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Review Article

Analyzing problems affecting the performances of public-private partnership transportation projects – Case studies in Vietnam

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Abstract

The increasing demand for transportation and the ineffectiveness in financing infrastructure projects contribute to various challenges for Vietnam in the recent decades. Financial investment in infrastructure projects is usually so large that the state budget cannot cover all of it. In order to encounter this challenge, Vietnam has called for the participation of other economic sectors, especially the private sector. Consequently, the government has been cooperating with the private sector in the form of public-private partnership (PPP). The development of PPP projects faces a variety of critical risks; therefore, it is challenging for the government to attract private investors. This paper investigates the problems affecting the performance of PPP transportation projects in Vietnam. We gathered general information and organizational structures of the PPP projects as well as compiled the problems experienced in previous PPP projects through in-depth interviews with PPP experts in Vietnam. Interestingly, there are a large number of critical problems affecting the feasibility stage of PPP projects, including inadequate feasibility studies, changes in the laws and regulations, government intervention, lack of transparency in bidding, unfair process of selection in the private sector, and conflicting or imperfect contracts. In addition, the only one significant success factor in the PPP projects was incentives provided by the government. The results of this study can assist in implementing PPP transportation projects in Vietnam so that the nation can establish public policies that attract both domestic and foreign private investors.

Keywords: case studies, public-private partnerships (PPP), problems, transportation, Vietnam

1. Introduction

The transportation infrastructure systems in Vietnam have been underdeveloped for many decades. The transnational road systems have been overloaded and degraded without an appropriate maintenance policy due to the nation's inadequate financial resources. In recent years, transportation infrastructure projects have been mainly financed by fiscal budgets, government bonds, and official development assistal is very limited because transportation public-private partnership (PPP) projects often encounter various difficulties, especially land acquisition and site clearance which significantly contribute to project delays. Therefore, participation of the private sector has been dreadfully low due to a lack of incentive policies. This is mainly because the Vietnamese government does not have the capacity to expand state budget funding. Attracting investment through government bonds is also ineffective because of the low rate of return and illiquidity. Moreover, since Vietnam has been excluded from the list of underdeveloped countries, the ODA fund has become limited. It is essential that the government pay close attention to the role of private capital in developing the infrastructure. To attract more investment from the private sector, the government has been cooperating with the private sector in the form of PPP projects. Since 1993, numerous infrastructure

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projects in Vietnam have been developed in different PPP forms such as build-operate-transfer (BOT), build-transfer-operate (BTO), and build-transfer (BT). However, there are still other challenges. Recent legislation regarding BOT/BT/BTO projects was issued at the end of 2009 and revised in early 2011, i.e. Decree 108 (2009) and Decree 24 (2011). The government also introduced pilot PPP regulations (Decision 71, 2010) for the implementation of PPP projects. The latest regulation was issued in April, 2015 (Decree 15, 2015) and is unfamiliar to both the public and private sectors. Private investors and competent state agencies face various difficulties during the implementation of PPP projects. Since the number of research papers concerning PPP projects in Vietnam is quite limited, this paper investigates and analyzes the problems affecting the performances of PPP transportation projects based on five particular PPP case studies in Vietnam.

2. Literature Review

PPP projects always encounter various challenges that adversely affect different project aspects, including project performance, organization, and environment. Risks associated with PPP transportation development are commonly analyzed by focusing on the project investment, e.g., expanding, building or renovating facilities, and risks regarding operation and maintenance services.

Several previous research studies investigated different issues associated with the implementation of PPP projects and the performance of project participants. In order to efficiently manage risk, risk factors need to be identified and categorized. Merna and Smith (1996) divided the risks of PPP projects into two main groups: systematic and unsystematic risk. Systematic risk is the risk beyond the control of project participants such as political, legal, and economic environment. Unsystematic risks are related to the project itself such as construction, design, operation, finance, and revenue risks. According to Toan and Ozawa (2008), risk factors were grouped into two main categories: general risk and project-specific risk. General risk was subdivided into political, commercial, and legal risks. Meanwhile, project-specific risk, which can be controlled by the stakeholders, was identified and analyzed in accordance with the life cycle of the PPP projects: development, construction, and operation phases. It was concluded that the private sector in Vietnam perceived greater risk in BOT projects than perceived by the public sector. As a result, the BOT infrastructure projects in Vietnam have not been quite attractive for foreign investors.

In China, Xu *et al*. (2010) identified 17 critical risk factors for PPP construction projects which were classified into six groups: (1) macroeconomic, (2) construction and operation, (3) government maturity, (4) market environment, (5) economic viability, and (6) government intervention. These results were consistent with those of Ke, Wang, Chan, and Cheung (2011), which revealed that intervention by the government and a poor public decision-making process were major threats on the success of PPP projects in China.

3. Research Methodology

3.1 Research steps

Figure 1 illustrates the research methodology adopted in this research which can be divided into four main parts:

Part 1 - Profile of case studies. Five PPP projects in Vietnam were chosen and necessary information was gathered and forwarded to experienced professionals to assess the risk environment of each project.

Part 2 - Structure of stakeholders. The organizational structure of the stakeholders was identified to understand the organization of each PPP project better.

Part 3 - Relations among stakeholders and activities. The related activities of each stakeholder during the life cycle of the PPP projects were identified based on the PPP laws and regulations to recognize their liability in PPP projects.

Part 4 - Problems affecting the performances through the life cycle of PPP projects. The opinions of experienced professionals were used to analyze the problems or issues affecting the performances throughout the life cycle of each PPP project.

