PASSENGER'S INTENTION TO USE AND LOYALTY TOWARDS PUBLIC TRANSPORT: A LITERATURE REVIEW

Son Truong Pham, Bien Van Nguyen, Anh Thi Phuong Tran, Duy Quy Nguyen-Phuoc*

The University of Danang - University of Science and Technology, Danang, Vietnam

*Corresponding author: npqduy@dut.udn.vn

(Received: March 21, 2023; Revised: April 23, 2023; Accepted: April 24, 2023)

Abstract - Public transport (PT) plays a vital role in an urban transport system since it can alleviate traffic congestion, air pollution and traffic accidents, thus promoting urban sustainability. In many countries, particularly in low- and middle-income countries, encouraging the mode shift from private vehicles to PT as well as retaining the current PT users are a challenge. One reason can be the lack of understanding about the aspects of PT services that affect the behavioural intention of users. This study reviews a growing body of peer-reviewed literature examining factors affecting the loyalty intention of PT users and factors influencing the intention to use of non-users. The methodological approach adopted to investigate these factors is also reviewed. The findings are very useful not only for authorities to develop comprehensive strategies aimed at enhancing PT ridership but also for scholars to extend key insights in this area.

Key words - Public transit; loyalty; intention to use; literature review; mode shift

1. Introduction

With the growth and development of the number of private vehicles, especially in big cities, the problems of urban traffic such as traffic congestion, traffic accidents, and environmental pollution caused by traffic is becoming more and more serious and difficult to manage. In low- and middle-income countries, the growth of motorcycles continues to be a big concern. Motorcycles are still the type of vehicles that accounts for a large proportion of traffic flow in urban areas. As of 2019, the number of registered motorcycles is 106 million in Indonesia and 21 million in Thailand [1]. Especially in Vietnam, the number of motorbikes reached 60 million registered motorbikes out of a total of 96 million people, equivalent to a ratio of 2 motorcycles: 3 people [2].

In Vietnam, the number of traffic accidents in the first six months of 2022 across the country were 5,703 cases, of which the number of mortality was up to 3,314 people and the number of injured was 3,690 people. The number of accidents in Hanoi is up to 408 cases, in Ho Chi Minh City is 1,042 cases, and in Da Nang is 51 cases. Along with the problem of traffic accidents, traffic congestion is another issue that is most noticeable in many big cities of Vietnam, such as Hanoi and Ho Chi Minh City. Statistics show that there are 34 frequent traffic congestion points in Hanoi, and congestion cost is from 1 to 1.2 billion USD per year. In Ho Chi Minh City, there are 18 traffic congestion points, with an annual cost up to 6 billion USD. In addition, private vehicles are also the main cause of environmental pollution. The emissions such as carbon monoxide, hydrocarbons, nitrous oxide, particulates, volatile organic compounds and sulfur dioxide, have serious harmful effects on the environment, causing many respiratory problems and lung damage for urban residents. The increase in the controllability of private transport means will affect the quality of urban life, not only noise pollution, and air pollution but also the potential risks of traffic accidents, which in turns increase the travel time of urban people.

To solve this problem, many solutions have been taken into account. In particular, the development of a public transport system is considered one of the most effective and sustainable solutions. Public transport is generally a mean of transport which has the capable of transporting a large number of customers at the same time, so it helps to reduce the number of private vehicles travelling on roads and reduces congestion traffic. An Australian study has proven that public transport can reduce traffic congestion by 63% and increase travel speed by 31.6% [3]. Using public transport can also help reduce annual fuel consumption [4]. Furthermore, using public transport is often associated with active traffic (walking and biking to access the system), which in turn is beneficial for maintaining and improving the health of road users. In addition, using public transport is also considered a safe, fast and economical mean of transportation.

In Vietnam, the main mode of public transport is still buses. The bus systems were put into operation from 1919 to 1920 until now, the network covers all cities, and in some places up to hundreds of bus routes are being exploited and operated. Some new and modern types of public transport have also been planned and are being invested in recently, such as the urban train system in Hanoi or the metro project in Ho Chi Minh City. Although public transport brings many benefits to both cities and its users [5], however, in Vietnam, public transport has not yet attracted many people to use it. One of reasons may be that the public transport system has not been fully developed, its operation is not effective, and it has not met the expectations of passengers [6]. The Vietnamese government is applying many policies to attract public transport users and limit the use of private transport. Some policies can be mentioned such as a price support policy, reduced fares for users, encouraging people to use public transport systems, or investment policy to upgrade the public transport infrastructure system, improve the quality of public transport services, etc. However, the efficiency of these measures is not as expected, and the rate of public transport use is still very low in most cities in the country (Da Nang is about 1.2% and Ho Chi Minh City is about less than 10% of public transport use).

With the above analysis, it is necessary to have more in-depth studies on users' perception and desires towards the public transport system, thereby identifying priorities for improving and investing in the system to encourage the use of public transport. As such, increase in the number of users in the future, the efficiency of system investment can be achived, which in turn contribute to reducing the problems of urban traffic, step by step reaching green transport development, sustainable urban development. In order to have appropriate research focus orientations, review the works that have been done and published in the academic world, and determine the factors affecting the intention to use as well as the loyalty of users are needed. The research results help identify issues that need to be focused on in future research related to passengers' perception of desire towards the public transport system. Addtionally, the review of influecing factors that have significant effects on the use intention and loyalty is also neccesary. From there, policy orientations and appropriate solutions for the public transport development strategy in general can be proposed.

2. Research Methods

This paper uses a systematic quantitative assessment method to review the literature. This method systematically analyzes documents, following a structured and repeatable process. In this way, the boundaries for proper document classification from the sources of supply are specified.

The scope of the study was limited to carrying out an overview of the intention to use (for people who have not used public transport) and loyalty of passengers using public transport (for people who have used public transport). These reviewed studies have been conducted in both high - and low and middle-income countries. A document is considered eligible for the synthesis if it meets all of the following criteria:

(1) Research on public transport systems;

(2) Research related to passenger loyalty or intention to use the public transport system;

(3) Research published in reputable transport journals.

To identify research-related literature, use keywords and search on ScienceDirect, Google Scholar:

+ Search related to passenger loyalty with English keywords: (“loyalty” or “loyalty of passenger” or “passenger loyalty” or “user loyalty” or “reuse” or “intention to reuse” or “willingness to reuse” or “recommend” or “continue to use”) and (“public transport” or “public transit” or “public transportation” or “rail” or “metro” or “urban train” or “underground”). With Vietnamese: (“sự trung thành” or “sự trung thành của hành khách” or “sự trung thành của hành khách” or “sử dụng lại” or “ý định sử dụng lại” or “sẵn sàng sử dụng lại” or “tiếp tục sử dụng”) and (“giao thông công cộng” or “phương tiện công cộng” or “đường sắt” or “xe điện” or “tàu điện ngầm”).

+ Search for keywords related to passenger's intention to use with keywords in English: (“intention to use” or “willingness to use”) and (“public transport” or “public transit” or “public transportation” or “rail” or “metro” or “urban train” or “underground”). With Vietnamese: (“ý định sử dụng” or “sẵn sàng sử dụng”) and (“phương tiện giao thông công cộng” or “đường sắt” or “tàu điện ngầm” or “tàu điện đô thị”).

The search results have a lot of articles and research related to the keywords found. However, according to the above criteria, only over 80 articles were reviewed, synthesized and used in critical analysis.

From the research articles that have been synthesized, detailed statistics of the studies are conducted. First, divide related documents into two groups: *(1) Group of research articles in high-income countries and (2) group of research articles in low- and middle-income countries.* Then, these papers were classified and reviewed based on research methods applied such as simple descriptive statistics, linear regression, confirmatory factor analysis (CFA), exploratory factor analysis (EFA), linear structural model and sample size of the study. Finally, these papers were classified and reviewed based on the factors affecting the intention to use and the loyalty of passengers. After reviewing the related papers, the research gap in the literature can be found.

3. Result

3.1. Customer's intention to use public transport

3.1.1. Studies in high-income countries

In high-income countries, many scholars studied the behavioural intention to use public transport and its factors affecting this behaviour. Studies usually focus on the intention to use trams, light rail, and subways. The authors' research is often concentrated on countries in Asian such as Taiwan, Qatar, and Saudi Arabia, countries in Oceania such as Australia, New Zealand, countries in North America such as the United States, Canada and other countries in Europe such as England, Germany, Italy, Spain, Norway.

Summary of research papers on the intention to use public transport includes 30 studies, mainly concentrated in Asian countries, especially the largest number of studies found in Taiwan (07 documents), the rest of each country has only 1 or 2 research papers on the intention to use. Most of the research is done based on data collected through a questionnaire survey.

In terms off research method, there are a number of methods that are used to analyse the data; however, structural equation modelling (SEM), linear regression model, and descriptive statistical analysis are the most commonly methods.

