

The Influence of Attitudes, Subjective Norms, and Perceived Behavioral Control of Commuter Intentions to Use Public Transportation in Greater Bandung, Indonesia

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Abstract: *Although public transport provides many benefits, such as a cleaner environment, reduced congestion, and increased sustainable transportation, many people still prefer private transport. This motivates the exploration of users' intention to choose and use public transportation. This study explores the psychological factors of public transport users based on the theory of planned behavior (TPB). TPB assumes behavior built because of the intention. Attitude (ATT) does not determine the intention to influence behavior directly but through a combination of Subjective Norms (SN) and Perceived Behavioral Control (PBC). Responses from public transport users in Greater Bandung were collected using a questionnaire. The results show that attitude (ATT) is the most vital factor that positively influences user intention, based on standardized estimates of 0.866 (ATT), 0.301 (PBC), and 0.202 (SN). Environmental and climate issues have the most significant influence on user attitudes when compared to quality factors sorted by standardized estimated values such as travel time, safety, and fare. Previous research revealed that the dominant factor was quality, but in this study, it switched to factors of transportation activities that affect the environment. In fact, the factor of ease of use and encouragement of information media is crucial to be considered by stakeholders.*

Keywords: *Public transportation, theory of planned behavior, latent variable, intention, psychology.*

1. Introduction

Excessive use of single-occupancy vehicles can negatively impact social, economic, environmental, and urban congestion in urban areas (Faulin et al., 2019). Unfortunately, people in developing countries, especially in urban areas, prefer to use private vehicles as the main mode of transportation for several reasons. This preference is partly driven by the poor performance of public transport (PT) (Dirgahayani & Sutanto, 2020).

In this study, Greater Bandung, one of the largest cities in Indonesia, is used as a case study. Greater Bandung is one of the cities in Indonesia. In 2017, of the 8.7 million population of the Greater Bandung area, 7 percent were commuters and only 12 percent of the commuter population used public

transportation (Triani, 2019). In fact, according to the Bandung Planning, Research and Development Agency, the number of motorized vehicles in the city of Bandung in 2017 increased, with vehicle growth reaching 11% for four-wheeled vehicles and around 70% for two-wheeled vehicles, while infrastructure growth in both length and volume dimensions was around 1.29%. This impacts congestion problems, one of which is due to the imbalance in the growth of motorized vehicles with the development of existing infrastructure (Saputra & Mulyanisa, 2018). The need to reduce the use of private vehicles has led to the development of actions aimed at directing car users to increase their awareness of the effects of using private vehicles to encourage changes in users' negative mode choice behavior (Sottile, et al., 2015).

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Received: March 4th, 2023; Revised: May 9th, 2023; Accepted: June 9th, 2023

Doi: <http://dx.doi.org/10.12695/ajtm.2023.16.1.2>

Print ISSN: 1978-6956; Online ISSN: 2089-791X.

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An effective solution to address the problem related to the use of cars requires a reduction in traffic volume based on changes in-car user behavior (Klößner, 2013).

It is important to know several actions to identify travelers' or users' needs and interests to understand their barriers to change in using transportation (Sonja, 2019). Willingness to use transport not only on whether this is possible but also on whether it is perceived as attractive (Gao, et al., 2020). Especially in this research want to know the factors that influence users' intention to use public transport. It is worth remembering that mode choice is not always controlled by "rational" factors, but emotional or "irrational" factors are just as important (Thøgersen & Møller, 2008).

Psychological factors, such as irrational factors, can significantly affect the individual decision-making process (Zhan, et al., 2019). Incorporating psychological influences in mode-choice decision-making has provided better results and a better understanding of mode-choice behavior (Devika, et al., 2020). Learning the behavioral users' intention of choosing transportation can use the 'Theory of Planned Behavior (TPB)' (Chowdhury & Ceder, 2013).

Many studies confirmed the applicability of TPB in understanding the psychological factors influencing mode preferences, including research previously carried out by Dirghayani & Sutanto (2020) using TPB to explain users' intention about willingness to shift from private transport to LRT, such as acceptability include effectiveness and fairness. Other research from Kwan, et al. (2020), analyze factor attitude, service quality, environmental health concern, and intention to use rail among private vehicle users, and research by Zhang, et al. (2019) using TPB and cost sensitivity for considering the indifference threshold is established to analyze a traveler's mode choice behavior to use public transportation. To know the factors determining the intention to use public transport for different travel purposes

(Zailani, et al., 2016). Determine Strategy for improving public transportation (Li, et al., 2015).

Although there is a debate on whether the TPB is still a relevant framework to justify interventions that may lead to behavioral changes (Ajzen, 2015), research came from Lanzini & Khan (2017) in the context of mode choice, TPB constructs have good predictive ability for intention and behavior. From these advantages, this study is interested in understanding the effects and relationships between various psychological factors such as attitudes, perceived behavioral control, and subjective norms that influence behavior using public transportation, and this study also aims to determine the attributes that have the strongest influence on influencing factors psychology of users in using public transport.

Research findings are expected to be beneficial for designing transportation policies, especially in Greater Bandung in reducing the use of private vehicles and shifting to public transportation (*Angkot* and TMB). Findings on the psychological factors that mostly affect or significantly affect users' behavior using a private vehicle to destination can provide recommendations in considering the kind of psychological interventions (Paundara, et al., 2017), which need to be applied by the government to affect the behavior of private transport users for their travel.