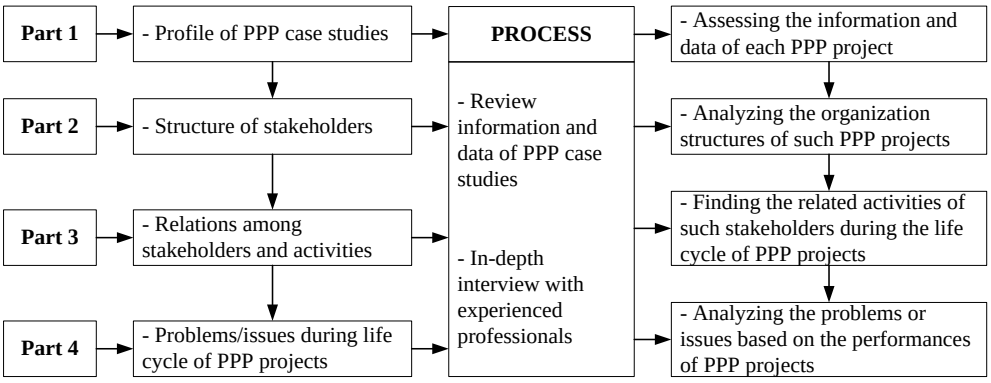

Figure 1. Research methodology.

3.2 Profiles of the respondents

The experienced professionals were divided into two groups: 1) the public sector and 2) the private sector. Seven experienced professionals who participated in the pilot test entailed two officers from the Ministry of Planning and Investment, a PPP investor, a consultant, a contractor, and two university lecturers. All professionals had at least ten years of experience in transportation projects in Vietnam (Table 1).

Table 1. Profiles of interviewees for the second pilot study.

No.	Designation	Organization	Experience	Sector
1	Public procurement policy	Ministry of Planning and Investment	≥ 10 years	Public
2	Assistant director	Ministry of Planning and Investment	≥ 10 years	Public
3	Representative investors	PPP investor	≥ 10 years	Private
4	Assistant director	Consultant	≥ 10 years	Private
5	Project management	Contractor	≥ 10 years	Private
6	Expert	University	≥ 10 years	Private
7	Project management	University	≥ 10 years	Private

The profiles of five case studies in Vietnam were then distributed to the respondents to collect their opinions on the structure of stakeholders and relevant problems (Table 2).

4. Research Results and Discussion

4.1 Profile of case studies

The information profiles of the five chosen PPP projects are shown in Table 2. The general information of the cases entails projects, investors, total investment, PPP forms, project executers, start and complete, and scope. One project has completed the toll fee collection process, i.e. Co May Bridge, three others under the operation stage, i.e. Yen Lenh Bridge, Phu My Bridge, and Binh Trieu II Road Bridge, and a remaining one is in the process of negotiating and looking for investors, i.e. Dau Giay - Phan Thiet Highway.

4.2 Structure of Stakeholders in PPP Projects

4.2.1 Typical structure of PPP transportation contracts

Based on research of Sy and Likhitruangsilp (2013), the typical structure of PPP transportation contracts in Vietnam is shown in Figure 2. It consists of various stakeholders, including government agencies, investors, contractors, specific purpose vehicle, financiers, and customers. It also illustrates the relations of these participants in typical PPP projects in Vietnam.

4.2.2 Stakeholder structures of PPP transportation projects in Vietnam

Based on the review process and in-depth interviews with PPP professionals, the structure of stakeholders in PPP projects were identified. Two typical examples of organizational structures of Yen Lenh and Phu My Bridge are shown in Figures 3 and 4. As can be seen, various stakeholders are involved including (1) government agencies, i.e. Ministry of Transportation or HCMC People's Committee, (2) investors/ financiers, i.e. Vietnam Development and Investment Bank, Vietnam Insurance Company (Yen Lenh Bridge), Societé Genérale Bank, Calyon Bank, HCMC Investment fund for Urban Development, Bank for Investment and Development of Vietnam JSC, and Sacombank (Phu My Bridge), (3) concession companies, i.e. TLC & CIENCO No. 4 (Yen Lenh Bridge), and PMC (Phu My Bridge), (4) customers/ users, and (5) contractors/sub-contractors. The relationships of these participants in these projects are also illustrated, i.e. contractual obligations, and flow of capitals.

First, the organizational structure of Yen Lenh Bridge is described in Figure 3. The Yen Lenh Bridge is 2.23 km long. It is located in the northern part of Vietnam and it spans the Red river. It was built as an alternative route to connect the two provinces of Hung Yen and Ha Nam (Ogunlana & Abednego, 2009). Although the project was developed under a BOT form, nearly half of the project cost was funded by the government and the two provinces (USD11 million), while Thang Long Construction Corporation (TLC) and Civil Engineering Construction Corporation No. 4 (CIENCO No. 4) covered the remaining cost. The Ministry of Transportation appointed the East Sea Project Management Unit (ESPMU, 2002) on behalf of the Ministry in the Concession Company, while the Vietnam Road Administration acted as an independent reviewer for the concession company to ensure the quality of the construction design and implementation (Figure 3). The Transportation Engineering Design Corporation was then appointed by the concessionaire and ESPMU to be the consulting company to design and supervise the project. The concession company was also supported by the central government through agreements with the Ministry of Finance and the Ministry of Investment and Planning, while the Vietnam Development and Investment Bank provided investment funding and a financial guarantee towards the concessionaire to help ensure the project's financial stability, especially during its construction stage, and the Vietnam Insurance Company agreed to provide insurance to guarantee the construction of the project. Additionally, the Yen Lenh BOT Company was established by the concessionaire in 2003 to operate the project for the agreed concession period.

