

OVERVIEW

1.1. The motivation for the research

Transport infrastructure plays a crucial role in the socio-economic development of any country and territory. A modern, synchronized, and well-designed transportation system is the prerequisite for promoting socio-economic activities and merchandise trade. As blood vessels of the economy, a developed transportation system boosts productivity and transparency for the national economy. Connectivity among domestic regions as well as international territories also creates favorable conditions for other industries to develop; Domestic and international cooperation and business opportunities are expanded; the socio-economy is improved, and global economic integration is accelerated. Transport infrastructure can only develop synchronously with the help of the government's orientation and strategies in regulating and allocating national resources.

Well-aware of the importance of developing transport infrastructure, in December 2004, the Prime Minister issued Decision no. 206/2004/QĐ-TTg regarding the approval of the Strategy on the Development of Vietnam's Transport until 2020. On February 25, 2013, the Prime Minister issued Decision no. 355/QĐ-TTg regarding the approval of modifications to the Strategy on the Development of Vietnam's Transport until 2020, with the vision towards 2030. According to the Decision, the demand for investment capital for transport infrastructure in Vietnam until 2020 is immense. 3.5% - 4.5% GDP in the form of state budget capital and government bonds, equivalent to 137,000 – 176,000 bn Dong, would be allocated annually. According to the Ministry of Transport, the demand for investment capital from 2016 to 2020 would be approximately 960,000 bn Dong. The government has paid particular attention to, and prioritized, allocating investment resources from the state budget, government bonds, and the official development assistance investment capital for building transport infrastructure. However, due to the requirement for fast development, transport infrastructure synchronization might encounter many challenges. These challenges stem from a great need for investment capital, a long payback period, high risks, and a need for the participation of many stakeholders. Currently available funding sources for transport infrastructure, such as state budget, ODA, and government bonds, only satisfy 20% demand. In the foreseeable future, with constant changes in the economic structure (including urbanization, industrialization, and international integration), the need for infrastructure services in crucial industries such as transportation in Vietnam will continue to increase.

One of the efficient methods of raising investment capital for socio-economic infrastructure development, including transport infrastructure, that has been studied and successfully implemented in many countries is the Public-Private Partnership (PPP). The partnership model between the public and private sector is currently the most appropriate choice for Vietnam.

Theoretically, the concept of PPP first appeared in training programs and was implemented in developing socio-economic infrastructure in the United States. The benefits and effectiveness of the PPP model have been confirmed and subsequently quickly studied and applied in many countries. To date, PPP has been considered and successfully implemented in over 50 countries, developed and emerging alike.

In essence, PPP is the agreement between the public sector (the government and other authority bodies) and the private sector wherein the latter provides public projects and services. The main component of a public-private partnership is the transfer of investment, responsibilities, and benefits from the public sector to their private sector partners. In other words, a PPP relationship includes coordination in project implementation, private investment

capital attraction, and shared responsibilities, benefits, and risks, through which the quality of public services is improved, and private investors gain more business opportunities.

There have been many domestic and foreign studies on PPP in developing socio-economic infrastructure in general and transport infrastructure in particular. Those works are based on different viewpoints and approaches. Studies using the economic-based approach include Jean-Etienne de Bettignies & Thomas W. Ross, (2004); Darrin Grimsey, Mervyn Lewis, (2005); Marian Moszoro & Paweł Gąsiorowski, (2008). Overall, these studies confirm the role, benefits, importance, and potential of PPP in mobilizing social resources to allocate optimally, mobilize, use, and structure capital between the private and public sectors with a view to socio-economic development for the public good. PPP allows the optimal resonance of stakeholders' strengths, mitigation of government resource limitations, exploitation of the advantages, capabilities, and management expertise in the private sector, and reallocation of stakeholders' roles, motivations, and responsibilities. Thus, it enables the government and the private sector to share risks and improve the quality and efficiency of public services.

Studies based on public administration theory such as David Osborne, Ted Gaebler (1997) mainly evaluate from the aspect of renovating the structure, functions, and management method of the public sector in the direction of increasing competition in the public sector and allowing the private sector to participate more in public services.

Studies based on the legal institutional perspective, such as Bharti Thakar, (2009), E. R. Yescombe, (2007) analyze impacts on the legal framework, policy issues related to the execution of public-private partnership activities, clarification of funding sources and financial structure, risk evaluation for stakeholders upon participation under the government's public policy framework.

Besides, there are studies conducted to determine efficient public-private partnership models, such as Stefano Gatti, Stefanie Kleimeier & Marco Percoco (2008), Jean-Etienne de Bettignies & Thomas W. Ross (2004). Studies evaluating factors contributing to the success or failure of PPP in infrastructure include Mona Hammami, Jean-Francois Ruhashyankiko & Etienne B. Yehoue (2006).

There are many studies on PPP in managing and developing specific socio-economic aspects. Studies in this category are diverse. They include PPP in building infrastructure and public services (Elizabeth Fife & Laura Hosman, (2008)); managing and developing the medical system, social security system, or social infrastructure (Johannes Jütting (1999)); improving the public housing system; education (Harry Anthony Patrinos, Felipe Barrera-Osorio & Juliana Guáqueta (2009); potable water supply and sewage drainage (Jennifer Baumert & Laura Bloodgood, (2004)); labor and employment solutions (Alfonso Arellano, Florentino Felgueroso, Pablo Vázquez & Enrique González (2008)). In the transportation industry, we have studies on PPP in developing transport systems (Antonio Estache, Ellis Juan & Lourdes Trujillo (2007)) and supplying transport services (M J Witkiss, J L Hine & S D Ellis (1999) and Engr. Paul Chukwuka Ugboaja (2010)).

Overall, international researches are diverse and play a crucial role in building the theoretical foundation for the field of PPP. They create an overview of PPP; theoretically analyze the definition, function, and practical experience of implementing PPP on different socio-economic aspects; evaluate the successes and failures of PPP in different countries.

