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Understanding Users' Intention to Use Park-and-Ride Facilities in Malaysia: The Role of Trust as a Novel Construct in the Theory of Planned Behaviour

Ahmad Nazrul Hakimi Ibrahim, Muhamad Nazri Borhan * and Riza Atiq O.K. Rahmat

Department of Civil Engineering, Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia (UKM), Bangi 43600, Selangor, Malaysia; nazrulkakimi@siswa.ukm.edu.my (A.N.H.I.); rizaatiq@ukm.edu.my (R.A.O.K.R.)

* Correspondence: mnazri_borhan@ukm.edu.my

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Abstract: This research aimed to use the extended theory of planned behaviour (TPB) to determine whether it can explain users' intention to use the bus-based park-and-ride (P&R) facilities in Putrajaya, Malaysia. This research introduced a new predictor related to the use of P&R facilities, namely trust. The survey involved 437 respondents. A structural equation model is used to show that trust positively influence the attitude and perceived behavioural control (PBC) towards the use of P&R facilities. However, the intention to use P&R facilities is not profoundly influenced by trust and subjective norm. Results also revealed that attitude, subjective norm, and PBC have a strong positive influence on the intention to use P&R facilities. In addition, several policy recommendations are discussed in this study. All things considered, the theory of planned behaviour was able to predict users' intention to use P&R facilities in Malaysia. It is hoped that this research would increase researchers' interest in conducting further investigation in this field and that the model is beneficial to service providers in helping them identify the factors that increase the number of P&R users.

Keywords: park-and-ride; TPB; trust; public transport

1. Introduction

At present, most trips in Malaysia and in cities around the world are made using private cars. For example, the statistics for the Klang Valley, Malaysia, showed that 6 million or 83% of the trips were made using private transport and only 1.24 million or 17% were made by public transport [1,2]. The use of private transport in Malaysia is relatively high compared to other cities, such as London (10%), Singapore (36%), and Hong Kong (26%) [2]. However, the use of private cars causes serious problems, such as traffic accidents, congestion, global warming, and pollution [3,4]. Numerous sustainable transport modes, such as car sharing, carpooling, cycling, park and ride, walking, and public transport, have been proposed to overcome the serious problems caused by the use of private transport [5]. Sustainable transport is a transport system that can provide economic, social, and environmental benefits. For instance, sustainable transport is able to provide basic access to a transport system that is needed by individuals and society as well as provide an efficient and affordable transport mode, thus supporting economic growth. It also minimizes wastes and emissions, limits the use of land, and reduces pollution. To date, many researchers have published proposals for sustainable transport designs in the transport literature. Iftekhar and Tapsuwan [6] elucidated the implications of sustainable urban transport design in their study on the factors affecting travel mode choice in Australia. Chen and Lu [5] explored the attitudes of bike-sharing system users in the hope to establish ways to enhance users' intention to use this system. In addition, Ahmad et al. [7] and Singh et al. [8] investigated the

possibility of using hydrogen fuel for sustainable transport, and Na et al. [9] have proposed an effective measure to improve the feasibility analysis system for sustainable transport in the Republic of Korea.

Of the various forms of sustainable transport, one way to reduce commuters' dependence on the use of private cars is through the use of park-and-ride (P&R) facilities [10,11]. P&R facilities allow users to drive their private cars to the facilities, park the car, and continue their journey by taking public transport. P&R facilities are a good alternative for those who have to run errands on the way to their destination or when the bus service operates on a low frequency. P&R is suitable for areas with a low population density where it is unproductive to operate a public transport service due to low demand, or on the main routes close to city centres where congestion starts [12]. The ability of P&R facilities to reduce the negative effect that result from the dependence on private transport has attracted the attention of many researchers to investigate and propose strategies to improve the effectiveness of these facilities. Qin et al. [13] used the Decision Field Theory to study the P&R decision behaviour in Beijing, China, and were able to provide useful information which would enable policy makers and authorities to better formulate plans and promote the use of P&R facilities. Islam et al. [14] carried out a study to explore the mode change behaviour of P&R users in Melbourne, Australia, by using the multinomial logistic regression; the researchers reported that the travel time taken by public transport and the transfer time at P&R facilities are the primary factors influencing the use of P&R facilities. Similarly, He et al. [15] studied the driver's willingness to use P&R facilities in Nanjing, China, and found that the parking fees and higher congestion levels increase the driver's intention to use P&R facilities.

