CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents an in-depth discussion on the methodology used in this study including the research design, instruments used, population of sample, sampling approach, data collection and the data analysis procedure. In the literature, methodology is defined as a way of collecting data, describing, illustrating and predicting situations by using chosen methods or techniques (Bryman 2012; Bryman & Bell 2007; Creswell 2014; Rajasekar et al. 2016). Basically, research methodology is the process that guides the research. Creswell (2014) added that the researchers are required to recognise and understand their ontological and epistemological orientations within their personal paradigm as this will determine the entire course of their research project.

3.2 Research Paradigm

In research, Ticehurst and Veal (2000) connotes that research paradigms are the basic set of philosophies related to the nature of the world proposed by the researcher. Thomas (2003) added that these basic philosophical beliefs of the researcher reveal his/her perception and understanding of the world's reality, together with the methods that assist him/her in obtaining the knowledge of that reality. It is necessary for the researcher to be able to justify and provide an explanation of the

reality, using the ontological, epistemological and methodological approaches (Banister et al., 2011). A research paradigm should have four main components – (i) what is the nature of the phenomenon under study; (ii) how can the researcher know of this phenomenon; (iii) what methodology can be used to study the phenomenon; and (iv) what tools or techniques can be employed to study the phenomenon (Gringeri et al., 2013).

The understanding of the said reality or social phenomena under study is dependent on the researcher's knowledge and perception of the nature and issues surrounding it. It is also largely dependent on how the researcher gathers this knowledge and information. However, any approach used by the researcher that is explicit in nature will result in a valid research design (Ekanem, 2007). Similarly, Hesse-Biber & Leavy, (2010) viewed that the ontological, epistemological, theoretical and methodological research approaches are all interrelated. Nevertheless, it is essential for the researcher to provide clarity and be able to identify the approach that is best suited for his/her research question. Saunders et al., (2012) noted that most researchers favour quantitative methods for its scientific approach and robustness.

Quantitative research, according to Thomas (2003), is a research approach aimed at determining facts, testing theories, explaining relationships between variables, and predicting outcomes. The methods used in quantitative research are adopted from the natural sciences, and are aimed to provide objectivity, generalisability and reliability (Sekaran, 2009). Thus, in this study, the quantitative method approach has been used for data collection. Figure 3.1 shows the item for the paradigm of the study's philosophy of research methodology.

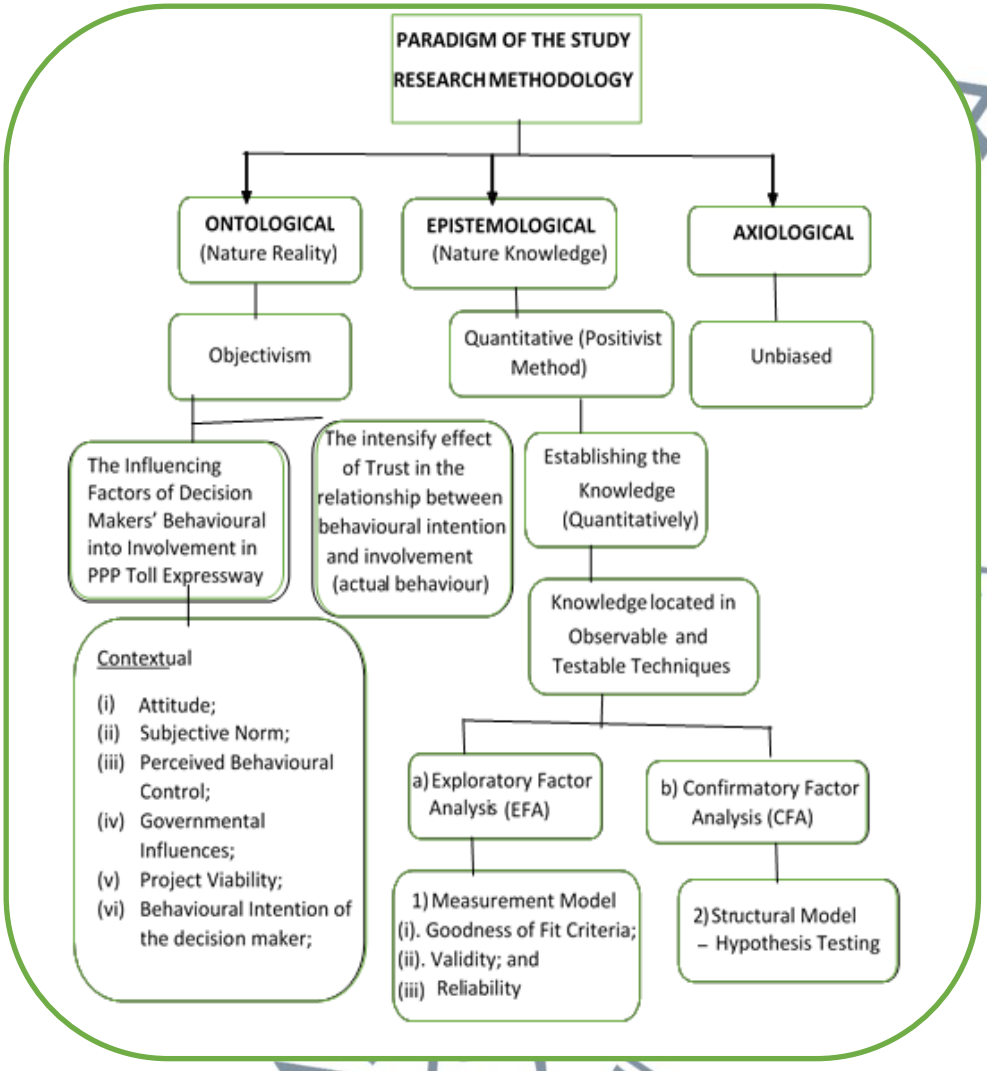


Figure 3.1: The Paradigm of the Study's Philosophy of Research Methodology

Sekaran and Bougie (2010) states that surveys and questionnaires are efficient means of data collection, where the researcher is able to accurately understand the study's requirements, along with the ideal measurement method to apply to test the identified variables. Conversely, the ontological assumptions of objectivism are aligned with the researcher's assumptions on the nature of reality, and the epistemological assumptions with what the researcher constitutes as knowledge and how this knowledge can be expanded. Thus, another reason for this study adopts the

quantitative approach for its ease in collecting observable and measurable data on variables.

Deducing from the theories and models available in the literature, thus, the researcher developed hypotheses and tested those using empirical data, as recommended by (Saunders et al. 2012). This study is hence a confirmatory research study. Creswell (2014), states that quantitative research is more appropriate for understanding how one or more variables can influence each other.

The quantitative data for this study was collected using a structured closed-ended questionnaire based on the Likert scale. This involved the structuring of questions with a fixed selection of responses to each question, and targeted to a number of identified respondents. The Likert scale is considered to have high validity in measuring variables (Henard & Dacin, 2010; Zehir et al., 2011). The Likert scale can also be used for collecting data which is suitable for factor analysis, regression analysis or structural equation modelling (Dawes, 2008).

3.3 Research Design

Akhtar (2016) connotes research design as the structure that 'glues' all the related elements of a research project. Burn & Grove (2009) defined research design as a "complete blueprint" of a research project which outlines the treatment and control of variables to ensure the validity of the research findings. In other words, it can be summarised that research design is a framework for a research that provides a detailed set of research activities and methodologies to be employed, to ensure the validity the research findings.