Although PPP is an efficient method to raise capital for infrastructure development globally, there has been limited research on this model in Vietnam. Studies on PPP have only appeared recently, focusing on two aspects. The first is the institutional and juridical conditions for PPP activities in Vietnam (Mai Thị Thu (2016); Đoàn Minh Huân (2012)). The second is PPP in specific fields such as the medical field (Nguyễn Thị Kim Dung (2008));

social security (Sử Đình Thành and Bùi Thị Mai Hoài (2014)); efficient management of urban development investment projects structured as PPP in Vietnam (Nam Hoàng Anh Tuấn (2019)). In the transport infrastructure field, there have recently been several pieces of research focusing on developing the road network (Nguyễn Hồng Thái (2010); Huỳnh Thị Thủy Giang (2012); Phạm Diễm Hằng (2019)). Most domestic research projects mainly study individual elements, among which the institutional and legal framework for PPP is the most mentioned, without illustrating all factors and the relationships between them, which might affect the effectiveness of PPP models in Vietnam. This is among the reasons for unsatisfying results in PPP transportation projects up until now.

In practice, the Vietnamese Party and Government are always well-aware of the importance of PPP in infrastructure development in general and transportation in particular. Given the challenges of the new situation, PPP is considered the solution that revolutionizes the public sector, restructures the government sector, spans many industries, and yields immense socio-economic benefits. This is a new and effective method that the government can leverage to resolve severe deficits in investment capital sources for development. The government faces increasing demands for sourcing enough funding to develop and maintain infrastructure. As the current situation demands fast economic growth, the state budget is always in deficit, the public debt ratio is increasing, ODA capital is more limited and inaccessible, allowing the private sector to join hands with the government is inevitable. This would be the kickstarting point for abundant domestic and international capital sources to flow into an inherently capital-depleted economy.

To enforce the policy of raising private capital for transport infrastructure development investment, the Prime Minister issued Decree 63/2018/NĐ-CP on May 4, 2018, on PPP investment and accompanying policies and solutions. Within a short time, many transport infrastructure PPP projects were approved and implemented. From 2013 to 2018, there were 71 BOT projects with a total investment of 202,556 bn Dong. Thanks to these PPP projects, the transport infrastructure system in Vietnam have been improved and positively transformed. Through socialization and PPP investment, transport projects have been modernized, and new technology has been adopted. Several new and synchronized projects boast improved capacity to serve economic growth: Operations on roads, ports, waterways, and airports have been sped up. It is safe to say that transport infrastructure PPP in Vietnam have been ardently supported and highly rated by the business community while yielding practical benefits for the society as well as private investors. This partnership mode helps the government do their job better and resolve the problem of capital deficit in public investment, especially in projects requiring tremendous amounts of capital to construct infrastructure and provide public services. This is hugely beneficial, given that there is a pressing demand for fast economic growth, and state budget deficits, as well as public debt ratio, have been continually on the rise. The mobilization of private resources to invest in developing transport infrastructure has contributed to ensuring the achievement of socio-economic development targets during the past few years.

However, successes aside, the implementation of PPP projects in the transport field has also manifested limitations preventing them from reaching their full potentials. Studies on PPP that thoroughly evaluate the impact of multiple factors on the effectiveness of PPP in constructing transport infrastructure have not been adequately addressed. To mitigate the theoretical and practical shortcomings in implementing PPP in building transport infrastructure, the author has chosen the research question: "Factors affecting the effectiveness of public-private partnership (PPP) models in transport infrastructure investment in Vietnam." The research aims to generate suggestions to construct and

implement a system of policies and solutions that promotes affecting factors and improves the efficiency of the PPP model in the transport field.

1.2. Study objective

Based on the theoretical basis of PPP, as well as the current situation and factors affecting the efficiency of the PPP model in transport infrastructure investment in Vietnam, the paper will suggest solutions that boost the efficiency of PPP in transport infrastructure investment in Vietnam.

1.3. Research questions

The paper aims to answer the following questions:

First, what are the factors affecting the efficiency of the PPP model in transport infrastructure investment?

Second, what is the current situation of PPP in transport infrastructure investment in Vietnam?

Third, what are the factors affecting the efficiency of the PPP model in transport infrastructure investment in Vietnam? How do they work, and which one is the most important in the current situation?

Fourth, how to improve the efficiency of the PPP model in transport infrastructure investment in Vietnam in the foreseeable future?

1.4. Scope and subject

1.4.1. Subject

The subject of the research is the PPP model and the factors affecting the efficiency of PPP in transport infrastructure investment in Vietnam.

1.4.2. Scope

Content scope: Since PPP is a broad topic, this paper focuses on researching and solving issues related to factors affecting the efficiency of the PPP model in transport infrastructure investment in Vietnam. The content researches and evaluates the efficiency of the PPP model in transport infrastructure investment in Vietnam on a general level instead of getting into specific projects.

Spatial scope: Researches the factors affecting the efficiency of the PPP model in transport infrastructure investment in Vietnam (including PPP forms in different aspects of transportation). The paper also researches other countries' experience in PPP models in transport infrastructure investment.

Time scope: Researches the situation from 2013 to 2018, evaluation statistics in 2018, solutions, and suggestions until 2025 with a vision towards 2030.

1.5. Methodology summary

1.5.1. Data source and data collection method

Regarding secondary data: To collect secondary data based on the research objective, subject, and scope, the author chose datatypes and scientific content necessary for the formation of a theoretical framework, determining the research model of the paper. Besides, they researched technical documents and systematized the theoretical basis. The author also collected data and statistics from reports and summary statistics published by research institutions and government organizations, legal documents issued by the government that are directly related to PPP, reports on PPP research results from domestic scientific research institutions, projects, schemes, and research programs by relevant organizations. These are necessary for the analysis and evaluation of the current situation regarding the PPP model and the impact of factors on the efficiency of the PPP model in infrastructure development in general and transport infrastructure in Vietnam in particular.

Regarding primary data: To collect primary data for the research, the author interviewed specialists and regulating authorities, as well as conducting direct surveys with questionnaires. These methods will be detailed in Chapter 3: Research methodology.

1.5.2. Data processing and analysis method

Data are gathered, selected, classified, and systematized into specific classes. The author then used a combination of various statistical analysis methods to describe, synthesize, compare, and contrast over time and across geographic regions. Statistical techniques are used to design table, present, and analyze data.

1.5.3. Approach

The paper simultaneously uses qualitative and quantitative analysis.

Qualitative research: Qualitative research was conducted based on inheriting and selectively applying the results of theoretical and practical research worldwide to identify factors and the differences in their effect on the success of PPP in transport in developing and developed countries. This research aims to understand how PPP works in countries where the market for PPP exists and then choose an appropriate approach to researching the mechanism of PPP in market conditions where PPP has yet to exist, such as in Vietnam. Results from the above research are combined with information from published statistics from certain government agencies, banks, and private corporations in transport and construction to achieve a multi-faceted evaluation of PPP and create a basis to calibrate metrics for the effectiveness of PPP projects in transportation in Vietnam.