The remainder of this paper contains various variable latent effects on attitude and PBC, especially in attitude factors. The attitude factor in this study contains the impact of the quality of public transportation compared to other transportation on the environment. In the future stakeholders can implement policies, especially on TMB (bus rapid transit in Bandung) and *Angkot* (paratransit) by the list of priorities recommended in this study.

2. Literature Review/ Hypotheses Development

Theory of Planned Behavior (TPB)

Users in choosing modes will consider characteristics that will become attributes in alternative trips as factors in mode selection. However, according to Hasim (2016) limited alternative combinations and attributes cannot understand aspects of the internal decision-making process of individual decisions and perceptions is alternative, but more on the external aspect, namely the attributes that exist in the alternative, so to overcome the lack of understanding of individual behavior it is necessary to understand the psychological approach, one of which is the TPB model.

Before heading to the TPB developed by Icek Ajzen, we need to know a TRA theory. "Theory of Reasoned Action (TRA) suggests that a person's behavior is determined by their intention to perform a behavior, and intention by itself, which is a function of attitudes and subjective norms.

According to Ajzen (2006), attitude is a disposition to respond positively or negatively or the benefits or losses that may be obtained if we do or do not perform a behavior. This belief can strengthen attitudes towards behavior based on the evaluation of the data obtained that the behavior can provide benefits for the perpetrator. Another function is Subjective norms. Subjective norm is a function based on normative beliefs, namely beliefs about the agreement or disagreement of a person or group that are important for individuals toward a behavior. Ajzen I. added that social referrals that are considered necessary in some behaviors also include social referrals from parents, marriage partners, friends, co-workers, and other behavioral references.

Icek Ajzen developed TRA its known TPB (Theory of Planned Behavior). TPB assumes that a person's behavior is not only controlled by himself (full control of the individual) but also requires control, namely the availability of resources and opportunities for certain skills,

so it's necessary to add the concept of perceived behavioral control (PBC). PBC is perceived to affect behavioral intentions According to TPB, behavior is built because of intention. Behavioral beliefs can produce favorable or unfavorable attitudes towards behavior, normative beliefs can produce perceived social pressure or subjective norms. Control beliefs lead to PBC ease or difficulty in performing the behavior (Tavousi, et al., 2015).

Sometimes, beliefs about not performing a behavior reflect beliefs about doing it. In those cases, we can assess the TPB constructs related to performing the behavior. However, sometimes different beliefs are easily accessible in relation to alternative behaviors. For example, suppose we are interested in the choice of mode of travel. In that case, the considerations that come to mind about using public transport may be more than just a reflection of the considerations that guide car use. In the same way, attitudes, subjective norms, perceived control, and intentions concerning the two alternatives may also not stand in perfect inverse relation to each other. Where practicable, all TPB construction is assessed regarding the two options considered. Doing so will provide a more complete explanation of the factors that guide decisions, thereby improving the prediction of intentions and behavior (Ajzen I., 2020).

Latent Variables & Hypothesis

As previously described, attitude as a consequence of a behavior, attitude is influenced by many behavioral beliefs. So behavioral beliefs are needed that can describe the user's attitude. In this study, behavioral beliefs are divided into five indicators. The first indicator is the image that describes the passenger's mentality towards the offer, including the symbol of the passenger's memory of public transportation services (Sumaedi, et al., 2014). Improving the public transit image in social orderliness is highly important for promoting commuting mode, especially in developing countries (Van, et al., 2014). The second indicator is 'tariff', the tariff describes the ability and willingness in other

words to become a user's benchmark for the quality of public transportation (Joewono, 2009). Users will have a positive attitude toward cost savings would increase ridership on public transport (Brohi, et al., 2021). The third indicator is travel time, which includes waiting time, time in the vehicle, and access time. According to the Ministry of Transportation Republic of Indonesia Number SK: SK.687/AJ.206/DRJD/2002, the greater travel time can be a user's benchmark regarding the effectiveness and efficiency of public transportation. Travel time will affect the perceived usefulness, the faster the user arrives at the destination using certain transportation, the user will feel the usefulness of transportation (Chen & Chao, 2011). The fourth indicator is safety, safety is the fundamental focus on transportation which describes the conditions in which users can travel without fear, without loss or perception without loss or potential loss from crime and accidents (Ngueutsa, 2017; Currie, et al., 2013), security is a basic requirement for inclusive development (ITF, 2018). Safety will be related Attitudes of public transport users, which reflect their perceptions of public transport attributes, are positively related to overall satisfaction (Fu & Juan, 2017). The last indicator is climate and environmental issues, these indicators are factors that influence user perceptions of their travel activities in the surrounding environment (Castel, et al., 2019). The concern of the environment, such as the contribution of vehicle exhaust gas will significantly influence the user's intention to use public transportation through attitude (Borhan, et al., 2014).

The next latent variable is PBC, according to Ajzen (2006), PBC is a person's feelings about the ease or difficulty of realizing a certain behavior. The first indicator is the ease of use, including conditions in the vehicle, where to pick up and drop off passengers, and the ease of moving or transferring between modes (Zhang, et al., 2019). The second indicator is conditions in the future, the indicator is the perception of user expectations for improving the quality of public transportation in the future (Dirgahayani & Sutanto, 2020).

