

TRAVEL BEHAVIOUR ANALYSIS IN PETALING JAYA, MALAYSIA USING THE THEORY OF PLANNED BEHAVIOUR⁺

Ahmed Madha Mohammed *

Riza Atiq Abdullah **

Abstract:

This study expands the original model of theory of planned behavior (TPB) by adding four predictors to the existing model to evaluate travel behaviour in the city of Petaling Jaya in Malaysia. These predictors are: situational factors, trust, novelty seeking, and external influence. Petaling Jaya has witnessed a dramatic growth in terms of population size and geographical importance making it ideal for this study. The study collected research data from employees in Petaling Jaya, Malaysia, resulting in valuable data of 400 participants over the course of three months. Results indicate that attitude, perceived behavioural control, and subjective norm are found to have positive effects on the behavioural intention of using public transport. Furthermore, novelty seeking also has a positive influence on attitude. The three antecedents of trust were found to have an indirect positive effect on commuters' intention to use public transport via attitude, subjective norm and PBC. Situational factors were found to have an indirect negative significant influence on people's intention to use public transport through attitude. While external influence was found to have an indirect positive significant influence on people's intention to use public transport through subjective norm.

تحليل سلوك السفر في بيتالينك جايا. ماليزيا باستخدام نظرية السلوك المخطط

رضى عتيق عبد الله

احمد مضاء محمد

المستخلص:

تقوم هذه الدراسة بتطوير نموذج نظرية السلوك المخطط بإضافة اربعة متغيرات (العوامل الظرفية، الثقة، البحث عن الحداثة، والتأثير الخارجي) الى النموذج الاصلي لتقييم سلوك السفر في مدينة بيتالينك جايا في ماليزيا والتي تعتبر نموذج مثاليا لما تتميز به من اهمية جغرافية وعمرانية وسكانية. استمرت الدراسة للفترة من 2013 ال 2015 تم خلالها جمع 400 عينة من موظفي بيتالينج جايا في ماليزيا لغرض انجاز هدف البحث. وتشير النتائج الى ان متغيرات الموقف، السيطرة السلوكية المحسوسة والمعيار الشخصي لها تاثير ايجابي على النية السلوكية لاستخدام وسائل النقل العام. وعلاوة على ذلك، فان متغير البحث عن الحداثة ايضا يؤثر ايجابيا على النية السلوكية من خلال متغير الموقف. في حين تم التوصل الى ان متغيرات الثقة الثلاثة لها تأثير ايجابي غير مباشر على نية الركاب على استخدام وسائل النقل العام عن طريق متغيرات الموقف، المعيار الشخصي والسيطرة السلوكية المحسوسة. تشير النتائج ان العوامل الظرفية لها تأثير سلبي غير مباشر على نية الناس على استخدام وسائل النقل العام من خلال متغير الموقف. في حين

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^{*} PhD candidate at UKM university, Malaysia .

^{**} Professor at the Faculty of Engineering and Built Environment, UKM university, Malaysia.

وجد ان متغير التأثير الخارجي له تأثير ايجابي غير مباشر على نية الناس على استخدام وسائل النقل العام عن طريق متغير المعيار الشخصي.

Introduction:

The Malaysian city of Petaling Jaya is located in the state of Selangor adjacent to the capital city of Kuala Lumpur. The city was initially developed as a satellite municipality for Kuala Lumpur encompassing mostly residential and commercial areas with the addition to some industrial areas as well. It covers an area of approximately 97.2 square kilometres and a population of about 613,977 [1]. The overpopulation of the capital city in the early nineteen fifties led to the development of Petaling Jaya, since then, the city has experienced massive growth in terms of geographical importance and population size. Petaling Jaya is facing traffic congestion most of the time and especially in peak hours either in the morning or evening. The central business district, CBD is growing rapidly in Petaling Jaya; this is resulting in an increase of private car ownership on the road where private cars and motorcycles are bottling up roads and highways in the city.

A significant reduction in the annual cost of road accidents, congestion, energy consumption and pollution in the city can be obtained by implementing a modal shift, which will create enormous economic reforms, and provide funds for local developments in a time where all natural resources are facing depletion. Public transport can also help develop urban areas and utilize its efficiency, thus, strengthening the back bone of Malaysia and see it glide into future prosperity.