Correspondingly, the contractual structure of Phu My Bridge in Figure 4 was drawn by authors based on the contractual commitments to illustrate all stakeholders of this project. The Phu My Bridge is a cable-stayed bridge over the Saigon River with four lanes that is 2.4 km long that connects District 2 and District 7 of Ho Chi Minh City. The investor is a consortium of five organizations: Hanoi Construction Company, INVESCO Corporation, HCMC Infrastructure Investment Joint Stock Company (CII), CIENCO 620, and Thanh Danh Company. According to the BOT contract, the Phu My Bridge has a total investment of 1,807 billion VND, excluding VAT and interest during the construction period. The investor financed 30% of the total equity investment and the rest with loans from financial institutions. The contractual structure in Figure 4 shows four main groups of stakeholders. First, BOT Phu My Company (PMC) was established as a concession

Table 2. Case studies of PPP projects in Vietnam.

Projects		Investors	Total investment	PPP Form	Project executers	Start – Complete	Scope
1. Binh Trieu II Road Bridge	Phase I	Civil Engineering Construction Corporation No.5 (CIENCO 5)	- Plan: VND341 billion (USD21.3 million) - Reality: VND2,000 billion (USD125 million)	BOT	Investment and Construction of Binh Trieu Bridge JSC	- Expected: 1996 – 2001 - Reality: 02/2001 – 2004 (partly completed)	- Construct Binh Trieu II Bridge - Upgrade and extend certain roads around Eastern Terminal. - Repair and maintenance Binh Trieu I Bridge - Continue to construct Binh Trieu II Bridge
	Phase II	Ho Chi Minh City Infrastructure Investment Joint Stock Company (CII)	Plan: VND3,493 billion (USD218.3 million)	BOT	Ho Chi Minh City Infrastructure Investment Joint Stock Company (CII)	- Expected start: 2005	
2. Yen Lenh Bridge		Thang Long Construction Corporation and Civil Engineering Construction Corporation No.4 (CIENCO 4)	- Plan: VND360 billion (USD22.5 million) Investors (53%) + Ha Nam and Hung Yen Provinces (19%) + Government (28%)	BOT	Yen Lenh Bridge BOT Company Limited	- Construction start: 01/6/2002 - Completion: 15/5/2004 (10 months early than expected)	Concession period: 17 years
3. Phu My Bridge		Phu My Bridge Corporation (PMC) consists of Hanoi Construction Company, Investco, Cienco 620, Thanh Danh Co, and CII	- Plan: VND1,806 billion (USD84.91 million) - Reality: VND3,250 billion (USD153.3 million) - Investors: 30% Equity + 70% Debt	BOT	- Financiers institutions: Société + Calyon (Crédit Agricole CIB) Bank, BIDV bank, and Sacombank - Hochiminh City Finance and Investment State-owned Company - Bilfinger Berger (Germany), Baulderstone Hornibrook (Australia), Freyssinet International et Companie and Arcadis (France)	- Construction start: 2/2007 - Construction finish: 9/2009	Concession period: 26 years
4. Dau Giay – Phan Thiet Express way	Phase I	- 1st nominated investors: Bitexco Group - Under finding additional investors	- Plan: USD881 million	PPP	-	-	-
	Phase II	- The Bitexco Group no longer acts as the first investors - Under finding investors	- Plan: USD881 million	State + PPP	-	-	-
5. Co May Bridge		Hai Chau Company Limited	- Plan: VND78 billion (USD6.5 million) - Reality: VND113 billion (USD9.4 million)	BOT	Co May Bridge Construction and Operation	- Construction finish: 8/1997 - Operation: 6/1999 to 8/2011	Concession period: 8 years Revised: 12 years and 1 month

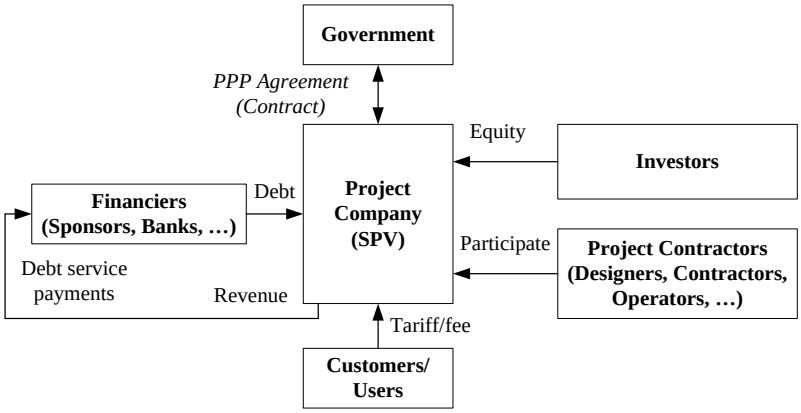

Figure 2. Typical structure of PPP transportation contract.