From all these variables, we can deduct from this logic or some hypotheses to test using SEM:

- H1: Image is positively related to attitude,
- H2: Tariff is positively related to attitude,
- H3: Time is positively related to attitude,
- H4: Safety is positively related to attitude,
- H5: Environment is positively related to attitude,
- H6: Ease of use is positively related to PBC,
- H7: Conditions in the future or users' expectations is positively related to PBC,
- H8: Attitude is positively related to intention,
- H9: Subjective norms (SN) is positively related to intention, and
- H10: Perceived Behavioral Control (PBC) is positively related to intention.

3. Methodology

Data Collection & Design Experiment

The location of this study is Greater Bandung which includes Bandung Regency, West Bandung Regency, Sumedang Regency, Padalarang Regency, Cimahi City, and Bandung City. Based on the 2017 Greater Bandung commuter survey (Midayanti, et al., 2017), Greater Bandung has a population of 8.7 million, of which 7% are commuters.

Various rules of thumb have been developed for determining sample size requirements for Structural Equation Modeling (SEM), including (a) a minimum sample size of 100 or 200 (Boomsma, 1982), (b) 5 or 10 observations per parameter estimate (Bentler & Chou, 1987), and (c) 10 cases per variable or indicator (Nunnally, 1967). This study determines sample size using 10 cases per variable, so the minimum sample size is as much as 420 samples. This study begins with a preliminary survey was conducted one week from Monday, August 16, 2021 to Friday, August 20, 2021. A preliminary survey was conducted to 30 respondents randomly to find out the shortcomings of each narrative and questions that the respondents might not understand to reduce errors in filling out the main questionnaire.

After the preliminary survey has been carried out and refinements, and the main questionnaire will be distributed. The main questionnaire was conducted from Monday, October 18, 2021 to Sunday, October 24, 2021. As a token of gratitude and feedback to the respondents at the end of the questionnaire, 30 respondents will randomly receive a headphone. The main questionnaires were distributed online using a non-probability sampling method with a purposive sampling technique. The criteria for the sample in this study are experience using public transportation for at least 1 year (TMB or *Angkot*), at least 16 years old or have a minimum education of junior high school or equal, domiciled in Greater Bandung. In this study, respondents with one experience using either TMB or *Angkutan Kota* are still needed because they can also provide predictive data for further estimates besides continuing to use the dominant transportation in Bandung Raya, they can also provide predictive data for further estimates.

After 7 days, the main questionnaire was distributed. A total of 540 respondents have filled out the questionnaire. However, 37 respondents' answers were invalid, so they were not analyzed further. Respondents considered invalid mostly occurred because they did not complete the questionnaire and did not meet the expected respondents' criteria. Thus, from a total of 540 respondents who have been collected, only 503 respondents will be analyzed further.

The questionnaire in this study was divided into three parts, namely socio-demography or personal characteristics, travel characteristics,

and theory of planned behavior statements. Socio-demography in this study includes gender, age, last education, occupation, monthly income, private car and motorbike ownership. The travel characteristics questionnaire is one of the factors expected to influence the choice of transportation modes in Greater Bandung.

Questions regarding travel characteristics include the purpose of the trip, departure time, travel time, travel costs, experience using public transportation, location of residence, distance traveled, use of transportation modes for the first mile, last mile, and the main mode, and theory of planned behavior statements were designed to determine the latent variables that have a significant effect on user intentions in the Greater Bandung area. All psychological factors analyzed in this study will be explored with TPB are: (1) attitude, ATT (toward: image, safety-SAFE; Travel time-TIME; Tariff-FARE, environment, and climate-ENV), (2) Subjective Norms-SN, (3) Perceived Behavioral Control-PBC (Ease of use-EOU, Control Beliefs relate to future-CB), (4) Intention-INT. All indicators are determined based on previous research on mode choice using 'Theory of Planned Behavior'. The response from this section is obtained in the form of the user's level of agreement with the given statement with a range of 1 (strongly disagree) – 2 (Strongly Agree). The data obtained will be a model using 'Structural Equation Modeling (SEM)' to know the effect of every latent variable on behavioral intention. Two or more indicators measured all latent variables of the model. Total indicators used in this study are 42 indicators (Table 1).