Transport systems are one of the main factors of economic development[2]. Major economic and social growth provides a further challenge which will inevitably bring about an increase in car trips in the city. An optimal solution where growth can be accommodated with the reduction in car use would be ideal. There are numerous ways to control car use: cars with an odd license plate number drive on one day while cars with an even license plate number drive on another, increase the parking costs, improve public transport[3], and create no vehicles areas.

This study applies the theory of planned behavior (TPB) as the research framework to predict the behavioral intention of using public transport TPB, a widely used model to predict and explain human behavior, has been applied to a variety of social behaviors with strong predictive utility [4]; [5].

Most studies related to the transport mode selection have extended the theory of planned behaviour with the addition of the predictor constructs. Additional predictors of TPB constructs were found to have increased the explanatory power of the model[6]. A study was conducted to identify the determinants of recycling behaviour using five additional predictor for the TPB model (control, moral norm, situational factors, the impact of recycling and reducing waste attitude) in the city of Bristol, UK [7]. By using multiple regression analysis, only AT, PBC and situational factors had a significant relationship to the intention to recycle. A study was conducted to investigate the determinants of recycling behaviour of residents in Brix worth, UK [8]. In this study, a total of eight predictors were added (Moral norms, Situational factors, Past behaviour, Outcomes, Consequences, Concerns, Buying to reduce waste and Re-using/repairing to reduce waste) to the TPB model. Through the multiple regression method, only three additional predictors were found to be significantly related to recycling intentions. Among the three original predictors, attitude was the only statistically significant predictor. The addition of new predictors has increased the value of R² from 26.1% to 33.3% compared to the original TPB model. Hsu [9] research used the revised theory of planned behaviour as a conceptual framework to explore its relationship to career planning

for hospitality vocational college students in Taiwan. The analysis conducted by structural equation modeling revealed that attitude has a positive influence on intention; the subjective norm has a negative influence on intention; perceived behavioral control has a positive influence on intention; intention has a positive influence on behaviour; and perceived behavioural control has a positive influence on behaviour.

Using the TPB model to measure the willingness to use public transport, we expect that commuters are more likely to develop an intention to use public transport if they: hold positive attitudes about the behaviour, expect family members, friends and colleagues to approve of the behaviour, and believe they have the proper resources such as time or money to undertake the behaviour. In addition, it is suggested in this paper that four more predictors – situational factors, trust, novelty seeking and external influence – are likely to influence commuters' willingness to use public transport. These constructs are reviewed after the basic constructs of TPB. In sum, aims of this study were:

- a- Use a modified version of the theory of planned behaviour as a model predicting employees' intention to use public transport.
- b- To identify other significant predictors of intentions, such as situational factors, trust, novelty seeking and external influence, to take the train within the TPB.

Methodology:

Methods of data collection were conducted on the respondents through a questionnaire distributed in commercial and residential areas in Petaling Jaya, as well as in a few local companies. The data was collected in about three months. In total, between 400 and 500 copies were distributed, however only about 400 copies were used in the final study.

Table 1 shows the demographic, socioeconomic and travel characteristics of the respondents. Male percentage (57.8%) was slightly higher than that of women (42.3%). The majority of participants were between 26 and 54 years old (75.1%). Most of respondents had a college degree (42.5%). The majority of monthly income was below RM4000 (59.4%). The sample representation is somewhat similar of that of official statistics: male percentage 51%, female percentage 49%. 67% of total population are less than 40 years old [1]. About 47.5% had a degree and 7.5% had a higher education degree.

Table 1 Profiles of respondents

	Attribute	Percentage	
		Study Data	Official Data
Gender	Male	57.8	51
	Female	42.3	49
Age	18-25	14.2	16.9
	26-54	75.1	41.2
	55 and above	10.7	13.1
Education	Primary and Secondary School	23.6	data unavailable
	Diploma	24.8	29.8
	Degree	42.5	47.5
	Higher Education	9.3	7.5
Income	Below 4000	59.4	43.4
	Above 4000	40.6	56.6
Transportation mode	Car	59.3	data unavailable
	Motorcycle	13.3	data unavailable
	Train	14.8	data unavailable
	Bus	12.8	data unavailable

Theory and Hypothesis:

The Theory of Planned Behaviour (TPB) is a model that has been applied extensively to explain and predict human behaviour across various disciplines [10], such as psychology, education, health, technology applications, the environment, business, security and transportation. TPB is an extension of the theory of reasoned action TRA that was founded by Martin Fishbein and Icek Ajzen in 1975 [11].