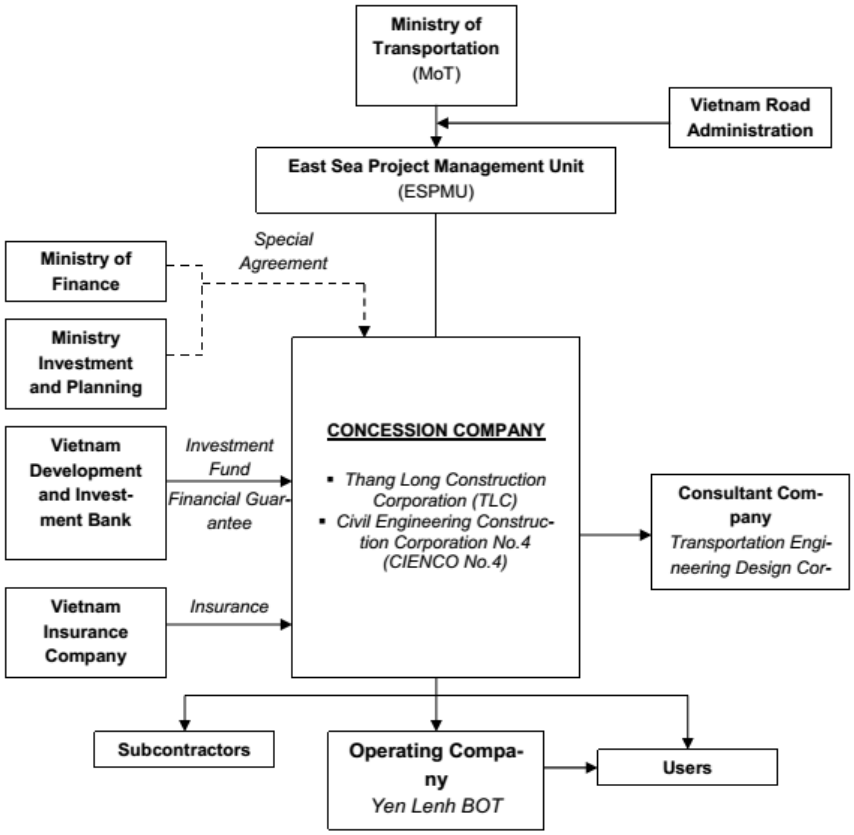

Figure 3. Structure of stakeholders in Yen Lenh BOT Bridge project (Source: Ogunlana & Abednego, 2009).

company. Second, the public sector is the People's Committee of HCMC (signing BOT contract), and the Ministry of Finance is the guarantor agency for foreign loans. Third, the financial institutions consist of two French banks, i.e. Société Générale and Calyon (renamed Crédit Agricole CIB). HCMC Investment fund for Urban Development (HIFU), now known as the HCMC Financial Investment Corporation (HFIC), borrows foreign loans under the guarantee of the Ministry of Finance and then re-lends to PMC. Additionally, two local banks, Bank for Investment and Development of Vietnam (BIDV) and Sacombank are also sponsors of this project. Finally, PMC has signed an EPC contract with a joint venture contractor (BBBH) including Germany's Bilfinger Berger and Australian unit Baulderstone Hornibrook.

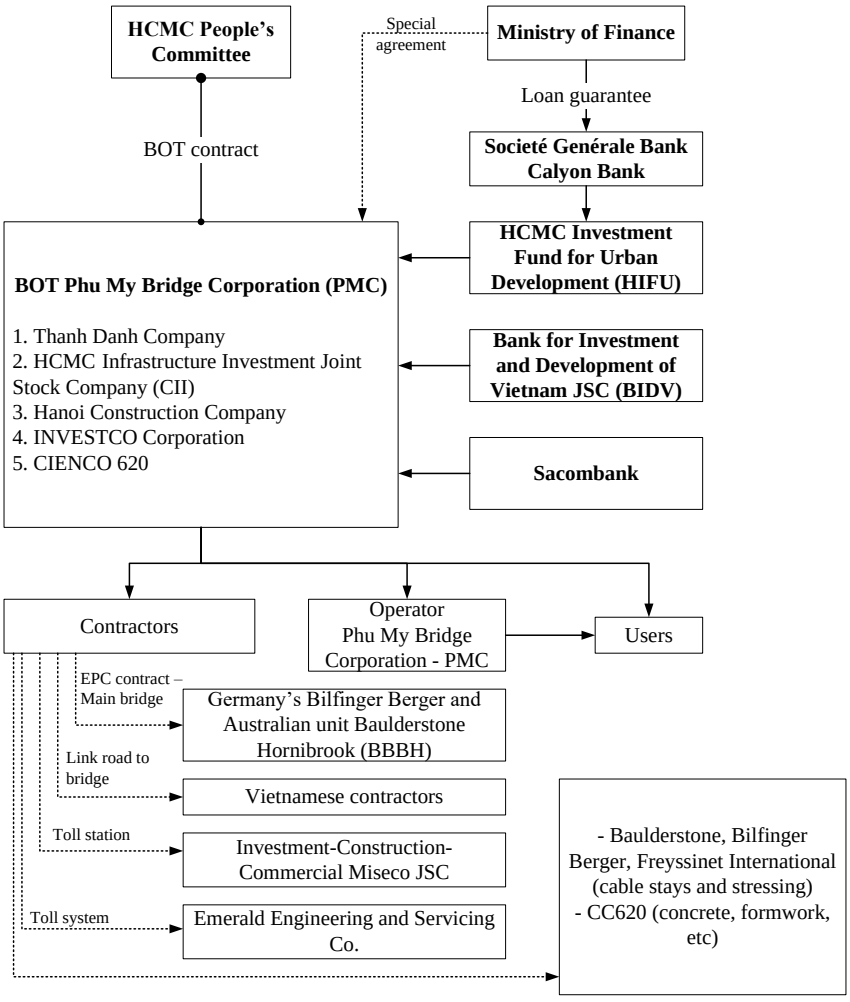

Figure 4. Contractual structure of Phu My BOT Bridge project (based on contractual commitments).

4.3 Relations among stakeholders and their activities during the life cycle of PPP projects

Based on a literature review and in-depth interviews with experienced professionals, the relationships among the stakeholders and activities during the life cycles of the PPP projects in Vietnam were identified (Table 3). For example, in the feasibility stage, during a "propose list of potential PPP projects" process, a list of potential PPP projects is proposed by state or investors based on the regulations. Consequently, the activities of stakeholders during "propose list of potential projects" are as follows:

Step 1: The Competent State Agencies (CSA) initiate (I) proposals for potential PPP projects.
Step 2: Investors initiate (I) proposals for potential PPP projects.
Step 3: The Ministry of Planning and Investment and/or concerned Ministries or Sectors appraise (AP) the feasibility of the proposals of potential PPP projects.
Step 4: The Prime Minister (PM) approves (A) the list of potential PPP projects.