For the purpose of this study, the quantitative method is employed for determining facts, testing theories, explaining relationships between variables, predicting outcomes and the major attributes of quantitative method according to Creswell (2012) are:

i. describing the research problem by explaining the trend or need showing the relationship among variables;

ii. acknowledging the major role of existing literature in recommending the questions of research, rationalising the research problem and recognising the need for the direction (purpose statement and research questions or hypotheses) of the study;

iii. developing the purpose statement and research questions or hypotheses that are specific, focused, measurable, and observable; collecting numeric data from a large number of people using instruments with pre-set questions and responses;

iv. analysing phenomenon, trends, comparisons, or finding the relationship between variables using statistical analysis, and interpreting findings through comparing with previous predictions and research papers; and

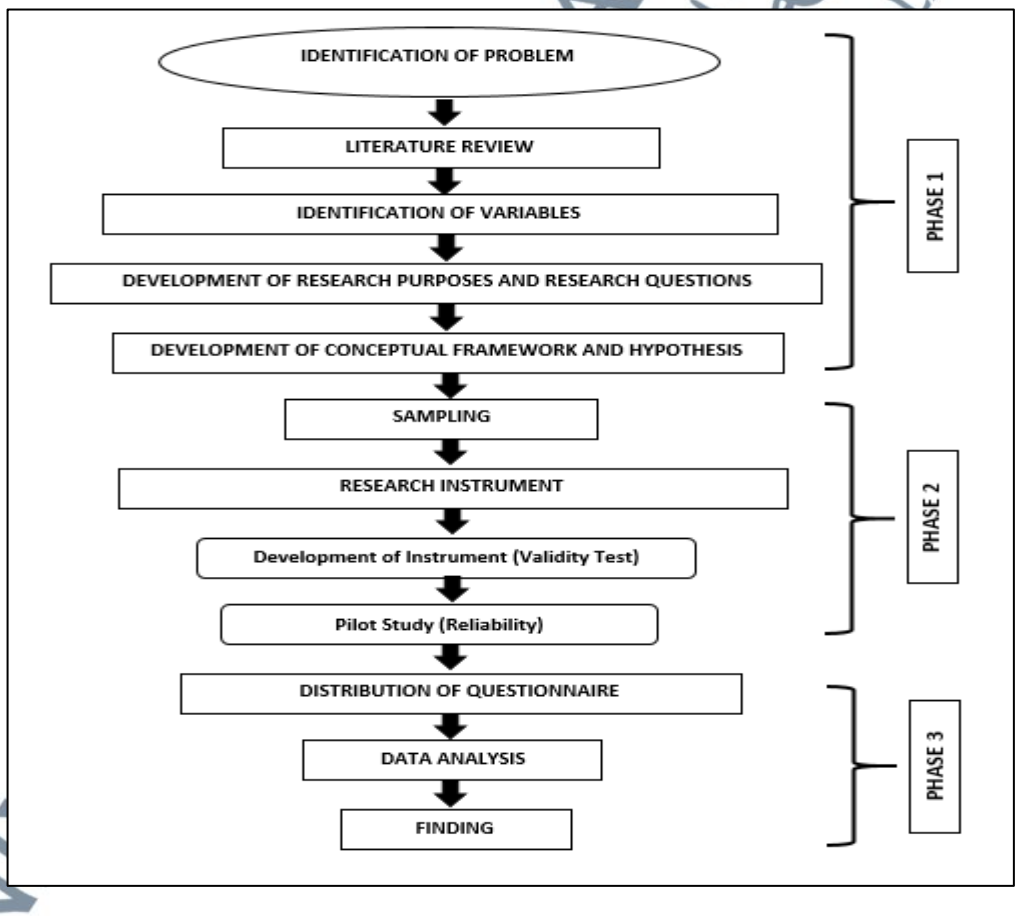
v. writing an objective, unbiased research report using standardised and fixed structures as well as evaluation criteria, and taking an objective, unbiased approach.

This study aims to establish the significant factors that influence the decision makers' behavioural towards involvement in PPP toll expressway projects in

Malaysia. To study this subject matter, research is conducted through hypothesis testing using quantitative data. The researcher has thus to employ a questionnaire survey which has been designed to comprehensively frame the research activities in line with the needs of this research.

3.3.1 Operational Framework

Based on the research design discussed above, the operational framework of this study is presented in Figure 3.2 to explain in chronological order the steps which have been taken in conducting this research.



Source: Sekaran (2009)

Figure 3.2: Research Operational Framework based on Questionnaire Survey Research Design

3.4 Population and Sampling Procedures

A population is the whole group of people from whom the researcher wishes to examine and gather data (Bryman, 2012). Collis & Hussey (2003) adds that it is necessary to have clarity on a study's target population – that it must be identified as a set of people or collection of items based on certain considerations. This study takes this into consideration and adopts the following five-step sampling procedures as introduced by (Churchill & Iacobucci, 2005).

3.4.1 Step I: Define the Target Population

According to Hair et al (2010), data reliability can frequently be impacted by certain underlying contextual and cultural features. This asserts the need to be aware of, and understand, the cultural background of the target population to ensure the reliability of a study. In this study, the population consists of the middle and top management employees from the 26 toll concessionaire companies, which have been involved in the implementation of PPP in Malaysia. The 26 toll concessionaire companies are based on the number of toll expressway companies in Malaysia which are currently operational and under construction, as reported by Malaysian Highway Authority (LLM). In this study, the middle and top management employees are those employed from the executive up to chairman level in these 26 companies and the pre-requisite of the designation towards the level of the management has been decided and provided by the Human Resources Department (HRD) of the companies.

According to the Wooldrigde, Schmid and Floyd (2008), the middle management team members those who take five essential roles which are strategic

administrative, leadership, communication and cooperation, and decision-making. While for top management team members, all those people who have "strategic" responsibilities within firms, such as: CEOs, CFOs, COOs, board chairpersons, other board members or specific top managers outside board (Abatecola, Mandarelli, and Poggesi, 2013).

Based on this criterion, the total population of this study is 988 consists of middle (677) and top (311) management employees. Table 3.1 provides some basic information on the toll concessionaires companies. The study has chosen 26 toll concessionaires because of all these companies are directly involve for 36 PPP toll expressway in Malaysia and the selection of the target population specifically among middle and top management employees, which are anticipated involved in the decision-making process on the actual behaviour towards PPP.

Table 3.1: Toll Concessionaires Private Companies

No.	Toll Concessionaire	Name of Expressway	Population (middle & top management)
1.	PLUS Berhad	North-South Expressway (NSE) E1/E2 Second Link Expressway (MSSC) E3 North South Expressway Central Link (NSECL/Elite) E6 Butterworth-Kulim Expressway (BKE) E15 Seremban-Port Dickson Highway E29 Penang Bridge E36 Sultan Abdul Halim Muadzam Shah Bridge (Penang Second Bridge) E28 East Coast Expressway Phase 2 E8	118

No.	Toll Concessionaire	Name of Expressway	Population (middle & top management)
2.	KESAS Sdn Bhd	Shah Alam Expressway (KESAS) E5	29
3.	Syarikat Mengurus Air Banjir & Terowong Sdn Bhd	Stormwater Management and Road Tunnel (SMART) E38	30
4.	Sistem Penyuraian Trafik KL-Barat Sdn Bhd	Sprint Expressway (Kerinchi Link, Damansara Link and Penchala Link) E23	38
5.	Lingkaran Trans Kota Sdn Bhd	Damansara-Puchong Expressway (LDP) E11	37
6.	Anih Berhad	Kuala Lumpur-Karak Highway E8 East Coast Expressway Phase 1 E8 KL-Seremban Highway E37	48
7.	Konsortium Lebuhraya Utara-Timur (KL) Sdn Bhd	Duta-Ulu Kelang Expressway (DUKE) Phase 2 E33	36
8.	Lebuhraya Duke Fasa 3 Sdn. Bhd	Setiawangsa-Pantai Expressway (SPE)	28
9.	Lebuhraya Kajang Seremban Sdn Bhd	Kajang-Seremban Highway (LEKAS) E21	42
10.	Besraya Sdn Bhd	Sungai Besi Expressway (BESRAYA) E9	39
11.	New Pantai Expressway Sdn Bhd	New Pantai Expressway (NPE) E10	43
12.	Projek Lintasan Kota Sdn Bhd	Ampang-Kuala Lumpur Elevated Highway (AKLEH) E12	26
13.	Pro Lintasan Shah Alam Sdn Bhd	Kemuning-Shah Alam Highway (LKSA) E13	38
14.	Prolintas Expressway Sdn Bhd	Guthtrie Corridor Expressway E3	34
15.	Sistem Lingkaran-Lebuhraya Kajang	Kajang Dispersal Link Expressway (SILK) E18	31
16.	SKVE Holdings Sdn Bhd	South Klang Valley Expressway (SKVE) E26	34
17.	Grand Saga Sdn Bhd	Cheras Kajang Expressway (CKE/Grand Saga) E7	24

No.	Toll Concessionaire	Name of Expressway	Population (middle & top management)
18.	Grand Sepadu Sdn Bhd	New North Klang Straits Bypass (NNKSB) E30	27
19.	Senai Desaru Expressway Bhd	Senai-Desaru Expressway (SDE) E22	38
20.	Maju Express Sdn Bhd	Kuala Lumpur-Putrajaya Expressway (MEX) E20 Putrajaya-KLIA Expressway (MEX II)	42
21.	Lingkaran Luar Butterworth Sdn Bhd	Butterworth Outer Ring Road (BORR) E17	39
22.	KL-Kuala Selangor Expressway Bhd	Kuala Lumpur-Kuala Selangor Expressway (KLS/LATAR) E25	42
23.	Projek Lintasan Sungai Besi-Ulu Klang Sdn. Bhd	Sungai Besi-Ulu Klang Expressway (SUKE)	31
24.	Projek Lintasan Damansara-Shah Alam Sdn Bhd	Damansara-Shah Alam Elevated Expressway (DASH)	22
25.	EKVE Sdn Bhd	East Klang Valley Expressway (EKVE)	37
26.	WCE Holdings Bhd	West Coast Expressway (WCE)	35
TOTAL POPULATION			**988**

3.4.2 Step II: Identification of the Sampling Frame

The second step is to determine the sampling frame, which is a comprehensive list of the whole population from which the sample is drawn (Saunders et al. 2012). In identifying an appropriate sampling frame for this study, the characteristics of the target population were investigated based on the available sources from the middle and top management of 26 toll concessionaire companies in Malaysia.

