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MSc Programme in Urban Management and Development

Rotterdam, The Netherlands

September 2017

Thesis

Title: Paratransit Transportation as a feeder for Rail-Based Transportation

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Specialization: Managing and Financing Urban Infrastructure

UMD 13

MASTER'S PROGRAMME IN URBAN MANAGEMENT AND DEVELOPMENT

(October 2016 – September 2017)

Paratransit transportation as a feeder for rail-based transportation

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UMD 13 Report number:

Rotterdam, 7 September 2017

Summary

Connectivity is still one of the most crucial issues to be solved in Bandung Metropolitan Area. A limited number of adequate mass transits convinced the informal operators to provide the market demand for movement (Cervero and Golub, 2007b) and establishment of Paratransit Transportation is inevitable. Angkutan Kota, as one of Paratransit Transportation, is considered as most reliable transportation with 91% loyal users (Tarigan, Susilo, et al., 2014). It suitable for Bandung's geographical landscape, and has acceptable fares for its service. Conversely, many residents of BMA perceived Angkutan Kota as the sources for traffic problems and crime issues, and 56% of online respondents want Angkutan Kota to be eliminated from the city.

Despite these situations, it was confirmed that Angkutan Kota has a potential in enhancing the mass transit ridership. This idea is supported by the previous studies about the connectivity of mass transit, in which might influence the satisfaction level from mass transit (Okada, et al., 2003; Tangphaisankun, Okamura, et al., 2009, Givoni and Rietveld, 2007). Moreover, another study reveals that around 68% train passengers in Bandung city use Angkutan Kota to access its main station (Rohjan, Surdia, et al., 2012).

This paper aims to explain the capability of Angkutan Kota as a feeder to complement connectivity for existing Bandung Metropolitan Area's commuter train services, based on its user satisfaction and intention to use, specifically in Cimahi City. Several studies emphasize the importance of user satisfaction as the determinant for behavioral-intention (Zeithaml, 1988; Cronin and Taylor, 1992), by utilizing perceived value and service quality for the empirical measurement. (Lai and Chen, 2010; Joewono and Kubota, 2007; Sumaedi et al., 2012; de Ona, 2016). Surveys was employed as the main research strategy, by applying quantitative data analysis. The data set for this research was obtained via questionnaire, in which assessing users' opinion about their satisfaction and loyalty through Angkutan Kota, and their present journey characteristics. The data set was analyzed on SPSS software.

In brief, the demographic background indicates that the most common respondents were women (66,8%), generally dominated by full-time employees and students, in the age between 16-25, and 40,3% of them are living in Cimahi city. Based on their livelihood, 52% of the respondents classified as low-income residents. Regarding their present journey, 34,3% of the respondents are considered as a frequent rider of Angkutan Kota. However, only 21,1% are the frequent rider of a commuter train, while the other respondents only use it occasionally. The present journey characteristics also indicate that in general, the respondents spend more than 10 minutes to go to the station from their home and depart from station to their destination. Accordingly, 57,4% of respondents access the station by Angkutan Kota, and 49,8% also ride with it to reach their workplace or school.

Addressing the satisfaction score for Angkutan Kota, on average, respondents affirm its perceived value and service quality by assign the decent scores for both variables. However, the ratings from its intention to use indicators illustrate the uncertainty of future use of

Angkutan Kota, because most of the respondents keep being neutral in their opinion about it. For this reason, the Ordinal Logit Regression (OLR) analysis was employed, to figure out the probability from the commuters to use Angkutan Kota in the forthcoming events. In summary, the results from data analysis and interpretation indicate that the perceived value from Angkutan Kota have seen as the key aspect to determine the future use of Angkutan Kota, especially in developing countries (Joewono and Kubota, 2007; Tangphaisankun, 2009). Similarly, cleanliness, reliability in time, accessibility of the vehicle, emergency information and drivers' skill and attitude perceive as important aspects to motivate people to keep travel with Angkutan Kota in the several years ahead.

In regards to commuter train connectivity, loyalty indicators of Angkutan Kota evidently have a significant influence on commuter train ridership. However, even if the perceived value and service quality have a relatively small influence on commuter train ridership, it has a considerable indirect impact towards train services. In this intention, the operators and regulators should manage the plan for both modes of transportation, and improve the attractiveness of public transportation, and reduce the dependency on a private vehicle.