Table 1.
Indicators Used for the Latent Variables

Latent Variable		Indicators I like public transportation (TMB or Angkot) because	Descriptive Statistics			
			Mean*	Std. Dev	Min*	Max*
Attitude (ATT)	Image (IMG)	Public transportation has a good ‘image’ (X1)	3.12	0.77	1.00	5.00
	Cronbach’s α : 0.863	Public transportation is ‘cool’ (X2)	3.16	0.90	1.00	5.00
	Mean: 3.11	Public transportation is ‘trending to use’ (X3)	3.05	0.93	1.00	5.00
	Fare (FARE)	Public transport fares are reasonable for me (X5)	3.64	0.68	2.00	5.00
	Cronbach’s α : 0.797	Satisfied with the Public transportation fares (X6)	3.61	0.67	2.00	5.00
	Mean: 3.62	Cheaper than online transportation/ ride-hailing (X7)	3.70	0.70	2.00	5.00
		Cheaper than private transportation (X8)	3.54	0.71	1.00	5.00
	Travel Time (TIME)	Get time for myself / support for multitasking (X9)	3.42	0.91	1.00	5.00
	Cronbach’s α : 0.665	Public Transportation more saves time than private transportation (X10)	3.51	0.71	1.00	5.00
	Mean:3.46	Public Transportation more saves time than online transportation/ raid hailing (X11)	3.51	0.71	1.00	5.00
		Public transport is more punctual than online transportation/ ride-hailing (X12)	3.42	0.74	1.00	5.00
	Safety (SAFE)	Public transportation more safety than private transportation (X13)	3.43	0.79	1.00	5.00
	Cronbach’s α : 0.650	Public transportation more safety than online transportation/ride-hailing (X14)	3.55	0.69	1.00	5.00
	Mean:3.49					
	Environment (ENV)	More environment friendly than private transportation (X15)	3.46	0.70	1.00	5.00
	Cronbach’s α : 0.878	More environment friendly than online transportation (X16)	3.45	0.72	1.00	5.00
Mean: 3.53	Environmental issues are important for me (X38)	3.54	0.72	2.00	5.00	
	I am well aware of future disasters that environmental problems will bring (X39)	3.53	0.84	2.00	5.00	
	Commuters/ Users/ People contribute to environmental issues (X40)	3.58	0.78	2.00	5.00	
	Commuters/ Users/ People can take action to decrease climate change (X41)	3.62	0.77	1.00	5.00	

Latent Variable		Indicators	Descriptive Statistics				
			Mean*	Std. Dev	Min*	Max*	
		I like public transportation (TMB or Angkot) because					
		Commuters/ Users/ People can help the environment with our transportation activities (X42)	3.56	0.70	1.00	5.00	
Perceived Behavioral Control (PBC)	Cronbach's α : 0.680 Mean: 3.36	For me to take the public transit would be easy (have no trouble using public transportation) (X24)	3.49	0.68	1.00	5.00	
		I don't have other alternative transportation except using public transportation (X25)	3.19	0.86	1.00	5.00	
		Pedestrian facilities to the place to pick up and drop off passengers are very good (X28)	3.49	0.77	1.00	5.00	
		My schedule supports to use public transportation (X29)	3.60	0.63	1.00	5.00	
		The choice to use public transportation is completely up to me (X30)	3.66	0.67	2.00	5.00	
		More confident when using public transportation during the current 'Covid 19 pandemic' (X31)	2.73	1.27	1.00	5.00	
		Ease of Use (EOU)	Easier to get it than online transportation/ ride-hailing (X4)	3.59	0.71	1.00	5.00
		Cronbach's α : 0.553 Mean: 3.55	allows the fare to be cheaper so that it makes it easier for me to use it (X26)	3.45	0.70	1.00	5.00
		Future - expectations (FUTURE)	Allows fast travel time making it easier for me to use it (X27)	3.60	0.72	1.00	5.00
		Cronbach's α : 0.802 Mean: 3.53	In the future, if public transportation access is better, it will be easier for me to use it (X17)	3.53	0.63	1.00	5.00
	In the future, if fares are cheaper than before, it will be easier for me to use it (X18)	3.54	0.70	2.00	5.00		
	In the future, if travel times are faster than before, it will make it easier for me to use (X19)	3.53	0.65	1.00	5.00		
Subjective Norms (SN)	Cronbach's α : 0.882 Mean: 2.88	Influenced by the attitudes if friends and relatives (X20)	2.70	0.94	1.00	5.00	
		Influenced by television, internet, and other media and public opinion (X21)	2.76	1.02	1.00	5.00	
		Influenced by the family, friends, and relatives because they do (X22)	3.07	1.04	1.00	5.00	
		Influenced by the government's/Office/School (X23)	2.99	0.99	1.00	5.00	
Intentions (INT)	Cronbach's α : 0.826 Mean: 3.47	I have a strong intention to choose public transportation (X32)	3.46	0.73	1.00	5.00	
		I have plan to choose public transportation instead of private transportation (X33)	3.46	0.77	1.00	5.00	

Latent Variable	Indicators	Descriptive Statistics			
	I like public transportation (TMB or Angkot) because	Mean*	Std. Dev	Min*	Max*
	I would like to encourage people around me to choose public transportation (X34)	3.40	0.75	1.00	5.00
	I have a strong intention to use public transportation that have "intermodal integrated" (X35)	3.53	0.76	2.00	5.00
	I have a strong intention to use public transportation that have "integrated in terms of travel costs" (X36)	3.46	0.63	2.00	5.00
	I have a strong intention to use public transportation that have "short travel time" (X37)	3.48	0.71	1.00	5.00

*1 (strongly disagree) – 5 (strongly agree)

Before entering into structural testing, in this study an initial test was carried out, namely reliability testing. Reliability testing is a test carried out on questionnaire variables to determine how consistent a variable's measurement results are. There are several reliability tests: retest reliability, equivalent reliability, and internal consistency reliability (Bolarinwa, O.A., 2015). The technique used in this study is *Cronbach's Alpha*. Reliability can also be expressed by the criteria for the Cronbach's Alpha values range. According to Sugiyono (2011), reliability criteria are divided into 5 range, (0 - 0.199) very low, (0.20 - 0.399) low, (0.40 - 0.599) moderate, (0.60 - 0.799) high, and (0.80 - 1.00) very high.