Regarding structural equation modelling (SEM), many authors have used this approach to test the inter-relationships between factors considered in the proposed model (18/30 documents) like a study on the intention to use public transport conducted in Norway [7]. In addition, regarding the SEM, the authors also use methods for comparison or detailed analysis such as multi-cause analysis (SEM - MIMIC), multi-group analysis (MGA), and MICOM [8]. Some common theories used in these models are the theory

of planned behaviour (TPB) [9], [10], [11], [12]; or technology acceptance model theory (TAM) [10], multi-attribute attitude model (MAM) [13], etc.

With the regression model, 11/30 related documents were found. Multivariable logit model [14], hierarchical logistic regression [15], and the usual least squares regression (OLS) model are often used to investigate influencing factors [16]. The descriptive statistical analysis method is found with 01/30 related documents. The details of the meta-analysis are shown in Table 1.

Table 1. *Summary of studies on intention to use public transport in high- and low- and middle-income countries*

	STT	Author	Year	Country	Public transport	Sample size	Model	Theory
High-income countries	1	Carrus, et al. [17]	2008	Italia	Public transport	180	SEM	-
	2	Hsiao and Yang [18]	2010	Taiwan	High-speed train	300	SEM	TPB
	3	Chen and Chao [19]	2011	Taiwan	Public transport	442	SEM	TPB, TAM
	4	Lai and Chen [20]	2011	Taiwan	Train	763	SEM	-
	5	Wu, et al. [21]	2011	Taiwan	Train	529	LRM	-
	6	JEN, et al. [22]	2013	Taiwan	High-speed train	334	SEM	TAM
	7	Chowdhury and Ceder [23]	2013	New Zealand	Public transport	223	DS	TPB
	8	Chowdhury and Ceder [24]	2013	New Zealand	Public transport	263	SEM	TPB
	9	Donald, et al. [25]	2014	UK	Public transport	827	SEM	TPB
	10	Şimşekoğlu, et al. [7]	2015	Norway	Public transport	1039	SEM	-
	11	de Oña, et al. [26]	2015	Spain	Train	3,211	SEM	-
	12	Cheng and Tseng [27]	2016	Taiwan	Bus and subways	469	SEM	PV
	13	Chen [28]	2016	Taiwan	Bus	1401	SEM	-
	14	Hoang-Tung, et al. [29]	2016	Japan	Bus	333	LRM	-
	15	Madigan, et al. [30]	2017	Greece	Automated Guided Vehicle	315	LRM	UTAUT
	16	Hasnine, et al. [31]	2018	USA	Public transport	15,226	LRM	-
	17	Mugion, et al. [32]	2018	Italia	Public transport	114	SEM	-
	18	Hoang-Tung and Kubota [33]	2019	Japan	Bus	270	SEM	-
	19	Sener, et al. [34]	2020	USA	Subway	750	LRM	-
	20	König and Grippenkoven [35]	2020	Germany	Public transport	205	SEM	UTAUT
	21	Tran, et al. [36]	2020	Japan	Bus	1604	SEM	-
	22	Chee, et al. [37]	2020	Switzerland	Bus	574	SEM	-
	23	Kassens-Noor, et al. [38]	2020	USA	Bus	1,468	LRM	-
	24	Shaaban and Maher [39]	2020	Qatar	Public transport	270	LRM	TPB
	25	De Vos, et al. [40]	2020	Canada	Public transport	986	LRM	-
	26	Halawani and Rehimi [41]	2021	Saudi Arabia	Bus	953	LRM	-
	27	Mouratidis and Serrano [42]	2021	Noway	Bus	117	LRM	-
	28	Chee, et al. [43]	2021	Switzerland	Bus	185	SEM	-
	29	Nayum and Nordfjærn [44]	2021	Norway	Public transport	441	SEM	TPB
	30	Horjus, et al. [45]	2022	Holland	Bus	710	LRM	UTAUT
Low- and middle-income countries	1	Nurdden, et al. [46]	2007	Malaysia	Public transport system	1200	LRM	-
	2	Fujii and Van [47]	2009	Viet Nam	Bus	282	LRM	-
	3	Wang, et al. [48]	2013	China	Metro	437	ML	-
	4	Wang, et al. [49]	2013	China	Public transport system	460	LRM	-
	5	Zhao, et al. [50]	2013	China	Bus	467	EFA, CFA, SEM	-
	6	Van, et al. [51]	2014	6 Southeast Asian countries	Public transport system	1118	ML	-
	7	Borhan, et al. [52]	2014	Malaysia	Public transport system	290	SEM	-
	8	Ambak, et al. [53]	2016	Malaysia	Bus	282	LRM	-
	9	Zailani, et al. [54]	2016	Malaysia	Public transport system	392	SEM - PLS	TPB
	10	Zhang, et al. [55]	2016	China	Public transport system	465	SEM	-
	11	Feng and Li [56]	2016	China	Bike	608	LRM	-
	12	Yazdanpanah and Hadji Hosseinlou [57]	2017	Iran	Public transport system	557	SEM	-

STT	Author	Year	Country	Public transport	Sample size	Model	Theory
13	Fu and Juan [58]	2017	China	Public transport system	1616	SEM	TPB, CST
14	Irtema, et al. [59]	2018	Malaysia	Metro	412	SEM	TPB
15	Kwan, et al. [60]	2018	Malaysia	Metro	509	ML	-
16	Kang, et al. [61]	2019	Malaysia	Public transport system	317	SEM - PLS	TPB
17	Borhan, et al. [62]	2019	Northern Africa	Metro	338	SEM	TPB
18	Dirgahayani and Sutanto [63]	2020	Indonesia	Metro	193	SEM	TPB, TSB
19	Hussain [64]	2020	Malaysia	Metro	400	SEM	TPB
20	Zhang, et al. [65]	2020	China	Shared media	356	SEM	TPB
21	Brohi, et al. [66]	2021	Pakistan	Metro	240	LRM	TPB
22	Shah, et al. [67]	2021	Pakistan	Public transport system	Unclear	SEM – PLS	-
23	Ng and Phung [68]	2021	Viet Nam	Public transport system	873	SEM	TPB
24	Brohi, et al. [69]	2021	Pakistan	Metro	385	SEM	TPB
25	Matubatuba, et al. [70]	2022	South Africa	Bus	227	SEM	TAM, TPB
26	Baqarizky and Sumabrata [71]	2022	Indonesia	Metro and bus	250	LRM	-
27	Ating, et al. [72]	2022	Malaysia and Philipine	Public transport system	250	SEM – PLS	-
28	Bandyopadhyaya and Bandyopadhyaya [73]	2022	Ấn Độ	Public transport system	303	SEM	TPB
29	Mahardika, et al. [74]	2022	Indonesia	Metro	412	CFA, SEM	TPB
30	Zhao, et al. [75]	2022	China	Public transport system	761	CFA, SEM	TPB & PRT

Note: LRM: Linnear regression model; CFA: Confirmatory Factor Analysis; ML: Logistic Regression; DS: Descriptive Statistics; PV:Perceived Value; TPB: Theory of Planned Behavior; TAM: Technology Acceptance Model; UTAUT: Unified Theory of Acceptance and Use of Technology; MGDB: Model of goal-directed behavior.

3.1.2. Studies in low- and middle-income countries

In most low- and middle-income countries, public transport is still not considered to be a major form of mobility. Most are still in under the construction, development and completion. This pushes the governments of these countries to pay more attention to the research on the intention to use the public transport system, thereby aiming to develop it to perfection according to the expectation of the passengers. Encourage and attract passengers to use, increase the number of people using the system in the future, increase investment efficiency and step by step to achieve the sustainable development of urban transport systems.

The results of a synthesis of research papers on passenger intention conducted in developing countries show that there are 30 related documents that are relevant to the identified research topic. The research area found in these studies is mainly concentrated in Asian countries such as Malaysia (08 documents), China (08 documents), Indonesia (03 documents) and Vietnam (02 documents).

Most of the studies used quantitative methods and no qualitative studies were found. Which, the Structural Equation Model (SEM) is commonly used with 19/30 documents, of which 04 documents use the calculation method of the SEM model which is the least squares of each part (PLS). Besides SEM, some other models are also used such as the linear regression model (07 documents), or the logistic regression model (03 documents).

The data analysis in the studies of intention mostly use well-known theories as the foundation to build the analytical model. The theory of planned behaviour (TPB) is used the most (15 documents) to analyze the behaviour of passengers with 3 variables (attitude, subjective norm, perceived behavioural control). TPB theory is also extended by some authors by adding new constructs or combining with some other theories to develop new models. In addition, many theories have been synthesized for research such as Theory of Interpersonal Behavior (TIB), Theory of Belief in Specific Policies (TDM).