Wang et al. [16] contended that encouraging people to use P&R facilities could help reduce congestion on the roads and the adverse impacts of driving private vehicles, such as air and noise pollution and parking problems in CBD areas. Several studies carried out in Europe (e.g., Meek et al. [4], Clayton et al. [10], Dijk and Montalvo [11]) have come to the conclusion that P&R is an efficient means to reduce congestion. Several Asian countries, such as Singapore and Hong Kong, have been successful in dealing with traffic congestion through the use of P&R. The P&R project in Singapore has been well-received by the public since the MRT-based project was first launched in 1990, and the number of commuters using the facilities continue to increase with each relaunching. This is due primarily to good publicity and attractive incentives [17]. Lam et al. [18] carried out an experimental study of the trial P&R project in Hong Kong involving the northern end of the current east rail line of the Kowloon–Canton Railway and found that the response from the public is encouraging.

Even though the world literature has reported many benefits of using P&R facilities [4,10,11,16], car drivers in Malaysia are still not persuaded to use the facilities. Borhan et al. [19,20], Norhisham et al. [21], and Syed Adnan and Kadar Hamsa [22] have demonstrated that the utilisation rate of P&R facilities is relatively low. According to Borhan et al. [19,20], this underutilisation is due to several factors, such as an unsuitable location of the P&R lots, low quality public transit, and high parking fees. This finding is congruent with those reported in P&R studies in Asian [17,18] and European countries [4,10,11]. A review of the P&R literature showed that the underutilisation of P&R facilities is due to the physical characteristics of the parking lot and the quality public transit service provided. Only a small number of researches focussed on user behaviour factors to predict the intention to use P&R facilities, particularly in developing countries such as Malaysia. Thus, this study was conducted to explore the relationship of car driver's behaviour with the intention to use P&R facilities by extending the TPB with a new construct, namely trust. This study is significant because it investigates the factors influencing Malaysian commuters to use bus-based P&R facilities. In addition, this study will provide information on the measures that has to be implemented by the service providers of P&R facilities in order to enhance the intention to use P&R facilities in Malaysia. To the best of the authors' knowledge, this is the first study to use extended TPB to solve the problems associated with bus-based P&R facilities in Malaysia. Therefore, this study hopes to provide a basic framework for the use of behavioural science models to solve the endless problem of traffic congestion.

The remainder of this paper is structured as follows: Section 2 discusses the reviewed literature from the previous studies; Section 3 elucidates the research methodology; Section 4 presents the

results of this study; and, finally, Section 5 presents the policy recommendations and the conclusion of the study.

2. Theory of Planned Behaviour

The theory of planned behaviour (TPB) introduced by Ajzen [23] was chosen as the theoretical background of this study. TPB is a popular theory that has been used across the globe in various research domains because it provides a structure to methodically investigate the factors that influence behaviour choices. TPB postulates that the actual determinant of behaviour is an individual's resolution on whether to carry out a certain behaviour (in this case, to use the P&R facilities). There are three factors that regulate intention, namely (i) Attitude, which reflects an individual's overall evaluation whether to carry out a behaviour; (ii) Subjective norm, which is an individual's awareness of social pressure to participate in the behaviour; and (iii) perceived behavioural control (PBC), which is an individual's awareness of their capability to carry out the behaviour.

In the present study, TPB is used to investigate users' intention to use P&R facilities in Putrajaya, Malaysia. The intention to use P&R facilities is influenced by attitude, subjective norm, and PBC. Many studies have shown that these three constructs influence the intent to take public transport. De Groot and Steg [24] contended that enthusiasm, positive subjective norm, and high PBC towards using P&R facilities are associated with deeper intention to use P&R facilities. Haustein and Hunecke [25] discovered that PBC is the most powerful predictor of the intention to use eco-friendly transport, followed by subjective norm and attitude. In general, greater PBC and more favourable attitude and subjective norm in terms of behaviour results in stronger intention to carry out a required behaviour [26].