Keywords: Paratransit Transportation, Perceived Value, Service Quality, Commuter Train, Intention to Use

Acknowledgements

I would like to thank Allah almighty, for all His mercy, beneficence, and guidance; and allowed me to reach this stage in my life;

My parents; for all their kindness and love, and keep pushing me to fulfill my dreams;

Lembaga Pengelola Dana Pendidikan (Education Endowment Fund) Ministry of Finance, Indonesia, who not only granted me the full scholarship so I could pursue my master degree abroad but also enhances my confidence and helps us gaining some networks;

My supervisor Giuliano Mingardo, who kindly gave me some suggestions and improvement, and helped me to write the appropriate paper with the right outcomes. I also would like to deliver my thanks for Somesh Sharma, Taslim Alade, and Daniel Adamu, who are constantly questioning their curiosities to be answered, and correcting some parts so that we could understand our study better than ever.

A team of Institute for Housing Studies, who affectionately share their experiences and knowledge about developing countries, and how to develop the solutions; not only complain. Moreover, of course; I am so grateful because after joining IHS, I can establish a new network with my worldwide friends.

A team of Managing and Financing Urban Infrastructure (Ogenis Brilhante; Somesh Sharma; Julia Skinner, Forbes Davidson, and Alberto Gianoli), who helps and coordinates us in learning process, by providing an enormous discussion and debate sessions, a bunch of group works, numerous mind-blowing field visits, a tips of how to manage and finance urban infrastructure, and of course, introduced me to SimCity as well;

All fellow IHS students; I have been spending a lovely year with their cooperation and generosity, and learning a new perspective from many different cultures and countries. Particularly, I am sending special thanks to my Indonesian classmates, whose cooking skills are incredibly satisfying, and helping me to save my money from expensive Indonesian food restaurant;

Last but not least, I would like to thank all of the stakeholders who were so helpful during my thesis period; PT. Kereta Api Indonesia who allowed me to survey the railway's station; the respondents who willingly to fill the questionnaires; and special surveyor who accompany me in collecting the questionnaires and supporting me throughout this fieldwork data collection period.

Abbreviations

Angkot	Angkutan Kota
BMA	Bandung Metropolitan Area
DAMRI	Djawatan Angkutan Darat Milik Republik Indonesia (Bus Company)
KAI	Kereta Api Indonesia/ Indonesian Railway Company
Ojek	Motorcycle Taxi
Gojek	Indonesian Online Motorcycle Taxi Service
Uber	Online Taxi Service
OLR	Ordinal Logit Regression
SPSS	Statistical Package for Social Science

Table of Contents

List of Figures

List of Graphs

List of Tables

Chapter 1: Introduction

1.1 Background

As one of the core aspect of the city, transportation is essential needs to travel, for both people and goods, from one place to another (Wright, 2012, van Wee, Annema, et al., 2013). To be able to perform these needs, adequate transportation systems is necessarily playing an important role in providing accessibility and movement ability and should be taken into consideration in the new development plan.

Bandung Metropolitan Area (BMA) is a newly developing area, which plans to be developed as a new metropolitan area in West Java, with 11.4 million inhabitants. It consists of five cities and districts with a dense population; Bandung city, Cimahi city, District of Bandung, District of West Bandung, and District of Sumedang. According to Provincial Government of West Java (Pemerintah Provinsi Jawa Barat, 2013), in 2025 the number of a resident of BMA will reach into 12.8 million, and nowadays this area is embracing numerous accessibility and movement challenges. Moreover, several issues, for instance, the rapid growth rate of inhabitants, fast expansion of urban centers, a huge number of private motorized vehicles, and lack of sufficient public transportation, lead to congestion, economic loss, and heavily polluted air (Wright, 2012).

In fact, BMA has several types of public transportation modes; formal transportation such as commuter train and conventional bus system; and also informal transportations, for instance, informal minibus (called Angkutan Kota), rickshaw, and motorbike-taxi. Formal transportations are managed by state-owned companies, such as PT KAI (Indonesia Railway Company) and DAMRI (Indonesia Motorized Transportation Company). On the other hand, informal transportation is managed by independent private companies in small-scale business and regulated by Provincial Government Transportation Department, for its tariff, routes, and performance (Government Regulation No. 74 the year 2014).