3.2. Studies on customer loyalty in public transport

3.2.1. Studies in high-income countries

The studies on passenger loyalty in the field of public transport have been considered to be the main interesting research topic of many scientists in the past decade. This topic is very important and necessary as the findings can be used to develop strategies aiming to increase public transport ridership. Research papers are mainly found in high-income countries where public transport systems are well organised and investigated. A research review on the loyalty of public transport users includes 30 related research papers, mainly concentrated in countries such as the United States (10 documents), Taiwan (07 documents), Canada (03 documents), Italy (02 documents), Spain, Portugal, Denmark, (01 document) and cities in Europe (02 documents)

In the synthesized studies on the loyalty of public transport vehicle users, the authors use analytical models such as the structural equation model (SEM), linear regression model (Regression model), factor analysis (EFA), or descriptive statistics. Specifically, there are

17/30 research articles using structural equation modelling, of which some studies also use more in-depth analytical methods such as multi-group analysis (SEM-MGA) [76], and multi-factor analysis model (SEM-MIMIC), in addition, there is SEM model according to least squares method (SEM-PLS).

Regarding the linear regression model, some authors also used it to study the loyalty of passengers to the public transport system, specifically, 08/30 related research documents were found, and some still used logistic regression method and VAR model for analysis. In addition, in the literature review, there is also a statistical model of factor analysis with 01/30 related documents, and a descriptive statistical analysis model with 02/30 documents.

3.2.2. Studies in low- and middle-income countries

In low- and middle-income countries, most public transport systems are not well developed and people are still not interested in this form of transportation. Therefore, the research on customer loyalty towards public transport is still limitted. Similar to the above sections, after searching documents, the synthesis found 30 documents related to the research topic. All the documents found are in the Asian region, in which mainly the studies were carried out in China with a relatively developed public transport system.

A majority of the studies found did not use any background theory to build the research model, although most of the synthesized studies used SEM structural equation modelling (27 documents) to analyze the data. A few authors have used theories to support the developed models. For example, in research [77, 78], the author uses the theory of satisfaction and loyalty to examine the factors affecting loyalty. Or the author's research Yilmaz, et al. [78] uses both the satisfaction and loyalty theory and the confirmative expectation theory to measure the influence of customer expectations, perceived quality, perceived value, customer satisfaction, and customer complaints on customer loyalty using the metro in Eskisehir, Turkey.

Table 2 provides a detailed overview of the analysis. Accordingly, analytical models are synthesized in very diverse documents. In which the SEM structural equation model is still found in most of the related documents (27 documents). Some authors also combine the SEM model with other analytical methods such as descriptive statistics [79], exploratory factor analysis and confirmatory factor analysis [80], and multigroup analysis [81]. SEM methods used in previous studies are also different. Partial Least Squares based Structural Equation Modeling (PLS-SEM) was employed to analyze loyalty in the documents [82-84]. Besides, simple statistical analysis methods are used by scholars to study the relationship between service quality, customer satisfaction and loyalty; or regression model was used to study six dimensions of service quality that have a significant positive impact on passenger satisfaction and passenger loyalty in Fuzhou Metro Line 1, China [85].

The data used for analysis is mainly collected by the authors through many forms such as an online questionnaire survey [81, 86], a combination of both face-to-face and online survey methods [87], a survey by asking passengers directly [88, 89], or using electronic information cards combined with direct surveys [77]. Which, a questionnaire survey is still the most popular form of data collection with 17 documents using this method.

Table 2. *Synthesis of studies on the loyalty of public transport users in high- and low- and middle-income countries*

	ST	Author	Year	Country	Transportation	Sample size	Model	Theory
High income countries	1	Burkhardt [90]	2003	USA	Public transport	88	DS	-
	2	Jen and Hu [91]	2003	Taiwan	Bus	750	CFA	-
	3	Wen, et al. [92]	2005	Taiwan	Bus	600	SEM	-
	4	Chou and Kim [93]	2009	Taiwan and Korea	High-speed train	418 and 414	SEM	-
	5	Minser and Webb [94]	2010	USA	Bus and Train	2439	SEM	-
	6	Webb [95]	2010	Chicago	Bus and Train	2439	SEM	-
	7	Liu and Liao [96]	2010	Taiwan	High-speed train	884	DS	-
	8	Figler, et al. [97]	2011	Chicago	Bus	2439	LRM	-
	9	Kim and Ulfarsson [98]	2012	USA	Light train	824	LRM	-
	10	Kuo and Tang [99]	2013	Taiwan	Light train	341	SEM	-
	11	Chou and Yeh [100]	2013	Taiwan	High-speed train	292	SEM	-
	12	De Oña, et al. [101]	2013	Spain	Bus	1200	SEM	-
	13	Zhao, et al. [102]	2014	USA	Public transport	264	SEM	-
	14	Carreira, et al. [103]	2014	USA	Bus	1226	SEM	-
	15	Chou, et al. [104]	2014	Taiwan	High-speed train	1235	SEM	-
	16	Imaz, et al. [105]	2015	Canada	Subway and Bus	1536	LRM	-
	17	Shiftan, et al. [106]	2015	Israel	Bus and Train	286(Train) 219(Bus).	SEM	CST
	18	Van Lierop and El-Geneidy [107]	2016	Canada	Subway and Bus	2568	SEM	-
	19	Tao, et al. [108]	2017	Australia	Bus	469	CFA	-
	20	Chang and Yeh [109]	2017	Taiwan	Bus	349	SEM	-
	21	van Lierop and El-Geneidy [110]	2018	Canada	Bus	395	LRM	-
	22	Allen, et al. [111]	2019	Spain	Subway	2500	SEM	-

	ST	Author	Year	Country	Transportation	Sample size	Model	Theory
	23	Losada-Rojas, et al. [13]	2019	USA	Train	908	LRM	MAM
	24	Carrel and Li [112]	2019	USA	Public transport	850	LRM	-
	25	Kawabata, et al. [113]	2020	13 cities in Europe	Public transport	1000	LRM	-
	26	Allen, et al. [114]	2020	Italia	Train	96,763	SEM	-
	27	Vicente, et al. [115]	2020	Portugal	Public transport	583	SEM	-
	28	Park, et al. [116]	2021	USA	Public transport	445	SEM	CLS
	29	Mas-Machuca, et al. [117]	2021	4 European countries	Public transport	429	SEM	-
	30	Ingvardson and Nielsen [118]	2022	Đan Mạch	Public transport	17,355	LRM	-
Low- and middle-income countries	1	Canming and Jianjun [119]	2011	China	Metro	386	SEM	-
	2	Kamaruddin, et al. [79]	2012	Malaysia	Public transport	467	SEM; DS	-
	3	Esmaeili, et al. [120]	2013	Iran	Metro	384	DS	-
	4	Hussein, et al. [121]	2014	Indonesia	Bus	152	SEM	-
	5	Jomnonkwao, et al. [122]	2015	Thailand	Bus	2554	SEM	-
	6	Shen, et al. [82]	2016	China	Metro	813	SEM	-
	7	Ratanavaraha, et al. [81]	2016	Thailand	Public transport system	3261	SEM	-
	8	Fu and Juan [123]	2017	China	Bus	6837	LRM	-
	9	Yilmaz and Ari [124]	2017	Turkey	Metro	352	SEM	-
	10	Fu, et al. [125]	2018	China	Bus	429	SEM	SLT; ECT
	11	Sun [80]	2018	China	Public transport system	664	EFA; CFA; SEM	-
	12	Li, et al. [126]	2018	China	Public transport system	337	SEM	-
	13	Pratiwi, et al. [83]	2018	Indonesia	Public transport system	860	SEM	-
	14	Ha, et al. [84]	2019	Malaysia	Public transport system	179	SEM	-
	15	Sun, et al. [127]	2019	China	Bus	664	SEM	-
	16	Egi and Budhi [128]	2019	Indonesia	Metro	200	SEM	-
	17	Xue, et al. [87]	2019	China	Metro	523	LRM	-
	18	Sulistyo and Development [129]	2020	Indonesia	Public transport system	160	SEM	-
	19	Wang, et al. [130]	2020	China	Metro	220	SEM	-
	20	ALÇURA, et al. [88]	2021	Turkey	Metro	900	SEM	-
	21	Wonglakorn, et al. [89]	2021	Thailand	Metro	600	SEM	-
	22	Sun, et al. [77]	2021	China	Public transport system	664	SEM	-
	23	Yilmaz, et al. [78]	2021	Turkey	Metro	360	SEM	SLT
	24	Hizam, et al. [86]	2021	Malaysia	Metro	141	SEM	SLT; ECT
	25	ALÇURA, et al. [88]	2021	Turkey	Metro	900	SEM	-
	26	Nguyen-Phuoc, et al. [131]	2021	Viet Nam	Bus	870	SEM	-
	27	Shen and Yahya [132]	2021	Asian countries	Plane	200	SEM	ECT
	28	Mohamad [133]	2022	Malaysia	Metro	360	SEM	-
	29	Nguyen-Phuoc, et al. [134]	2022	Viet Nam	Bus	910	SEM	-
	30	Nguyen-Phuoc, et al. [135]	2022	Viet Nam	Bus	870	SEM	SIT

Note: *LRM: Linnear regression model; CFA: Confirmatory Factor Analysis; ML: Logistic Regression; DS: Descriptive Statistics; PV:Perceived Value; TPB: Theory of Planned Behavior TAM: Technology Acceptance Model; UTAUT: Unified Theory of Acceptance and Use of Technology; MGDB: Model of goal-directed behavior*

4. Factors affecting the intention to use and loyalty of public transport users in SEM analysis

4.1. Factors affecting customers' intention to use

4.1.1. Research results in high-income countries

Table 3 shows the summary of factors that have a significant impact on the intention to use public transport of people who have not used publish transport.Three TPB based factor, including "Attitude", "Perceived behavioural control", "Subjective norm" are common factors which were explored by previous scholars in this topic. This can be the reason that TPB was mostly chosen to explore the intention to use. For example, in a study by Chen, et al. [10] the author uses the theory of planned behaviour to find out the impact of factors such as attitude, perceived behavioural control and subjective norm on the shift to public transport.