In the present study, the constructs of TPB are used to investigate the relationship between users' attitude towards using P&R, the influence of reference groups (such as family, spouse, and colleagues) in using P&R facilities, and the required resources, ability, or opportunities to use P&R facilities. Hence, the following hypotheses are proposed:

Hypothesis 1. *The attitude towards using P&R is positively linked with users' intention to use P&R facilities.*

Hypothesis 2. *The subjective norm towards using P&R is positively linked with users' intention to use P&R facilities.*

Hypothesis 3. *The PBC towards using P&R is positively linked with users' intention to use P&R facilities.*

2.1. Proposed Additions to the TPB

Borhan et al. [27,28] and Conner and Abraham [29] suggested that the predictive ability of TPB can be improved by adding new constructs. To date, numerous new constructs have been proposed by researchers from various research domains; Haustein and Hunecke [25], Borhan et al. [27,28], and Hsiao and Yang [30] reported that among the new constructs are trust, novelty seeking, situational factors, external influence, egoistic, altruistic, and biospheric concerns. The evidences from these studies proved that the addition of new constructs improve the predictive ability of TPB. The current study chose trust as the new TPB construct in an attempt to improve TPB's ability to predict the intention of Malaysian car drivers to use P&R facilities.

Trust

Trust is consumers' expectations that the service providers could provide reliable services [31]. Morgan and Hunt [32] stated trust is the essence of all relationships. Trust, from the consumers' perspective, is the obligation of the service provider to provide a good service [33]. In order to ensure trust, consumers have to be convinced that the entrusted party is capable of and have the determination to provide high quality goods or services [34].

In the transport literature, trust is shown by a person who has a conviction or belief that the journey to the destination is reliable with regard to quality of service and safety during travel [35]. In particular, trust and satisfaction are influenced by several behavioural attitudes, such as transportation facilities and security [36]. Earlier investigations have shown that trust has a considerable influence on the behaviour intention to take any kind of transportation, such as driverless cars [37], trains [38], high speed rail [30], and low-cost airlines [27]. Hsiao and Yang [30] noted that, in Taiwan, trust via attitude, subjective norms, and perceived behavioural control has a positive and indirect influence on the intention of college students to take High Speed Rail (HSR). This finding is similar with that made by Chuang et al. [39] in their investigation of the effect of trust on users' intention to take Taiwan's HSR. Madha et al. [38] investigated the willingness of commuters in Petaling Jaya, Malaysia, to take the train, and found that trust via three antecedents of intention (attitude, subjective norms, and perceived behavioural control) has an indirect and positive influence on users' intention to take the train. Borhan et al. [27] have recently revealed that trust is the most important element in convincing travellers to take low-cost airlines for travelling between cities in Libya. Borhan et al. [27] have shown that trust has a direct positive impact on attitude, subjective norms, and perceived behavioural control, and an indirect positive influence on behaviour intention. These findings are congruent with those made in the most recent research done by Kaur and Rampersad [37].

In summary, the superior service quality and good security provided by the service providers are crucial in increasing user trust. User trust may result in the intention to use the provided service. Based on a review of the transport literature, the present study holds the same argument that trust could persuade users to use P&R facilities. Therefore, the following hypotheses have been formulated based on the relevant literature:

Hypothesis 4. *Trust is positively linked with the intention to use P&R facilities via attitude.*

Hypothesis 5. *Trust is positively linked with the intention to use P&R facilities via subjective norm.*

Hypothesis 6. *Trust is positively linked with the intention to use P&R facilities via PBC.*

2.2. Theoretical Model Structure

A framework of the research model that comprises the explored hypotheses is shown in Figure 1. The framework is based on a comprehensive and methodical literature review. This theoretical framework is an extended version of TPB, which includes a new construct, namely trust. Therefore, this study systematically examined the impacts and the relationships between trust, attitude, subjective norms, and perceived behaviour control on car drivers' behavioural intentions to use the P&R facilities in Malaysia.