Quantitative research: Quantitative research used multivariable regression on the statistical software SPSS to measure factors affecting the efficiency of the transport PPP model. Interviewed several government officials and staff in corporations and banks that implemented the PPP model in transport infrastructure investment in Vietnam to thoroughly evaluate the current situation of the PPP model in the Vietnam transport industry and modify the research model (if necessary). Afterward, the paper would construct a set of metrics for variables and design the questionnaire. The questionnaire would be tested and modified, if necessary, before being officially used on government officials and staff in corporations and banks. The trial survey uses randomized sampling, including five government officials, five managers, and 20 staff from corporations and banks. Afterward, the author conducted the official research, collecting data via 250 questionnaires.

In addition, the author leveraged insights from transport PPP models in South Korea, China, Thailand, Singapore...; national and international conferences on PPP hosted and sponsored by the World Bank; and the practical experience from current transport PPP projects, combined with data from previous research steps to evaluate factors affecting the efficiency of the PPP model in transport infrastructure investment in Vietnam.

1.6. Results

Theoretically: Systematized and contributed new theoretical insights regarding the PPP model for transport infrastructure investment in Vietnam. Suggested a research model and clarified the factors affecting the efficiency of the PPP model in transport infrastructure investment in Vietnam. Determined the essential factors in the current situation.

Practically: Evaluated the current status of PPP investment in transport infrastructure in Vietnam. Enumerated the limitations and challenges of applying the PPP model in the current condition of transport infrastructure investment in Vietnam.

The paper also quantified the relationship between the attitude, abilities, and experience of the private sector, the role and commitment from the government, support from lenders, the satisfaction of transport service users, investment environment, and the characteristics of transport projects. It further examined how they affect the efficiency of the PPP model in the

current situation of transport infrastructure investment in Vietnam. Through the research, consolidated insights on promoting positive factors to accelerate and improve the efficiency of the PPP model in transport infrastructure investment in Vietnam.

The paper also suggested solutions that improve the efficiency of the PPP model in transport infrastructure investment in Vietnam.

1.7. Outline:

Besides the Overview, Conclusion and suggestions, Reference, and Appendix, the paper is divided into five chapters:

Chapter 1: A literature review on researches related to the topic

Chapter 2: Theoretical basis of the PPP model and factors affecting the efficiency of the PPP model in transport infrastructure investment

Chapter 3: Research methodology

Chapter 4: Analysis and result discussion

Chapter 5: Suggestions on the improvement of factors to increase the efficiency of the PPP model in transport infrastructure investment in Vietnam.

CHAPTER 1: LITERATURE REVIEW ON RESEARCHES RELATED TO THE TOPIC

When conducting a literature review on researches related to the topic, the author divided the content of previously published domestic and international work into two groups:

- Foreign works related to PPP.
- Domestic works related to PPP and PPP in the field of transportation.

1.1. Foreign works related to PPP

PPP appeared relatively early in the world. Since the 18th and 19th centuries, England and France saw many modes of collaboration between the state and the private sector to construct infrastructure or provide public services. However, it was not until the 1950s that the term "public-private partnership" appeared in the United States in educational programs sponsored by both the public and private sectors. Since the 1970s, PPP has thrived along with the social democracy and neoliberalism trends in countries operating based on the market mechanism, which narrowed down the public sector and expanded the role of the private sector in providing public services. Thanks to this, the topic has attracted considerable attention from international scholars and been researched using multiple approaches.

Overall, international researches provided an overview of PPP; theoretically analyzed the definition, role, and practical insights regarding the implementation of PPP on multiple socio-economic aspects; evaluated the successes and failures of PPP globally. This is among crucial secondary sources that help shape the overview and construct a theoretical framework for PPP in Vietnam. In addition, these researches suggested new approaches, thus aid researches on PPP in Vietnam in the current situation of the market economy and international economic integration.

1.2. Domestic works related to PPP and PPP in the field of transportation

Despite being an efficient cooperation and investment method when it comes to raising capital for infrastructure development, PPP has not received adequate attention in Vietnam.

The researches above partially reflect the interest of the Vietnamese academia and policymakers in PPP. However, most studies only analyze individual projects in individual fields without generalizing theoretical issues regarding PPP. Thus, it is crucial and urgent that we continue researching this issue at the conceptual level.

1.3. Overview of the results of relevant studies and the focus issues of the paper

Due to differences in the objective, subject, content, research scope, and approach, there is diversity among the researches above, although they all study the same topic. These works play a crucial role in explaining the following issues:

First, although researches related to PPP have different approaches, they all confirm the vital role of PPP in socio-economic development in general and the benefits of PPP in infrastructure investment in particular. Researches on PPP have been seriously conducted and yielded specific solutions to improve the quality of the PPP model.

Second, based on a scientific basis, the authors determined and analyzed the development of requirements as well as factors affecting PPP and suggested essential solutions to improve the PPP model; paid particular attention to the direction and measures to improve the system of legal documents, as well as constructing policies on PPP in general and PPP in transport in particular. These are the content and measures with scientific backing and profound theoretical and practical value. The author inherited and developed them in the research topic: "*Factors affecting the efficiency of public-private partnership (PPP) models in transport infrastructure investment in Vietnam.*"

Third, the works above confirmed that PPP is only a method of investment that attracts private resources to construct infrastructure and provide services along with the government.

This is one of the measures that can be applied to improve the efficiency of the government in ensuring social development and expand investment opportunities for the private sector and relevant stakeholders.

Fourth, most researches claimed that PPP is not suitable for every field and in every environment. PPP can only be implemented when specific prerequisites have been satisfied, in a stable environment with a clear legal framework. Recent domestic researches have evaluated and suggested broad solutions to improve the efficiency of current PPP models in Vietnam.

CHAPTER 2: THEORETICAL BASIS OF THE PPP MODEL AND FACTORS AFFECTING THE EFFICIENCY OF THE PPP MODEL IN TRANSPORT INFRASTRUCTURE INVESTMENT

2.1. Definition and role in transport infrastructure investment

According to Mossman F. H. and Morton N. (1957), *Principles of Transportation*, (e-book), the term Transport infrastructure means a system of material-technical projects and architectural works that create the infrastructural basis for the development of the transportation industry and the economy. Transport infrastructure includes systems of bridges, roads, seaports, river ports, railway stations, airports, storage yards, and auxiliary equipment systems such as signal information, signs, and streetlights.