One of the notorious informal transportation, which known as Angkutan Kota (Angkutan Kota), is a small capacity vehicle with 12-14 seats of passenger, and based on the study, it is contributing 15% of road traffic flow, while it is also moving more than 46% passengers (Joewono and Kubota, 2007). According of the study in 2009, Angkutan Kota is considered as the most reliable public transportation in BMA, which covers 570.000 passenger trips per day or 31% from all motorized trip (Syabri and Pradono, 2011) and also delivering services for up to 78.83% area in Cimahi city (Saputra and Prakoso, 2014).

However, since the driver is worked for personal business, their services to some extent are acceptable, but it could not meet the user's satisfaction and rated very low (Tangphaisankun, Nakamura, et al., 2009, Gang, Zhang, et al., 2011). Furthermore, since the middle-income people number is increasing, they urgently purchase some cars and motorcycles and shifted from public transportation to private vehicles. As a consequence, Angkutan Kota lost its revenue because they cannot compete with private vehicles, and then, its quality of service

becomes worse (Tamin, 2005). Additionally, another research conducted in Greater Jakarta area reveals that Angkutan Kota achieved the highest score for operation frequency in several indicators in public transport performance, while security indicator for Angkutan Kota demonstrates the low performance. (Weningtyas, Fujiwara, et al., 2011)

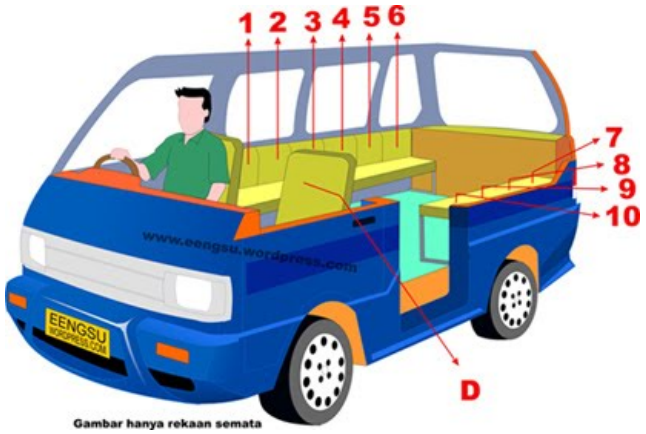

Figure 1 Illustration of Angkutan Kota
Source: Peta Tasikmalaya

1.2 Problem Statement

Transport Problems in Cimahi City

Cimahi, as one part of the BMA, is a dense city which has approximately 579.015 inhabitants and level of density 14.592 people/ km^2. Based on statistic data from Badan Pusat Statistik of Cimahi (Cimahi Centre of Statistic Department), in the year 2014, the residents mostly work in the industrial sector (31,75 %), commercial sector (28,38%), and service provision (23,88%). Since most of the industrial factories are located in South Cimahi, consequently, 43% of Cimahi city's population is living in southern part of the city. Due to its location, Cimahi is considering as one of the most important parts within BMA, in which linking Bandung city and West Bandung district, and ranks in second place for human resource capacity within West Java Province. Previously, most of the activities conducted in Cimahi is Indonesian Army Training Centre. Moreover, after the number of people is increased, Cimahi becomes residential and industrial area, which is supporting economic sector of Bandung city, and West Java Province as well.