4. Findings and Discussion

Respondents Characteristics

Table 2
Personal Characteristics

Domicile	Bandung City (81.51%), West Bandung District (4.97%), Bandung District (7.36%), Cimahi City (6.16%)
Gender	Male (38.37%), Female (61.63%)
Age	16-24 (55.07%), 25-34 (29.82%), 35-44 (8.75%), 45-54 (0.37%), More than 55 (0.99%)
Education	Junior High School (4.37%), Senior High School (69.38%), Diploma (21.47%), Bachelor (4.57%), Master/Doctor (0.2%)
Jobs	Student (25.65%), Government Employee (5.77%), Public company employee (0.4%), Private employee (45.33%), Entrepreneur (17.89%), Other (4.97%)
Income	Less than Rp1.000.000 (0.4%), Rp1.000.000 - Rp3.000.000 (19.68%), Rp3.000.001 - Rp5.000.000 (45.73%), Rp5.000.001 - Rp10.000.000 (22.27%), Rp10.000.001 - Rp15.000.000 (7.75%), More than Rp15.000.000 (4.17%)
Motorcycle ownership	0 Unit (66.4%), 1 Unit (30.22%), 2 Unit (2.58%), 3 Unit (0.60%), 4 Unit (0.2%)
Car ownership	0 Unit (26.44%), 1 Unit (45.13%), 2 Unit (22.86%), 3 Unit (3.98%), 4 Unit (0.8%), 5 Unit (0.6%), 6 Unit (0.2%)

Based on travel characteristics (Table 3) show that the majority of respondents have a travel destination to work, 280 respondents (55.67%). Based on the travel time when leaving for the activity location, most respondents depart from home to the activity location between 07.00 - 08.00 am, which is

Based on the personal characteristics of respondents (Table 2), it was found that the majority who took part in the survey were Female, as many as 310 people (61.63%), living in the city of Bandung as many as 410 respondents (81.51%), with the majority aged 16-24 years as many as 277 respondents (55.07%) The majority with the latest education in SMA/equivalent is the largest number, namely 349 respondents (69.38%). The majority of respondents having jobs as private employees constitutes the largest number, namely 228 respondents (45.33%). The majority of respondents, namely 230 respondents (45.73%), have an income of Rp. 3,000,001 – Rp. 5,000,000. Then the majority of respondents, as many as 334 respondents (66.40%), do not have a private car, and the majority of respondents, as many as 227 respondents (45.13%), have a personal motorbike.

246 respondents (48.91%). Then based on the total distance traveled by respondents, the majority of respondents who traveled less than five kilometers were 249 respondents (49.50%).

Based on their experience of using public transportation (Table 3), the majority of respondents stated that they used conventional motorcycle taxis for less than one year as many as 199 respondents (39.80%), the use of online motorcycle taxis for one to two years was 184 respondents (36.58%), there was no experience using

conventional taxis as much as 368 respondents (52.87%), using online taxis for less than one year as many as 217 respondents (43.14%), using city transportation for more than five years as many as 217 respondents (43.14%), and using TMB buses less than one year as many as 114 respondents (22.66%).

Table 3.
Travel Characteristics

Destination	Office/Work (55.67%), School/University (26.84%), Shopping (13.72%), Hospital (2.19%), Recreation (1.39%), other (0.2%)
Departure Time	Under 07.00 (30.22%), 07.00-08.00 (48.91%), 08.01-09.00 (9.34%), 09.00-12.00 (6.76%), above 12.00 (5.03%)
Total Travel Distance	Under 5 km (49.50%), 5-10 km (40.95%), more than 10 km (9.54%)
Experience in Using Transportation	
Conventional Ojek	Never (21.47%), < 1 year (39.56%), 1-2 Year (22.86%), 2-4 year (11.33%), 4-5 year (3.58%), >5 year (1.19%)
Ojek Online	Never (5.37%), < 1 year (31.41%), 1-2 Year (36.58%), 2-4 year (16.50%), 4-5 year (8.55%), >5 year (1.59%)
Conventional Taxi	Never (35.98%), < 1 year (45.13%), 1-2 Year (7.36%), 2-4 year (8.75%), 4-5 year (1.79%), >5 year (0.99%)
Taxi Online	Never (28.43%), < 1 year (43.14%), 1-2 Year (13.12%), 2-4 year (9.15%), 4-5 year (3.98%), >5 year (2.19%)
Angkot	Never (0.00%), < 1 year (0.80%), 1-2 Year (1.99%), 2-4 year (26.44%), 4-5 year (27.63%), >5 year (43.14%)
TMB	Never (22.27%), < 1 year (22.66%), 1-2 Year (11.13%), 2-4 year (18.09%), 4-5 year (13.32%), >5 year (12.52%)

Factor Loading

This examined its data's construct validity by face, convergence, and discriminant validity. It established face validity based on its rigorous literature review, which suggested a valid measurement. Factor loadings (regression weights using SPSS), variance-extracted estimates, and construct reliability explained the convergent validity. All standardized regression weights are higher than 0.5 except for two indicators (Time 1 and PBC 2), as seen in Table 4.