Table 3. *Factors affecting the intention to use publish transport of potential passengers*

Authors	**Economy**	**Countries**	Attitude	Subjective norms	Perceived behavioural	Service quality	Trust	Environment concern	External influence	Novelty seeking	Perceived social	Descriptive norms	Habits	Percevied value	Image	Past behaviour	Situational factors	Perceived ethic	Percevied risk	Risk of COVID-19	Percevied benefits	Percevied easy to use
Carrus, et al. [17]	High-income countries	Italia	X	X	X											X						
Hsiao and Yang [18]		Taiwan	X	X	X																	
Chen and Chao [19]		Taiwan	X	X	X								X									
JEN, et al. [22]		Taiwan	X																			
Chowdhury and Ceder [24]		NewZealand			X																	
Donald, et al. [25]		UK	X	X	X								X									
Şimşekoğlu, et al. [7]		Norway	X										X									
Hoang-Tung and Kubota [33]		Japan	X	X									X	X								
Tran, et al. [36]		Japan	X	X	X																	
Chee, et al. [37]		Switzerland				X																
Nayum and Nordfjærn [44]		Norway	X	X	X																	
Zhao, et al. [50]	Low- and middle-income countries	China				X																
Borhan, et al. [52]		Malaysia	X			X		X														
Zailani, et al. [54]		Malaysia	X	X	X										X	X						
Zhang, et al. [55]		China		X							X	X										
Yazdanpanah and Hadji Hosseinlou [57]		Iran											X									
Fu and Juan [58]		China	X	X	X								X									
Irtema, et al. [59]		Malaysia	X	X	X	X								X								
Kang, et al. [61]		Malaysia				X																
Borhan, et al. [62]		Africa	X	X	X		X		X	X												
Dirgahayani and Sutanto [63]		Indonesia	X	X	X																	
Hussain [64]		Malaysia	X	X	X		X		X	X							X					
Zhang, et al. [65]		China	X	X	X			X														
Shah, et al. [67]		Pakistan	X	X	X			X														
Ng and Phung [68]		Vietnam	X	X	X			X				X										
Brohi, et al. [69]		Pakistan	X	X	X																	
Matubatuba, et al. [70]		South Africa	X	X	X																X	X
Ating, et al. [72]		Malaysia & Philipine				X	X				X			X								
Bandyopadhyaya and Bandyopadhyaya [73]		India	X	X	X																	
Mahardika, et al. [74]		Indonesia	X	X	X		X		X	X								X				
Zhao, et al. [75]		China	X	X	X														X	X		

4.1.2. Research results in low- and middle-income countries

The factors affecting the intention to use passengers in low- and middle-income countries have been studied by many previous scholars using mainly the theory of planned behaviour TPB [54, 63, 64, 67, 68]. Among these documents, some studies used original TPB model [63] while others used extended TPB model by adding new variables such as environmental concerns environment [67, 68], overall behaviour, past behaviour [54], situational factors, trust, external influence, seeking novelty [64].

4.2. Factors affecting passenger loyalty

4.2.1. Research in high-income countries

Regarding the studies about loyalty towards public transport systems among customers in high-income countries, a number of factors affecting loyalty are found. In this paper, we focus on studies using SEM approach to explore the loyalty topic as this method is recognised to be a dominated method in this area. Through the synthesis of studies in Table 4, it shows that common factors (top 3) found to influecing loyalty are "service quality", "satisfaction", and "experience". “Image”, “trust”, “cost” and other ones are the influencing factors found prior studies.

Table 4. *Factors affecting the loyalty of publish transport passengers among high-income countries (SEM methods)*

Authors	Countries	Influencing factors										
		Service quality	Satisfaction	Experience	Image	Trusk	Cost	Informstion display	Perceived value	Social environment	Perceived value	Others
Jen and Hu [91]	Taiwan	X					X		X			X
Wen, et al. [92]	Taiwan	X	X			X	X		X			
Chou and Kim [93]	Taiwan and Korea	X	X		X							
Minser and Webb [94]	USA	X	X	X	X							
Webb [95]	Chicago	X	X									
Kuo and Tang [99]	Taiwan	X	X		X							
Chou and Yeh [100]	Taiwan	X	X		X							
De Oña, et al. [101]	Spain	X					X	X				
Zhao, et al. [102]	USA	X	X	X							X	
Carreira, et al. [103]	USA	X					X	X		X		
Chou, et al. [104]	Taiwan	X	X									
Shiftan, et al. [106]	Israel	X		X		X			X			
Van Lierop and El-Geneidy [107]	Canada	X				X		X				
Chang and Yeh [109]	Taiwan	X	X	X	X							
Allen, et al. [111]	Spain	X	X									
Allen, et al. [114]	Italia	X		X		X	X	X				
Vicente, et al. [115]	Portugal		X	X								
Park, et al. [116]	USA	X	X							X		
Mas-Machuca, et al. [117]	4 EU countries	X	X			X						
Total		18	13	6	5	5	5	4	3	2	1	1

Table 5. *Factors affecting the loyalty of publish transport passengers among low- and middle-income countries (SEM methods)*

Authors	Countries	Influencing factors																
		Satisfaction	Service quality	Perceived value	Image	Expectation	Complain	Cost	Trust	Safety	Perceived safety and security	Past experience	Attraction of private vehicles	Accessibility	Perceived usefulness	Suitable behaviour of other users	Interaction among users	Service asmosphere	Cues from other passengers
Canming and Jianjun [119]	China	X	X		X		X												
Kamaruddin, et al. [79]	Malaysia	X	X			X													
Hussein, et al. [121]	Indonesia																		
Jomnonkwao, et al. [122]	Thailand																		
Shen, et al. [82]	China	X	X	X	X	X													
Ratanavaraha, et al. [81]	Thailand	X	X																
Yilmaz and Ari [124]	Turkey	X	X		X		X												
Fu, et al. [125]	China	X	X	X	X	X		X											
Li, et al. [126]	China	X	X					X					X						
Pratiwi, et al. [83]	Indonesia	X	X	X	X							X			X				
Sun [80]	China	X	X		X		X												
Egi and Budhi [128]	Indonesia	X	X																
Sun, et al. [127]	China	X	X	X		X		X		X									
Zhang, et al. [136]	China	X	X	X		X	X												
Ha, et al. [84]	Malaysia		X	X					X	X				X					
Sulistyo and Development [129]	Indonesia	X	X																
Wang, et al. [130]	China	X	X																
ALÇURA, et al. [88]	Turkey	X	X	X	X				X										
Hizam, et al. [86]	Malaysia	X	X																
Wonglakorn, et al. [89]	Thailand	X	X	X				X	X										
Yilmaz, et al. [78]	Turkey	X	X	X		X	X												
Sun, et al. [77]	China	X	X																
Nguyen-Phuoc, et al. [131]	Vietnam	X	X		X						X								
Shen and Yahya [132]	Asian countries	X	X					X											
Mohamad [133]	Malaysia	X	X							X									
Nguyen-Phuoc, et al. [134]	Vietnam					X										X	X	X	
Nguyen-Phuoc, et al. [135]	Vietnam			X							X								X
Total		22	18	15	8	7	5	5	3	3	2	1	1	1	1	1	1	1	1

4.2.2. Research in low- and middle-income countries

Differ to the studies in high-income countries, the three most common factors affecting passenger loyalty which were found in studies in low- and middle-income countries include satisfaction, service quality, perceived value. Besides, several other factors that are less of concern can be mentioned such as the attraction of private vehicles [126], accessibility [84], and usefulness [83]. It can be seen that, more number of factors are explored in loyaly studies in low- and middle-income countries.

5. Discussion and conclusion

5.1. Conclusion

This study aims to provide an overview of studies exploring the intention to use and the loyalty of passengers towards public transport systems worldwide. Research results provide scientists with an overview of the literature on related topics by showing the research context and boundaries of the literature, research methods and analysis models, variable affecitng intention to use and loyalty... Thereby, it can provide scientists with the basis to orientate the issues that need to be focused on in future research. Research results can also help guide the specific consideration of priority policies and solutions which aim to encourage and attract more users, thereby helping to maintain and increase the number of public transport users, and increase investment efficiency from public transport systems.

