General as they were unable to produce the value for tax payers.

The world's oldest underground railway, "London Underground", was partially privatized in 2002 in such a way that track maintenance, rehabilitation and upgrading of lines were outsourced under two concessions named Metronet and Tublines respectively. The asset ownership and operations were remained under the public sector agency named "Transport for London (TFL)". Metronet was responsible for a majority of lines except for the Jubilee Line, Northern Line and Piccadilly Line, which came under Tublines's concession. Since the start of project, Metronet somehow was not able to keep the pace with operational requirements of TFL. Ref [34] identified poor governance as the main reason driving Metronet slow in progress. In Metronet's organizational structure, many decisions were needed to be agreed by five shareholders. All these shareholders also acted as Metronet's suppliers. They had different motivations depending on their supplier roles. The executive management changed frequently and therefore was unable to manage the work of its shareholder dominated supply chain effectively. Being responsible for both maintenance and supplies, Metronet had power over some scope of work expected to be paid for extra work undertaken and had better access to cost information then the management. Ref [34] also found that Metronet was unable to provide adequate evidence to support claims to have performed work economically and efficiently. Due to organizational flaws, Metronet had problems in delivering its capital works program on time and within the costs bid.

The public sector client was not satisfied with the quality or timeliness of information that was emerging from Metronet, and thus was not agreeing with work charge demanded by Metronet. This conflict of trust led both partners to the arbitration and later to the transfer of Metronet under public ownership. However, the performance of Tubelines remained better than Metronet. Affected by Metronet's commercial tactics, the public sector client doubted the quantity of work charges demanded by the Tubleliens. This matter also went under arbitration and won by Tublines [48]. The arbitrator ruled out that either London Underground should pay Tublines the demanded charges or decrease the amount of work. Instead of following these two alternatives, the public sector client chose to buyout Tubelines, and thus Tublelines was also transferred under public

provision. The London Underground PPPs went fail majorly due to lack of capacity of corporate governance in Metronet concessionaire while Tubeliens was just a consequence of lack of trust by the public sector client. If Metronet shareholders could have bring balance to their simultaneous roles of supplier and concessionaire, the results would have been different. The rapid change in management officials at Meteronet was also the reason lapsing in corporate governance which causes misconducts in operations and increased the client's distrust on concessionaire.

The PFI deal of Railtrack was another example of poor governance by the concessionaire. Unlike London Underground, the poor governance of Railtrack cost a lot to the public and users directly. Soon after privatization, the Railtrack was criticized for continuing bad performance in operations and safety standards. The Railtrack customers and other freight train operators, who used the same railway network, were desperate for regulatory action to be taken to improve performance and railway network [35]. Consequently, only after two years of privatization Railtrack began to receive castigate from government for its failure to perform as per required standards [36]. The fatal train crash of Hartsfield on October 17, 2000, in which four people killed and thirty four injured, raised more protests and concerns against Railtrack. Finally in 2003 Railtrack was nationalized preceded by the concessionaire's insolvency.

Among cancelled PFI projects, the Skye Bridge concession project was solely cancelled due to massive public opposition. Sky Bridge was constructed under 33 years of concession in 1995, to connect island of Skye with Scottish mainland. Since start of operations, the Skye Bridge remained controversial for its toll charges. Despite of subsidizing by the Scottish government, it cost residents £5.70 one way for a car - the highest levy of its kind in Europe [37]. The higher tolls were continuously protested by the users and anti toll campaign ran by the island residents. A toll-collector interviewed by the BBC in 2005 said that abuse of collectors by motorists had been commonplace. Many passengers were cited for refusing to pay toll, with around 500 being arrested and 130 subsequently convicted for nonpayment [37]. These protests were continued until 2004 when Scottish government announced to buy back the bridge and consequently abolishment of tolls.