The first characteristic of transport infrastructure is that it exhibits uniformity and synchronization; there is a harmonious link among components that creates a steady unit ensuring the optimization of the system. The second characteristic is large-scale infrastructure works that are mainly outdoors, scattered throughout the country, and heavily influenced by natural forces.

Given these characteristics, investment to synchronously develop transport infrastructure will yield high efficiency and transparency to the economy. Transport infrastructure, with its strong links between roads, railways, waterways, maritime, and aviation, as well as its connection between domestic and international regions, will enable other industries to develop. Local and international cooperation and business opportunities will be expanded; there will be socio-economic improvements and accelerated global economic integration. However, synchronous transport infrastructure development encounters a myriad of challenges due to the need for a large amount of capital, long payback periods, high risks, and involvement of many stakeholders. The government needs to establish a synchronous and transparent institution, strictly control the implementation of policies to attract capital and private investors, effectively hit targets, and ensure stakeholders' benefits.

2.2. PPP models in transport infrastructure investment

A popular definition of the public-private partnership model is one where the government allows the private sector to participate in public services and projects. With this model, the government establishes criteria on service provision, and the private sector is incentivized by payment in keeping with service quality. This is a partnership form that will benefit both the government and the public due to the exploitation of financial resources and management capabilities from the private sectors while ensuring citizens' benefits. The term 'public-private partnership' describes a series of relationships that might emerge among government institutions and private companies that are related to infrastructure and other service industries. PPP illustrates a framework that features the participation of the private sector while acknowledging and establishing the role of the government in ensuring the satisfaction of social responsibilities and achieving successes in reforms in the public sector and public

investments [PPP-Handbook-VN; ADB; 2007].

Despite the presence of different definitions of PPP, they all state that a public-private partnership is an agreement between the public sector (the government and other authority bodies) and the private sector, leading to the latter providing projects and services traditionally offered by the former. The main feature of a public-private partnership is a transfer in investment, responsibilities, and benefits from public partners to their private counterparts.

PPP contracts come in many forms, each of which is suitable for a specific condition and timespan, wherein the roles of the public and private sectors wildly fluctuate. The government might bear significant risks in service/management contracts; the private sector might take the lion's share of risks in BOT and BOT contracts, or both parties might bear equal risks. The choice of the PPP model is context-based.

2.3. Factors affecting the efficiency of PPP models

The researchers used different models to study the factors affecting the efficiency of PPP. Overall, the results show four main factors as follows:

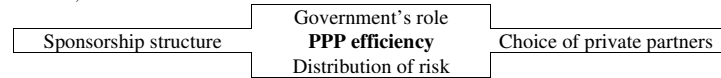


Figure 2.1: Factors affecting the efficiency of PPP

Source: author's research

2.4. The stakeholder theory impacts the efficiency of PPP models in transport infrastructure investment

According to Zhang X. Q. (2005), the efficacy of the implementation of PPP projects is evaluated based on stakeholders' achievements. Efficiency is measured by the gap between stakeholders' expectations and the desired results of the project.

The terms "stakeholders" originated from Stanford's SRI in the 1960s. Stakeholders are groups without whom the organization cannot survive. Freeman (1984) defined stakeholders as groups and individuals that influence or are influenced by the organization's ability to achieve goals or groups of people that are crucial to the organization's survival. Venkat Raman (2004) defined stakeholders as individuals, groups, or organizations that directly or indirectly impact the way the organization operates and formulates policies, makes decisions, and takes actions in a significant manner. Jones & Wicks (1996) stated that the theoretical content of stakeholders centers around making managerial decisions for the organization, having relationships with multiple groups (stakeholders), and being influenced by the decisions of those groups. The theory of stakeholders is helpful when determining stakeholders and their interrelationships during the operation of an organization. Tuan L. A. (2016), stated that in a PPP project, determined stakeholders include: the public sector, the private sectors, service users, and lenders. Thus, based on the stakeholder theory, in this paper, the subjective standard includes impacts from the public sector, service users, and lenders.

The stakeholder theory, throughout the implementation of a PPP project, facilitates an effective model for PPP with seven independent variables affecting its efficiency: (1) *Commitments from the government*; (2) *Investment environment*; (3) *Lenders' support*; (4) *Project characteristics*; (5) *Attitude of the private sector*; (6) *Ability and experience of the private sector*; (7) *Satisfaction of service users*.

CHAPTER 3: METHODOLOGY

After conducting a literature review and gap analysis and specifying research orientation, objectives and theoretical basis about PPP and significant factors affecting the PPP model, the author now focuses on articulating the paper's methodology, which includes

building a research process, proposing research models, metrics and research hypotheses, preliminary qualitative and quantitative research aiming at optimizing the research model. The focus will also be on official preliminary research to build a method to collect and analyze primary data from interviewing experts and supervisors, as well as from directly surveying with questionnaires.

3.1. Research process

To achieve the objective of studying factors that affect the effectiveness of the PPP model in investments in Vietnam's transport infrastructure, the author builds a five-step research process (Figure 3.1), integrating both qualitative and quantitative research methods. Details regarding the main five steps in the research process are as follows:

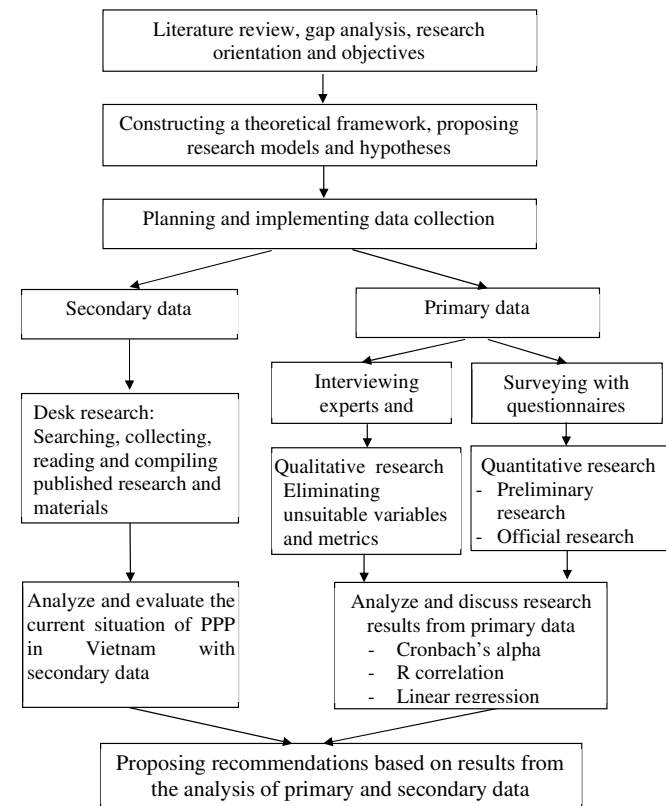
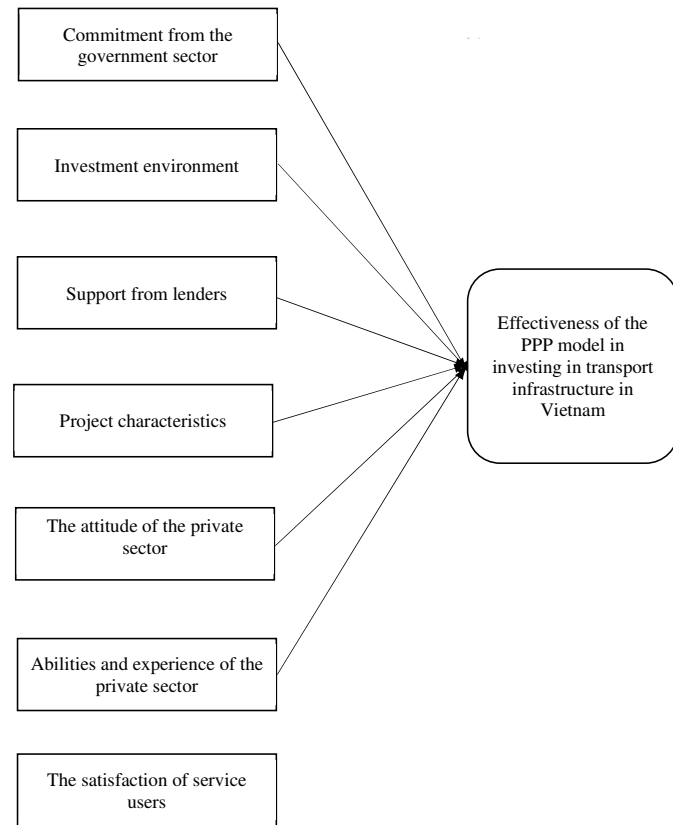


Figure 3.1: Research process of the study**3.2. Proposing the research model and hypotheses**

Based on basic theoretical research about PPP, the effectiveness of the PPP model in transport, theories regarding relevant stakeholders as well as an overview of past research, the author applies the approach from the research model of Zhang X. Q. (2005) about relevant stakeholders to propose a research model for factors affecting the effectiveness of PPP in investing in transport in Vietnam. Seven factors are affecting the efficiency of PPP in investing in transport infrastructure in Vietnam in this model, as described in Figure 3.2.

**Figure 3.2: Proposed research model and hypotheses****3.3. Overview of primary research methodologies**

To conduct research, the author integrates the research methodologies of descriptive statistics, synthesis, qualitative and quantitative analysis.

Desk research methodology:

Systemizing and utilizing domestic and international published research results about the usage of PPP in developing infrastructure in general and transport infrastructure in particular, as well as factors affecting the effectiveness of PPP in this field, specifying transferable elements that could be further developed, as well as “gaps” to be researched with practical scientific contributions, and constructing the theoretical framework and proposed research model.

Method of synthesis, comparison, and analysis: From synthesizing the results of implementing PPP in Vietnam during the 2013-2018 period in reports from the Ministry of Transport and the Ministry of Planning & Investment, the author compares and analyzes to accurately evaluate the current situation in investment and development of transport infrastructure with the PPP model, as well as identifying shortcomings and weaknesses of this activity.

Method of qualitative analysis: conducted based on inheriting and selectively applying the results of theoretical and practical research worldwide to identify factors and the differences in their effect on the success of PPP in transport in developing and developed countries. This research aims to understand how PPP works in countries where the market for PPP exists and then chooses an appropriate approach to research the mechanism of PPP in market conditions where PPP has yet to exist, such as in Vietnam. Results from the above analysis are combined with information from published statistics from certain government agencies, banks, and private corporations in transport and construction to achieve a multi-faceted evaluation of PPP and create a basis to calibrate metrics for the effectiveness of PPP projects in transportation in Vietnam.

Method of quantitative analysis: The author collected primary data to supplement secondary data to guarantee the accuracy and scientific nature of analyses, evaluations, and research conducting a survey using questionnaires that represent the relevant components of PPP projects in transport. This is to investigate factors affecting the effectiveness of the PPP model in investing in transport infrastructure in Vietnam.

3.4. Qualitative analysis

The qualitative analysis aims to examine, select and affirm the suitability, accuracy, and trustworthiness of factors affecting the effectiveness of the PPP model in investing in transport infrastructure in Vietnam and the relationship between variables in the proposed research model. The results from the qualitative analysis are used to determine if there are any adjustments or improvements to be made on the factors used in the initial theoretical model to be more appropriate to Vietnam’s context as well as the research objectives of this paper.

3.5. Quantitative analysis

3.5.1. Preliminary quantitative analysis

This is the preliminary research to re-select variables as input into the research model, examine the metrics used, consult opinions from experts, thus construct metrics as input into the research model and building questionnaires.

The author conducts a preliminary quantitative analysis with detailed questionnaires with a sample size of 30. This analysis aims to standardize the terms and adjust questions in the questionnaire to make sure survey participants do not misunderstand the questions before mass-conducting the official survey.