In the same way, all activities of the stakeholders during the implementation of PPP projects in Vietnam are also illustrated on Table 3.

4.4 Problems affecting the performance of the PPP projects

Sy and Likhitruangsilp (2013) divided the life cycle of PPP projects in Vietnam into the eight main phases of feasibility, planning, finance, design, construction, operation, maintenance, and own phases. These phases are then separated into three main stages of PPP projects: feasibility; pre-construction and construction; and operation (Figure 5). In this paper, problems of PPP projects in Vietnam were gathered from the literature and in-depth interviews. Table 4 shows a summary of all the problems that have affected the five PPP projects in each phase of the project life cycle. Consequently, major problems of PPP projects in Vietnam were identified which included six main problems in the feasibility stage, two key issues in the pre-construction and construction stage, and three major matters in the operation stage. These problems are considered the most critical for PPP

Table 3. Relations among stakeholders and activities throughout the life cycle of PPP projects in Vietnam.

Phases	Feasibility (Feasibility + Plan + Finance)						Pre-Construction and Construction		Operation
	Lists of potential projects	Contribution of GOV and stakeholders	Feasibility study	Investor selection	Negotiation	Investment Certification and sign	Design	Construction	Operation + Maintenance + Own
Stakeholders/ Activities	* Propose list of potential PPP projects	* Establish the portion of state participation	* Select consultants * Establish feasibility study reports	* Select consultants for MPI * Select investors	* Negotiate between investors and CSA	* Establish investors and SPV companies (sign contract with CSA) * Select consultancy, and engineering	* Conduct technical design, supervision and management * Proceed land acquisition	*Conduct construction	* Operate and monitor projects * Maintain and transfer projects
The Prime Minister (PM)	Approve (A)	Approve (A)	-	-	-	-	-	-	-
Competent State Agencies (CSA)	Initiate (I)	Initiate (I)	Procure (P)	Procure (P), Appraise (A) and Approve (AP)	Negotiate (N)	Sign (S)	Execute (E) and Monitor (M)	Monitor (M)	Monitor (M)
The Ministry of Planning and Investment (MPI)	Appraise (AP)	Appraise (AP)	Appraise (A) and Approve (AP)	Appraise (AP)	-	Approve (A)	-	Monitor (M)	-
Concerned Ministries and Sectors	Appraise (AP)	Appraise (AP)	Appraise (A) and Approve (AP)	-	Negotiate (N)	-	-	-	-
Inter-sectoral working team	-	-	-	Consult (C)	Negotiate (N)	Consult (C)	Consult (C)	Consult (C)	-
Investors and Project Companies (SPV)	Initiate (I)	-	Initiate (I) or Execute (E)	Initiate (I)	Negotiate (N)	Sign (S) and Procure (P)	Execute (E)	Execute (E)	Operate (O) and Transfer (T)
Financiers	-	-	Initiate (I)	-	Negotiate (N)	Sign (S)	Execute (E)	Execute (E)	-

A: Approve; AP: Appraise; C: Consult; E: Execute; I: Initiate;M: Monitor and check; N: Negotiate; O: Operate; S: Sign; and T: Transfer.

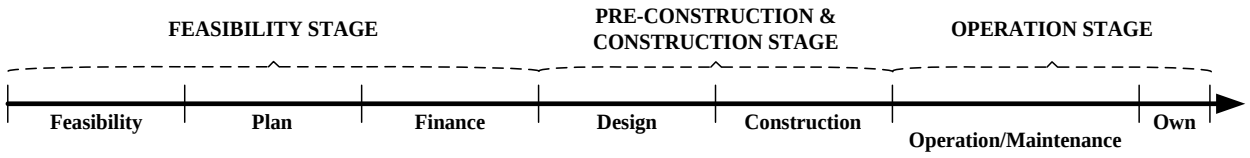

Figure 5. Life cycle of PPP projects in Vietnam.

Table 4. Relations among stakeholders and activities throughout the life cycle of PPP projects in Vietnam.

Projects		Problems/Issues	Phases					
			Feasibility	Plan	Finance	Design and Pre-Construction	Construction	Operation/ Maintenance/ Own
1. Binh Trieu II Road Bridge	Phase I	- Land acquisition and compensation	- Volatility of land and real estate market.			-	-	-
		- Change of government policies (scope change)	-	-	-	- Adjusting the expansion of lane of Highway No.13 project from 32m to 53m (increasing total investment of project from VND341 to VND1,600 billion).		-
		- Problems due to partner's differences in practice	-	-	-	- Incomplete and bad design (delay schedule and cost overrun).		-
		- Breach of contract by the government	-	-	-	-	-	- When Binh Trieu II Bridge construction was completed, the link road connecting to this bridge was not yet completed. The public sector did not assure the contract commitment.
		- Early termination of concession by the concession company	-	-	-	-	-	- After Binh Trieu II Bridge was completed, CIENCO 5 (SPV) has been terminated of concession due to scope change of projects.
	Phase II	- Inefficient feasibility study	- Adjusting scope and design of Binh Trieu II Road Bridge (e.g. divide the project into seven sub-projects) led to total investment rose to VND3,493 billion.	- Submitting appraisal process for adjusting projects late two years.	-	-	-	-
		- Change of project scope	-	-	- Soaring price for land acquisition and compensation (Adjusting the lane width from 32m to 53m).	-	-	-