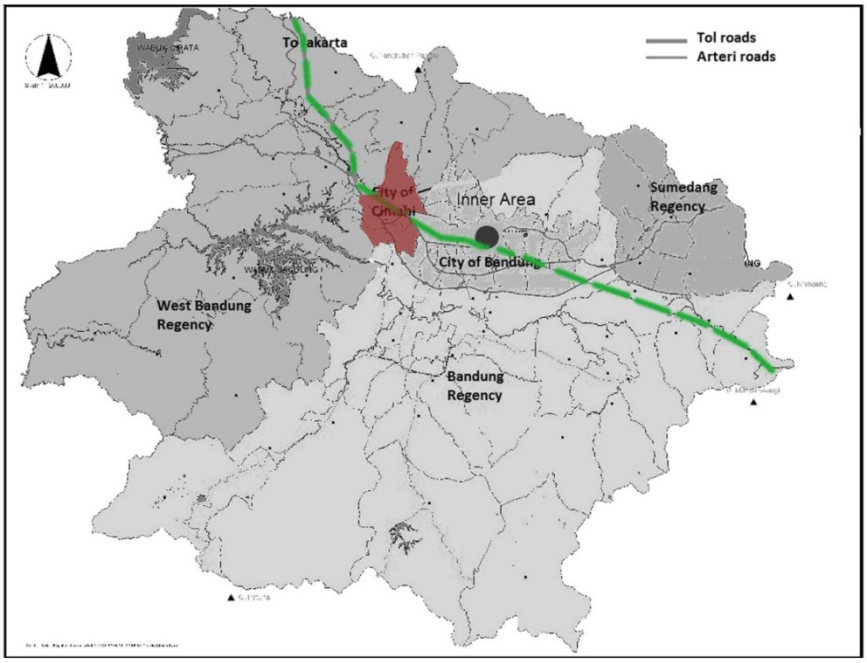

Figure 2 Bandung Metropolitan Area

Source: Bappeda, 2010

On the other hand, accessibility is still one of the most crucial issues to be solved. The only mass rapid transits available to relate Cimahi with another area within BMA are buses and limited service of a commuter train, and since formal modes of transportation fail to deliver movement services in suburban and periphery areas, informal operators tend to fulfill the market demand for accessibility (Cervero and Golub, 2007b). Until now, Indonesian Railway (PT KAI) serves two rail stations in Cimahi; both are placed between Padalarang and Bandung, in line together with long-haul journey trains to Jakarta (Kementerian Pekerjaan Umum, 2002), and as soon as public authorities recognize them, they started to create a regulatory framework. Municipal of Cimahi operates five local public transport terminals, and using it just for taxation purpose and controlling the flows of intercity Angkutan Kota Movement.

As explained in the background part, the poor services of public transportation cannot accomplish user's expectation. Consequently, high-income and middle-income residents prefer to purchase private vehicles. Without a major extension of road systems, congestion tends to happen every day in primary and secondary roads, especially during the peak hour at 08.00-16.00, with average speed is calculated between 11 – 33 km/hour (Titania, 2008). Generally, road types in Cimahi consist of local road, except for Central Cimahi, and size of the roads are relatively small (Kementerian Pekerjaan Umum, 2002). Obviously, it inevitably creates another difficult obstacle, because there's no chance for Cimahi to expand the size of the road, especially in residential, industrial, commercial area, and army training center.

Advantages and Disadvantages of Angkutan Kota

Angkutan Kota, which disorderly growing in numbers, are accused of causing congestion in

several nodes around BMA, and also accidents because of its unskilled driver's behavior (Weningtyas, Fujiwara, et al., 2013). Despite its low quality of service, there is still a high demand for Angkutan Kota. Although there was an online survey which indicated that 56% public wants to terminate Angkutan Kota's service provision (Pikiran Rakyat, 2017), another study reveals that Angkutan Kota has 91% of loyal users, such as lower-income residents and students (Tarigan, Susilo, et al., 2014). Besides, it fits with Bandung's geographical landscape, which consists of narrow roads, hilly landscape, and also acceptable fares for its service. It seems even when Angkutan Kota is stigmatized negatively; there is not easy at all to eliminate its services, since it has a major role, especially to fulfill the demands of a certain characteristic of commuters (Tarigan, Susilo, et al., 2014).

Connectivity between Commuter Train Services and Angkutan Kota

Based on Planning Department of Provincial Government of West Java, a commuter train is contributing less than 5% in daily commutes of BMA (Asapa, 2014). Another research also stated the number of commuter train passengers fluctuated in the past ten years, from almost 2 million in 2005 and decreased slightly to 330.000 in 2007. Later on, PT KAI decided to implement additional schedules for the commuter train, and it was successfully increasing the ridership until reaching its peak in 2011 and decrease significantly in number for the next three years (Diniati, 2015).

Past studies mentioned that improvement of connectivity of Mass Rapid Transit could be a valuable solution to increase the ridership of existing Mass Rapid Transit (Tangphaisankun, Okamura, et al., 2009, Givoni and Rietveld, 2007). According to the previous study of BMA's commuter train regarding customer satisfaction, around 68% train passengers in Bandung city use Angkutan Kota to access its main station (Rohjan, Surdia, et al., 2012). It implies that Angkutan Kota as a relatively small public transportation plays a significant role to relate a passenger from their origins and destination to the train stations, and can increase ridership of commuter trains.