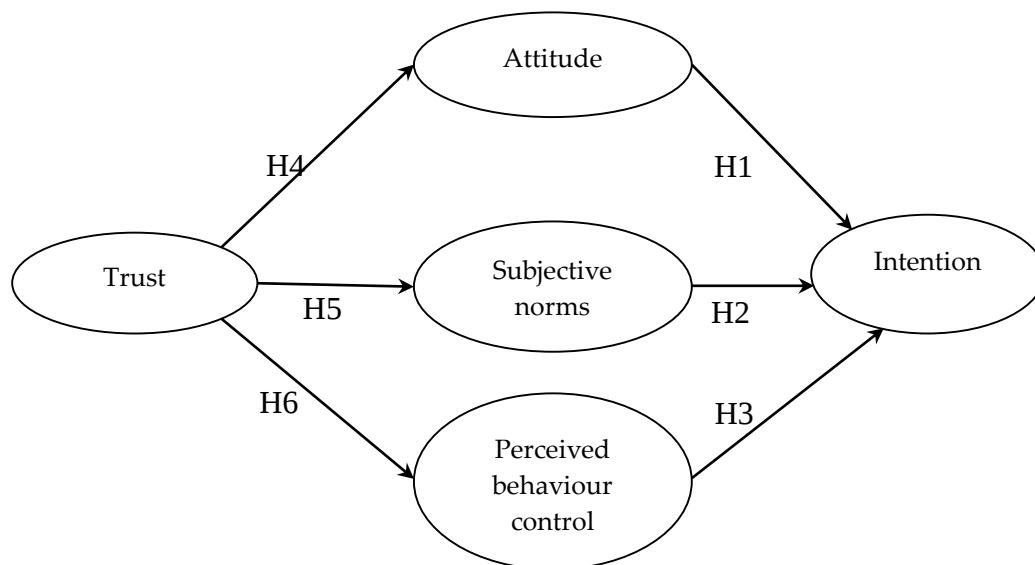


Figure 1. Framework of the proposed model.

3. Methodology

Data was gathered by distributing questionnaires to car users in Putrajaya, Malaysia. Putrajaya is the federal administrative capital of Malaysia and is situated about 20 km to the north of the Kuala Lumpur International Airport (KLIA), which is the main entryway to Malaysia, and 25 km south of Kuala Lumpur, which is the centre of the Klang Valley (see Figure 2). Putrajaya was designed to attain 70% travel by public transport within the city. Due to the present circumstances, however, this goal has yet to be achieved; as a result, there is a need to reverse the current mode split of 15:85 between public transport and private transport [40,41]. A scrutiny of the transport action plan revealed that the average passenger occupancy for a public bus is approximately 25 persons for a bus with a legal load capacity of 44 people; this is an indication of the failure to encourage the public to use public transport. Field investigations have shown that the average vehicle occupancy of private cars making daily commute to Putrajaya is about 1.69 person [42]. At present, the main public transports available in Putrajaya are public buses and bus-based P&R facilities. Both services are managed by Putrajaya Public Transport Private Limited, which is a subsidiary of Putrajaya Corporation.

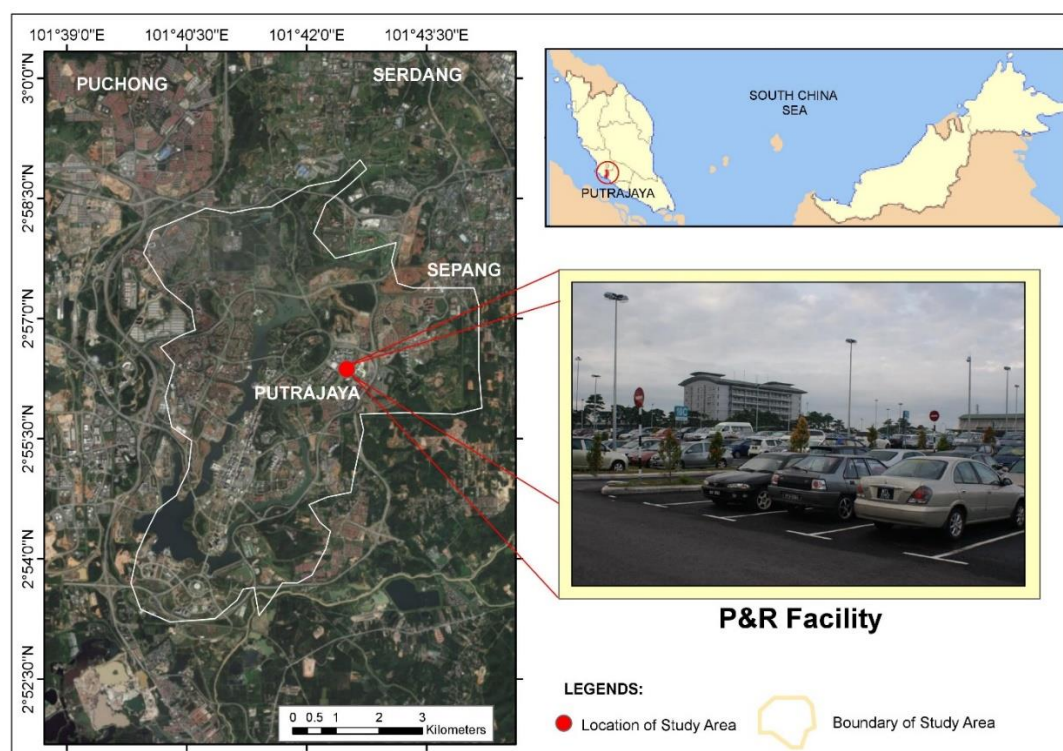


Figure 2. Location of the case study.