In many studies after applying the TRA as a framework for studying the behaviour it was found to be successful in measuring the behaviour of the public's intention to behave [12]. According to the TRA, an important determinant to measure behaviour is the intention to behave. The intention to behave is a combination of attitude (AT) and subjective norm (SN). Attitude toward behaviour is the tendency to perform or not perform behaviour. Meanwhile, subjective norms refer to the social pressure imposed by the immediate family (parent, spouse or friend) either to do a certain action or not. Figure 1 shows the theory of reasoned action.

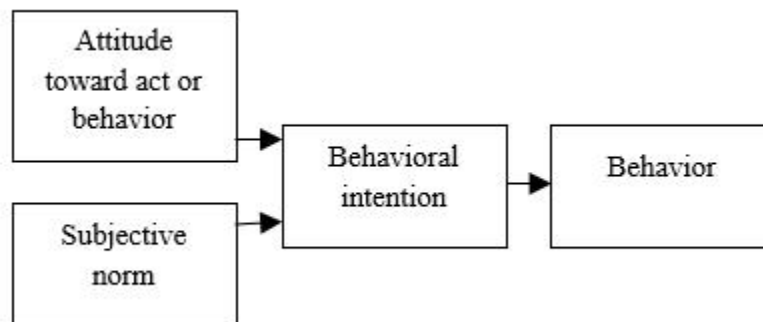


Figure 1: The theory of reasoned action (TRA) Source: Fishbein& Ajzen 1975

According to Fishbein, M. and Ajzen [11], the stronger the behavioural intention, the more likely the individual will perform a behaviour. However, the TRA model failed to assess whether the individual intends or not to perform the behaviour. Therefore, Ajzen [10] expanded TRA to TPB by adding another predictor that measures behavioural control, PBC. Perceived behaviour control refers to the individual's perception of their capability to perform a particular behaviour. The predictor of perceived behaviour control is linked directly to intention and behaviour. Figure 2 shows the improvement of the TRA to TPB introduced by Ajzen.

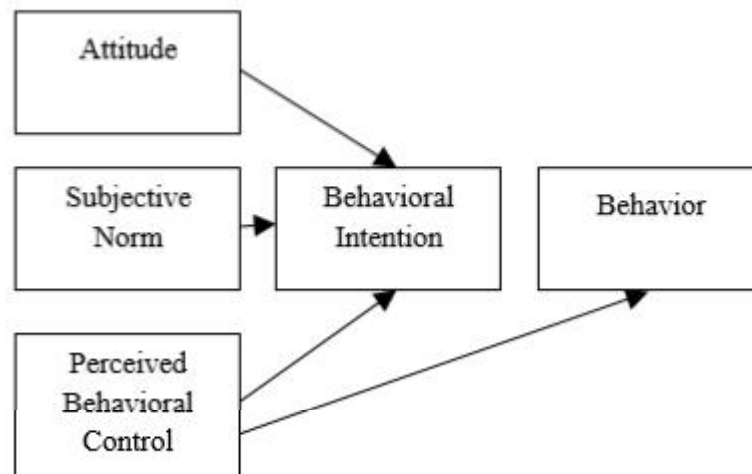


Figure 2: Theory of Planned Behaviour (TPB) Source: Ajzen 1985

Since Ajzen has suggested that the TPB can be developed with Additional several other constructs, many researchers have proposed the addition of new predictor. In this study four new predictors have been chosen to be included in the TPB. These predictors include situational factors, trust, novelty seeking, and external influence.