Table 4. Continued

Projects	Problems/Issues	Phases					
		Feasibility	Plan	Finance	Design and Pre-Construction	Construction	Operation/ Maintenance/ Own
2. Yen Lenh Bridge	- Land acquisition and compensation	-	-	-	- The compensation price for land is lower than its actual market price. - Land owners did not have bargaining/ negotiation power.	- The compensation rates are different from one province to another. - Weak coordination between government agencies.	-
	- Inadequate laws and regulation system	- Unexperienced of the government officials - Inadequate law and regulations (e.g., inappropriate, non-transparent, and series of amendments)			-	-	-
	- Approvals and permits	- Complex and bureaucratic approval procedures - Unnecessary requirements from many divisions and levels of public sector			-	-	-
	- Inefficient feasibility study	-	-	-	-	-	- Availability of competition projects - Poor condition quality of connecting roads - Wrong estimation on the number of vehicles passing
	- Unrealistic forecast on future economic development and demand of the society (demand risk)	- There has not been any study about the amount of demand for this project	-	-	-	-	- Change policies of government by approving alternative toll-free projects - Over-estimated on the socio-economic development of the surrounding region
	- Inflation	-	-	- Increased inflation rate	-	- Price of main construction materials increased. Total investment cost increased over 30% from the initial project.	-
	- Fluctuation of interest rate	- Interest rate increased, thus reducing the private sector's potential profit, and paying additional interest.					
	- Corruption	- Corruption occurred (untrustworthiness of public official). - Corruption in the compensation process.					
	- Toll fee issues	-	-	-	-	-	Actual traffic revenues lower than estimated due to: - Availability of competition projects - Unwillingness to pay by users

Table 4. Continued

Projects	Problems/Issues	Phases					
		Feasibility	Plan	Finance	Design and Pre-Construction	Construction	Operation/ Maintenance/ Own
3. Phu My Bridge	- Conflicting or imperfect contract - Change in laws and regulations	Private equity issues - PMC has not fully contributed 30% of the total investment, PMC has got loans from BIDV and Sacombank. Initial investment capital of investors is failure to comply contractual commitments. - PMC has mortgaged "rights to collect toll fees" to borrow money. - Lack of monitoring mechanisms and sanctions for the parties to comply with contractual commitments. - Lack of regulations on reimbursement project from the concession company			-	-	-
	- Land acquisition and compensation	-	-	-	- Dispute between private and public on the compensation issue. It leads delay and increasing expenses for compensation and site clearance.		- Delay to deliver construction site for Phu My - Rach Chiec Bridge II BT project.
	- Subjective project evaluation method - Inefficient feasibility study	-	-	-	-	-	- Problems with evaluating the financial and economic feasibility of the project. - Revenues from toll fees were so low although traffic flow is assumed to be equivalent to the forecast in feasibility study.
	- Poor decision-making process	- Public sector has provided foreign commercial loan guarantees for private investors.			-	-	-
	- Breach of contract by the government	-	-	-	-	-	People's committee of HCMC (Public sector) did not perform contractual commitments such as: - Public sector did not finish Eastern ring road to connect Nguyen Van Linh Street, Phu My Bridge, and Ha Noi Highway. - Public sector did not organize and manage traffic to ramification of heavy trucks to Phu My Bridge. - Government did not allow to charge motorcycles toll fee that not complied with financial plan of BOT contract.

Table 4. Continued

Projects		Problems/Issues	Phases					
			Feasibility	Plan	Finance	Design and Pre-Construction	Construction	Operation/ Maintenance/ Own
		- Lack of supporting infrastructure	-	-	-	-	-	- Public sector did not finish Eastern ring road to connect Nguyen Van Linh Street, Phu My Bridge, and Ha Noi Highway
		- Inflation	-	-	-	-	-	- High inflation index (i.e., loan foreign currency: 1USD = 15,500 VND, 1Euro = 20,502 VND --> payment: 1USD = 21,000 VND, 1Euro = 28,685 VND).
		- Toll fee issues	-	-	-	-	-	- Government changed policies to approve some alternative toll-free projects - Over estimation on the socio-economic development of the surrounding region - Increasing total investment (lead increasing toll fees or extending concession period)
		- Early termination of concession by concession company	-	-	-	-	-	- Private sector terminated the project and then returned to public sector
4. Dau Giay – Phan Thiet Express way	Phase I	- Lack of transparency in bidding	- Public sector selected the 1st nominated investor (Bitexco Group - 60% total investment capital) without bidding. During 2008 - 2013, Government still cannot find additional investors (40% investment capital) cooperated with Bitexco Group			-	-	-
		- Government's intervention	- Dau Giay - Phan Thiet expressway is one of 20 pilot PPP projects. Thus, this project experienced a lot of problems/issues related to intervention of government such as policies changes, approval and permits issues.			-	-	-
		- Sponsor interventions	- World Bank request to suspend the project to implement quality improvement review, and propose many changes in plan to implement the project - World Bank propose new mechanisms (e.g., back-up credit instruments, accounts designated to protect the lenders in order to avoid demand risks and traffic volume)					

Table 4. Continued

Projects		Problems/Issues	Phases					
			Feasibility	Plan	Finance	Design and Pre-Construction	Construction	Operation/ Maintenance/ Own
	Phase II	- Unfair process of selection in the private sector	- Government decided to divide this project into two projects: 36Km expressway (State budget) and 62Km expressway (PPP). The Bitexco Group no longer acts as the first investors			-	-	-
5. Co May Bridge	Problem	- Change of project scope	-	-	-	- Increasing the investment cost of project from VND78 to VND113 billion.		-
		- Conflicting or imperfect contract	-	-	-	-	-	- Public sector adjusted the concession period from 8 years to 12 years 1 month based on the increasing of investment cost
	Success	Success factors	Feasibility	Plan	Finance	Design	Construction	Operation/ Maintenance/ Own
		- Suitable incentives from the government	- Government committed to construct the path in and out of Co May Bridge from Ba Ria Province to Vung Tau Province in BOT contract (20Km)			-	- Government has built the path road from the junction of Ba Ria to Co May Bridge and road from Co May to Vung Tau Province (20Km)	

transportation projects in Vietnam that deserve to be investigated.