1.3 Research Objective

Research objective in this paper is to explain the capability of Angkutan Kota as a feeder to support connectivity for existing Bandung Metropolitan Area's commuter train services, based on its user satisfaction and intention to use, specifically in Cimahi City.

1.4 Provisional Research Question

To what extent does user satisfaction and intention to use of Angkutan Kota influence commuter train ridership in Cimahi City?

Sub-question:

a. How is the current user satisfaction score, in regards to service quality and perceived value, towards Angkutan Kota in Cimahi City?
b. Which factors of user satisfaction, in regards to perceived value and service quality, impact on intention to use of Angkutan Kota?

c. To what extent user satisfaction, in regards to perceived value and service quality, and intention to use of Angkutan Kota, impact on ridership of Commuter Train?
d. Which factors of user satisfaction, in regards to perceived value and service quality, and intention to use of Angkutan Kota, impact on ridership of Commuter Train?

1.5 Scope and Limitation

This research will be limited to the relationship between user perceptions of Angkutan Kota and commuter train ridership. The main purpose of this investigation will be focused on how user the satisfaction travel influence behavior and intention to use Angkutan Kota as main transportation for and how commuter train's users influenced by Angkutan Kota services. Due to the limited period of field work and data analysis, this research is only focusing on a particular city, which is Cimahi City, and will not assess the intercity linkage. The city was chosen because it is considered as one of the densest parts of Bandung Metropolitan Area, and at the same time has no proper attention in the research world. The research was conducted in two Cimahi city's train stations, as a part of Bandung Metropolitan Area. Likewise, these two stations have the slightly different characteristics, so the outcomes could have a bigger perspective. Admitedly, the result of this investigation cannot be generalized over time, since the data set only obtained in one period.

Chapter 2: Literature Review

2.1 Introduction

In the past decade, numerous authors tend to focus on Paratransit transportation studies, as it becomes popular issues, mainly in developing countries in Global South. As explained in Chapter 1, it offers not only numerous advantages for accessibility in an urban area but also able to improve the prosperity for less-educated people by providing jobs. On the other hand, it also blames as the fundamental cause of congestion, accident, and environmental problems (PHUN and Tetsuo, 2016).

Correspondingly, the rail-based transportation ridership worldwide shows the decrease trends in the past ten years, which happened due to the numerous factors, and one of them is accessibility to the train stations (Okada et al., 2003; Tangphaisankun, 2009). The notion of feeder systems to support rail services was examined in numerous literature. In developing countries, Paratransit Transportation is revealed as one of the possible feeder options, since it can both complimenting the existing transportation systems and also able to connect those areas which uncover by formal modes of transportation to its system (Tangphaisankun, Okamura, et al., 2009), improve the ridership and user satisfaction of mass rapid transit, by providing sufficient access to mass rapid transit and paratransit transportation (Okada, Doi, et al., 2003), and reduce the dependence on private cars to reach the mass rapid transit station (Loo, 2007). Another study has also mentioned the importance of engaging Paratransit Transportation in the development planning of new Mass Transit Systems, such as Bus, Metro, or Light Rail Transit, and arrange its service regulations critically regarding cities' local condition (Ferro, Muñoz, et al., 2015).

This chapter aims to discuss the literature reviews about user perceptions' satisfaction, behavior, and the future intention to use of Paratransit Transportation in an international world and to what extent it strengthens the rail-based Transportation services. Theory of Planned Behavior (TPB) is chosen to explain how the present social behavior may affect the intention to use certain service in the future, and empirically, this theory supported by existing studies, which are mentioned about perceived value and service quality. This theory relates to the question of how the commuters of Paratransit Transportation may engage with this service in forthcoming years. Also, recent studies in Paratransit Transportation and its user perception are also mentioned. This chapter will also explain the factors that influence ridership of commuter train and the importance of access and egress mode of commuter train users. Last, the final part of this chapter briefly analyzes the connection between user perception and intention of use from Paratransit Transportation with a ridership of Commuter Train.

2.2 Theory of Behavioral Intention, Satisfaction, Perceived Value, and Service Quality

2.2.1 Theory of Planned Behavior

To be able to interpret user perception and intention of use, it is better to understand the theory about human behavior. Theory of Planned Behavior (TPB) is one of the studies in which explaining about the intention of individual to perform particular behavior (Ajzen, 1991), and it likely used as valuable tools in forecasting future intention of customers based on their satisfaction (Lai and Chen, 2010). Ajzen (1991) conceptualize Theory of Planned Behaviour in three elements, which influence intention of individuals, such as attitude toward the behavior, subjective norms, and perceived behavior control. These factors specify about how individuals evaluate certain behavior, their opinion about other persons' behavior, and their perception about dealing over in performing the behavior properly.