3.4.3 Step III: Selection of Sampling Method

Employing the right sampling technique is crucial to meet the needs of an empirical research. This study uses the probability technique combined with the stratified random sampling technique due to the having respondents from different employee groups – top and middle management – within the sample (Creswell, 2015).

Gay (1987) reported that stratified random sampling is a method that is suitable to make proportionate and substantial comparisons between sub-groups of a certain population. Robson (1995) supported this view saying that this type of sampling is an applicable method as it allows the closest method to having a sample that is representative of the study population. Leary (1995) similarly stated that the conclusions that can be made through stratified random sampling of the overall population are able to provide an efficient generalisation of the population. It is also noted that there are many other PPP studies and literature that have used the stratified random sampling technique such as Anyaehie et al (2014); Ng'ang et al (2018); and Yuan et al. (2018). Hair et al, (2010) stated that stratified sampling works best when a heterogeneous population is split into fairly homogeneous groups. Under this condition, stratification generally produces more precise estimates of the population percentage than estimates that can be found from a simple random sample.

The data collection exercise involved the identified sample in different identified areas to provide a good representation of the population, taking into consideration cost management and other resources, with emphasis on fair geographical distribution (Sekaran, 2009). Similarly, the sampling method for this study is stratified random sampling of employees (middle and top management) from

the 26 toll concessionaire companies which require to determine the sample size before the stratification process being done.

3.4.4 Step IV: Determination of Sample Size

As this study intends to test the proposed research model and hypotheses using structural equation modelling (SEM), determining the right sample size is a critical factor to achieve reliable findings. Creswell (2012) proposed that a quantitative survey should have a minimum sample size of 300 to 500 respondents while, according to the table developed by Krecjie and Morgan (1970) from the accumulated total population of 988 employees (middle and top management) as derived from the 26 toll concessionaire companies, the optimum sample size is only 278 respondents.

However, as the hypotheses of the study is using structural equation modelling (SEM), it is more appropriate to have a sample size of more than 300 Creswell (2015). This was supported by Savalei & Bentler (2005) stated that in SEM, the the robust adjustments with full information Maximum Likelihood (ML) appear to work well when data are Missing At Random (MAR) and sample sizes are 400 or above. Thus, in order to achieve sufficient power for significance tests, overall fit and likelihood ratio tests, it was decided 400 respondents as a sample size for this study (Lee et al 2012; Hancock, 2013; Hair et al., 2010).

The respondents of this study were also limited as they were sampled from only two levels of management (middle and top), and the stratified random sampling technique was used. According to Creswell (2015), there are two options of calculating the sample size stratification; proportionate stratification and disproportionate

stratification. He added that if costs and variances are about equal across the strata, then either could be chosen. However, for this study, since there are variances that differ across the strata, disproportionate stratification was selected.

According to Creswell (2015), there are several steps under disproportionate stratification; Firstly, determine the number of elements to be selected from each stratum:

$$\frac{\text{Sample size (n)}}{\text{Number of strata (k)}} : \frac{400}{2} = 200$$

Secondly, the required number of elements from each stratum are selected with simple random sampling technique, for instance, a total number of 200 from each level of management taken at random in order to achieve n = 400. Thus, Table 3.2 show the stratification for both (middle and top) management, the calculation of this stratified sample size is shown in Table 3.3

Table 3.2: Stratification Table for Level of Management

No.	Level	Population	Stratification	Sample Size
1.	Middle	677	677/3.34	200
2.	Top	311	311/1.56	200
		988		400

Table 3.3: Stratified Random Sampling - Calculation for Sample Size

No.	Toll Concessionaire	Name of Expressway	Population Middle(M) & Top(T)	Sample Calculation	Sample Size
1.	PLUS Berhad	North-South Expressway (NSE) E1/E2	Middle: 70 Top: 48	70/3.34 48/1.56	21 31

No.	Toll Concessionaire	Name of Expressway	Population Middle(M) & Top(T)	Sample Calculation	Sample Size
		Second Link Expressway (MSSC) E3			
		North South Expressway Central Link (NSECL/Elite) E6			
		Butterworth-Kulim Expressway (BKE) E15			
		Seremban-Port Dickson Highway E29			
		Penang Bridge E36			
		Sultan Abdul Halim Muadzam Shah Bridge (Penang Second Bridge) E28			
		East Coast Expressway Phase 2 E8			
2.	KESAS Sdn Bhd	Shah Alam Expressway (KESAS) E5	Middle: 16 Top:13	16/3.34 13/1.56	5 8
3.	Syarikat Mengurus Air Banjir & Terowong Sdn Bhd	Stormwater Management and Road Tunnel (SMART) E38	Middle: 18 Top: 12	18/3.34 12/1.56	5 8
4.	Sistem Penyuraian Trafik KL-Barat Sdn Bhd	Sprint Expressway (Kerinchi Link, Damansara Link and Penchala Link) E23	Middle: 27 Top: 11	27/3.34 11/1.56	8 7
5.	Lingkaran Trans Kota Sdn Bhd	Damansara-Puchong Expressway (LDP) E11	Middle: 26 Top: 11	26/3.34 11/1.56	8 7
6.	Anih Berhad	Kuala Lumpur-Karak Highway E8	Middle: 31 Top: 17	31/3.34 17/1.56	9 11
		East Coast Expressway Phase 1 E8			
		KL-Seremban Highway E37			
7.	Konsortium Lebuhraya	Duta-Ulu Kelang Expressway	Middle: 25 Top:11	25/3.34 11/1.56	7 7

No.	Toll Concessionaire	Name of Expressway	Population Middle(M) & Top(T)	Sample Calculation	Sample Size
	Utara-Timur (KL) Sdn Bhd	(DUKE) Phase 2 E33			
8.	Lebuhraya Duke Fasa 3 Sdn. Bhd	Setiawangsa-Pantai Expressway (SPE)	Middle: 19 Top: 9	19/3.34 9/1.56	6 6
9.	Lebuhraya Kajang Seremban Sdn Bhd	Kajang-Seremban Highway (LEKAS) E21	Middle: 30 Top: 12	30/3.34 12/1.56	9 8
10.	Besraya Sdn Bhd	Sungai Besi Expressway (BESRAYA) E9	Middle: 28 Top: 11	28/3.34 11/1.56	8 7
11.	New Pantai Expressway Sdn Bhd	New Pantai Expressway (NPE) E10	Middle: 30 Top: 13	30/3.34 13/1.56	9 8
12.	Projek Lintasan Kota Sdn Bhd	Ampang-Kuala Lumpur Elevated Highway (AKLEH) E12	Middle: 18 Top: 8	18/3.34 8/1/56	5 5
13.	Pro Lintasan Shah Alam Sdn Bhd	Kemuning- Shah Alam Highway (LKSA) E13	Middle: 30 Top: 8	30/3.34 8/1.56	9 5
14.	Prolintas Expressway Sdn Bhd	Guthtrie Corridor Expressway E3	Middle: 24 Top: 10	24/3.34 10/1.56	7 6
15.	Sistem Lingkaran-Lebuhraya Kajang	Kajang Dispersal Link Expressway (SILK) E18	Middle: 22 Top: 9	22/3.34 9/1.56	6 6
16.	SKVE Holdings Sdn Bhd	South Klang Valley Expressway (SKVE) E26	Middle: 22 Top: 12	22/3.34 12/1.56	6 8
17.	Grand Saga Sdn Bhd	Cheras-Kajang Expressway (CKE/Grand Saga) E7	Middle: 16 Top: 8	16/3.34 8/1.56	5 5
18.	Grand Sepadu Sdn Bhd	New North Klang Straits Bypass (NNKSB) E30	Middle: 18 Top: 9	18/3.34 9/1.56	5 6
19.	Senai Desaru Expressway Bhd	Senai-Desaru Expressway (SDE) E22	Middle: 24 Top: 14	24/3.34 14/1.56	7 9
20.	Maju Express Sdn Bhd	Kuala Lumpur-Putrajaya	Middle: 32 Top: 10	32/3.34 10/1.56	10 6