The final results from conducting preliminary quantitative and qualitative analysis confirm that the research model, the proposed factors and metrics appropriate with Vietnam's conditions consist of 8 variables, among which the variable of Effectiveness of PPP is the dependent variable. This is calculated using three specific criteria and seven independent variables representing seven factors with particular metrics in the following table:

Table 3.9: Metrics for factors affecting the effectiveness of the PPP model in investing in transport infrastructure in Vietnam

Effectiveness of PPP	
1	The investor is very interested in investment and development of transport infrastructure in Vietnam using the PPP model
2	The investor is very satisfied with the results from investing in transport infrastructure in Vietnam using the PPP model
3	The investor is willing to invest in developing transport infrastructure in Vietnam using the PPP model in the foreseeable future
Commitment from the government sector	
1	Commitment from the government
2	Planning the development of PPP projects
3	Building implementation policies for PPP projects
4	Establishing authorities to manage PPP
5	Supervise and evaluate projects
6	Identifying suitable projects to invest using the PPP model
7	The ability to cooperate financially of the government
8	Backing from the government
9	The government's experience regarding PPP
10	Investment incentives and guarantee
11	Communication regarding the PPP investment model
Investment environment	
1	Complete and favorable legal framework
2	Political stability
3	Favorable economic conditions
4	Favorable financial markets

5	Democracy and low corruption
6	Transparency in PPP projects' implementation
7	Ease of finding trustworthy partners
Support from lenders	
1	Availability of financial resources in the medium and long term
2	Trust in debt repayment abilities of the private sector
3	Activeness in lending for PPP projects
4	Abilities and experience of the lender parties' human resources
Project characteristics	
1	Reasonable distribution and sharing of risks
2	Financial feasibility of the project
3	Technical feasibility of the project
The attitude of the private sector	
1	Investing in developing transport infrastructure in Vietnam using the PPP model is a good idea
2	Investing in developing transport infrastructure in Vietnam using the PPP model is a correct idea
3	The investor likes the idea of investing in developing transport infrastructure in Vietnam using the PPP model
Abilities and experience of the private sector	
1	Technical expertise
2	Financial ability
3	Managing ability
4	Relationship ability
5	Experience in implementing PPP projects
The satisfaction of service users	
1	Agreement with the PPP model
2	Willingness to pay for using the service

3.5.2. Official quantitative analysis

Conducted with domestic investors with a sample size of 200 through surveying with questionnaires. The data is collected with the supporting software of SPSS.20 and will be used to evaluate the trustworthiness of metrics through analyzing Cronbach's alpha, examining the research model and hypotheses using correlation and linear regression analysis.

CHAPTER 4: ANALYSIS AND DISCUSSION OF RESEARCH RESULTS

4.1. Current situation of transport infrastructure in Vietnam

In recent years, the transport infrastructure system in Vietnam has been upgraded and reconstructed, contributing to the improvement of capacity, and facilitating economic growth. Specifically, we saw increased road capacity, decreased time taken on railroads and waterways, increased merchandise volume through seaports, increased passenger and merchandise volume through airports. Ranking of capacity and quality of Vietnam's transport infrastructure (by the World Economic Forum) rose rapidly from 103 in 2010 to 74 in 2014. However, the majority of the transport infrastructure in Vietnam is of small scale, inconsistent and unable to create an uninterrupted connection; the ability to meet transport needs and safety is limited. Compared to certain advanced countries in the area, the transport infrastructure system in Vietnam is only average.

4.3. Achieved results

Private capital has begun to be mobilized for developing infrastructure and sharing the burden with the government, thus significantly contribute to socio-economic development, as well as stimulating other economic projects. This investment method does not only mobilize foreign capital but has recently also pushed domestic investors to boldly propose and implement many BOT projects, especially in transport.

A consistent legal framework about PPP has been steadily finalized, approaching international standards, reflecting the true nature of projects, and gradually clarifying the distribution of benefits and risks between the government and investors. This is indicated by how the number of projects being implemented recently has significantly increased. Consequently, the preparation and implementation process has decreased considerably.

4.4. Shortcomings in implementing PPP projects in transport in Vietnam

Because the legal corridor regarding PPP is not yet consistent, legal documents have to be frequently amended, supplemented, or changed, which makes foreign investors think twice about the PPP projects they are interested in or investing in due to legal risks. For the above reasons, foreign investors are still quite hesitant to step into Vietnam's investment environment in general and transport infrastructure in particular, especially with the new PPP model.

Conventionally, preparation fees for PPP projects are quite high, with the majority being used to hire experts, advisors (financial, legal, technical) to carry out tasks such as project proposal, feasibility research report, and supporting the bidding process to select investors. However, currently, not only the Ministry of Transport but also several other ministries, regional and local authorities are not yet able to balance and allocate funding for a standardized preparation for PPP projects. Therefore, Ministries, regional and local authorities find it very difficult to construct a project proposal actively and will, in most cases, only have a rough idea with preliminary information. The Ministry of Planning & Investment has also established a fund for the preparation of PPP projects. However, the size is limited at US\$ 30 million, and the process for access is not yet optimal.

Projects that invest in infrastructure, especially projects within transport, often require large amounts of capital and have a long payback period. In reality, there have been many

companies suggesting a customized mechanism to support and increase the projects' feasibility. However, most suggestions are yet to be accepted as there has been no financial solution to guarantee the benefits of the government, the residential communities, and the investors. Proposed solutions have been infeasible, such as increased fees (cannot raise the price too high due to the fee limit as required by the Ministry of Finance and the residents' ability to pay).

Most sources of long-term credit currently come from domestic credit institutions. However, the ability to provide long-term credit of domestic credit institutions is at capacity. Mobilizing capital from foreign banking credit institutions is difficult as most credit institutions require a guarantee of revenue, exchange rate risk, and even the government's warranty for the loan. The underdeveloped bond market has high risks, and long-term bond issuance proves to be infeasible.

Due to the complex, diverse and novel nature of the projects, the quality of human resources at ministries, regional and local authorities as well as investors is yet to meet real needs. It is limited in terms of both quantity and quality, especially in fields of project finance, legal, and risk distribution.

A factor to be mentioned is the awareness of some officials in some agencies is lacking as they are used to the traditional investment model using 100% budget capital and are reluctant to research and consider implementing under the socialization model.

As such, PPP is becoming an objective trend for the current situation in Vietnam to further improve the shortcomings and obsolescence of transport infrastructure to meet the needs for social development. PPP is akin to a "piece of cake" that the government wants to promise investors. Nevertheless, it is not without risk. For this model to be truly optimized and brings benefits as expected, there needs to be an effective policy and legal framework. At the same time, it is essential to increase the management capabilities of relevant government authorities.