The variance-extracted estimates are equal to or 0.5, while all construct reliabilities are above 0.7. The Evidence supported the convergent validity of the measurement model and variance-extracted estimate are greater than the corresponding inter-

construct squared correlation estimates, this does not suggest problems with discriminant validity, so it can be confirmed that the construct in this study is valid for proposed measurement.

Ten factors with 42 attributes were used for the final model. Attributes about time and PBC are still included in the model, but these indicate that users in attitudes to used public transport are not concerned about multitasking and alternative transportation. The first factor from variable attitude is an image of public transport, all indicators had high loading. This is unsurprising because a better image will give users trust or confidence to use public transportation. and the image is defined as the overall value of the user's view of a product or service.

The factor of public transportation fare, all indicators had high loading, which indicates users using public transport because public transport has a cheap fare. One of the advantages of using *Angkutan Kota (Angkot)* is the benefit of a short trip. The factor of time, one of four indicators, had small loadings specifically for multitasking. This is surprising because one of the advantages of using public transport is that users can do something while not driving.

All indicators in the safety factor had high loadings, which indicates that users are concerned about their safety. This factor can be why users have small loading in multitasking because they consider their safety instead of doing something while using public transportation. The last factor from attitude is the environment, all indicators had high loading, which indicates users's concern about the advantages of using public transportation and its effect on the environment.

The factors against encouragement from outside or around or called SN, all indicators had high loading, this indicates user's expectations and encouragement from social (family, friends, government, media information, and relevant institute) had a big influence on users' action to choose PT, especially from information from television, media, and public opinion. In the future, stakeholders should pay more attention to using public transportation promotion with the media information.

The factor regarding the ease or difficulty of realizing a certain behavior or perceived behavioral control (PBC), ease of use, and future conditions. All indicators had high loading, especially on the frequency of PT and fare in the future, but one indicator from the PBC indicator had small loading, especially in private transport ownership. This indicates that users choose not to use public transport unaffected by private vehicle ownership. The PBC indicator significantly affects the ease of using public transportation. This can be seen from an indicator such as confidence in using public transportation during a pandemic. Users will judge this as an obstacle starting from the level of approval, which tends to disagree, strengthening that this is why users do not use public transportation.

The last indicator is user intention in using public transport, all indicators had high loading, especially on the plan to use PT. This indicates that users are still planning to use public transport.

Table 4.
Standardized Factor Loading Estimates

	IMG	Fare	TIME	Safe	ENV	SN	PBC	Future	EOU	INT
IMG1 (X1)	0.889									
IMG2 (X2)	0.919									
IMG3 (X3)	0.857									
Fare1 (X5)		0.783								
Fare2 (X6)		0.838								
Fare3 (X7)		0.820								
Fare4 (X8)		0.712								
Time1 (X9)			0.314							
Time2 (X10)			0.855							
Time3 (X11)			0.828							
Time4 (X12)			0.830							
Safe1 (X13)				0.862						
Safe2 (X14)				0.862						
ENV1 (X15)					0.688					
ENV2 (X16)					0.704					
ENV3 (X38)					0.787					
ENV4 (X39)					0.782					
ENV5 (X40)					0.781					
ENV6 (X41)					0.808					
ENV7 (X42)					0.774					
SN1 (X20)						0.873				
SN2 (X21)						0.880				
SN3 (X22)						0.816				
SN4 (X23)						0.873				
PBC1 (X24)							0.719			
PBC2 (X25)							0.388			
PBC3 (X28)							0.641			
PBC4 (X29)							0.749			
PBC5 (X30)							0.752			
PBC6 (X31)							0.611			

Table 4. (Continued)
Standardized Factor Loading Estimates

	IMG	Fare	TIME	Safe	ENV	SN	PBC	Future	EOU	INT
Future1 (X17)								0.848		
Future2 (X18)								0.849		
Future3 (X19)								0.844		
EOU1 (X4)									0.746	
EOU2 (X26)									0.704	
EOU3 (X27)									0.729	
INT1 (X32)										0.737
INT2 (X33)										0.800
INT3 (X34)										0.661
INT4 (X35)										0.740
INT5 (X36)										0.756
INT6 (X37)										0.702
Variance Extracted	0.888	0.788	0.707	0.862	0.760	0.860	0.772	0.847	0.727	0.733
Construct Reliability	0.918	0.869	0.817	0.852	0.906	0.920	0.813	0.884	0.847	0.875

Structural Model

This study used multiple-fit indices to assess the model’s goodness of fit, each parameter is analyzed based on the provisions that have been determined based on Hair, et al. (2019), Ghozali (2017), and Shi, et al. (2019). Shi, et al., (2019) suggested a minimal set of fit indexes as Chi-square root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean squared residual (SRMR). Table 5 shows that the Chi-square of this model is 1596.16 with 227 degrees of freedom.

The p-value associated with this result is small (0.000), which indicates a significance at 0.01. The chi-square is heavily influenced by sample size. To reduce the sensitivity of the *chi-square* to sample size, some research divides its value by the degree of freedom, which generally results in a lower value called the normed chi-square (NC). The NC value of this study is 7.032, which is more than 5, indicating not fit. The absolute fit indexes of this model are explained by the value of

RMSEA (0.11) and the root mean square (0.196), which appear notably high, being far above 0.08. The incremental fit indexes are 0.778 and 0.752 for the CFI and the Tucker-Lewis index (TLI) respectively. The goodness-of-fit index (GFI) of this model is 0.814. All values of indices appear notably high (near 1).