4.4.1 Feasibility stage

The major problems in this stage are inadequate feasibility studies, changes in laws and regulations, government intervention, lack of transparency in bidding, unfair process of selection of the private sector, and conflicting or imperfect contracts. These problems could affect the entire schedule and viability of the project that deserve to be investigated in detail.

1) Inadequate feasibility studies

In Vietnam, a proposal of a PPP transportation project must be assessed by the public sector or proposed by investors first. If it is approved, the project will then be put into a PPP project list. Based on this list, an authorized state body will develop bidding documents and choose consultants to prepare feasibility study (FS) reports. According to the in-depth interviews, the feasibility studies of PPP transportation projects in Vietnam are considered inadequate. FS reports require adjustments, or even changes, several times. An example of misjudging the feasibility study that led to the failure of a PPP project in Vietnam is the Phu My Bridge. There were a large number of problems related to an inadequate FS including lack of roads connecting the bridge to main traffic, government policy changes, and failing to follow the contract's guarantees by the government. Since the roads connecting the bridge to the main traffic were not complete, few vehicles passed by the bridge while the operator was not allowed to charge tolls on motorbikes. Moreover, the city authorities did not carry out the contractual commitments such as limiting the number of vehicles from the ports in Districts 4 and 7 that enter the city, and asking the vehicle owners to use this bridge instead (Tuoi Tre News [TTN], 2014). As a result, the revenue from this project was insufficient to pay the concessionaire's annual debt.

2) Changes in laws and regulations

Laws and regulations in Vietnam are very complicated, and some of them contradict each other. Transportation projects are required to be approved by several administration levels and various laws, decrees, decisions, circulars, and dispatches. The implementation of the law and regulations of government officials was very poor in all case studies. Indeed, PPP laws and regulations in Vietnam are quite complicated and difficult to apply (Sy, Nguyen, Likhitruangsilp, & Onishi, 2015). For instance, based on research by Sy et al. (2015), a comparison with other PPP laws and regulations during the evolution of PPP in Vietnam, the participation portion of the public decreased from "up to 49% Project's Total Investment

Capital (TIC)" (Decree 24, 2011) to "up to 30% TIC" (Decision 71, 2010), then "to be considered on the basis of the financial plan of project" (Decree 15, 2015).

3) Conflicting or imperfect contracts

The issue of complying with contractual commitments in PPP projects in Vietnam is very serious. Indeed, the public sector still does not have monitoring mechanisms and sanctions for the parties to comply with contractual commitments. For example, the initial investment capital of investors in PPP projects failed to comply with contractual commitments. The concession company, Phu My Bridge Corporation (PMC), has not fully contributed 30% of the total investment capital even though PMC obtained loans from BIDV Bank and Sacombank. Moreover, PMC has mortgaged the right to collect a toll fee to borrow money which was in breach of the contract.

4) Government intervention, lack of transparency in bidding, and an unfair process of selection in the private sector

After the government introduced pilot PPP regulations (Decision 71, 2010) for the implementation of pilot PPP projects, the Dau Giay–Phan Thiet Highway was chosen as one of the pilot PPP projects to be implemented under the PPP form (Decision 1597, 2012). This project experienced a lot of problems related to intervention of government, non-transparent bidding process, and unfair process of selection of the private sector. The public sector selected the first nominated investor without a tendering process (Bitexco Group – 60% total investment capital) and other investors with international competitive bidding (Decision 1777, 2013). During 2008-2015, the government still could not find additional investors (40% investment capital) to cooperate with Bitexco Group after having organized a series of events introducing this project in India, South Korea, and Singapore.

Consequently, in 2016, the government approved a proposal to divide this project into two components with one financed by the State budget (the first 36 km from Dau Giay to Xuan Loc District of Dong Nai Province), and the other executed under the PPP form (the remaining 62 km Highway from Xuan Loc to Phan Thiet City of Binh Thuan Province) (Saigon Times [ST], 2015). Interestingly, the Bitexco Group no longer acts as the first investor for this project.

4.4.2 Pre-construction and construction stage

The critical problems that occurred in this stage consisted of land acquisition and compensation, scope change of projects, and corruption.

1) Land acquisition and compensation

In Vietnam, land acquisition and compensation have to face various challenges. For example, in the cases of Yen Lenh Bridge and Phu My Bridge, the compensation for land acquisition proposed by the government agency was always lower than the market price and the land owner had to accept this condition without any bargaining or negotiating power (Ogunlana & Abednego, 2009). Another obstacle is different compensations for different provinces and corruption problems during the compensation process. This problem occurred in the Yen Lenh Bridge project (Ogunlana & Abednego, 2009). Moreover, the coordination between government agencies and the private sector is very weak. For instance, there are many compensation issues among the private and public sectors on the Phu My Bridge project. The public sector did not complete the land acquisition and the eastern ring road did not connect to the bridge (breach of contract commitments) in line with the Phu My Bridge. It led to low traffic volume and revenue (TTN, 2014) for the private investor. Moreover, in three years, the eastern ring road was still not finished by the HCMC People's Committee to the Phu My Bridge. Then the HCMC People's Committee had to return to the investor all of the investment capital of the project that included the loan, interest, and equity.