4.5. Analyze research results about factors affecting the effectiveness of the PPP model in investing in transport infrastructure in Vietnam

4.5.1. Description of the research sample

The author conducts data collection by surveying. In May 2019, 250 questionnaires were sent to companies and banks nationwide. The number of questionnaires sent back is 236, with a response rate of $236/250 = 94.4\%$. The number of questionnaires with sufficient information and used in data analysis is 200, achieving 80% ($200/250=80\%$) of total questionnaires.

Target participants include 04 business structures: state-owned, private, joint-stock, and limited liability, in which the joint-stock structure accounted for the highest proportion of 53.5%. Businesses are distributed across North, Central, and South Vietnam, but the focus is on the North (74%) due to limited resources for surveying. The majority of these businesses operate in construction (62%). The time in the operation of these businesses is mostly 15 years and above (48%). Among 200 participants, 65 have never implemented a PPP project (32.5%), 135 have implemented PPP projects with 45.5% implementing from 1-3 projects, and 22% with more than three projects. Detailed information about the research sample is

provided in the following table.

Table 4.4: Research sample description

Criteria		Number	Percentage (%)
Field of operation	Construction	124	62.0
	Banking	16	8.0
	Service	06	3.0
	General	54	27.0
Time in operation	1 – 5 years	47	23.5
	6 – 10 years	25	12.5
	11 – 15 years	32	16.0
	> 15 years	96	48.0
Business Structure/Investor	State-owned	22	11.0
	Private	15	7.5
	Joint-stock	107	53.5
	Limited Liability	56	28.0
Geographical region	North	148	74.0
	Central	29	14.5
	South	23	11.5
Number of PPP projects implemented	0 project	65	32.5
	1 - 3 projects	91	45.5
	> 3 projects	44	22.0

Source: Author's research

4.7.1. Results and determining the importance of variables in the model

From regression results, we can conclude as follow:

Table 4.15: Testing the research model's hypotheses

Hypothesis	Test result
Hypothesis H1 Commitment from the government sector is positively correlated with the effectiveness of the PPP model	Accept
Hypothesis H2 The investment environment is positively correlated with the effectiveness of the PPP model	Accept
Hypothesis H3 Support from lenders is positively correlated with the effectiveness of the PPP model	Accept
Hypothesis H4 The attitude of the private sector is positively correlated with the effectiveness of the PPP model	Accept
Hypothesis H5 Project characteristics are positively correlated with the effectiveness of the PPP model	Accept
Hypothesis H6 Abilities and experience of the private sector are positively correlated with the effectiveness of the PPP model	Accept
Hypothesis H7 Satisfaction from service users is positively	Accept

correlated with the effectiveness of the PPP model

Standardized regression coefficients and contribution levels in the model are as follow: (Table 4.18)

Table 4.18: Determining the importance of independent variables with the dependent variable

Variable code	Variable	Standardized beta	%	Order of importance
SCK	Commitment from the government sector	0.326	24.94	1
MTDT	Investment environment	0.215	16.46	2
HT	Support from lenders	0.154	11.79	5
TD	The attitude of the private sector	0.141	10.80	6
DD	Project characteristics	0.208	15.91	3
NLKN	Ability and experience of the private sector	0.164	12.52	4
SHL	The satisfaction of service users	0.099	7.57	7
Tổng		1.308	100%	

Source: Author's research

4.8. Discussion of research results

Research results confirm that there are seven factors measured by 35 metrics that affect the effectiveness of the PPP model in investing in transport infrastructure in Vietnam. To be specific, they are: Investment environment; the attitude of the private sector; satisfaction of service users; project characteristics; abilities and experience of the private sector; support from lenders; commitment from the government sector all have a positive effect with statistical significance on the effectiveness of the PPP model in investing in transport infrastructure in Vietnam. This confirms the proposed hypotheses in the research model.

Research results also show the influence level of each factor on the effectiveness of the PPP model in investing in transport infrastructure in Vietnam. Among them, 03 factors have the most significant effect on the effectiveness of the PPP model in investing in transport infrastructure in Vietnam: commitment from the government sector; Investment environment, and Project characteristics.

CHAPTER 5: SUGGESTIONS ON THE IMPROVEMENT OF FACTORS TO INCREASE THE EFFICIENCY OF THE PPP MODEL IN TRANSPORT INFRASTRUCTURE INVESTMENT IN VIETNAM

5.1. Specific directions regarding PPP in transport infrastructure investment

Vietnam is in its nascent phase of the industrialization and modernization process. At this stage, there is a significant demand for the construction and maintenance of the infrastructure system. During the next decades, the demand for construction, operation, and maintenance of large-scale infrastructure projects, such as the expressway system, urban

transport system in major metropolitans, national railway systems, seaports, airports, and logistics centers in Vietnam will shoot up. This will open up a vast market for PPP projects and create opportunities for both domestic and foreign businesses.

Until now, the legal corridor and policies regarding PPP have at large been reviewed, adjusted, amended, and modified in accordance with the current situation and international practices, ensuring clarity, transparency, and harmonization of interests between Government – Investors – Users. The government recently issued Decree no. 63/2018/NĐ-CP on May 4 2018, regarding investment in the form of public-private partnership; Circular no. 09/2018/TT-BKHĐT on December 28, 2018, from the Ministry of Planning and Investment, guided the implementation of several articles of Decree no. 63/2018/NĐ-CP on May 4, 2018. Besides, Vietnam has joined several international organizations (WTO, ASEAN...). We have been signing many free trade agreements as well as agreements avoiding double taxation with multiple countries. We also have socio-political advantages and a stable political institution, a large population, steady economic growth, abundant human resources, and reasonable costs, all of which are favorable and attractive conditions for investors.

According to the Ministry of Transport, Vietnam's transport is demanding synchronous development of infrastructure, carriage, and the transport industry in the direction of urbanization – modernization. The goal is to form a complete and uninterrupted transportation network, link different transport modes, ensure smooth, fast, safe, and convenient transportation nationwide, bringing it on a par with other countries. This would help Vietnam become a modern industrialized country meeting the requirements of international and regional integration.