The results of the review show that most research on the intention to use public transport has been carried out in low- and middle-income countries in the past decade. The statistics in Table 1 show that the research area is mainly concentrated in Asian countries; all of the studies that were aggregated used quantitative data and were collected through questionnaire surveys. The impact of the factors considered is usually not only one-way, but also interacts with each other in many directions, so the studies often use SEM to analyze collected data. In which, PLS-SEM seems to be used more common for the last few years. The main reason can be due to the more advances of the PLS-SEM model.

Regarding the research theory, the intention to use and the loyalty of passengers towards public transport systems is mainly based on the theories in the field of marketing. Concepts and factors such as service quality, satisfaction, and perceived value are often used to test the influence on the dependent variables, which are the intention to use and the loyalty of passengers to the systems. In addition, the scholars also explore other factors that are less concerning such as the attraction of alternatives, the cost of shifting to public transport, the image of the transport company, the past experience, environmental concerns, and other related psychosocial factors.

The research results are meaningful, providing important bases for managers and executives to orientate and consider priority policies and solutions based on verifying the impact of important factors found in the study. At the same time, providing basic arguments for scientists to focus on further research in the future, aiming to encourage and attract more users to use public transport.

5.2. Future research directions

Future research will be obtained by investigating the relationship between factors of little interest in the results of the meta-analysis. Similarly, the understanding of loyalty and intention to use can be increased by evaluating in different research context, such as in the post-COVID-19 context where customers may have a fear of using public transport. As such, other theories related to prevention behavviour can be employed. For instant, the health belief model can be used to test whether COVID-19 affects the intention to use and the loyalty of public transport users. In terms of theory used to explore the intention to use, there are some new extended TPB model that have been used successfully in other field. Hence, find and test these models in the context of behavioural intention towards publish transport can be a good direction.

REFERENCES

[1] A. Consulting. *ABeam Insights: The Motorcycle Tipping Point in ASEAN*, 2022.

[2] D. Q. Nguyen-Phuoc, O. Oviedo-Trespalacios, N. D. Q. Vo, Q. T. Le, D. N. Su, and M. X. Cao, "Prevalence and factors associated with turn signal neglect-related crashes among motorcyclists and car drivers in Vietnam". *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 73, pp. 38-49, 2020.

[3] D. Q. Nguyen-Phuoc, G. Currie, C. De Gruyter, and W. Young, "Net impacts of streetcar operations on traffic congestion in Melbourne, Australia", *Transportation Research Record: Journal of the Transportation Research Board*, vol. 2648, no. 1, pp. 1-9, 2017.

[4] F. Delussu, F. Imran, C. Mattia, and R. Meo, "Fuel Prediction and Reduction in Public Transportation by Sensor Monitoring and Bayesian Networks", *Sensors*, vol. 21, no. 14, p. 4733, 2021.

[5] L. Steg, "Car use: lust and must. Instrumental, symbolic and affective motives for car use", *Transportation Research Part A: Policy and Practice*, vol. 39, no. 2, pp. 147-162, 2005.

[6] T. Nguyen. "Solutions to develop effective public passenger transport". *Ho Chi Minh City Law Newspaper* 2022. Available: https://plo.vn/cac-giai-phap-phat-trien-van-tai-hanh-khach-cong-cong-hieu-qua-post691090.html [Accessed 15/01/2023]

[7] Ö. Şimşekoğlu, T. Nordfjærn, and T. Rundmo, "The role of attitudes, transport priorities, and car use habit for travel mode use and intentions to use public transportation in an urban Norwegian public", *Transport Policy*, vol. 42, pp. 113-120, 2015.

[8] A. Nayum, T. Nordfjærn, "Predictors of public transport use among university students during the winter: A MIMIC modelling approach", *Travel Behaviour and Society*, vol. 22, pp. 236-243, 2021.

[9] C.-H. Hsiao, C. Yang, "Predicting the travel intention to take High Speed Rail among college students", *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 13, no. 4, pp. 277-287, 2010.

[10] C.-F. Chen, W.-H. Chao, "Habitual or reasoned? Using the theory of planned behavior, technology acceptance model, and habit to examine switching intentions toward public transit", *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 14, no. 2, pp. 128-137, 2011.

[11] S. Chowdhury and A. J. Ceder, "A psychological investigation on public-transport users' intention to use routes with transfers", *International Journal of Transportation*, vol. 1, no. 1, pp. 1-20, 2013.

[12] I. J. Donald, S. R. Cooper, and S. M. Conchie, "An extended theory of planned behaviour model of the psychological factors affecting commuters' transport mode use", *Journal of Environmental Psychology*, vol. 40, pp. 39-48, 2014.

[13] L. L. Losada-Rojas, C. Gkartzonikas, V. D. Pyrialakou, and K. Gkritza, "Exploring intercity passengers' attitudes and loyalty to intercity passenger rail: Evidence from an on-board survey", *Transport Policy*, vol. 73, pp. 71-83, 2019.

[14] M. S. Hasnine, T. Lin, A. Weiss, and K. N. J. Habib, "Determinants of travel mode choices of post-secondary students in a large metropolitan area: The case of the city of Toronto", *Journal of Transport Geography*, vol. 70, pp. 161-171, 2018.

[15] I. N. Sener, K. Lee, C. P. Durand, A. O. Oluyomi, and H. W. J. Kohl III, "Intention to use light-rail transit in Houston, Texas, United States: Findings from the Travel-Related Activity in Neighborhoods study", *International Journal of Sustainable Transportation*, vol. 14,

no. 12, pp. 944-955, 2020.

[16] K. Shaaban and A. Maher, "Using the theory of planned behavior to predict the use of an upcoming public transportation service in Qatar", *Case Studies on Transport Policy*, vol. 8, no. 2, pp. 484-491, 2020.

[17] G. Carrus, P. Passafaro, and M. Bonnes, "Emotions, habits and rational choices in ecological behaviours: The case of recycling and use of public transportation", *Journal of Environmental Psychology*, vol. 28, no. 1, pp. 51-62, 2008.

[18] C.-H. Hsiao and C. Yang, "Predicting the travel intention to take High Speed Rail among college students", *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 13, no. 4, pp. 277-287, 2010.

[19] C.-F. Chen and W.-H. Chao, "Habitual or reasoned? Using the theory of planned behavior, technology acceptance model, and habit to examine switching intentions toward public transit", *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 14, no. 2, pp. 128-137, 2011.

[20] W.-T. Lai and C.-F. Chen, "Behavioral intentions of public transit passengers - The roles of service quality, perceived value, satisfaction and involvement", *Transport Policy*, vol. 18, no. 2, pp. 318-325, 2011.

[21] J. H.-C. Wu, L. Y.-C. Lin, and F.-S. Hsu, "An empirical analysis of synthesizing the effects of service quality, perceived value, corporate image and customer satisfaction on behavioral intentions in the transport industry: A case of Taiwan high-speed rail", *Innovative Marketing*, vol. 7, no. 3, pp. 83-99, 2011.

[22] W. Jen, M. L. Lu, W.-T. Wang, And Y.-T. Chang, "Effects of perceived benefits and perceived costs on passenger's intention to use self-ticketing kiosk of Taiwan high speed rail corporation", *Journal of the Eastern Asia Society for Transportation Studies*, vol. 10, pp. 215-230, 2013.

[23] S. Chowdhury and A. Ceder, "The effect of interchange attributes on public-transport users' intention to use routes involving transfers", *Psychology and Behavioral Sciences*, vol. 2, no. 1, pp. 5-13, 2013.

[24] S. Chowdhury and A. Ceder, "A psychological investigation on public-transport users' intention to use routes with transfers", *International Journal of Transportation*, vol. 1, no. 1, pp. 1-20, 2013.

[25] I. J. Donald, S. R. Cooper, and S. M. Conchie, "An extended theory of planned behaviour model of the psychological factors affecting commuters' transport mode use", *Journal of Environmental Psychology*, vol. 40, pp. 39-48, 2014.

[26] R. de Oña, J. L. Machado, and J. de Oña, "Perceived service quality, customer satisfaction, and behavioral intentions: structural equation model for the Metro of Seville, Spain", *Transportation Research Record*, vol. 2538, no. 1, pp. 76-85, 2015.

[27] Y.-H. Cheng and W.-C. Tseng, "Exploring the effects of perceived values, free bus transfer, and penalties on intermodal metro–bus transfer users' intention", *Transport Policy*, vol. 47, pp. 127-138, 2016.

[28] H.-K. Chen, "Structural interrelationships of group service quality, customer satisfaction, and behavioral intention for bus passengers", *International Journal of Sustainable Transportation*, vol. 10, no. 5, pp. 418-429, 2016.