During the study period, only one bus-based P&R station was operating in Putrajaya, i.e., the P&R station in Precinct 1, which is located about 3 km from the city centre. The station is managed by Putrajaya Corporation (Parking Division) (see Figure 2). The Precinct 1 P&R station began its commercial operation in September 2006. It has 320 open air parking spaces that is provided free of charge. The bus service is provided by Nadi Putra with a flat fare of MYR 0.50 (USD 0.15) per trip and operates at a frequency of two trips per hour between 6.30 am and 9.00 pm on workdays.

Six hundred self-administered questionnaires were distributed throughout the data collection period. A total of 459 questionnaires were returned, and of these 22 were rejected as invalid and 437 of the questionnaires were considered for further analysis (73% response rate). Table 1 shows the demographic information.

Table 1. Demographic profile of respondents.

	Frequency	Percentage
Age		
29 and below	137	31.4
30–39	153	35.0
40–49	102	23.3
50 and above	45	10.3
Total	437	100.0
Gender		
Male	253	57.9
Female	184	42.1
Total	437	100.0
Education		
High school	96	22.0
Diploma	138	31.6
University	150	34.3
Postgraduate degree	53	12.1
Total	437	100.0

The questionnaire was intended to collect the relevant information from respondents for research purposes. The questionnaire used in this study was modified from the questionnaires used in previous studies and consists of two main sections: (i) Part A: Background of respondents; and (ii) Part B: Information based on TPB.

The questionnaire was translated to ensure consistency between the Malay version and the original language of the instrument. Two professors from the school of engineering and social sciences translated the items used in earlier studies from English to Malay. The items for attitude, subjective norm, and perceived behaviour control and intention construct were adapted from Taylor and Todd [43]; and the trust scales were adapted from Hsio and Yang [30]. A pilot test of the survey instrument was carried out prior to implementing the main survey to ensure that the questionnaire is acceptable and can be easily answered by respondents from different backgrounds. A pilot test involving 50 respondents was carried out to gather information and feedback on the questionnaires. Generally, respondents were able to understand the questions asked in the survey. However, there was some confusion with regard to the questions. The ambiguous questions were paraphrased based on the feedback. A second pilot test was then carried out to make certain that respondents fully understand the questions. The feedback from respondents showed that they were able to understand the requirements of the questions. The questions were based on TPB with a seven-point Likert scale where 1 equals Strongly Disagree and 7 equals Strongly Agree. The measurement items, which used standardized loading, and the associated source for each construct are presented in Table 1.

SPSS 24.0 software was used to analyse the data. The demographic characteristics of the respondent are presented in frequency and percentage, as shown in Table 1. Cronbach's alpha was calculated to estimate the internal consistency of the items of TPB constructs, namely trust, attitude, subjective norm, and PBC. A confirmatory factor analysis was done to determine the goodness-of-fit of the previous model (TPB) with the study cohort. A p-value not more than 0.05 was considered significant in the analyses. SPSS AMOS version 24 was used for Structural Equation Modelling (SEM) to establish the ability of the trust and TPB constructs to predict car drivers' intention to use P&R facilities. The maximum likelihood estimation was used to estimate the parameters of the model. Examination of the adequacy of the model fit was done using the chi-square test statistic, the comparative fit index (CFI), and the root mean squared error of approximation (RMSEA).

4. Results

4.1. Measurement Model

The fit criteria of the measurement model were assessed to make certain that the empirical data and the hypotheses are acceptable. In this study, the adequacy of the model was examined using the commonly used fit indices in recent studies (e.g., Borhan et al. [28], Fu et al. [44], Hussain et al. [45], Yilmaz and Ari [46]), namely, the ratio of chi-square to degrees of freedom (χ^2/df), goodness-of-fit index (GFI), normed fit index (NFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). The measurement model is considered to be a good fit since the χ^2/df value is 2.631 (<3.00) [44,47]. Furthermore, the values of GFI, NFI, and CFI of 0.903, 0.931, and 0.954, respectively, are acceptable. According to Hussain et al. [45], GFI, NFI, and CFI values greater than 0.95 is considered to be an excellent fit, while values between 0.9 to 0.95 are an acceptable fit. The RMSEA of 0.065 is below the cut-off point of 0.08 recommended by Fu et al. [44], Hussain et al. [45], and Yilmaz and Ari [46].