The numbers beside the lines in Fig. 1 represent the standardized parameter estimates of the magnitude of the effects. All standardized loading estimates for factor attitudes are significant at 1% and range from 0.279 (image) to 0.872 (environment). The questionnaire contained eight factors to determine PBC. The highest standardized loading came from ease of use (0.781). Subjective norms contained four indicators, and the highest standardized factor came from indicators related to media information or public opinion (0.868). The Intention has six factors with planning to use public transportation reaching the highest magnitude (0.688).

Table 5.
Goodness-of-Fit of the Model

Goodness-of-Fit Indicators	Acceptable Threshold Levels	Estimate
Chi-square	expected low	4345.51
Degree of Freedom		810
CMIN/df	≤ 5.00	7.032
GFI	≥ 0.90 (good fit) 0.80 ≤ GFI < 0.90 (marginal fit)	0.814
RMR	≤ 0.05 (good fit)	0.196
RMSEA	≤ 0.08 (good fit) < 0.05 (close fit)	0.110
TLI		0.752
CFI	Near 1 (good fit).	0.778

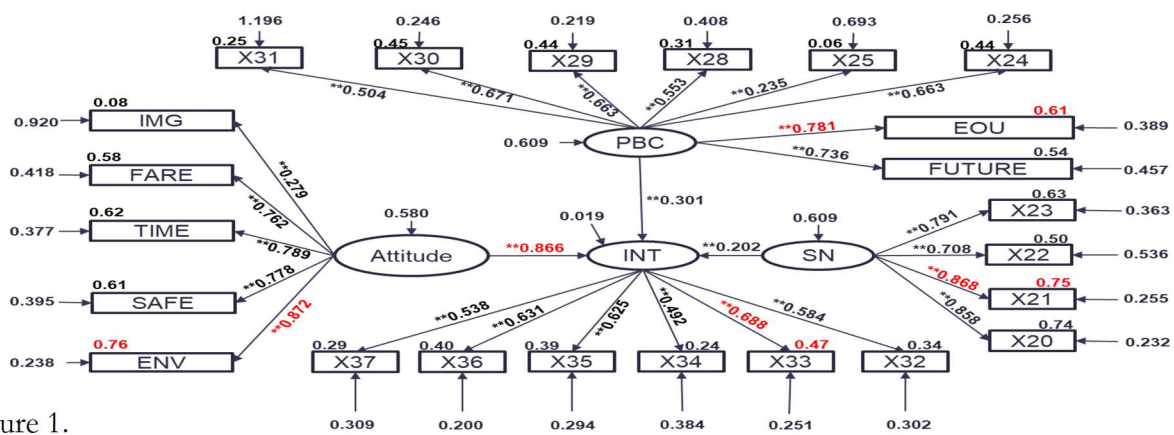


Figure 1.
Standardized Parameter Estimates

There are ten hypotheses in which all regression weights were significant ($p < 0.01$). The first hypothesis, which positively relates the image of public transportation with user attitude, was statistically significant and supported by a positive value. This implies that the better the indicator of the image or the better people perceive public transportation, the user will prefer public transportation. The second hypothesis is the relationship between fare and attitude. has a positive value and is statistically significant. This shows that more reasonable, more satisfied, and cheaper the tariff or fare of public transport, the user will prefer public transportation. The third hypothesis is the correlation between travel time and attitude, which implies that the users prefer to use public transport for shorter time travel of public transport. The fourth hypothesis is the relationship between safety and attitude. When users feel safer outside and inside

transportation, the users prefer to choose public transport. The fifth hypothesis is that users better understand the effect of transportation activity on the environment and climate, and the users will prefer public transportation.

The sixth hypothesis is the relationship between ease-of-use public transportation and PBC. That hypothesis was confirmed as statistically significant and positive. Ease to use public transportation includes getting a mode, ability to pay, and a trip that doesn't take much time, so users prefer to use public transport. The seventh hypothesis, the relationship between future expectations with PBC. This hypothesis is significant and positive, this implies that if in the future the user's expectations of public transportation occur, then the user will prefer to choose public transportation.

The eighth hypothesis comes from the main structure related to theory of planned behavior, that is, the relationship between intention and attitude, that hypothesis was confirmed by statistically significant and positive. In this research, attitude describes the quality of public transportation. This implies that getting a better attitude about the quality of public transport will make user intention to use public transport improve. The ninth hypothesis comes from another factor influencing user intention, namely PBC. This hypothesis indicates easy or difficult to realize a certain behavior, easier to realize the behavior to use public transport, the users prefer to use public transport. The tenth hypothesis, the relationship between SN and intention, this hypothesis was confirmed significant and positive. This indicates that the bigger the encouragement and approval from social or external to use public transport will make users prefer to use public transport.