Some early transportation PFI deals had proven to be not delivering value as planned. Among sampled projects in the UK, six projects were not able to deliver anticipated results. The case studies of the six projects reveal that public sector officials were unable to predict future traffic demand and to perform comprehensive economic and financial assessment. The PFI projects of Railfreight Distribution, ROSCO and Royal Dockyards (at Davenport and Rosyth) may be mainly highlighted for such poor practice by the public sector. The Auditor general of UK for the sale of Railfreight Distribution [51] identified that the public sector had relied on single point values and subjective assessment of risk rather than performing detailed uncertainty analysis for all available alternatives to the privatization. The sale of Royal Dockyards (at Davenport and Rosyth) is almost a similar case to that of Railfreight Distribution. The Roayal Dockyard deal proceedings represented a significant discount (56% discount at Devonport, and 36% at Rosyth) on public sector official's own valuations of the business [38]. The concerned public sector agency argued that the sales would help to cater substantially lower refit prices at docks. However, financial forecasting was quite uncertain as they were based on hypothetical comparison of the future cost of an illustrative program of refit work. Furthermore, both PFI deals were also headed by the unhealthy competitive tendering. In the sale of ROSCO (Rolling Stock Leasing Companies), the public sector officials were unable to estimate market prevailing price of asset and therefore the assets were sold in lower price. The ROSCO sale took place in February 1996 for a gross price of £1.8 billion under three different sales. By December 1997, all three businesses were sold by initial purchasers for a total price of £2.7 billion [34]..

The greenfield project of Channel Tunnel and its associated project channel Tunnel Rail Link (CTRL) also suffered in capturing required demand. Ref [39] identified that Eurotunnel's forecasts were extremely optimistic, forecasting between 2 and 3 times the current numbers of passengers. The traffic demand lower than expected was actually due to improper forecasting by consultants hired by the concessionaire. The consultants and commercial department of the concessionaire tended to concentrate on wrong issues, i.e., the prospects for economic growth and the size of the total market, rather than Eurotunnel's likely share of market and the effect of

competition from the ferries on prices. Eurotunnel did not properly understand the economics of its competitors, the ferries, and their potential to cut their prices by large amounts and still remain profitable. Later, the calculations by [40] showed that the ferries were able to break even with an average load factor of only 30% at the low price levels which were prevailing then in 1995; thus, any additional traffic above this level provided profit contribution. These factors left channel tunnel with least ability to compete in market. Apart from improper traffic predictions, the tunnel suffered problems since the start of operations. After the Tunnel was opened in 1994, it was found that many aspects of the project design were not suitable for the operating business. Eurotunnel's TUGO ticketing system and toll booths did not easily allow price differentiation between different groups of passengers. Eurotunnel soon realized that this was a fatal flaw and intended to introduce new ticketing and pre-booking systems; but this took sufficient time. Other problems existed in the Tunnel environment due to dust, salinity, humidity, water seepage and high temperatures, which caused failures to the signaling system and electrical supplies [40]. Besides these problems, the tunnel experienced three fire incidents that were significant enough to close the tunnel [50]. The sister project of channel tunnel, Channel Tunnel Rail Link (CTRL) also suffered through less demand and consequently less revenue generation. Finally, the project was sold in 2010 to a Canadian consortium under a 30-year concession.

In analyzing the UK's transportation PFI's, it was disclosed that early projects were affected by pre-bid and improper financial and economic assessments by both public sector officials and prospect bidders. Often these assessments were also accompanied by unrealistic traffic demand predictions. This was the case in Channel tunnel and its rail link, which consequently resulted in Channel Tunnel Rail link's concessionaire's insolvency [54]. However, in the case of channel tunnel concessionaire's insolvency, it was secured by restructuring and writing off the debt [40]. Apart from unrealistic traffic predictions, the poor governance and ineffective commercial strategies also caused the concessionaire's insolvency.

5.6. UNITED STATES OF AMERICA

Private sector had been playing important role in providing transportation infrastructure in USA since very long during past decades. The private turnpikes (In USA, the private toll road is known as Turnpike) were common throughout the 19th century [41] with construction of public toll roads and bridges until half of 20th century. In 1950, the tradition shift was observed with the development of federal funded interstate highway system and consequently toll roads were largely superseded by public sector funding [41]. In USA, the most of public sector funding for highways comes from dedicated fuel and vehicle taxes; and tolls were forbidden on federal highways except on some bridges and tunnels. However, in late 20th century the federal tax revenues were unable to keep pace with growth in demand for new highways. To cover such financial deficits, in 1991 the USA government passed Intermodal Surface Transportation Efficiency Act (ISTEA). The ISTEA enabled state governments to utilize federal funding for non interstate toll roads in conjunction with state or private sector funding. To further facilitate private participation in public infrastructure the National Highway Designation Act was passed in 1995. Under this act state infrastructure banks could be established to leverage federal funding, inter alia, for privately financed projects. In 1998, the Transportation Infrastructure Finance and Innovation Act (TIFIA) passed to support private sector to bring forward more innovative ways to finance transportation projects. The TIFIA also encourages the use of private sector financing for the transportation projects exceeding US$100 million, offering direct federal loans and guarantees covering up to 33% of project cost [41].