[29] N. Hoang-Tung, A. Kojima, and H. Kubota, "Impacts of travellers' social awareness on the intention of bus usage", *IATSS Research*, vol. 39, no. 2, pp. 130-137, 2016.

[30] R. Madigan, T. Louw, M. Wilbrink, A. Schieben, and N. Merat, "What influences the decision to use automated public transport? Using UTAUT to understand public acceptance of automated road transport systems", *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 50, pp. 55-64, 2017.

[31] M. S. Hasnine, T. Lin, A. Weiss, and K. N. Habib, "Determinants of travel mode choices of post-secondary students in a large metropolitan area: The case of the city of Toronto", *Journal of Transport Geography*, vol. 70, pp. 161-171, 2018.

[32] R. G. Mugion, M. Toni, H. Raharjo, L. Di Pietro, and S. P. Sebathu, "Does the service quality of urban public transport enhance sustainable mobility?", *Journal of Cleaner Production*, vol. 174, pp. 1566-1587, 2018.

[33] N. Hoang-Tung and H. Kubota, "Clarifying multiple-mode decision making in conventional psychological models: A consideration of the influential mechanism of car use's characteristics on the behavioral use of public transportation", *IATSS Research*, vol. 43, no. 2, pp. 114-121, 2019.

[34] I. N. Sener, K. Lee, C. P. Durand, A. O. Oluyomi, and H. W. Kohl III, "Intention to use light-rail transit in Houston, Texas, United States: Findings from the Travel-Related Activity in Neighborhoods study", *International Journal of Sustainable Transportation*, vol. 14, no. 12, pp. 944-955, 2020.

[35] A. König and J. Grippenkoven, "The actual demand behind demand-responsive transport: Assessing behavioral intention to use DRT systems in two rural areas in Germany", *Case Studies on Transport Policy*, vol. 8, no. 3, pp. 954-962, 2020.

[36] Y. Tran, T. Yamamoto, H. Sato, T. Miwa, and T. Morikawa, "Attitude toward physical activity as a determinant of bus use intention: A case study in Asuke, Japan", *IATSS Research*, vol. 44, no. 4, pp. 293-299, 2020.

[37] P. N. E. Chee, Y. O. Susilo, and Y. D. Wong, "Determinants of intention-to-use first-/last-mile automated bus service", *Transportation Research Part A: Policy and Practice*, vol. 139, pp. 350-375, 2020.

[38] E. Kassens-Noor, Z. Kotval-Karamchandani, and M. Cai, "Willingness to ride and perceptions of autonomous public transit", *Transportation Research Part A: Policy and Practice*, vol. 138, pp. 92-104, 2020.

[39] K. Shaaban and A. Maher, "Using the theory of planned behavior to predict the use of an upcoming public transportation service in Qatar", *Case Studies on Transport Policy*, vol. 8, no. 2, pp. 484-491, 2020.

[40] J. De Vos, E. O. D. Waygood, and L. Letarte, "Modeling the desire for using public transport", *Travel Behaviour and Society*, vol. 19, pp. 90-98, 2020.

[41] A. T. Halawani and F. Rehimi, "Evaluation of the intention to shift to public transit in Saudi Arabia", *Transportation Research Part D: Transport and Environment*, vol. 94, p. 102809, 2021.

[42] K. Mouratidis and V. C. Serrano, "Autonomous buses: Intentions to use, passenger experiences, and suggestions for improvement", *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 76, pp. 321-335, 2021.

[43] P. N. E. Chee, Y. O. Susilo, and Y. D. Wong, "Longitudinal interactions between experienced users' service valuations and willingness-to-use a first-/last-mile automated bus service", *Travel Behaviour and Society*, vol. 22, pp. 252-261, 2021.

[44] A. Nayum and T. Nordfjærn, "Predictors of public transport use among university students during the winter: A MIMIC modelling approach", *Travel Behaviour and Society*, vol. 22, pp. 236-243, 2021.

[45] J. Horjus, K. Gkiotsalitis, S. Nijënstein, and K. Geurs, "Integration of shared transport at a public transport stop: mode choice intentions of different user segments at a mobility hub", *Journal of Urban Mobility*, vol. 2, p. 100026, 2022.

[46] A. Nurdden, R. Rahmat, and A. J. Ismail, "Effect of transportation policies on modal shift from private car to public transport in Malaysia", *Journal of Applied Sciences*, vol. 7, no. 7, pp. 1013-1018, 2007.

[47] S. Fujii and H. T. Van, "Psychological determinants of the intention to use the bus in Ho Chi Minh City", *Journal of Public Transportation*, vol. 12, no. 1, p. 6, 2009.

[48] Y. Wang, L. Li, Z. Wang, T. Lv, L. Wang, and development, "Mode shift behavior impacts from the introduction of metro service: Case study of Xi'an, China", *Journal of Urban Planning and Development*, vol. 139, no. 3, pp. 216-225, 2013.

[49] L. Wang, L. Li, B. Wu, Y. Bai, "Private car switched to public transit by commuters, in Shanghai, China", *Procedia-Social and Behavioral Sciences*, vol. 96, pp. 1293-1303, 2013.

[50] L.-n. Zhao, W. Wang, X.-j. Hu, "The importance of resident's attitude towards service quality in travel choice of public transit", *Procedia-Social and Behavioral Sciences*, vol. 96, pp. 218-230, 2013.

[51] H. T. Van, K. Choocharukul, S. Fujii, "The effect of attitudes toward cars and public transportation on behavioral intention in commuting mode choice-A comparison across six Asian countries", *Transportation Research Part A: Policy and Practice*, vol. 69, pp. 36-44, 2014.

[52] M. N. Borhan, D. Syamsunur, N. M. Akhir, M. R. M. Yazid, A. Ismail, and R. A. Rahmat, "Predicting the use of public transportation: a case study from Putrajaya, Malaysia", *The Scientific World Journal*, vol. 2014, p. 784145, 2014.

[53] K. Ambak, K. K. Kasvar, B. D. Daniel, J. Prasetijo, and A. R. Abd Ghani, "Behavioral intention to use public transport based on theory of planned behavior", in *MATEC Web of Conferences*, vol. 47, p. 03008: EDP Sciences, 2016.

[54] S. Zailani, M. Iranmanesh, T. A. Masron, T.-H. Chan, "Is the intention to use public transport for different travel purposes determined by different factors?", *Transportation Research Part D: Transport and Environment*, vol. 49, pp. 18-24, 2016.

[55] D. Zhang, J.-D. Schmöcker, S. Fujii, and X. J. T. Yang, "Social norms and public transport usage: empirical study from Shanghai", vol. 43, no. 5, pp. 869-888, 2016.

[56] P. Feng and W. J. Li, "Willingness to use a public bicycle system: An example in Nanjing City", *Journal of Public Transport*, vol. 19, no. 1, p. 6, 2016.

[57] M. Yazdanpanah and M. J. Hadji Hosseinlou, "The role of personality traits through habit and intention on determining future preferences of public transport use", *Behavioral Sciences*, vol. 7, no. 1, p. 8, 2017.

[58] X. Fu and Z. J. T. Juan, "Understanding public transit use behavior: integration of the theory of planned behavior and the customer satisfaction theory", *Transportation*, vol. 44, no. 5, pp. 1021-1042, 2017.

[59] H. I. M. Irtema, A. Ismail, M. N. Borhan, A. M. Das, and A. B. Alshetwi, "Case study of the behavioural intentions of public transportation passengers in Kuala Lumpur", *Case Studies on Transport Policy*, vol. 6, no. 4, pp. 462-474, 2018.

[60] S. C. Kwan, R. Sutan, H. Hashim, "Trip characteristics as the determinants of intention to shift to rail transport among private motor vehicle users in Kuala Lumpur, Malaysia", *Sustainable cities and society*, vol. 36, pp. 319-326, 2018.

[61] A. S. Kang, K. Jayaraman, K.-L. Soh, W. P. Wong, "Convenience, flexible service, and commute impedance as the predictors of drivers' intention to switch and behavioral readiness to use public transport", *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 62, pp. 505-519, 2019.

[62] M. N. Borhan, A. N. H. Ibrahim, M. A. A. P. Miskeen, "Extending the theory of planned behaviour to predict the intention to take the new high-speed rail for intercity travel in Libya: Assessment of the influence of novelty seeking, trust and external influence", *Transportation Research Part A: Policy and Practice*, vol. 130, pp. 373-384, 2019.

[63] P. Dirgahayani and H. Sutanto, "The effect of transport demand management policy on the intention to use public transport: A case in Bandung, Indonesia", *Case Studies on Transport Policy*, vol. 8, no. 3, pp. 1062-1072, 2020.

[64] D. H. Hussain, "Predicting the commuter's willingness to use lrt, utilising the theory of planned behaviour and structural equation", *Journal of Applied Engineering Science*, vol. 18, no. 3, pp. 403-412, 2020.

[65] Y. Zhang and L. Li, "Intention of Chinese college students to use carsharing: An application of the theory of planned behavior", *Transportation Research Part F: Traffic Psychology and Behaviour*, vol. 75, pp. 106-119, 2020.