The validity of the constructs in this study was then evaluated using three approaches: (1) construct reliability, (2) convergent validity, and (3) discriminant validity, as suggested by Fu et al. [44]. The reliability of the constructs was evaluated to establish the internal consistency of the coefficient of the data measuring tool for each construct. In order to measure the construct reliability, the Cronbach's alpha and composite reliability were determined as suggested by Fu et al. [44], Golob [48], and Yilmaz and Ari [46]. The Cronbach's alpha and composite reliability values for all constructs range between

0.711 and 0.948 and 0.589 to 0.901, respectively, as shown in Table 2. This indicates that the reliability coefficients for all constructs are acceptable because both values (Cronbach's alpha and composite reliability value) are greater than the cut-off point of 0.7 as suggested by Borhan et al. [27] and Hussain et al. [45].

Table 2. Standardized loading and reliability.

Constructs and items	Standardized loading	Composite reliability	AVE	Cronbach's α
Attitude		0.858	0.731	0.806
(AT1) Using the P&R is a good idea	0.925			
(AT2) Using the P&R is a wise idea	0.981			
(AT3) I like idea of using P&R	0.719			
Subjective norm		0.901	0.698	0.841
(SN1) People who influence my behaviour would think that I should use the P&R	0.880			
(SN2) People who are important to me would think that I should use the P&R	0.856			
PBC		0.589	0.537	0.618
(PBC1) I am able to take P&R	0.801			
(PBC2) I think taking P&R would be entirely within my control	0.828			
(PBC3) The local council provides satisfactory facilities for using P&R.	0.775			
Intention		0.738	0.585	0.714
(INT1) I intend to take P&R	0.880			
(INT2) I will try to take P&R	0.856			
Trust		0.629	0.502	0.948
(T1) Based on my perception of P&R, I believe it provides a good service	0.779			
(T2) Based on my perception of P&R, I know it cares about customers	0.803			
(T3) Based on my perception of P&R, I know it is safe	0.779			

Furthermore, the convergent validity was determined based on the two criteria recommended by Fornell et al. [49], Hair et al. [50], and Yilmaz and Ari [46]: (1) All items are statistically significant and the item loading (or standardized factor loading) is equal to or greater than 0.5, and (2) the average variance extracted (AVE) for each construct is equal to or greater than 0.5. Table 2 shows that all constructs meet the criteria for convergent validity since all item loadings are statistically significant ($p < 0.01$) and greater than 0.5 (ranging from 0.719 to 0.981). In addition, the AVE value exceeds the cut-off points (ranging from 0.502 to 0.731). Thus, the convergent validity has been shown to be good.

The last approach is discriminant validity. Discriminant validity is defined as a low correlation between two constructs and is evaluated by comparing the AVE of each construct with the squared correlation between these construct as well as with all other constructs [44]. As can be seen in Table 3, the AVE in the present study is higher than the squared correlation. Hence, the discriminant validity is acceptable [46,47].

Table 3. Correlation coefficient and results of average variance extracted (AVE).

	Mean	STD	AVE	AT	SN	PBC	INT	T
AT	13.75	4.35	0.731	0.85				
SN	7.35	2.87	0.698	0.56	0.84			
PBC	13.37	3.18	0.537	0.5	0.51	0.73		
INT	8.36	2.79	0.585	0.55	0.6	0.54	0.74	
T	15.16	4.12	0.502	0.27	0.2	0.35	0.34	0.71

* Note: AT = Attitude; SN = Subjective norm; PBC = Perceived behavioural control; INT = Intention; T = Trust; STD = Standard deviation.

4.2. Structural Equation Model and Hypothesis Testing

After verifying the measurement model, the structural coefficient of the overall model was assessed to obtain the basis for testing the offered hypotheses. The overall model proposed by this study is illustrated in Figure 3. The overall model is a sufficient fit for predicting the intention of car drivers to use P&R facilities in Malaysia since the values of the fit index are acceptable ($\chi^2/df = 2.604$, GFI = 0.911, NFI = 0.943, CFI = 0.930, and RMSEA = 0.062).