2) Changes in the scope of the projects

The projects in Vietnam are often faced with issues related to the change in scope of the projects, especially in the case of transportation PPP projects. The changes in the scope of the projects during the feasibility and pre-construction stages have a huge impact on the total investment capital as well as the concession period. For instance, the Binh Trieu II Road Bridge project, with an initial investment of VND341.9 billion (USD16.6 million), was first given to Civil Engineering Construction Company No. 5 (CIENCO 5) in the year 2000. Due to policy changes of Ho Chi Minh City on Binh Trieu II Road Bridge from Phase I to Phase II in 2003, the lane width of National Highway 13 was adjusted from 32 m to 53 m (Vietnam Investment Review [VIR], 2011). As a result, the total cost of Binh Trieu II Road Bridge increased nearly five times from VND341 billion (USD16.6 million) to VND1.6 trillion (USD77.6 million). Moreover, the total cost of the new project exceeded CIENCO 5's funding capacity. After Binh Trieu II Bridge was completed, CIENCO 5 handed over the second phase of the project to the city in 2004, who then gave the project to CII in 2005. It also experienced increased investment costs on the Co May Bridge project from VND78 billion (USD6.5 million) to VND113 billion (USD9.4 million) (Tuoi Tre Online [TTO], 2011).

4.4.3 Operation stage

1) Toll fee issues

The major risk factors are unrealistic forecast on future economic development and demand of the society, lack of supporting infrastructure, toll fee issues, and early termination of concession by the concession company. For example, the Phu My Bridge project (BOT) was the first cable-stayed bridge project in Ho Chi Minh City. The public sector did not finish the eastern ring road to connect to the bridge which did not follow contract commitments. It led to low traffic volume and revenue (TTN, 2014). As a result, after operating for three years, the two parties were negotiating to determine the new toll fee and new concession period possibly to 40 years.

Additionally, the Yen Lenh Bridge project is also a failure due to low actual traffic revenues which affected the payment of BOT projects in Vietnam. Indeed, after the Yen Lenh Bridge was completed, actual traffic revenues were

lower than estimated. One year after the opening, the toll fees were not enough to pay the interest on the concessionaire's bank loans. It meant that the investment capital could not be returned during the operation stage. In order to address this problem, the Ministry of Finance reported that the government should switch the PPP scheme from BOT (Build-Operate-Transfer) to the BT (Build-Transfer) form. As a result, the Yen Lenh Bridge was transferred to Vietnamese government.

2) Breach of contract by government, and lack of supporting infrastructure

The public sector in three case studies, including Binh Trieu II Road Bridge, Yen Lenh Bridge, and Phu My Bridge, failed to comply with the contract commitments. After completing the construction of these three bridge projects, the link or connecting roads to these bridges were not yet completed (Table 4). The actual amount of traffic was certainly lower than the estimate in the feasibility studies. As a result, one year after the opening, the toll fees were not enough to pay the interest on the concessionaire's bank loans (Yen Lenh Bridge). Moreover, the revenue from Phu My Bridge was not enough to pay the concessionaire's annual debt. In addition, the concession company in Binh Trieu II Road Bridge terminated the concession and returned the project to the government.

4.5 Success factors affecting the performances of PPP case study projects

4.5.1 Suitable incentives provided by the government

The Co May Bridge is one of a rare successful PPP projects that could be profitable after the concession period (12 years and one month). The Co May BOT Bridge is 4 km long and is a vital project connecting two provinces - Ba Ria and Vung Tau (the fast-growing provinces in Vietnam) an investment by the Hai Chau Company Limited since 1997. This small-scale project received a lot of incentives from the Vietnamese government. Indeed, to ensure the feasibility of this project, the government committed to construct a road from Ba Ria Province to Co May Bridge and 20 km from Co May Bridge to Vung Tau Province in the BOT contract and completed them on time. Moreover, the concession company was in a good financial position and finished this project on time with good quality. Consequently, this project benefited from many preferential policies such as an exemption from corporate income tax for four years and reduction of corporate income tax for the next nine years (TTO, 2011). In a comparison with other PPP case studies, the Co May BOT Bridge was a project with small capital investment, short concession period (8 years), and received many policy incentives from the public sector.

5. Conclusions

PPP is viewed as a new opportunistic option to implement PPP transportation projects in Vietnam. However, public and private sectors might face various difficulties during the implementation of PPP projects. In this paper, we examined the problems affecting the performance of PPP transportation projects. The important results were (1) typical organizational structures of PPP transportation projects in Vietnam, (2) relations among stakeholders and their activities during the life cycle of PPP projects, and (3) problems affecting the performances of PPP projects.

Based on the opinions of seven experienced professionals concerning the five previous PPP transportation projects, typical organizational structures as well as relations among stakeholders and activities during the life cycle of PPP projects in Vietnam were discovered. It is helpful for private investors and public sector to have an overview and understand the operational procedures in projects in Vietnam.

Moreover, the problems concerning the performance of PPP transportation projects in Vietnam were identified and assessed. The critical problems throughout the life cycle of PPP projects consisted of (1) feasibility stage: inadequate feasibility study, changes in the laws and regulations, conflicting or imperfect contracts, government intervention, lack of transparency in bidding, and unfair process of selection in the private sector, (2) pre-construction and construction stage: land acquisition and compensation, scope change of projects, and (3) operation stage: toll fee issues, breach of contract by the government, and the lack of supporting infrastructure. Interestingly, many key problems occurred in the feasibility stage of the PPP projects. Only one significant factor was related to the success of the PPP projects and that was suitable incentives from the government.

These results should benefit the Vietnamese government and the private sector for an understanding of the problems that appear in PPP projects. It is necessary for the government to revise their policies, laws, and regulations so that PPP transportation projects might become more attractive for the private sector. In addition, private investors should recognize the organizational structure as well as the relations among parties in order to develop reasonable investment strategies.

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