No.	Toll Concessionaire	Name of Expressway	Population Middle(M) & Top(T)	Sample Calculation	Sample Size
		Expressway (MEX) E20 Putrajaya-KLIA Expressway (MEX II)			
21.	Lingkaran Luar Butterworth Sdn Bhd	Butterworth Outer Ring Road (BORR) E17	Middle: 27 Top: 12	27/3.34 12/1.56	8 8
22.	KL-Kuala Selangor Expressway Bhd	Kuala Lumpur-Kuala Selangor Expressway (KLS/LATAR) E25	Middle: 34 Top: 8	34/3.34 8/1.56	10 5
23.	Projek Lintasan Sungai Besi-Ulu Klang Sdn. Bhd	Sungai Besi-Ulu Klang Expressway (SUKE)	Middle: 21 Top: 10	21/3.34 10/1.56	6 6
24.	Projek Lintasan Damansara-Shah Alam Sdn Bhd	Damansara-Shah Alam Elevated Expressway (DASH)	Middle: 16 Top: 6	16/3.34 6/1.56	5 4
25.	EKVE Sdn Bhd	East Klang Valley Expressway	Middle: 30 Top: 7	30/3.34 7/1.56	9 5
26.	WCE Holdings Bhd	West Coast Expressway (WCE)	Middle: 23 Top: 12	23/3.34 12/1.56	7 8
TOTAL POPULATION			**M=677** **T=311** **988**		**M =200** **T= 200** **400**

3.4.5 Step V: Data Collection from the Sample

Data for the study was collected using a structured questionnaire on the google form survey platform (https://docs.google.com/forms/u/0/). The questionnaires were distributed by email to the sampled respondents with the assistance of the respective organisations' human resources personnel. Based on the sample size calculation as stipulated in Table: 3.3, 400 questionnaires were distributed to middle and top management employees according to the disproportionate stratification technique. All

potential respondents were assured of the confidentiality and anonymity of their responses.

The data collection exercise was conducted over a period of six (6) months, from 15 April to 15 August 2019. The long duration was due to a very low response rate in the first two months after the survey was sent out. However, with consistent reminders sent via email and through phone calls, the responses from a total of 352 were collected. The cooperation of the respective sample organisations was sought in the follow-up process, to ensure sufficient responses from their representatives were received.

3.5 Development of Measurement

The researcher adopted selected measuring instruments for every latent construct from literature and customized these instruments to suit this study. Upon customisation, the researcher sent the questionnaires to a selected panel of experts for pre-testing and pilot study. The questionnaire as the sole data collection tool was developed based on a conceptual framework, as in divided into six sections: Section A – Respondents Demographic Profile; Section B – Attitude, Subjective Norms, Perceived Behavioural Control, Behavioural Intention; Section C - Governmental Influence; Section D - Project Viability; Section E – Trust; and Section F - Involvement. The reliability of the questionnaire was tested for Cronbach's alpha coefficient, in which the items are required to be recognized at a value of not less than 0.70 (Hair et al, 2012). In addition, the construct validity was tested using Confirmatory Factor Analysis (CFA).

3.6 The Survey Questionnaire

Among the methods for quantitative data collection, the survey is commonly used for its convenience in collecting large amounts of data. Hair et al (2012) connotes that much literature has used the quantitative approach in measuring behaviour and performance. The survey also allows the researcher to obtain quantitative, numerical data through responses to questionnaires or interviews, which he/she then statistically analyses to describe trends or perceptions on the research questions or hypotheses. Similarly, this study applies the quantitative approach and follows the questionnaire design as suggested by Sekaran & Bougie, (2010).

Creswell (2015) defined survey research design as a quantitative research process where the researcher administers a survey to a sample or to the entire population of people to obtain data on their attitudes, opinions, behaviours, and characteristics. For this study, the researcher employs a questionnaire survey design that frames the whole spectrum of research activities. The questionnaire is a data collection instrument that encompasses a series of questions in an attempt to gather information from respondents (Akhtar, 2016).

In this study, the questionnaire was adopted, adapted and integrated from various literatures namely Badenfelt (2007), Brewer and Strahorn (2012), Ceric (2016), Coelho et al. (2013), Li et al. (2005), Meidute et al (2011), Osei Kyei et al (2017), Warson (2018), Wu, Z., et al (2016), Ye & Tiong (2003), Zhang, X., (2005), Zhang, Y., et al. (2018), and Zhao, W., et al (2010). The questionnaire was also refined to suit the nature of this study's research questions and hypotheses. It is also believed

that this is the first questionnaire that has been integrated and developed in PPP literature that focuses specifically on toll expressway issues in Malaysia.

The survey questionnaire was bilingual – in English and Malay languages – to facilitate greater understanding from the sample group of respondents. The questionnaire uses a five-point Likert scale, where 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, and 1= Strongly Disagree. The complete questionnaire was eight pages in length (including covers), and was accompanied by background information and an explanatory cover letter assuring respondents of the confidentiality of their responses as suggested by Smith & Dainty (1991).

3.6.1 Section A: Demographic Profile

This section developed by the researcher, collected data on two demographic characteristics of respondents – (i) professional background, and (ii) working experience. These items are shown in the following Table 3.3.

Table 3.4: Demographic Profile

Items	*Details*
Professional Background (PB)	
PB1	*Top Management in Private Sector*
PB2	*Middle Management in Private Sector*
Working Experience (WE)	
WE1	*More than 11 years*
WE2	*Between 6 – 10 years*
WE3	*Less than 5 years*

3.6.2 Section B: Attitude, Subjective Norms, Perceived Behavioural Control, Behavioural Intention

This Section B consists of 24 items that derived from Attitude (7 items), Subjective Norms (5 items), Perceived Behavioural Control (7 items) and Behavioural Intention (5 items) which adapted from Zhang Y et al. (2018).

Attitude (ATT)

Table 3.5: Attitude (ATT)

Items	*Details*
ATT1	*Participation in PPP projects is profitable*
ATT2	*Participation in PPP projects contributes to access to the infrastructure and public service market*
ATT3	*Participation in PPP projects contributes to increasing market share*
ATT4	*Participation in PPP projects can promote enterprise development and strategic transformation*
ATT5	*Participation in PPP projects can establish company's reputation and social image*
ATT6	*Participation in PPP projects is worthy to be advocated*
ATT7	*Involvement in PPP is sustainable for business*

Subjective Norm (SN)

Table 3.6: Subjective Norms (SN)

Items	*Details*
SN1	*Most of the competitors participate in PPP projects actively*
SN2	*Industry Associations support the company to participate in PPP projects*

SN3	*Financial Institutions support the company to participate in PPP projects*
SN4	*Private sectors with PPP experiences have a positive attitude towards PPP*
SN5	*Local society give support on the infrastructure development through PPP*

Perceived Behavioural Control (PBC)

Table 3.7: Perceived Behavioural Control (PBC)

Items	*Details*
PBC1	*My company has adequate funds to participate in PPP projects*
PBC2	*My company has the technical strength and capacity to participate in PPP projects*
PBC3	*My company has adequate PPP project experiences*
PBC4	*My company has good networking and relationship with the government agencies responsible for implementing PPP*
PBC5	*My company can successfully obtain funds from financial institutions when participating in PPP*
PBC6	*My company can easily acquire relevant information on the PPP projects to be initiated*
PBC7	*My company has adequate expertise in managing PPP projects*

Behavioural Intention (BI)

Table 3.8: Behavioural Intention (BI)

Items	*Details*
BI1	*I intend to carry out PPP business*

Items	*Details*
BI2	*I am willing to increase the proportion of PPP in business portfolio*
BI3	*I will participate in bidding for PPP projects with high probability*
BI4	*I prefer to be involved in PPP projects compared to conventional projects*
BI5	*I am willing to recommend partner companies to participate in PPP projects*

3.6.3 Section C: Governmental Influence (GI)

Governmental influence is measured using eleven (11) items, eight (8) of which are adapted from Zhang Y. et al (2018) and the remaining three (3) from Li et al. (2005), Osei Kyei et al (2017) and Zhang, X.Q(2005).