5.2. Suggestions for improving the factors to increase the efficiency of PPP models in transport infrastructure investment in Vietnam

Based on the results of using the stakeholder research model on the factors affecting the efficiency of PPP models in transport infrastructure investment in Vietnam, the author suggests several measures to improve the following factors:

5.2.1. Improving commitments from the government

Among 11 factors measuring 'commitments from the government,' the paper chose several suggestions to improve specific factors:

- Improving commitments from the government
- Improving the process of planning PPP projects
- Developing the policies regarding PPP implementation
- Improving the government's ability regarding PPP
- Determining suitable projects to be structured as PPP
- Supervising and evaluating the projects

5.2.2. Acceleration of the improvement of the investment environment

Both the theory and the result of the paper confirmed that a pleasant investment environment is a crucial condition in encouraging the private sector to participate in PPP projects. A well-equipped, synchronized, well-rounded, and convenient investment environment that ensures the harmonization of benefits between the government, the private sector, and other stakeholders in a PPP project is always immensely attractive to the private sector. Reality has shown that the rapid and noticeable improvements in recent years regarding the investment environment in Vietnam have vastly contributed to mobilizing the private sector to invest in transport infrastructure. Thanks to this, there have been positive changes in the transport infrastructure of the nation. To meet the demands and expectations regarding the efficient development of our transport infrastructure system using PPP, there is

a need for the legal corridor to be improved faster and more rigorously to erase barriers in the investment environment in the foreseeable future.

5.2.3. Regarding the characteristics of transport PPP projects

The study results show that project characteristics include a reasonable distribution of risks in the implementation of PPP and the financial and technical feasibility of the project. The fundamental solution to this is to ensure a fair mechanism of risk- and benefit-sharing among stakeholders in a PPP project. Significant investments, a long implementation period, and vulnerability to externalities such as natural conditions, environment, socio-economic situation, and complex relationships among stakeholders make PPP projects potentially high-risk. The efficiency of a transport PPP project is the sum of the socio-economic benefits it yields. In a PPP project, stakeholders pursue different goals. Private investors prioritize the ability to pay back the capital and make profits. The government prioritizes the socio-economic benefits achieved through the project, stakeholders such as sponsors (banks) prioritize the ability to preserve and develop the loans, consumers prioritize the quality of transport services and the fees they need to pay. It is crucial for the success of a PPP project that benefits and risks are reasonably distributed.

5.2.4. Regarding the private sector

In the research model above, factors affecting the efficiency of transport PPP projects include the Attitude, Ability, and Experience of the private sector. The study results showed that most Vietnamese private investors participating in PPP projects have a positive attitude and support the policies of developing PPP models in Vietnam transport. The private sector has gradually grown to claim its crucial role in developing the Vietnam transport infrastructure. The eager participation of the private sector in developing transport infrastructure is among the reasons we achieved encouraging successes in the past few years. Thus, promoting, fostering, and developing a strong enough private sector is an essential and meaningful requirement for effective PPP models in transport infrastructure investment in Vietnam in the foreseeable future. Since the Vietnam private sector is still limited in financial capacity, technology, ability, and managerial capability, individual private investors need a radical change in both their attitude and competence regarding the PPP model.

5.2.5. Improving lenders' support

Despite the rapid growth of several private companies in recent years, the Vietnamese private sector as a whole is still nascent. Equity does not account for a significant portion of the capital for transport PPP projects. Reality has shown that commercial banks and financial institutions significantly supported transport PPP projects implemented recently. The high leverage from banks speeds up the completion of the project but also increases risks. In the capital structure of Vietnamese banks, there is a low proportion of medium- and long-term capital sources. This is an obstacle to the decision to finance transport PPP projects. Along with that, the limited financial capacity of private investors requires banks to be very cautious in appraising and assessing the risks regarding repayment capacity and capital recovery before deciding to finance transport PPP projects.

5.2.6. Regarding service users

"The satisfaction of transport service users" is among the critical factors affecting the efficiency of transport PPP projects. This factor manifests through the approval and willingness to pay service fees in PPP projects. For a long time, our economy operated based on subsidies. The government built transport infrastructure from the state budget, and users were used to free services. When we switched to the new socialist-oriented market economy, the PPP model appeared, PPP projects were implemented, users were getting used to paying

for public services. However, due to deep-rooted habits, living standards, a lack of transparencies in the process of constructing, approving, and implementing transport PPP projects, and emphasis on investors' benefits, public disapproval often happened.

To improve on this factor, the government needs thorough evaluations and widespread propaganda to enhance public awareness, generate approval from the public, and create the habit of paying for public services. They also need to maintain financial transparency in transport PPP projects.

Moreover, they should improve the quality of service and professionalism to benefit and satisfy citizens truly. After that, they can promote public willingness to pay for services. Harmonization needs to be considered over user benefits during the construction, approval, and implementation of transport infrastructure PPP projects in Vietnam.

The government should issue appropriate policies and convincing fee collection methods in accordance with the purchasing power of users that still attract private investors to invest in transport infrastructure.

CONCLUSION

This paper studies the factors affecting the efficiency of the PPP model in transport infrastructure investment in Vietnam according to international theories and experiences. These factors are (1) *Commitments from the government sector*; (2) *Investment environment*; (3) *Support from lenders*; (4) *Project characteristics*; (5) *Attitude of the private sector*; (6) *Ability and experience of the private sector*; (7) *Satisfaction of service users*.

The paper clarified the definition of efficiency in PPP models for transport infrastructure investment. The results show that given the current situation, factors with the most significant impact on the efficiency of PPP for transport infrastructure investment in Vietnam are: commitments from the government, investment environment, project characteristics.

Based on the results, the paper suggested five groups of solutions that focus on improving Commitments from the government and Investment environment, improving the efficiency of PPP models in transport infrastructure investment in Vietnam.

PPP is very popular worldwide but still nascent in Vietnam and poses many hidden challenges. To effectively apply this model in attracting transport PPP projects, specific analysis and pilot projects need to be conducted and modified appropriately. Due to differences in policies, socio-economic conditions, experience, and economic maturity, the government needs to provide appropriate support to direct private investors to transport PPP projects.

It is safe to say the PPP is Vietnam's current first choice in transport infrastructure investment. Through PPP, we can facilitate transparent and fair competition among investors, attract capital, create opportunities for the private sector to invest, thus satisfy the goal of constructing high-quality transport infrastructure without increasing public debt. Once the PPP model for transport infrastructure has been developed, Vietnam will materialize the goal of improving public service quality, satisfying public demands, and contributing to the national socio-economic development.

Although the study objective has been satisfied, there remain limitations. Specifically, the survey subjects only include domestic companies and not multinationals; the research has not clarified 'Satisfaction of service users,' which, according to economic and business management theories, is an essential factor dictating the outcome of all forms of service trade.