The additional predictors used in this study have all been used in previous studies by many researchers to predict the behaviour of people in an extended TPB model, examples of these studies include: [13], [14], and [15]. The trust predictor is defined as belief held by consumers' expectations on service providers to provide reliable services to users [16]. Trust is the heart of all types of relationships [17]. Trust was defined as the willingness of a trustor to be vulnerable to the actions of a trustee based on the expectation that the trustee will perform a particular action [17]. To establish trust, consumers must believe that those who are entrusted (in this case public transport facilities) have the ability and motivation to provide good quality of service [18]. The Trust predictor was used by [19] to predict the use of high-speed trains in Taiwan. Through the resulting model, the trust predictor consisting of several significant items such as quality of service and security, these indicators were important in predicting the use of the service. Therefore, based on those studies the trust predictor will be suitable to use in this study to predict the quality of transport publicly available in Petaling Jaya and will be connected to the attitude predictor as well as intention's predictor.

For situation predictors, several studies have used these predictors to predict behaviour like using the TPB model to investigate the determinants of recycling behaviour [8] and where an expansion of the TPB model was used. Thus, the situation predictors can be adopted in this study as well to predict the desire to use public transport. Some of the items can be grouped together and categorized according to their relevance to each other like the conditions of transport facilities, transport routes and park availability.

External influence predictor was added to the model, and it had been stated that external influence might include mass media reports, expert opinions, and other non-personal information considered by adopters in making a “rational” acceptance decision [20]. Evidence of such form of influence is evident in the marketing literature [21]. It was found that external influence is an important predictor of subjective norms [20].

One other important predictor is novelty seeking, which is defined as the desire to seek out new stimuli [22]. Many studies suggested that novelty seeking influences attitude toward technological products [22, 4, and 23]. In the field of travel, novelty seeking is considered an important element of travel motivation because of its potential to stimulate pleasures for travellers [24]. Novelty seeking is usually seen as a curiosity drive or an experimental drive which would influence consumers’ attitudes toward technological products or travel destination choice [25]. It has been noted that novelty seeking can influence behavioural intention directly as in the cases of pirated software purchasing among student groups [26], but in this study, it will be regarded as an important factor of attitude as most researches did. Therefore, it was assumed that people who are influenced more by novelty seeking would be more open to experiencing new modes of transportation.

Hypothesis Development:

Predictors in the TPB model are used to study the relationship between trust, situation factors, attitude, subjective norms, perceived behavioural control, novelty seeking and external influences with intention (to urge employees to use public transportation to work). The TPB suggests in this study that people are more likely to use public transport instead of other travel modes if they have a positive attitude toward using public transport, and who is influenced by the opinion of family members, friends and colleagues to use public transport, as well as people who would take into consideration the external influences promoting public transport and have the necessary resources, the ability, or the opportunity to use public transport. Therefore, the previous discussion can be summarized in the following hypothesis:

1. Attitude is related to people’s intention to use public transport positively.
2. Subjective norm is related to people’s intention to use public transport positively.
3. Perceived behavioural control is related to people’s intention to use public transport positively.

Situation factors are defined as physical factors that can enable or inhibit behaviour [8]. According to this study, situation predictors are seen as factors that could prevent or promote the use of public transport. Therefore, the following hypothesis is proposed:

4. Situation Predictor Factors are related to people’s intention to use public transport negatively.

In Taiwan, a study had extended the TPB of the use of high-speed trains among students [10]. In the study, trust has been linked to the intentional behaviour through attitude, subjective norms and perceived behavioural control. To have a better understanding of the relationships between trust and the antecedents of intention, these hypotheses were suggested:

5. Trust is related to the attitude to use public transport positively.
6. Trust is related to the subjective norm to use public transport positively.
7. Trust is related to perceived behavioural control to use public transport positively.

According to [19], when opting for travel mode choice, commuter tourists with a higher tendency of indulging in novel experiences would be more inclined positively towards new modes of transportation. Therefore, the following hypothesis is proposed:

8. Novelty seeking is related to people’s attitude toward using public transport positively.

It was found that external influence is an important predictor of subjective norms [20]. Therefore, the following hypothesis is proposed:

9. External Influence is related to the subjective norm to use public transport positively.

Results and Discussion:

In the process of developing the SEM model in this study, two methods of approach (measurement model and structural model) are used to assess the construct validity, the appropriateness of the model and to test the hypotheses.