Since 2004, the behavioral shifts in USA transportation markets have been observed by privatizing existing public toll roads under fixed term franchises. The privatization of existing public toll roads reflected a different prospect of PPPs than in any developing countries. In developing countries, the PPPs in transportation are to develop the new infrastructure, while privatizing existing public toll roads are meant to produce funds for general public sector budget. Such privatizations of existing toll roads, have witnessed longer terms compared to the typical

types of PPPs in other countries. For example the Indiana Toll way and Chicago Skyway were sold to private entities under fixed terms of 75 and 99 years respectively. The practice of franchising already built and publicly owned highways was condemned by many public organizations [42]; however this kind of sells also had increase trust of private sector in American transportation markets and new deals for greenfiled projects are underway.

In sampled projects from USA, the SR91 Express Lanes were the first congestion pricing (the peak/off peak pricing) implemented toll road. During the first few years of operations many users viewed the project as a public benefit and supported congestion pricing [43]. However, after 5 years of project completion the peak time usage dropped to 43% [44]. The reduction of express lanes usage resulted in dual faced consequences. First, the congestion on free lanes increased to double. Second, to cover the loss the concessionaire started charging high occupancy vehicles a 50% of reported toll which was against the tolling criteria described in contract agreement. The increase in peak time traffic on free lanes gave rise to safety issues and urges CALTRANS (California Transport), the public agency, to expand the capacity of free lanes. The concessionaire did not accept the safety evaluations made by the public sector agencies and considered the expansion plans an attack on the commercial viability of the project. The concessionaire claimed its right of “non competition” under concession agreement, and rejected the public sector partner claim that safety issues can override the non competence clause [45]. The conflict between public and private partner couldn’t solved until concessionaire filled a legal petition against expansion plans. The court decision went in favor of concessionaire and public sector had no choice but to buy back the express lanes. The case of SR 91 Expressway showed that public sector’s failure to develop clear and rigors contract clauses could provide unfair rights to the concessionaire in the context to social justice and loss of value to the public.

The second sampled project, Comino Colombia Toll Road (CCTR), represented two unique risks not witnessed in any other sampled project. The project was originally planned to aid the international traffic from Mexico to provide by pass from city of Laredo. Soon after the opening, the toll road was unable to attract the required traffic. The less traffic was largely due to the continuation of government policies of restricting Mexican traffic, especially trucks to move freely inside USA [46]. The other reason of less traffic was construction of a new bridge over American - Mexican border which took most of the targeted traffic. The new bridge sized four fifth of the truck traffic of three cross border bridges that take trucks from Mexico; and truck traffic near the CCTR dropped from 5,000 a day to 1300 [46]. The prohibition of Mexican trucks movement on USA soils made unloading all loads in shipment yards on US-Mexican border and their US counterpart to carry these loads to the destinations. These US counterpart’s drivers prefer to be closer in where the truckstops and motels are concentrated even if it is a few miles more [46]. Followed by lower traffic, Just after three years of toll road opening in 2003 the project was foreclosed by the lenders; and ultimately bought back by the public sector. In this way, the two indirect actions of government (i.e. traffic restriction policy and construction of new bridge) resulted in failure of a Highway PPP project.

5.7. LATIN AMERICA

The highway privatization in Latin America was initiated in 1990a. The infrastructure deficit, combined with chronic budgetary problems, led governments to clinch private finance to fill budgetary gaps and also to accelerate the transportation infrastructure construction. However, the experiences from Colombia, Mexico and Argentina showed that anticipated results were not delivered. Ref [47] identified that that private financing of new highways freed up fewer public resources than expected because public funds were often diverted to bail out franchise holders. The early failures in Latin America can be attributed to the fact that privatization was initiated without developing any regulatory policies about them [47].