Table 3.9: Governmental Influence (GI)

Items	*Details*
GI1	*Government helps to create a fair and competitive market in PPP*
GI2	*Government provides proper legislations, policies and guidelines in PPP*
GI3	*Government carries out PPP contracts with integrity*
GI4	*Government promotes fair competition in PPP procurement*
GI5	*Government provides financial assistance to private companies participating in PPP projects*
GI6	*Government provides relevant tax incentives and waiver some fees for PPP projects*
GI7	*Government intends to transfer all the project risks to the private sectors*
GI8	*Government assists private companies raise funds for PPP projects with financial institutions*

Items	*Details*
GI9	*The risks of PPP projects can be allocated fairly between the government and private sector*
GI10	*Government will not unreasonably interfere with the implementation of the PPP projects*
GI11	*Government agrees to provide termination compensation*

3.6.4 Section D: Project Viability (PV)

Project viability consists of 14 items which were developed by Coelho et al. (2013), Ye & Tiong (2003), Wu et al (2016), Zhang. X., (2006), and Zhao et al (2010).

Table 3.10: Project Viability (PV)

Items	*Details*
PV1	*The construction cost of PPP project is manageable and under control*
PV2	*A continuous income/profit is received by the company during project operation*
PV3	*Lower life cycle cost is realised which enhances the project's value money*
PV4	*Technical and commercial evaluations are already taken into consideration before participating in PPP projects*
PV5	*Revenue streams of the project are sustainable throughout the concession period*
PV6	*Adequate concession period to recoup investment*
PV7	*The accuracy in forecasting traffic volume is vital for PPP toll expressways*
PV8	*Reasonable toll rate charges*
PV9	*The proposed road alignment should be free from any encumbrances*
PV10	*The design of the mainline expressway and cost of land acquisition should be borne by the Government*

Items	*Details*
PV11	*Environmental Impact Assessment (EIA) is evaluated during the project feasibility study*
PV12	*PPP projects should take into consideration its social impact*
PV13	*Interfacing issues with the other authorities such as local council etc. will distort the projects*
PV14	*Appropriate allocation of risks between government and private sectors are vital*

3.6.5 Section E: Trust (TRU)

Trust was measured using ten (10) items, all of which were developed by Badenfelt (2007), Brewer and Strahorn (2012) and Ceric et al. (2016).

Table 3.11: Trust (TRU)

Items	*Details*
TRU1	*I believe in PPP programmes*
TRU2	*PPP is a fair deal between all parties*
TRU3	*The procurement process in PPP is transparent and fair*
TRU4	*I believe PPP is a secure deal*
TRU5	*The government provides adequate and relevant information on PPP projects*
TRU6	*The government will inform and provide explanation on any changes of PPP policy*
TRU7	*The government has the competence to represent community interest*
TRU8	*The government has the expert people to manage PPP effectively*
TRU9	*The government is doing a good job in facilitating PPP projects*
TRU10	*All parties will uphold/abide by the PPP concession agreement*

3.6.6 Section F: Involvement Behaviour (INV)

The involvement behaviour was measured using of six (6) items adapted from Meidute et al (2011) and Warson (2018).

Table 3.12: Involvement Behaviour (INV)

Items	*Details*
INV1	*My involvement in PPP is increasing*
INV2	*PPP is less risky for private companies compared to the conventional procurement contract*
INV3	*In PPP, my company generates secure and long-lasting revenues*
INV4	*I have vast opportunity to explore advanced technology and innovation through PPP*
INV5	*I have the opportunity to create bigger market share in the industry through PPP*
INV6	*I create a good corporate image for the company through PPP projects*

Table 3.13: Summary of Research Instruments and Relevant Sources

Parts & Variables	**Constructs**	**No of Original Items**
A. Demographic Profile	Professional Background (PB1 – PB2) Working Experience (WE1 – WE3)	2
B. Behavioural Intention *Zhang Y et al, (2018*)	Attitude (ATT1 – ATT7) Subjective Norms (SN1 – SN5) Perceived Behavioural Control (PBC1 – PBC7) Behavioural Intention (BI1 – BI5)	24

Parts & Variables	Constructs	No of Original Items
C. Governmental Influence (GI) *Li et al., (2005); Osei Kyei et al., (2017) Zhang X. (2005); and Zhang Y. et al, (2018)*	Governmental Influence (GI1 – GI11)	11
D. Project Viability *Coelho et al., (2013); Wu et al., (2016); Ye & Tiong, (2003); Zhang X (2006); and Zhao et al., (2010)*	Project Viability (PV1 – PV14)	14
E. Trust *Badenfelt (2007) Brewer & Strahorn (2012); and Ceric et al (2016)*	Trust (TRU1 – TRU10)	10
F. Involvement Behaviour *Meidute et al., (2011); and Warsen (2018)*	Involvement Behaviour (INV1 – INV6)	6
TOTAL		67 items

3.7 Administration of the Survey

Surveys were anonymous in nature and were individually sent to the potential respondents' email address. The email addresses of the potential respondents of toll concessionaire companies were obtained through email lists provided by their human resources department. Due to the geographical locations of respondents, an online questionnaire was sent to their individual email addresses.

The respondents were required to answer the questionnaire online on the Google form platform, and responses were submitted online. This format allowed the researcher to control the conditions under which the questionnaires were completed, and to ensure that they were completed by the actual respondent.

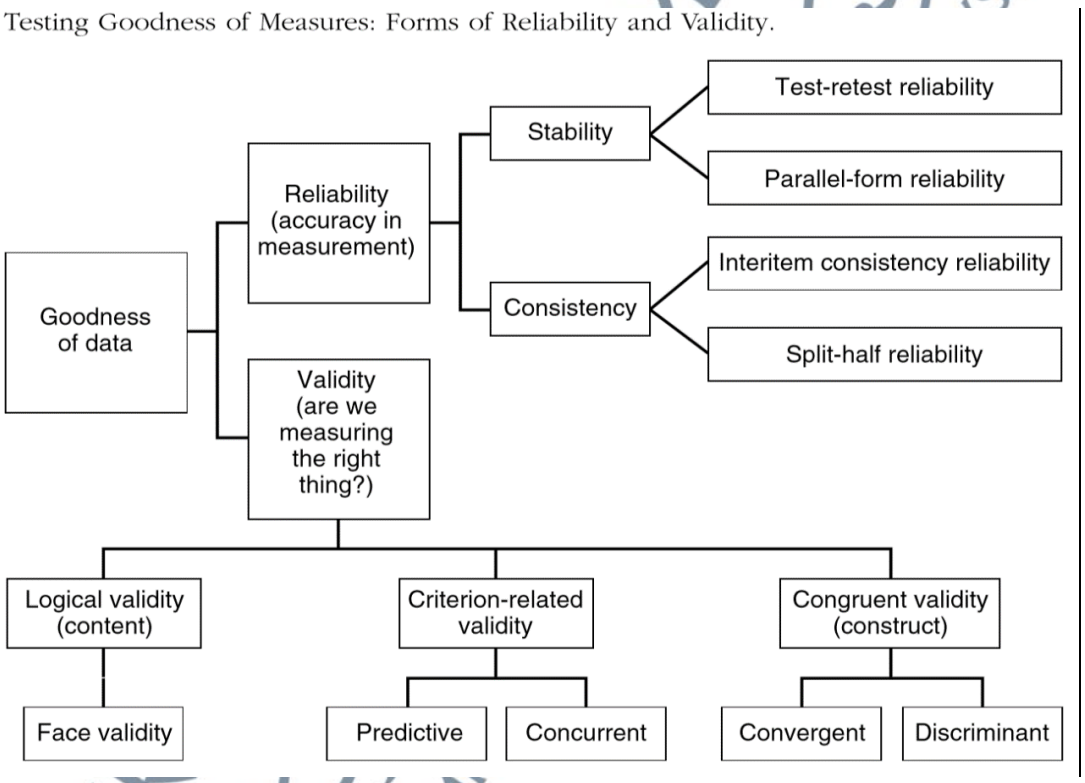
There were three steps in collecting the questionnaire from the respondents. The first step involved distributing the online questionnaires to the targeted respondents. 400 online questionnaires were distributed via email with a dedicated link to the Google form platform. The second step involved tracking the responses of potential respondents. The Google platform allowed the researcher to see non-responsive respondents where their email address was categorised as "no respond". The third step involved resending the online questionnaire to those non-respondents to follow-up on the questionnaire and requests their cooperation to submit their responses.