The first step in producing the model is developing the SEM measurement model and to validate it. Confirmatory factor analysis (CFA) method is used to remove or drop items in the constructs that have a loading factor that is less than 0.5. Moreover, the analysis is used to assess the reliability of the items and the reliability of the constructs. As shown in Table 2, the overall goodness-of-fit indices of CFA indicate a satisfactory fit of the measurement model, with Relative Chi-squared (χ^2/df) of 1.949, and other fit indices: GFI = 0.864, AGFI = 0.835, TLI = 0.951, CFI = 0.957, RMR = 0.066, RMSEA = 0.052.

To validate our measurement model, three types of validity were carried out: content validity, convergent validity, and discriminant validity. Content validity was initiated by ensuring consistency between the measurement items and the previous literature. Convergent validity was tested by examining composite reliability (CR) and average variance extracted (AVE) from the measures. As shown in Table 2, the composite reliabilities (CR) in this study ranging from 0.803 to 0.967 all exceed the recommended threshold of 0.50. Furthermore, the average variances extracted (AVE) range from 0.589 to 0.880, which are also above the acceptable value of 0.50. In addition, Table 2 shows the loadings of the measures in our research model. Most paths in the measurement model have a loading factor above 0.5. Table 3 shows the inter-correlations for all variables. The results show a significant correlation among behavioural intention and other constructs.

Fornell and Larcker stated that cause-squared AVE for each construct should exceed the correlations value between the constructs with other constructs [27]. The AVE for each construct will be squared right at source and will be compared with the correlation between the constructs. The analysis of the cause-squared AVE of the constructs of intention, attitude, situational factors, subjective norms, perceived behaviour control, novelty seeking, trust, and external influence for the measurement model is higher than the correlation between the constructs as shown in table 4. This shows a higher source-squared AVE value compared to the correlations between the constructs, this means that the discriminant validity has met the conditions. Table 3 shows a summary of the discriminant validity of the measurement model.

Table 2 Standardized loadings and reliability

Constructs and items	loading factor	Composite reliability	AVE
Intention		0.905	0.705
IN1	0.917		
IN2	0.807		
IN3	0.834		
IN4	0.838		
Attitude		0.947	0.749
ATT1	0.892		
ATT2	0.940		
ATT3	0.933		
ATT4	0.828		
ATT5	0.766		
ATT6	0.824		
ATT7	Dropped*		
Situational factors		0.906	0.662
SF1	0.682		
SF2	0.816		
SF3	0.878		
SF4	0.945		
SF5	0.720		
Subjective norms		0.916	0.785
SN1	0.816		
SN2	0.927		
SN3	0.912		
Perceived behaviour control		0.924	0.755
PBC1	Dropped*		
PBC2	0.880		
PBC3	0.970		
PBC4	Dropped*		
PBC5	0.922		
PBC6	0.713		
Novelty seeking		0.967	0.880
NS1	0.925		
NS2	0.959		
NS3	0.978		
NS4	0.903		
Trust		0.938	0.689
TR1	Dropped*		
TR2	0.606		
TR3	Dropped*		
TR4	0.812		
TR5	0.701		
TR6	0.934		

TR7	0.930		
TR8	0.964		
TR9	0.874		
External influence		0.803	0.589
EI1	0.772		
EI2	0.918		
EI3	0.567		

Note: IN (Intention), ATT (Attitude), SF (Situational factors), SN (Subjective norms), PBC (Perceived behaviour control), NS (Novelty seeking), TR (Trust), EI (External Influence).

Table 3 Correlations between constructs.

	IN	AT	SF	SN	PBC	NS	TR	EI
IN	0.839							
AT	0.210	0.864						
SF	-0.115	-0.159	0.813					
SN	0.215	0.111	0.073	0.886				
PBC	0.221	0.171	0.094	0.260	0.873			
NS	0.023	0.237	-0.097	0.103	-0.121	0.938		
TR	0.181	0.183	0.128	0.200	0.207	-0.113	0.830	
EI	0.050	0.132	0.041	0.268	-0.017	-0.006	0.067	0.768

Note: IN (Intention), ATT (Attitude), SF (Situational factors), SN (Subjective norms), PBC (Perceived behaviour control), NS (Novelty seeking), TR (Trust), EI (External Influence).