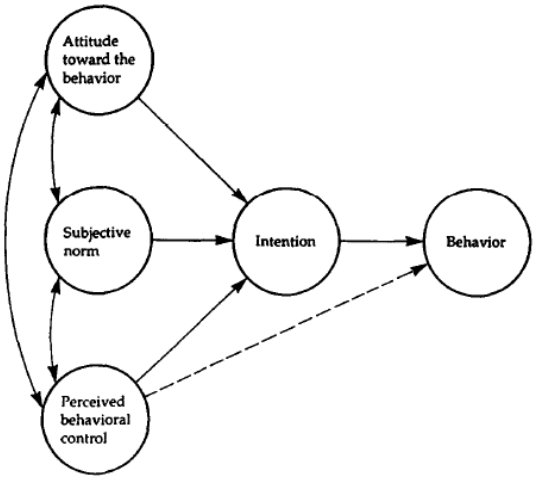

Figure 3 Theory of Planned Behavior
Source: Ajzen, 1991

Behavioral Beliefs and Attitude toward the Behavior. Each creates a belief about certain thing by linking it with another objects and characteristic. In this part, each belief relates to some other attributes, and already perceived with negative or positive values. Ajzen (1991) figured out that the subjective value has an impact to strengthen certain beliefs when desirable behaviors have significant outcomes, undesirable behaviors have fewer outcomes.

Normative Beliefs and Subjective Norm. Normative beliefs among certain groups are important in determining subjective norm. It relates to approval and disapproval of given behaviors in particular communities and motivates individuals to perform a specific behavior. For instance, individuals use of particular travel modes (Bamberg, Fujii, et al., 2011)

Control Beliefs and Perceived Behavioral Control. The last element assumes that intention of performing given behavior not only based on motivation but also actual control. These beliefs may result from experience or other people opinions about certain behavior. For instance, if particular behaviors have several options, a choice to perform those behaviors will be formed

based on the relative strengths of the intentions ((Bamberg, Fujii, et al., 2011). Moreover, individuals' perceived behavior will depend on resources and opportunities they have, and also their constraints (Ajzen, 1991).

Behavioral-Intention describes as to what extent a person wants to perform or not perform the certain present behavior in the future (Warshaw and Davis, 1985). Moreover, Oliver (1997) in Lai and Chen (2010) explains Behavioral Intention as a commitment to repurchase a particular product or certain services in the forthcoming years, or in short, it called customer loyalty. Sheeran (2002) assumes that behavior and intention are firmly related, and both can be predicted. There are seven factors which are fundamental to encourage persons in transforming intention to action, such as *knowledge* about the intention; *ability* and *opportunity* to perform the intention; *availability* of tools and *resources* (e.g., available resources are valuable in purchasing certain tools of the intention); *cooperation* between stakeholders within the intention; and anticipation for handling *unexpected situations.* These factors may impact the actual behavior-intention relation through the individuals. (Sheeran, 2002).

2.2.2 Satisfaction, Perceived Value, and Service Quality

To be able to explain behavior-intention theory with the empirical situation in travel behavior, several authors were developing studies in residents' commuting habits. Evidently, Theory of Planned Behavior elements have a considerable impact in influencing commuters' perception. One of the theory proves that commuters will ride certain mode of public transport or drive their private car if they have a positive evaluation of it, noticing social responsibility to use it, and they have favorable circumstances while using it (Donald, Cooper, et al., 2014). Despite its usefulness, the authors are also mentioned that Theory of Planned Behavior has not yet able to describe other relevant variables, such as *moral norm, descriptive norm, and also environmental effect*.

Recently, several authors analyze behavioral intention by relating it to customer satisfaction, perceived value, and service quality. The study that conducted by Lai et al (2010) indicates that passengers' loyalty or behavioral intention of Kaohsiung Mass Rapid Transit (KMRT) in Taiwan strongly affected by travellers' perception, which are measured by four factors, including perceived value, service quality, overall satisfaction, and involvement (Lai and Chen, 2010). Another study about High-Speed Rail (HSR) in Taiwan also reveals how perceived service quality has a positive impact on user satisfaction (Chou, Lu et al., 2014). De Ona (2016) found out that users perception about Light Rail Transit service in Seville and their satisfaction affect behavior-intention to use LRT again in the future (de Oña, de Oña, et al., 2016).