[66] S. Brohi, S. Kalwar, I. A. Memon, and A. Ghaffar, "Using the theory of planned behavior to identify the behavioral intention to use public transportation service: the case study of Karachi circular railway", *International Journal on Emerging Technologies*, vol. 12, no. 1, 317-322, 2021.

[67] M. H. Shah, I. A. Memon, A. H. Talpur, and W. A. Sethar, "Factors Influencing Private Transport Users to Shift Towards Public Transport In Karachi", *Engineering Science And Technology International Research Journal*, vol. 5, no. 1, pp. 61-65, 2021.

[68] P. Y. Ng and P. T. Phung, "Public transportation in Hanoi: Applying an integrative model of behavioral intention", *Case Studies on Transport Policy*, vol. 9, no. 2, pp. 395-404, 2021.

[69] S. Brohi, I. A. Memon, S. Kalwar, and N. J. P. Sahito, "Predicting the use of public transportation service: The case study of karachi circular railway", *PalArch's Journal of Archaeology of Egypt/Egyptology*, vol. 18, no. 3, pp. 4736-4748, 2021.

[70] R. Matubatuba and C. D. Meyer-Heydenrych, "Developing an intention to use amongst non-users of the Bus Rapid Transit (BRT) System: An emerging market perspective", *Research in Transportation Business & Management*, vol. 45, p. 100858, 2022.

[71] N. Baqarizky and R. J. Sumabrata, "Factor Analysis of Commuters' Willingness to Use Public Transport," in *IOP Conference Series: Earth and Environmental Science*, vol. 1000, no. 1, p. 012009: IOP Publishing, 2022.

[72] C. K. Mee, G. Subramaniam, R. Ating, and L. A. C. Sepeara, "Willingness to use Public Transport in Kuala Lumpur & Manila", *Environment-Behaviour Proceedings Journal*, vol. 7, no. 21, 411-419, 2022.

[73] V. Bandyopadhyaya and R. Bandyopadhyaya, "Understanding public transport use intention post Covid-19 outbreak using modified theory of planned behavior: Case study from developing country perspective", *Case Studies on Transport Policy*, vol. 10, no. 4, pp. 2044-2052, 2022.

[74] M. D. Mahardika, M. Z. Irawan, and F. P. Bastarianto, "Exploring the potential demand for Jakarta–Bandung high-speed rail", *Transportation Research Interdisciplinary Perspectives*, vol. 152, p. 100658, 2022.

[75] P. Zhao and Y. Gao, "Public transit travel choice in the post COVID-19 pandemic era: An application of the extended Theory of Planned behavior", *Travel Behaviour and Society*, vol. 28, pp. 181-195, 2022.

[76] J. Zhao, V. Webb, and P. Shah, "Customer loyalty differences between captive and choice transit riders", *Transportation Research Record*, vol. 2415, no. 1, pp. 80-88, 2014.

[77] S. Sun, L. Xu, Y. Yao, Z. Duan, "Investigating the determinants to retain spurious-loyalty passengers: A data-fusion based approach", *Transportation Research Part A: Policy and Practice*, vol. 152, pp. 70-83, 2021.

[78] V. Yilmaz, E. Ari, and Y. E. Oğuz, "Measuring service quality of the light rail public transportation: A case study on Eskisehir in Turkey", *Case Studies on Transport Policy*, vol. 9, no. 2, pp. 974-982, 2021.

[79] R. Kamaruddin, I. Osman, C. A. C. Pei, "Public transport services in klang valley: customer expectations and its relationship using SEM", *Procedia-Social and Behavioral Sciences*, vol. 36, pp. 431-438, 2012.

[80] S.-C. Sun, "Public transit loyalty modeling considering the effect of passengers' emotional value: a case study in Xiamen, China", *Journal of Advanced Transportation*, vol. 2018, p. 4682591, 2018.

[81] V. Ratanavaraha, S. Jomnonkwao, B. Khampirat, D. Watthanaklang, and P. Iamtrakul, "The complex relationship between school policy, service quality, satisfaction, and loyalty for educational tour bus services: A multilevel modeling approach", *Transport Policy*, vol. 45, pp. 116-126, 2016.

[82] W. Shen, W. Xiao, and X. J. T. P. Wang, "Passenger satisfaction evaluation model for Urban rail transit: A structural equation modeling based on partial least squares", *Transport Policy*, vol. 46, pp. 20-31, 2016.

[83] P. U. D. Pratiwi, N. Landra, and G. A. T. Kusuma, "The Construction of Public Transport Service Model to Influence the Loyalty of Customer", *Scientific Research Journal*, vol. 6, no. 2, pp. 56-63, 2018.

[84] S.-T. Ha, W. H. W. Ibrahim, M.-C. Lo, and Y.-S, "Factors affecting satisfaction and loyalty in public transport using partial least squares structural equation modeling (PLS-SEM)", *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, vol. 10, p. 60, 2019.

[85] Y. Xue and J. Chen, "Research on the influence of Service quality, passenger satisfaction and passenger loyalty on Fuzhou Metro Line 1", *International Journal of New Developments in Engineering and Society*, vol. 3, no. 4, pp. 117-125, 2019.

[86] S. M. Hizam, W. Ahmed, H. Akter, and I. Sentosa, "Understanding the public rail quality of service towards commuters' loyalty behavior in Greater Kuala Lumpur", *Transportation Research Procedia*, vol. 55, pp. 370-377, 2021.

[87] Y. Xue, J. N. D. Chen, "Research on the influence of Service quality, passenger satisfaction and passenger loyalty on Fuzhou Metro Line 1", *International Journal of New Developments in Engineering and Society*, vol. 3, no. 4, pp.117-125, 2019.

[88] G. A. Alçura, G. G. Şimşek, S. Ş. K. Gündoğar, S. C. Tanriverdi, And M. D. Gürsoy, "Determinants of passenger loyalty for high speed rail system in Turkey", *Journal of Balıkesir University Institute of Science and Technology*, vol. 23, no. 2, pp. 760-781, 2021.

[89] N. Wonglakorn, V. Ratanavaraha, A. Karoonsoontawong, and S. Jomnonkwao, "Exploring passenger loyalty and related factors for urban railways in Thailand", *Sustainability*, vol. 13, no. 10, p. 5517, 2021.

[90] J. E. Burkhardt, "Critical measures of transit service quality in the eyes of older travelers", *Transportation Research Record*, vol. 1835, no. 1, pp. 84-92, 2003.

[91] W. Jen and K.-C. Hu, "Application of perceived value model to identify factors affecting passengers' repurchase intentions on city bus: A case of the Taipei metropolitan area", *Transportation*, vol. 30, no. 3, pp. 307-327, 2003.

[92] C.-H. Wen, L. W. Lan, and H.-L. Cheng, "Structural equation modeling to determine passenger loyalty toward intercity bus services", *Transportation Research Record*, vol. 1927, no. 1, pp. 249-255, 2005.

[93] J.-S. Chou and C. Kim, "A structural equation analysis of the QSL relationship with passenger riding experience on high speed rail: An empirical study of Taiwan and Korea", *Expert Systems With Applications*, vol. 36, no. 3, pp. 6945-6955, 2009.

[94] J. Minser and V. Webb, "Quantifying the benefits: Application of customer loyalty modeling in public transportation context", *Transportation Research Record*, vol. 2144, no. 1, pp. 111-120, 2010.

[95] V. V. N. Webb, "*Customer loyalty in the public transportation context*", Massachusetts Institute of Technology, 2010.

[96] C.-H. Liu and S.-k. Liao, "An empirical study of factors affecting customer loyalty–Taiwan high-speed rail service industry as an example", *International Journal of Services Operations and Informatics*, vol. 5, no. 2, pp. 130-157, 2010.

[97] S. A. Figler, P. Sriraj, E. W. Welch, and N. Yavuz, "Customer loyalty and Chicago, Illinois, transit authority buses: Results from 2008 customer satisfaction survey", *Transportation Research Record*, vol. 2216, no. 1, pp. 148-156, 2011.

[98] S. Kim and G. F. Ulfarsson, "Commitment to light rail transit patronage: case study for St. Louis Metrolink", *Journal of Urban Planning and Development*, vol. 138, no. 3, pp. 227-234, 2012.

[99] C. W. Kuo and M. L. Tang, "Relationships among service quality, corporate image, customer satisfaction, and behavioral intention for the elderly in high speed rail services", *Journal of Advanced Transportation*, vol. 47, no. 5, pp. 512-525, 2013.

[100] J.-S. Chou and C.-P. Yeh, "Influential constructs, mediating effects, and moderating effects on operations performance of high speed rail from passenger perspective", *Transport Policy*, vol. 30, pp. 207-219, 2013.

[101] J. De Oña, R. de Oña, L. Eboli, and G. Mazzulla, "Perceived service quality in bus transit service: a structural equation approach", *Transport Policy*, vol. 29, pp. 219-226, 2013.