By modifying the measurement models, a complete structural model was developed to test or examine the cause of relationship structure as proposed in the theoretical model in this study. Results of the analysis resulted in the construct of a complete structure of the bus model as illustrated in Figure 3. AMOS 20 software is used to evaluate the suitability of the model and the path of suggested hypotheses. The results showed that most fit indices are below acceptable levels as shown in Table 4. The GFI can be increased to 0.90 by dropping items with small factor loadings; however, the researcher chose not to drop more items in this study. According to some researchers, it is normal that in some studies using SEM models rarely demonstrate the excellent suitability for all indices [28,29].

Table 4 Fit indices for the structural model

Fit Index	Standard Value	Model Value
Relative Chi-squared (χ^2/df)	< 3.0	2.017
Goodness of Fit Index (GFI)	≥ 0.9	0.854
Adjusted Goodness of Fit Index (AGFI)	≥ 0.9	0.828
Tucker-Lewis Index (TLI)	≥ 0.9	0.948
Bentler Comparative Fit Index (CFI)	≥ 0.9	0.953
Standardized Root Mean Square Residual (RMR)	< 1	0.093
Root Mean Error of Approximation (RMSEA)	< 0.08	0.054

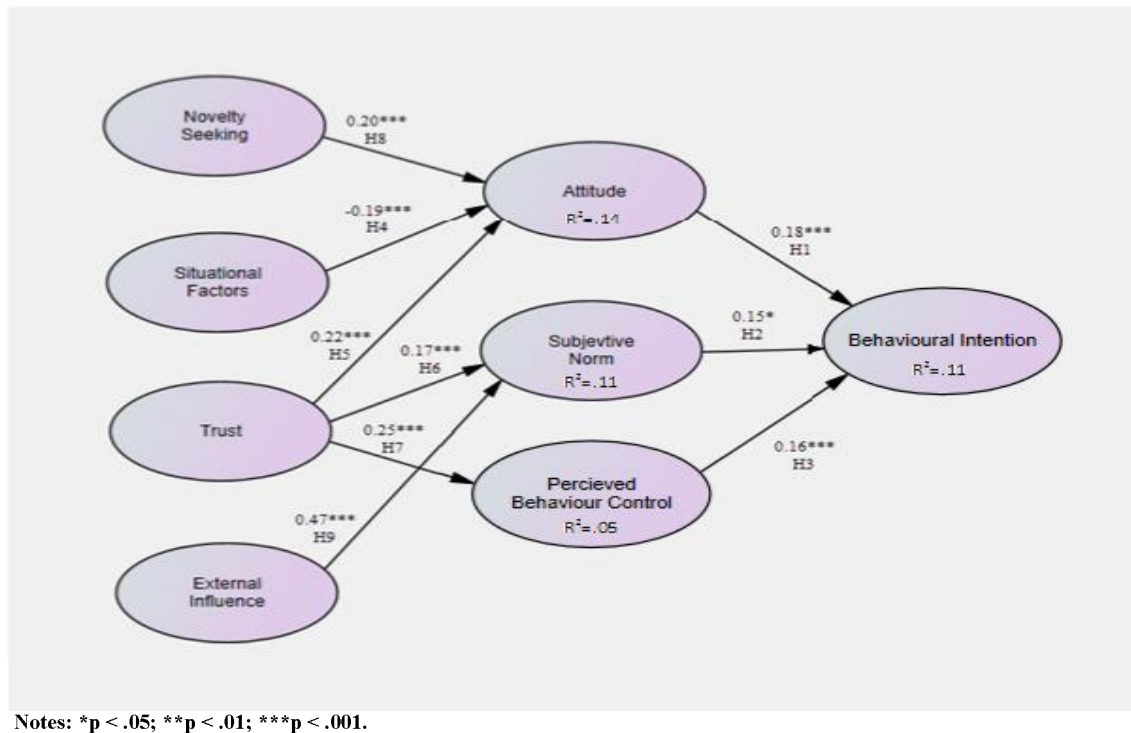


Figure 3 Result of the model.