Overall, this data collection process took over six (6) months to get a satisfactory response rate. The questionnaire was monitored on a weekly basis to see the total responses per week. During the monthly monitoring, the researcher sent a reminder to those respondents who had yet to respond and answer the questionnaire. Basically, this exercise required consistency in following-up and sending reminders until the targeted or satisfactory response rate is achieved.

3.8 Validity of Measurement

A selection of an effective survey measurement tools should demonstrate good psychometric properties in terms of reliability and validity. Churchill et al, (2005) reiterated that reliability and validity is the key in the accuracy of the measurement

model and the theoretical constructs of any scientific study of social sciences. However, he also argued that although reliability is important, the reliability of an instrument does not automatically deem the instrument as valid. On the other hand, a valid instrument is normally a reliable instrument. This study will cover the measures undertaken to ensure the reliability and validity of the survey instruments. For the overall measurement for testing goodness of data, this study follows the framework introduced by Sekaran (2009), which clearly states a step-by-step process for testing reliability and validity. This is illustrated in Figure 3.3.



Source: Sekaran (2009)

Figure 3.3: Testing Goodness of Data

For this study, the researcher has decided to start with the logical measure of validity (content validity). This is a subjective measurement, and has been argued by some researchers as a non-reliable validity test, the researcher is of the view that conducting both the logical and statistical tests of validity will be able to produce the most reliable validity result. The researcher will also perform the construct validity test, which includes convergent and discriminant validity, upon obtaining actual data. Unidimensional validity is an optional validity test that suggested by Gefen, Straub & Boudreau (2000) to show how each measurement item reflects one and only one latent variable (construct).

This can be achieved only if the factor loading of the measurement item for the respective latent construct is acceptable. A low factor loading should be deleted for the model to be unidimensional. This unidimensional test will also be conducted in this study as according to Churchill et al (2005), additional unidimensional tests are for studies using SEM analysis.

3.8.1 The Pre-Test

A pre-test of the survey questionnaire among a small sample of respondents is important to ensure that respondents are able to understand the instrument, as well as to identify and eliminate potential problems (Hunt, Sparkman, & Wilcox, 1982; Parasuraman, Zeithmal, & Berry, 1986). Singleton & Straits (1999) cautioned that a study could fail as a result of inadequate pre-testing, as the effort spent on the planning the study planning and pre-testing the measurement instrument has a direct impact on the quality of data collected, the ease with which data may be analysed, and ultimately the quality of findings. Alreck & Settle (1994) mentioned that pre-testing of

questionnaires may reveal serious errors, inconsistencies, oversights, or problems that had they not been detected and corrected, could have grave consequences for the study.

Hunt, Sparkman and Wilcox (1982) suggested that pre-tests should include three items that should be pretested namely; (i) features of the questionnaire itself – length, layout, question format, space allocation for responses and order of questions; (ii) items about specific questions – ambiguity, confusion and familiarity of terminologies used; and (iii) items about data analysis – accuracy of coding and tabulating procedures to be pre-tested with dummy data.

Galtung (1969) suggests that it is not necessary to have a statistically sophisticated probability sample for pre-testing, while Ferber and Verdoorn (1962) indicated 12, and Backstom & Hursch (1981) indicated 30, as satisfactory pre-test sample sizes. Along the same lines, Byrne, B. M. (2010) recommends 20 as adequate. However, Lynn (1986) advises a minimum of three experts as permissible, but also indicates that more than 10 were probably unnecessary.

Various experts should be involved in this pre-testing stage – content expert to assess content validity, language expert to determine face validity, and measurement expert to evaluate instrument criterion validity (Zainudin, 2010). Accordingly, the pre-testing for this study involved the initial questionnaire being assessed by four (4) experts – two (2) from the practitioners and professionals in PPP and another two (2) from among academicians in project management field.

Overall, there was no major criticism of the draft questionnaire and all assessors agreed that all variables of behavioural intention are able to measure the influence towards actual behaviour (involvement) in PPP, and the use of trust as a

moderator would give added-value towards the findings of this study. However, although it was generally agreed that the questionnaire was clear and understandable, one of the academicians suggested that some words needed to be refined to facilitate better understanding of the survey. Based on this feedback, some modifications were made to the questionnaire.

One method to evaluate content validity is based on expert rating using the Average Congruency Percentage (ACP) proposed by Popham (1978). For this process, experts were asked to rate the questionnaire using a rating tool. The scale used by the experts was 1 = Not Valid, 2 = Less Valid, 3 = Not Necessary, 4 = Valid, 5 = Essential. The results showed that the average (mean) of total rating results is 4.20 (Essential), with a breakdown of 97% for Essential and 93.5% for Valid, and only 3% for Not Necessary.

Table 3.14: Average Congruency Percentage (ACP)

Experts Rating for Content Validity

Scale	Interpretation	Percentage
5	Essential	97%
4	Valid	93.5%
3	Not Necessary	3%
2	Less Valid	0%
1	Not Valid	0%

The main objective of this exercise was to address issues related to biasness and ambiguity and ensures the questions are of high quality, have a high degree of reliability and a high standard of construct validity. The feedbacks received from the pre-tests were constructive and useful in improving the overall design and effectiveness of the questionnaire. An enhanced revised version of the questionnaire was produced and developed for after the pre-testing stage, ready for conducting a pilot survey.

3.8.2 Pilot Test

Piaw (2012) connotes that a pilot test is used to identify the reliability and internal consistency of a survey instrument. As the pre-testing has already ensured the scale of the instrument, clarity of questions and instructions (Pallant, 2011), a pilot test can then provide a reliability value of the measurement whereby a higher Cronbach's alpha result will show greater reliability. The minimum level of coefficient alpha is 0.70 as recommended by Hair et al. (2007).

Exploratory Factor Analysis (EFA) literature suggests that a minimum Ns in absolute numbers like 100 - 250 (Cattell, 1978; Gorsuch, 1983) is sufficient. This study uses the judgmental sampling method on a separate sample of 150 respondents from private companies involved in PPP were selected, who would not been used as the sample for the distribution of the final survey questionnaires.

A web-based survey was used to collect data for the pilot study. An invitation e-mail was sent with a link to a web-based survey to a number of potential participants working in PPP related areas (except toll expressway) from private sectors in Malaysia.

A factor analysis was conducted after obtaining the pilot test data. The eight constructs in this study – attitude, subjective norm, perceived behavioural control, governmental influence, project viability, behavioural intention, involvement behaviour and trust – were individually analysed based on the three EFA steps suggested by Pallant (2011).

The first step is an assessment on the suitability of the data for EFA. Before conducting an EFA, data suitability was measured based on the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity value. The minimum value 0.5 for KMO (Kaiser, 1974) and a significant value ($p<0.05$) for Bartlett's Test of Sphericity justified the adequacy of this study's sample size for proceeding with the factor analysis (Hair et al., 2010).

The second step is factor extraction. This study applies the principal component analysis technique where the degree of eigenvalue was used to identify (extract) the number of underlying factors. Only factors with an eigenvalue of 1.0 or more were retained for further investigation (Hair et al. 2010).

The third step is factor rotation and interpretation. Following the factor extraction process, the identified factors were rotated using the varimax rotation approach to assess the loading pattern of each item on the factors. The loading pattern refers to the correlation between the item and the factor. The cut-off points for item loading significance applied in this study was 0.50.

Scholars such as Hair et al. (2010) are of the view that for a sample of 150 respondents, factor loadings of 0.50 and above required for significance. Furthermore, Cronbach's alpha is used to measure the extent to which the multiple items for a latent construct belong together. In this case, a Cronbach's alpha value of 0.70 is used as the cut-off point (Hair et al. 2010). Table 3.15 shows a summary of the EFA results for the eight constructs in this study.