In Argentina, the first phase of toll road concession was planned in 1990; in which 12 year concessions for intercity roads were awarded. The concessions were mainly awarded to domestic private firms, having no experience in long term projects. The right to collect tolls was granted in

return for the responsibility of carrying out programs of maintenance, rehabilitation, and capacity improvements. Some concessionaires were observed collecting toll without implementing any rehabilitation and maintenance works. Besides that location of toll booths were located in such a way to create captive traps for users. In February 1991, after only five months of operation, the Argentine government suspended the concession contracts. The main reasons were the complaints lodged by the users and changes in law of convertibility of local currency [47]. The changes in convertibility law in 1991 affected the contract escalation clauses in concession agreement. Later, the Argentinean government renegotiated the contracts on better terms.

The example of Mexico toll road program was more devastating and left with many lessons for public sector involve with transportation PPPs. The Mexico toll road program was initiated in 1989 with the intentions of doubling the national road network. However the observers rated Mexican program a hurry approach to acquire road infrastructure [48]. The very first mistake was made at initial stage of procurement by not adopting precise and well defined scrutiny and selection procedures. The prequalification process was not rigorous enough to screen out potential bidders. The concession award criterion limited the pool of potential candidates and made it limited to the local construction companies which were more interested in construction works than in long term financial viability of the project. Debts were secured from local commercial banks which were not capable of providing long term financings and thus it resulted in high interest debt. Moreover, the local banks and concession awarding agencies were unable to perform a proper due diligence of bidders.

The Mexican toll road program planned to establish five main road corridors three of which were to run between the main industrial centers in Mexico and the principal border crossings into the United States. However, some high priority segments were never concessioned, while others that were constructed lacked the contiguous sections that would integrate them into the network [48]. Therefore, attractiveness of toll roads to the long distance traffic was reduced and targeted traffic demand was not achieved. Besides adoption of improper intermodal strategy, the gross miscalculation of investment costs and operating income, improper project management and delayed acquisition of right of way led concessionaires to an unsustainable set of operating conditions. The situation was more saddled with the Mexican currency crises of December 1994. Thus, the combined impact of national and project level factors halted the development of all projects. The local commercial banks were unable to retrieve the issued loans and many concessionaires and their affiliates had no other way but to write off their equities. Finally government was left with only alternative to buy back the concessions. However, in both cases of Argentina and Mexico the second generation of toll roads was launched with more detailed preparations with and the help of international financial institutes.

6.0 CONCLUSIONS

The overall trends of failures are quite similar in all regions; i.e. that any specific failure reason has similar consequences irrespective of any geo-political boundaries. However, different regions vary in PPP adoption patterns and thus in failure patterns. A typical failure pattern illustrates dominance of particular reasons/events in particular regions. In Sub-Saharan Africa, the majorities of failures are due to the political and bureaucratic conflicts; thus require establishment of strong and independent regulatory authority to attract more private finance. The Asian region also dominates with political and bureaucratic conflicts but the non competitive tendering dominates mostly. The non competitive tendering and consequently selection of unsuitable concessionaire reflects the lack of capacity in public sector agencies of Asian region.

The Canadian region illustrates the least potential failure reasons. However poor economic and financial assessment was highlighted in both sampled projects from Canada. The Canadian PPP project case studies showed that public officials were unable to make robust ex-ante evaluation of proposed PPP projects. It was the similar case in early PFI deals in United Kingdom. However, poor governance and adoption of non effective commercial strategies by the concessionaires also found responsible for partnership failures; e.g. Metronet, Railrack etc.

The cases from USA revealed unique types of transportation PPP risks, i.e. construction of new transport infrastructure and traffic movement restriction policies by the government. However, not many potential failure reasons were identified in case studies from USA. The less potential failure reasons in USA may be attributed to the fact that private toll roads exist there since 19th century, so users and public officials have longer experience of working together with private sector. The case from Latin American countries reflected entirely opposite picture as compare to USA.

The early PPP attempts went brutally failed in Argentina and Mexico due to the fact that privatization was initiated with no prior preparations. Neither public sector agencies nor the local financial institutes were had potential to embrace highway privatizations. The case of Mexico toll road program showed that the decisions made by public sectors, from initial planning to the PPP highways operation, were flawed. Thou, the second generation of toll roads were launched with more rigors preparations.

The failure patterns in CEE and other European countries revealed that many of PPP projects failed due to the lower feasibility for privatization of proposed project. It was identified that major potential failure reasons in CEE countries were due to the lack experience of public sector agencies. The lack of experience in public sector agencies could be attributed to their less interaction with long term private owned projects. The less interaction with private activity was due to the fact that many countries were part of communist bloc before 1989 when private activities had very limited share in public business.

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