With an adequate measurement model, the technique of structured equation modelling is used to examine the causal structure of the proposed bus model in this study. The results of the analysis are depicted in Fig. 3. By examining the standardized path coefficients, we found that all the paths are significant. As a result, all paths are significant and in the expected direction. Hypotheses 1–3 are supported as they have been in many studies by applying TPB to explain behavioural intentions. More specifically, attitude ($b = 0.182$, $p < 0.001$), subjective norm ($b = 0.154$, $p < 0.05$), and perceived behavioural control ($b = 0.162$, $p < 0.001$) all positively influence behavioural intention of using public transport in Petaling Jaya. Therefore, the hypothesis (H1, H2 and H3) suggests that respondents expressed positive views to leave their cars at home and use public transport to go to work. Among the three constructs that influence behavioural intention, it was found that attitude have the greatest impact on the behavioural intention to use public transport to work. On the other hand, subjective norm had the least impact among the three constructs; this result is consistent with the study conducted by [19].

Between the three main constructs, the most dominant contributor is attitude. This shows that the respondents' choice to use the car to work contributes to the congestion in Petaling Jaya and increase environmental pollution. Perceived behavioural control is also seen as a major contributor after attitude. This shows that respondents find it difficult not to use public transport to work. Meanwhile, subjective norm has the least impact on behavioural intention. The result is also consistent with that of [19]. The construct of subjective norm does not seem to contribute high because motorists can make their own decisions independently to manage their travel without having to negotiate with family or friends, whether by car or bus. It can be concluded that the right to drive belongs to the driver whether to drive or use public transport without consultation or input from others such as family members or close friends.

Situational factors (H4) is seen as one of the factors that prevent employees to use public transportation in Petaling Jaya ($b = -0.19$, $p < 0.001$). People can be constrained by a variety of factors to use public transport such as lack of facilities, opportunities and

experiences. SEM model analysis results show that the situational factors provide a significant negative relationship to the behavioural intention to use public transport to work.

There are five indicators in situational factors construct that affect the use of public transport to work with significant value. The first factor influencing the attitudes of the respondents is availability of free of charge parking facilities at the work place, respondents reported that free parking at work makes it easy to use their own transport. The second factor influencing the attitudes of the respondents is the distance between the bus stop and work, where respondents said travelling to the nearest bus stop affects their travel preference. The third factor is that public transport facilities are usually crowded and uncomfortable. The fourth factor is the influence of travel time to work, respondents said that the use of public transport will increase their travel time to work. And finally, the last factor is a lack of a sophisticated public transport network; most respondents stated that their destinations not being covered by public transport route is a major reason for choosing private transport over public transport.

Using the same method, the results shows that trust have a significant influence on the respondents' behavioural intention to use public transport to work through attitude H5 ($b = 0.22$, $p < 0.001$), subjective norm H6 ($b = 0.17$, $p < 0.001$), and perceived behavioural control H7 ($b = 0.25$, $p < 0.001$) suggesting the important relationship of trust with the three antecedents of intention. This illustrates that these three hypotheses suggests that by increasing employee's trust of public transport services in Petaling Jaya they'll be inclined to use it more often. This result is consistent with the findings of [19].

This study reveals that quality of service has a significant potential to improve the existing level of trust to retain existing users and attract new users to use it. Priorities for improving the quality of service can be done based on regression weights for each factor in the trust construct. Responsible parties such as governments and Majlis Bandaraya Petaling Jaya should be involved in improving the quality of services to improve consumer confidence in the future. Aspects that have high weights such as the frequency and accuracy of the bus and train arrives at the bus and train stations, safety, provision of bus travel information and customer service and the provision of bus and train routes.

Hypothesis 8 is supported ($b = 0.20$; $p < 0.001$), indicating that novelty seeking is the antecedent of attitude. Novelty seeking is the natural motivation to seek out new stimuli, new experiences, and novel products. Our study suggests that novelty seeking has indirect significant influences on employee's intention to use public transport via attitude.

Hypothesis 9 is supported as well ($b = 0.47$; $p < 0.001$) indicating that external influence is an important predictor of subjective norms. External influence is generated through advertisements in online and offline media, and promotional offers. External influence is important in individuals' formation of subjective norms toward public transport use.