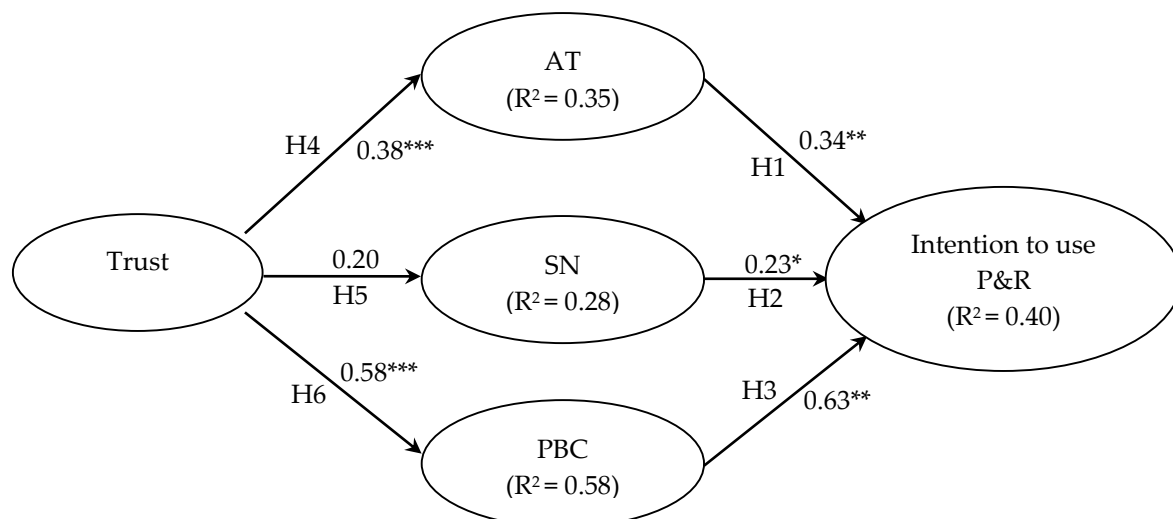


Figure 3. Result for the structural equation model. Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Figure 3 shows that attitude ($\beta = 0.34$, $p < 0.01$), subjective norm ($\beta = 0.23$, $p < 0.05$), and PBC ($\beta = 0.63$, $p < 0.01$) have a positive influence on the intent to use the P&R facility in Putrajaya city centre. Therefore, Hypotheses 1 to 3 are accepted. Of the three main constructs in TPB, PBC has the greatest influence on the behaviour to use P&R for their daily commute. On the other hand, the influence of subjective norm on the intent to use the P&R facilities is not as strong as that of attitude. Trust has a strong positive influence on attitude ($\beta = 0.38$, $p < 0.001$) and PBC ($\beta = 0.58$, $p < 0.001$) towards P&R use. This shows that both relationships support Hypotheses 4 and 6 even though trust is not significantly related to subjective norms. Thus, Hypothesis 5 is not acceptable.

5. Discussion and Conclusions

The structural model shown in Figure 3 is an extension of the TPB's core components. A predictor was added to extend TPB in order to identify the factors influencing the use of P&R facilities, which is currently not popular among car users in Putrajaya city centre. Results show that the trust, attitude, subjective norm, and PBC constructs explain 40% of the intention to use the P&R facility, with PBC being the dominant factor that influence intention. Physical situational factor and trust explain 35% of the attitude towards using P&R facilities, with trust having the strongest influence on attitude. Trust explains 58% of PBC towards using P&R facilities.

Results indicate that PBC is the most important predictor of the intention to use P&R facilities. Chen et al. [51] made a similar discovery where PBC was found to be the critical determining factor of behavioural intention. The findings of the present study reaffirmed that the behavioural perceived control in TPB reinforce the intention to carry out a behaviour [23]. It is anticipated, therefore, that using P&R is not a difficult behaviour for users. There are, however, constraints on the use of P&R facilities which discourage users from carrying out the behaviour. For example, the service provider is not able to ensure reliability of service if the facilities are not in good condition. Thus, as the degree of perceived external constraints by users increases, their willingness to use P&R facilities decreases.