Table 3.15: Summary of Results for Exploratory Factor Analysis (EFA)

No	Items	Factors							
		1	2	3	4	5	6	7	8
Behavioural Intention									
BI1	I intend to carry out PPP business	.745							
BI2	I am willing to increase the proportion of PPP in business portfolio	.787							
BI3	I will participate in bidding for PPP projects with high probability	.807							
BI4	I prefer involved in PPP projects compare to conventional projects	.737							
BI5	I am willing to recommend partner companies to participate in PPP projects	.823							
Attitude									
ATT1	Participation in PPP projects is profitable		.721						
ATT2	Participation in PPP projects contributes to access to the infrastructure and public service market		.763						
ATT3	Participation in PPP projects contributes to increasing market share		.816						
ATT4	Participation in PPP projects can promote enterprise development and strategic transformation		.800						
ATT5	Participation in PPP projects can establish company's reputation and social image		.803						
ATT6	Participation in PPP projects is worthy to be advocated		.788						

No	Items	Factors							
		1	2	3	4	5	6	7	8
ATT7	Involvement in PPP is sustainable for business		.751						
Subjective Norm									
SN1	Most of the competitors participate in PPP projects actively			.654					
SN2	Industry associations support the company to participate in PPP projects			.797					
SN3	Financial institutions support the company to participate in PPP projects			.791					
SN4	Private sectors with PPP experiences have a positive attitude towards PPP			.741					
SN5	Local society give support on the infrastructure development through PPP			.742					
Perceived Behavioural Control									
PBC1	My company has adequate funds to participate in PPP projects				.792				
PBC2	My company has the technical strength and capacity to participate in PPP projects				.834				
PBC3	My company has adequate PPP projects experiences				.828				
PBC4	My company has good networking and relationship with the government agencies responsible for implementing PPP				.757				
PBC5	My company can successfully obtain				.732				

No	Items	Factors							
		1	2	3	4	5	6	7	8
	funds from financial institutions when participating in PPP								
PBC6	My company can easily acquire relevant information on the PPP projects to be initiated				.788				
PBC7	My company has adequate expertise in managing PPP projects				.816				
Governmental Influence									
GI1	Government helps create a fair and competitive market in PPP					Removed			
GI2	Government provides proper legislations, policies and guidelines in PPP					Removed			
GI3	Government carries out PPP contracts with integrity					Removed			
GI4	Government promotes fair competition in PPP procurement					Removed			
GI5	Government provides financial assistance to private companies participating in PPP projects					Removed			
GI6	Government provides relevant tax incentives and waiver some fees for PPP projects					.706			
GI7	Government intends to transfer all the project risks to the private sectors					.633			
GI8	Government assists private companies to raise funds for PPP projects with financial institutions					.749			
GI9	The risks of PPP projects can be allocated fairly between the					.710			

No	Items	Factors							
		1	2	3	4	5	6	7	8
	government and private sector								
GI10	Government will not unreasonably interfere with the implementation of the PPP projects					.750			
GI11	Government agrees to provide termination compensation					.675			
Project Viability									
PV1	The construction cost of PPP project is manageable and under control						.710		
PV2	A continuous income/profit is received by company during project operation						.741		
PV3	Lower life cycle cost is realised which enhances the project's value money						.743		
PV4	Technical and commercial evaluations are already taken into consideration before participating in PPP projects						.737		
PV5	Revenue streams of project are sustainable throughout concession period						.783		
PV6	Adequate concession period to recoup investment						.718		
PV7	The accuracy in forecasting traffic volume is vital for PPP toll expressway						.662		
PV8	Reasonable toll rate charges						.648		
PV9	The proposed road alignment should be free from any encumbrances						Removed		

No	Items	Factors							
		1	2	3	4	5	6	7	8
PV10	The design of the mainline expressway and cost of land acquisition should be borne by the Government						Removed		
PV11	Environmental Impact Assessment (EIA) evaluation during the project feasibility study						Removed		
PV12	PPP projects should take into consideration on the social impact						Removed		
PV13	Interfacing issues with the other authorities such as local council etc. will distort the projects						Removed		
PV14	Appropriate allocation of risks between government and private sectors are vital						Removed		
Trust									
TRU1	I believe in PPP programmes							.734	
TRU2	PPP is a fair deal between all parties							.782	
TRU3	Procurement process in PPP is transparent and fair							.822	
TRU4	I believe PPP is a secure deal							.765	
TRU5	The government provides adequate and relevant information about PPP project							.793	
TRU6	The government will inform and provide explanation on any changes of PPP policy							.774	
TRU7	The government has the competence to represent community interest							.728	
TRU8	The government has the expert people to							.796	

No	Items	Factors							
		1	2	3	4	5	6	7	8
	manage PPP effectively								
TRU9	The government is doing a good job in facilitating PPP projects							.825	
TRU10	All parties will uphold/abide the PPP concession agreement							.761	
Involvement Behaviour									
INV1	My involvement in PPP is increasing								.719
INV2	PPP is less risky for private companies compared with conventional procurement contract								.760
INV3	In PPP, my company generates secure and long-lasting revenues								.784
INV4	I have vast opportunity to explore advanced technology and innovation through PPP								.803
INV5	I have the opportunity to create bigger market share in the industry through PPP								.856
INV6	I create a good corporate image for the company through PPP projects								.783
Eigenvalue		3.046	4.238	2.789	4.406	4.501	4.138	6.063	3.700
Percentage of Variance (%)		60.928	60.540	55.780	62.943	50.014	51.719	60.632	61.666
KMO Measure of Sampling Adequacy		.840	.906	.821	.897	,870	.888	.935	.895
Approximate Chi-Square		641.98	1177.0	501.17	1340.7	1270.1	1069.5	2141.1	940.19
Sig		.000	.000	.000	.000	.000	.000	.000	.000

The pilot test data involving 150 sample questionnaires answered by respondents were keyed into the software. The pilot study for EFA result showed that a few items were removed due to low loading (below than 0.50), five of which were

related to governmental influence (G1, G2, G3, G4, G5) and six items related to project viability (PV9, PV10, PV11, PV12, PV13, PV14). The Cronbach's alpha values consistently exceeded the cut-off point of 0.70, ranging from 0.798 to 0.928. Most of the pilot test sample respondents agreed that the questionnaire was readable and easy to understand. Overall, no problems were detected with the questionnaire, and after the items with low factor loading were excluded, the survey questionnaire was finalised.

Table 3.16: The Reliability Score

Constructs	Total Original Items	Total Items Removed	Total Item Retained	Cronbach's alpha
Behavioural Intention	5	0	5	.838
Attitude	7	0	7	.890
Subjective Norms	5	0	5	.798
Perceived Behavioural Control	7	0	7	.902
Governmental Influence	11	5	6	.888
Project Viability	14	6	8	.888
Trust	10	0	10	.928
Involvement Behaviour	6	0	6	.874

3.9 Data Analysis Procedures

A Data from the questionnaire was analysed using two mains statistical software, the IBM SPSS Version 23.0 and AMOS Version 23.0.

3.9.1 Descriptive Analysis

Descriptive analysis is used to review, organise, and describe a set of scores or results. Descriptive analysis is to summarise the sets of individual measurements from this study's survey questionnaire (e.g. professional background and working

experience) to clearly present and interpret them. The analysis includes the reporting of the frequencies and percentages of this data.

3.9.2 Hypothesis Testing

Structure Equation Modelling (SEM) intends to maximise and test the degree of consistency between the model and data (Ringle et al., 2009). SEM lets researcher model relationships among and between independent and dependent constructs (Gefen et al., 2011). It is also used to confirm a research model, by running a factor and path-model analysis simultaneously in Analysis of Moment Structures (AMOS).

Table 3.17: Description of Fit Indices for SEM Analysis

Fit Indices	Description
Factor Loading	The correlation between a new variable and the previously developed variable of the study is known as factor loading (Hair, Bush, and Ortinau, 2002).
CFI	The goodness of model between proposed model and independence model can be determined through the Comparative Fit Index (CFI) (Moss, 2009), However, the CFI value must be more than 0.90 (Byrne, 2010).
RMSEA	Hair et al. (2006) explained that Root Mean Square of Approximation (RMSEA) is determined by how well a model fits a population, not just a sample used for estimation. RMSEA with lower values indicate a better fit while the value of 0.10 indicates a good value for most acceptable models. RMSEA is a confidence interval that can be constructed giving the range of RMSEA values for a given level of confidence. Thus, RMSEA is between 0.03 and 0.08, for example, shows 95% confidence.
Normed Chi-square	Moss (2009) stated that chi-square index is less sensitive to sample size. Normed chi-square is x2/df to make the x2 less dependent on sample size. The desired value for Normed Chi-square is less than 3.
Chi-square	Hair et al. (2006) stated that a chi-square test can provide a statistical test of the resulting difference. SEM estimation procedures such as maximum likelihood produce parameter estimates that mathematically maximise this difference for a specified model
Degree of Freedom (DF)	The total mathematical information which is used to approximate the model parameter is known as degree of freedom (Hair et al., 2010).