Conclusions:

- Hypotheses 1–3 are supported by applying TPB to explain behavioural intentions, all positively influencing behavioural intention of using public transport in Petaling Jaya. Among the three constructs that influence behavioural intention, it was found that attitude have the greatest impact on the behavioural intention to use public transport. On the other hand, subjective norm had the least impact among the three constructs.
- Hypothesis 4 is supported; model analysis results show that the situational factors provide a significant negative relationship to the behavioural intention to use public transport. The results also shows that trust has a significant influence on the respondents' behavioural intention to use public transport through attitude (hypothesis 5), subjective norm (hypothesis 6), and perceived behavioural control (hypothesis 7).

- Hypothesis 8 is supported, our study suggests that novelty seeking has indirect significant influences on employee's intention to use public transport via attitude.
- Finally, it was found that external influence affects intention positively via subjective norm, supporting hypothesis 9.

Based on TPB, this study has produced useful observations into an employee's behavioural intention to use public transport in Petaling Jaya, and the findings display a relatively good predictive validity. For future research, a multi-aspect approach or alternative models can be utilized to understand the entire picture of an employee's choice of travel mode. Furthermore, future studies may question if past behaviour serves as a mediator in the causal relationship between the antecedents and behavioural intentions or loyalty as more and more travellers experience taking the train.

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Appendix A. Study questionnaire

Constructs and items	Source
Behavioural Intention	
IN1 - I intend to use the train to reduce congestion	Ajzen and Driver (1992), Taylor and Todd (1995), Bhattacharjee (2000)
IN2 - I am willing to use the train to reduce congestion	
IN3 - I want to take the train to reduce congestion	
IN4 - I will try to use the train	
Attitude	
ATT1 - I feel good about using the train	Taylor and Todd (1995), Bhattacharjee (2000)
ATT2 - Using the train is a good idea	
ATT3 - Using the train is a wise idea	
ATT4 - I like the idea of using the train	
ATT5 - Using the train is the right thing to do	
ATT6 - I prefer using the train	
ATT7 - It is inconvenient to use the train	
Subjective norms	
SN1 - People who are important to me (family, spouses, friends, neighbours, colleagues, etc.)would support me to take the train	Taylor and Todd (1995), Bhattacharjee (2000), Hsiao and Yang (2010)
SN2 - People who influence me would want me to take the train instead of my alternative means	
SN3 - People whose opinions I value would prefer that I should take the train	
Perceived behaviour control	
PB1 - I am able to take the train	Taylor and Todd, 1995, Mathur (1998), Sparks (2007), Hsiao and Yang (2010)
PB2 - I think taking the train would be entirely within my control	
PB3 - It is completely my decision to take the train	
PB4 - I think taking the train would be very easy	
PB5 - I have enough money to take the train	
PB6 - I can use the train all by myself	
Situational factors	
SF1 - On-site parking is available and free at work/school	Nazri (2013)
SF2 - Distance between train stations and work/school is far	
SF3 - Train facilities are crowded and uncomfortable	
SF4 - Travel time to work/school increases using the train	
SF5 - My travel destination is not covered by train route	
Novelty seeking	
NS1 - I am always seeking new ideas and experiences so I use the train	Mehrabian and Russell (1974), Lee and Crompton (1992), Hsiao and Yang (2010)
NS2 - When things get boring I like to find some new and unfamiliar experiences so I use the train	
NS3 - I like to continually change activities so I use the train	

NS4 - I like to experience novelty and change in my daily routine so I take the train	
Trust	
TR1 - Services: ATM, kiosk & store availability at train stations	Nazri (2013)
TR2 - Travel cost reduction	
TR3 - Providing shuttle services from bus stop to train station	
TR4 - Increase frequency of trains	
TR5 - Timeline of trains arriving and departing	
TR6 - Cleanliness on the train	
TR7 - Travel time reduction	
TR8 - The preparation of a systematic purchase system	
TR9 - Trains and train stations are safe and secure	
External influence	
EI1 - I read/saw news reports that using the train was a good way to reduce congestion	Bhattacharjee (2000)
EI2 - The popular press depicted a positive sentiment for using the train	
EI3 - Mass media reports influenced me to try out the train	