These studies can provide input or anticipate to the government as a Trans Metro Bandung (TMB) operator and *Angkot* (paratransit) operator in the future. Based on standardized estimates, a priority list of service quality factors that influence the attitude of respondents could be drawn up, which will affect the intentions to use public transportation. The factor that most influence attitude is environmental and climate issues; that indicator has a positive influence. Service quality has dominated the construct of public transport studies (Borhan, et al., 2014). In fact, in this study, factors like image, tariff, safety, and travel time have smaller effects than environmental and climate issues. For example, according to Joewono & Kubota (2005), public transport users in Bandung have an ability to pay more than the stated prices. It becomes interesting because if the ability to pay is already greater than the stated prices, the focus on choosing public transportation shifts to other factors in this case, namely environmental and climate issues. Other evidence is the probability of choosing ride-hailing or *Angkot* in Bandung based on research conducted by Cariera, et al.

(2021); even though the *Angkot* fare is free, the probability of users choosing ride-hailing is greater than choosing *Angkot*. Government and non-government organizations need to promote an awareness campaign to protect the environment from pollution caused by the use of private transport to influence users' attitudes to use public transport (Borhan, et al., 2014).

Even though factors like fares, travel time, and safety does not have a greater impact than climate & environmental issues, but also need to be considered. So, seeing this, the main factor that can be improved or become the main focus is the attitude factor with the hope of improving the quality of transportation, the user's intention to use public transportation is improving.

Other factors with a positive and significant influence come from the PBC factor. In this factor, the most positive influence is the ease-of-use indicator, including the ease of transfer between modes, cheaper fares to make it easier for people to use it, and user considerations of travel time. Cheaper fares here may have more to do with a person's ability to pay to use public transport. Travel time in this study can be related to the schedule, the more appropriate the travel time with the user's schedule, the easier it will be for users to use it. These factors can be developed with ICT (Information and Communication Technology). According to a survey conducted by Eurobarometer in the EU in 2014, ICT has a large potential for users to leave private cars to switch to public transport, although not the primary factor of influence, can play a supportive role, e.g., cheaper tickets can implement integrated e-tickets (e.g., divided by zones) so they can get cheaper and fairer fares. Regarding travel time, ICT can help to satisfy users regarding the actual travel time including waiting time (VTPI, 2013). Bandung has an application that can make it easier for users, namely 'Semut' and 'Jaramba' for *Angkot* and 'Teman Bus' for TMB. This application contains information about which codes can be used, which alternative route is more profitable,

and the amount of fees to be paid (Salmiati, 2017), but the application does not seem to be widely known. Therefore, the government and stakeholders must work together to invest in ICT, including harmonization legislation, procedures, and standards for establishing effective partnerships that can play an active role. In this scheme, it is necessary to involve operators, authorities, and academics in urban/regional and national and transnational reach (Morfoulaki, et al., 2015).

5. Conclusion

Based on the research analysis results, it was found that attitudes have the greatest standardized estimates in influencing intentions, the second came from perceived behavioral control, and the last came from subjective norms. The attitude indicator has five indicators, including image, tariff, safety, travel time, and climate and environmental issues, all of which have a significant and positive influence. The indicators in the attitude variable that have the greatest influence on attitudes come from climate and environmental issues. This indicator also has the largest *Cronbach's alpha* value among other indicators in the attitude variable. It has an average value of respondent's approval above three so it can be said that respondents tend to agree with the statement given.

On perceived behavioral control, all indicator has a significant and positive influence. The ease of use of public transportation is the most influenced by PBC. Ease of use concerns the ease of obtaining public transportation, appropriate fares, and appropriate travel times so that users can avoid conditions that hinder them from using public transportation. Ease of using transportation has one of the indicators of approval, with levels that tend to disagree, such as pandemics or user concerns about their health when using public transportation. It is hoped that the government can provide standards regarding this matter, such as implementing health and hygiene protocols.

Although ease of use has the largest loading, factors such as future conditions cannot be ruled out because future conditions describe user expectations regarding public transportation in the future.

The factor with the smallest influence comes from the Subjective norms factor, even though the effect is the smallest among other factors or variables. This variable also has an average agreement value below three which can be said that users tend to disagree with statements related to social influence. The subjective norms indicator with the greatest influence comes from the influence of television, the internet, and other media and public opinion. Even though the effect of subjective norms is the smallest among other factors or variables, this factor can be a trigger tool for the government to encourage users to use public transportation.

The recommendation that can be given based on this research is the first in terms of attitude, the government can increase public knowledge regarding the effects of transportation activities on the environment. It began to improve the quality of public transportation, starting with tariffs, travel times, and safety, which later led the image of public transportation will follow by itself.

The second recommendation is come from perceived behavioral control and subjective norms. It is necessary to facilitate the use of public transportation which can be assisted with the help of ICT. One example is encouraging users to use public transportation using social media to promote applications that can make it easier for users to use public transportation, in this case *Angkot* and TMB. In addition to being a promotional field, it can also increase users' knowledge about the positive effects of using public transportation compared to private transportation. So, the subjective norms factor can help the attitude and perceived behavioral control factors.

Acknowledgement

This study is funded by The Directorate of Research, Technology, and Community Services, Directorate General of Higher Education, Research, and Technology, The Ministry of Education, Cultural, Research, and Technology, the Republic of Indonesia under the scheme of World Class Research and co-funding from Research Institute and Community Service (LPPM) Universitas Katolik Parahyangan. The authors thank all parties who have participated in data collection.

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