Attitude is the second most important determinant of users' intention to use the P&R facilities. This finding is similar to those reported by De Groot and Steg [24] and Hsiao and Yang [30], where positive attitudes are associated with stronger intention to perform a behaviour. Thus, Putrajaya Corporation (the service provider of P&R) could persuade commuters to use the P&R facilities by enhancing the positive tendency about the provided P&R service and the corporation. Promotion of this service and the corporate image of the P&R service provider through mass media campaign could enhance the positive attitude of users towards P&R facilities, thereby influencing their intention to use the facilities. Borhan et al. [27] recommended implementing a mass media campaign based on the findings of their study, which showed that this approach has a positive and direct influence on the behaviour intention to take low-cost airlines. In addition, Lam et al. [18] asserted that a promotional campaign is important in attracting trip makers to use P&R facilities. In this context, the aim of a promotion campaign is to educate and expose the public to the benefits of using P&R facilities. Subjective norm is the lowest and least significant contributor to the intention to use P&R facilities. This result is consistent with those of previous studies where researchers have demonstrated subjective norm to have the least influence on intention in their TPB models [30,52]. In addition, some researchers asserted that subjective norm is not a powerful predictor and has an insignificant relationship with intention [53,54]. In the current study, perceived subjective norm contributes very little to intention since users were able to independently decide how to manage their travel, either by using P&R facilities or by driving private cars, without having to consult their families or friends.

In the same vein, the trust predictor has indirect significant positive effects on users' intention to use P&R facilities via attitude and PBC. This shows that the service provider of Putrajaya P&R was not able to gain users' trust. Therefore, in order to gain the trust of users and potential users and to ensure that the objectives of the Putrajaya P&R facilities are successfully achieved, measures must be taken to increase the number of P&R users. The best solution for increasing the demand for P&R facilities in Putrajaya is by increasing the frequency of bus service and improving the bus route to reduce the travel time from the P&R area to the workplace. According to Kuby et al. [55], a high frequency bus service and providing more bus stops and more bus routes could increase the demand for P&R facilities as well as for public transport. This is consistent with the previously proposed policy by Zhao et al. [56]. Currently, users working in Putrajaya do not have to pay any parking fee. Only visitors who conduct business at government offices have to pay for parking. As a result, users working in Putrajaya are more inclined to use private vehicles to travel to their workplace. Imposing onsite parking fee in Putrajaya is another way to encourage users to use P&R facilities. Bos et al. [15] suggested that private car drivers are more preceptive to any change in commute length and charges for using P&R facilities instead of changes in the same attributes with regard to car-use alternatives. Hole [57] noted that P&R facilities will be well accepted if parking charges are imposed for on-site parking. The success of this practice has been reported by Asadi-shehari [58], where a 1%-3% reduction in vehicle trips was observed after a 10% increase in parking cost in comparison to the normal cost. Furthermore, P&R facilities have to be located outside or at the outskirts of Putrajaya area and not too close to the city centre. When this study was carried out, the P&R facility is located across the street from the users' workplace. This P&R facility has been closed due to lack of response from commuters. This has resulted in users having to drive directly to their workplace instead of using the P&R facility. The service provider of P&R facilities could also consider the proposal made by Borhan et al. [20]

and Lam et al. [18] to increase the use of P&R facilities in Putrajaya, i.e., providing a good public bus service, providing free parking or charging a small parking fee at P&R facilities, and a reasonable bus fare. As asserted by Madha et al. [38], belief is “the basis for loyalty.” This will indirectly increase the intention of the users to use P&R facilities. However, no significant effect was observed between trust and subjective norm towards the use of the P&R facility. One possible reason for this is the lack of significant effect of the two predictors could be due to the influence of family or friends, who are not affected by travel decision.

This study has provided an important understanding of the TPB-based model for the use of P&R facilities. The findings of the study showed that the structural equation model is good and meet all the criteria for goodness-of-fit indexes. To the best of the researchers’ knowledge, this is the first study to explore the factors influencing Malaysian users to use bus-based P&R facilities. Another novelty of the present study is the extension of the TPB model through the addition of the new construct, namely trust. The significance of this study is that it identifies the relationship among several constructs on users’ intention to use P&R facilities in the future. Therefore, the aim of this study is to provide insights to authorities, such as public transport providers and policy makers, in measuring the extent of consumer acceptance of the quality of P&R facilities and public transport services in Malaysia. This study has also shed light on the measures that has to be implemented by the service providers of P&R facilities in order to enhance the intention of Malaysians to use P&R facilities instead of driving private cars.

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