Sources: Shi et al. (2018)

Table 3.17 shows that an analysis of the fit indices produced by AMOS for the structural model that indicates a significant chi-square in turn implies that the model does not have a good fit. However, scholars generally agree that the chi-square tends to be significant where assumptions of the structural equation model are violated or where the sample size is large (N>250). From this perspective, the significant chi-square value for this study could be due to the large sample size. Besides the chi-square and its degrees of freedom (DF), the alternative test of the fitness indexes shows that the study's model has a good fit. Table 3.18 shows the recommended level of acceptance to test the fitness for each individual construct.

Table 3.18: Level of Acceptance Fitness of the Individual Constructs

	Name of Category	Name of Index	Level of Acceptance	Comments	Literature Support
1.	Absolute fit	Chi square (Discrepancy Chi Square)	P>0.05	Sensitive to sample size>200	Wheaton et.al (1977)
		Root Mean Square of Error Approximation (RMSEA)	RMSEA < 0.08	Range 0.05 to 0.08 acceptable	Browne & Cudeck (1993)
		Goodness of Fit Index (GFI)	GFI > 0.90	GFI= 0.95 is a good fit	Joreskog & Sorbom (1984)
2.	Incremental fit	Adjusted Goodness of Fit Index (AGFI)	AGFI > 0.90	AGFI= 0.95 is a good fit	Tanaka & Huba (1985)
		Comparative Fit Index (CFI)	CFI > 0.90	CFI= 0.95 is a good fit	Bentler (1990)
		Trucker-Lewis Index (TLI)	TLI > 0.90	TLI=0.95 is a good fit	Bentler & Bonett (1980)
		Normed Fit index (NFI)	NFI > 0.90	NFI-0.95 is a good fit	Bollen (1989)
3.	Parsimonious fit	Chisq/df	Chi-Square/ df < 5.0	The value should be less than 5.0	Marsh & Hocevar (1985)

Sources: Shi.et al. (2018)

SEM can be likened to a combination of multiple regression and factor analysis. Using SEM allows the researcher to address multi-collinearity issues and look at way to manage the unreliability of collected data in a more effective way (Shi, D., et al 2018). This research uses SEM and AMOS as tools from the SPSS Inc. AMOS is especially designed to complement SEM and has a unique graphical interface.

3.10 Measurement Model

SEM also uses the CFA approach to analyse the structural theory of a specific event through the linking of regression analysis with factor analysis (Byrne, 2010). SEM consists of statistical models that are able to interpret relationships between variables (Hair et al., 2007). Its uniqueness is that it allows the testing of multiple equations involving relationships, as well as concurrent testing of both measurement properties and relationships. There are six stages under an SEM analysis:

(i) define individual constructs (CFA);

(ii) develop measurement model;

(iii) design study to obtain empirical results;

(iv) evaluate validity of measurement model;

(v) describe structural model, and

(vi) measure validity of structural model. Validity is an indicator of the ability of an instrument to accurately measure what it is supposed to measure (Hair et al., 2007).

In short, validity refers to the precision of the measurement tool (Cooper & Schindler, 2006). Construct validity on the other hand, measures theories. This means that there is a need to have evidence – either conceptual or theoretical – on the measurement tool. The construct validity of this study was accounted for by deriving the determinants of involvement behaviour from existing literature. There are two types of construct validity – convergent validity and discriminant validity, and both can be tested by deducing CFA results (Straub et al., 2004).

CFA is commonly in hypothesis testing where a factor structure with factor loading at zero when testing the factor with the first independent variable (IV). CFA is used to test reliability for independent variables. On top of using CFA, this study also uses the measurement model to test the degree of interrelationships and co-variation between latent constructs. The CFA produces goodness of fit measures to evaluate the model as shown in Table 3.18.

All the factors in this study – perceived behavioural control, subjective norm, attitude, governmental influence, project viability, behavioural intention, and involvement behaviour – are analysed and tested for model fit through the Pooled-CFA method (Zainudin, 2015). This method assesses the latent construct's unidimensionality, validity and reliability.

The measurement model then maps the measures into theoretical constructs with the aim to identify specification errors, and approximate a structural model or approximate a CFA model (no causation, just correlations between the latent variables). The measurement model is required to fit for the structural model to be interpreted (Hair et al, 2012).

3.11 Structural Model

A structural model provides the study's definition and explanation of the relationships between the identified factors. The model includes a set of exogenous and endogenous latent variables as well as possible direct effects, error variances and relationships between variables. As such, any variable which is not measured, or measured with an error, will be reflected as an error variance.

Exogenous latent variables are present to give an effect on the variance of other latent variables in the model. However, changes in these values are not explained as they are considered to be influenced by external factors outside of the model. Similarly, endogenous latent variables can also be directly or indirectly influenced by exogenous variables. Variances in the values of endogenous variables are explainable as the latent variables effecting the change are included in the model. Based on Hair et al. (2010), the proposed framework of this study is considered valid to the extent that the parameter estimates are statistically significant, and are in the predicted direction. These two factors, plus being a good fit model allows this study to be considered a structural model.

3.12 Moderating Test

The research question of this study addresses the effect of a moderating variable (trust) in the relationship between an independent variable (behavioural intention) and a dependent variable (involvement behaviour) in the model. According to Zainudin (2015), the task of analysing the moderating effects in a model with latent constructs is very complicated.

The commonly used modelling procedure using interaction is not a viable option for latent constructs as it would give rise to model convergence issues and misrepresentation of standard errors. These will usually result a premature end to the test, due to a model misfit (Zainudin, 2015). The multi-group CFA is an alternative method that can be employed to assess the effect of a moderator variable in this study's model. In a multi-group CFA, the researcher is required to determine the path of interest where the moderator variable is to be assessed. This path would be controlled by the parameter = 1, and as such, the model is termed as the constrained model.

The procedure will estimate two models separately: (i) the constrained model; and (ii) the unconstrained model, upon which the researcher will obtain the difference in the Chi-Square value between the two models. A difference in the value by more than 3.84 indicates that moderation has occurred in the particular path (Zainudin, 2015).

Table 3.19: Summary of Research Methodology

	Methods used by the Researcher	**Supported and Applied by Previous Researchers**
Research Paradigm	Positivism (Quantitative)	Aziz et al (2011); Babatunde et al (2012); Zhang Y et al (2018);
Sampling Procedures		
1. Target Population	Middle and top management in toll concessionaire companies	Ghauri et al (2005); Li.et al (2005);
2. Sampling Frame	26 toll concessionaire private companies	Zhang et al (2005). Ng et al. (2018);
3. Sampling Method	Stratified Sampling Technique	Yuan, et al. (2018); Anyaehie et al (2014)
4. Sample Size	- 400 determined by Savalei & Bentler (2005); Creswell, 2015))	Yuan, et al. (2018)
5. Data Collection	- Survey	Coelho et al., (2013); Zhao et al., (2010); and Wu et al., (2016);

	Methods used by the Researcher	Supported and Applied by Previous Researchers
Data Collection Procedures		
1. Measures	- Questionnaire - Online Survey - Likert Scale	Abawi (2013); Suhaiza (2013); Sarvari et al (2014); Zhang Y et al (2018); Smith & Dainty (1991)
2. Administration of Survey		Turk et al (2018)
3. Validity of Measurement		
a) Pre-Test	- 2 practitioners and 2 academicians	Lynn (1986)
b) Pilot Test	- 150 experts in PPP from toll concessionaire companies	Warsen et al (2018)
Data Analysis Procedures		
1. IBM SPSS Version 23.0	- Descriptive statistics	Suhaiza, S. (2013); Zhang et al (2018)
2. SEM AMOS Version 23.0		Wu Z et al (2018); Coelho et al., (2013)
Pooled-CFA	- Factors that influence involvement behaviour	Osei-Kyei, et al (2017)
Moderation test using Multi-Group CFA	- Moderator effects	Yousaf (2018); Moon et al (2017; Ke et al (2015); Wu et al (2017).

3.13 Conclusion

This chapter outlines the research methodology and quantitative designs that are used in this thesis. In the sub-sections, the research design model, including elements such as the research paradigm, population and sampling, development of measurement and data analysis procedures according to each research objective, are elaborated. The direction of the relationships among variables in this study is depicted through explanations on the research questions and methodological design. This is followed by a description of the reliability measures for all scales used in the study and elaboration on their findings, the measures taken to ensure non-biased response and analysis as well as the common methods for analysing variances in a quantitative study.