[102] J. Zhao, V. Webb, and P. Shah, "Customer loyalty differences between captive and choice transit riders", *Transportation Research Record*, vol. 2415, no. 1, pp. 80-88, 2014.

[103] R. Carreira, L. Patrício, R. N. Jorge, and C. Magee, "Understanding the travel experience and its impact on attitudes, emotions and loyalty towards the transportation provider–A quantitative study with mid-distance bus trips", *Transport Policy*, vol. 31, pp. 35-46, 2014.

[104] P.-F. Chou, C.-S. Lu, and Y.-H. Chang, "Effects of service quality and customer satisfaction on customer loyalty in high-speed rail services in Taiwan", *Transportmetrica A: Transport Science*, vol. 10, no. 10, pp. 917-945, 2014.

[105] A. Imaz, K. M. Nurul Habib, A. Shalaby, and A. O. Idris, "Investigating the factors affecting transit user loyalty", *Public Transport*, vol. 7, no. 1, pp. 39-60, 2015.

[106] Y. Shiftan, Y. Barlach, and D. Shefer, "Measuring passenger loyalty to public transport modes", *Journal of Public Transportation*, vol. 18, no. 1, p. 7, 2015.

[107] D. Van Lierop and A. El-Geneidy, "Enjoying loyalty: The relationship between service quality, customer satisfaction, and behavioral intentions in public transit", *Research in Transportation Economics*, vol. 59, pp. 50-59, 2016.

[108] S. Tao, J. Corcoran, and I. Mateo-Babiano, "Modelling loyalty and behavioural change intentions of busway passengers: A case study of Brisbane, Australia", *IATSS Research*, vol. 41, no. 3, pp. 113-122, 2017.

[109] Y.-H. Chang and C.-H. Yeh, "Corporate social responsibility and customer loyalty in intercity bus services", *Transport Policy*, vol. 59, pp. 38-45, 2017.

[110] D. van Lierop and A. El-Geneidy, "Is having a positive image of public transit associated with travel satisfaction and continued transit usage? An exploratory study of bus transit", *Public Transport*, vol. 10, no. 2, pp. 241-256, 2018.

[111] J. Allen, L. Eboli, C. Forciniti, G. Mazzulla, and J. de Dios Ortúzar, "The role of critical incidents and involvement in transit satisfaction and loyalty", *Transport Policy*, vol. 75, pp. 57-69, 2019.

[112] A. L. Carrel and M. Li, "Survey-based measurement of transit customer loyalty: Evaluation of measures and systematic biases", *Travel Behaviour and Society*, vol. 15, pp. 102-112, 2019.

[113] Y. Kawabata, T. Ryo, M. Friman, L. E. Olsson, K. Lättman, and S. Fujii, "Time-series analysis of the causal effects among perceived quality, satisfaction, loyalty, and frequency of public transportation use", *Frontiers in Built Environment*, Vol. 6, p. 137, 2020.

[114] J. Allen, L. Eboli, G. Mazzulla, and J. d. D. Ortúzar, "Effect of critical incidents on public transport satisfaction and loyalty: an Ordinal Probit SEM-MIMIC approach", *Transportation*, vol. 47, no. 2, pp. 827-863, 2020.

[115] P. Vicente, A. Sampaio, and E. Reis, "Factors influencing passenger loyalty towards public transport services: Does public transport providers' commitment to environmental sustainability matter?", *Case Studies on Transport Policy*, vol. 8, no. 2, pp. 627-638, 2020.

[116] K. Park, A. Farb, and S. Chen, "First-/last-mile experience matters: The influence of the built environment on satisfaction and loyalty among public transit riders", *Transport Policy*, vol. 112, pp. 32-42, 2021.

[117] M. Mas-Machuca, F. Marimon, and C. Jaca, "The unexplored potential of trust to boost customer loyalty for transport platforms", *Research in Transportation Business & Management*, vol. 41, p. 100618, 2021.

[118] J. B. Ingvardson and O. A. Nielsen, "The influence of vicinity to stations, station characteristics and perceived safety on public transport mode choice: A case study from Copenhagen", *Public Transport*, vol. 14, no. 2, pp. 459-480, 2022.

[119] C. Canming and C. Jianjun, "An empirical analysis of the relationship among the service quality, customer satisfaction and loyalty of high speed railway based on strctural equation model", *Canadian Social Science*, vol. 7, no. 4, pp. 67-73, 2011.

[120] A. A. Esmaeili, B. Manesh, and E. Golshan, "Service quality, customer satisfaction and customer loyalty in RAJA rail transportation company", *International Research Journal of Applied and Basic Sciences*, vol. 4, no. 12, pp. 4248-4253, 2013.

[121] A. S. Hussein and R. Hapsari, "How quality, value and satisfaction create passenger loyalty: An empirical study on Indonesia bus rapid transit passenger", *The International Journal of Accounting and Business Society*, vol. 22, no. 2, pp. 95-115, 2014.

[122] S. Jomnonkwao, V. Ratanavaraha, B. Khampirat, S. Meeyai, and D. Watthanaklang, "Factors influencing customer loyalty to educational tour buses and measurement invariance across urban and rural zones", *Transportmetrica A: Transport Science*, vol. 11, no. 8, pp. 659-685, 2015.

[123] X. Fu and Z. Juan, "Drivers of transit service loyalty considering heterogeneity between user segments", *Transportation Planning and Technology*, vol. 40, no. 5, pp. 611-623, 2017.

[124] V. Yilmaz and E. Ari, "The effects of service quality, image, and customer satisfaction on customer complaints and loyalty in high-speed rail service in Turkey: a proposal of the structural equation model", *Transportmetrica A: Transport Science*, vol. 13, no. 1, pp. 67-90, 2017.

[125] X.-m. Fu, J.-h. Zhang, and F. T. Chan, "Determinants of loyalty to public transit: A model integrating Satisfaction-Loyalty Theory and Expectation-Confirmation Theory", *Transportation Research Part A: Policy and Practice*, vol. 113, pp. 476-490, 2018.

[126] L. Li, Y. Bai, Z. Song, A. Chen, and B. Wu, "Public transportation competitiveness analysis based on current passenger loyalty", *Transportation Research Part A: Policy and Practice*, vol. 113, pp. 213-226, 2018.

[127] S. Sun, and Z. P. Duan, "Modeling passengers' loyalty to public transit in a two-dimensional framework: A case study in Xiamen, China", *Transportation Research Part A: Policy and Practice*, vol. 124, pp. 295-309, 2019.

[128] R. Egi and H. Budhi, "Loyalty analysis of mass transportation facilities customers based on service quality and user satisfaction: a case study of inter-city train customers in Indonesia", *Eurasia: Economics & Business*, vol. 7, no. 25, pp. 68-74, 2019.

[129] A. P. Sulistyo, "Delivering experiential markerting and service quality to improve customer loyalty in public transportation", *International Journal of Trend in Scientific Research and Development*, vol. 4, no. 4, pp. 351-355, 2020.

[130] Y. Wang, Z. Zhang, M. Zhu, and H. Wang, "The impact of service quality and customer satisfaction on reuse intention in urban rail transit in Tianjin, China", *Sage Open*, vol. 10, no. 1, p. 10, 2020.

[131] D. Q. Nguyen-Phuoc, A. T. P. Tran, T. V. Nguyen, P. T. Le, and D. N. Su, "Investigating the complexity of perceived service quality and perceived safety and security in building loyalty among bus passengers in Vietnam–a PLS-SEM approach", *Transport Policy*, vol. 101, pp. 162-173, 2021.

[132] C. Shen and Y. Yahya, "The impact of service quality and price on passengers' loyalty towards low-cost airlines: The Southeast Asia perspective", *Journal of Air Transport Management*, vol. 91, no. 6, p. 101966, 2021.

[133] N. Mohamad, "The influence of service quality on tourist loyalty: a case of electric train services", *International Journal of Knowledge Management in Tourism and Hospitality*, vol. 2, no. 4, pp. 315-330, 2022.

[134] D. Q. Nguyen-Phuoc, D. N. Su, T. Nguyen, N. S. Vo, A. T. P. Tran, and L. W. Johnson, "The roles of physical and social environments on the behavioural intention of passengers to reuse and recommend bus systems", *Travel Behaviour and Society*, vol. 27, pp. 162-172, 2022.

[135] D. Q. Nguyen-Phuoc, T. Nguyen, D. N. Su, P. T. Le, and O. Oviedo-Trespalacios, "How do social cues from other passengers affect word-of-mouth and intention to continue using bus services? A second-order SEM approach", *Transportation Research Part A: Policy and Practice*, vol. 158, pp. 302-320, 2022.

[136] C. Zhang, Y. Liu, W. Lu, and G. Xiao, "Evaluating passenger satisfaction index based on PLS-SEM model: Evidence from Chinese public transport service", *Transportation Research Part A: Policy and Practice*, vol. 120, pp. 149-164, 2019.