This paper will emphasize the differences and relationship between behavioral-intention, perceived value, and service quality; which have a direct and indirect impact on user satisfaction, to measure the intention to use public transportation. Cronin and Taylor (1992) point out slight different definitions of perceived value and customer satisfaction, both are

related, but not always identical. What is customer satisfaction? Oliver (1997) in Muhammad and Alhamdani (2011) clarify that customer satisfaction is the actual evaluation from the customers' point-of-view, based on their expectation, after using or experiencing certain products and services. The author also supports the notion of satisfaction as a 'psychological state' of the customer to judge and evaluate particular services and products quality that already given (Mohammad and Alhamadani, 2011).

Meanwhile, service quality defines as the technical assessment in measuring the service delivery; whereas satisfaction obtains from of expected desired level of service versus actual performance (Transportation Research Board, 1999, in Joewono and Kubota, 2007). Service quality is a predecessor for customer satisfaction (Chou, Lu, et al., 2014), and it portrays the technical judgment, while customer satisfaction views as the acknowledgment of the desired level of service that perceived by the user (Oliver, 1997 in Chou et al., 2014). Moreover, service quality is explained as "form of attitude, with a long-run evaluation" while satisfaction represents "transaction-specific measure" (Parasuraman et al., 1988; Cronin Jr. and Taylor, 1992)

On the other hand, several authors recognize the perceived value as the new approach in predicting behavioral intention (Jen, Tu et al., 2011). Perceived value describes as an overall assessment of the utility or service by consumers, in which combining customers' perception of two factors, such as benefits and costs (Zeithaml, 1988). The result of previous studies state that perceived value shows larger impact in indicating behavior-intention, rather than service quality and overall satisfaction (Chen, 2008, Sumaedi, Bakti, et al., 2012). Despite these statements, both of customer satisfaction and perceived value may convince positive behavioral-intentions of passengers to use the service in the future (e.g., customer loyalty) and reduce their attention for another rivals (Zeithaml, 1988; (Cronin, Brady, et al., 2000) (Jen, Tu, et al., 2011).

In summary, Theory of Planned Behavior mentions three elements of attitude in which creating the intention of the persons to perform the certain behavior in the future. Regarding travel behavior context, this theory describes the strong framework for mobility behavior; it easy to translate in anticipating travel studies; and it flexible enough to add other prediction indicators to develop more intensive research about the behavior-intention relationship (Haustein and Hunecke, 2007). This theory is widely used in numerous studies on public transportation, and many researchers claim about the relevance between customer loyalty, which resulted from behavior-intention measurement, with service quality, perceived value, and customer satisfaction (Zeithaml, 1988; Cronin and Taylor, 2000; Lai and Chen, 2010; Sumaedi, 2012; Chou et al., 2014; de Ona, 2016). Furthermore, since the users' perception is actively changing over time, these methods might become useful tools in evaluating existing services and helps providers to improve the quality until reaching the desired level. (Zeithaml, 1988).

2.2.3 User Perception and Intention to Use Paratransit Transportation

Passengers' point of view is one of the most powerful tools to measure the quality of public transportation service, and they have a different aspect for each person (Eboli and Mazzulla, 2011, Zeithaml, Berry, et al., 1996). It happens due to the various characteristics of services, different expectations from users and their taste, and socio-economic factors. Abenoza et al. (2017) mention that commuters' experience and satisfaction has several determinants, which are consist of *individual attributes, contextual variables, and attitude.* Besides, socio-demographic backgrounds, which are consist of age, occupation, income level, gender, educational attainment, and car ownership, have a fundamental effect on user satisfaction level in public transportation (Abenoza, Cats, et al., 2017).

According to (Johnson, Anderson, et al., 1995), there are two concepts of customer satisfaction that exist in the academic world, which are transaction-specific satisfaction and cumulative satisfaction. *Transaction-specific satisfaction* highlights the measurement of individual fulfillment for certain services product or experiences, while *cumulative satisfaction* represents total consumption of users' experience in certain service product or experiences. In management sector, cumulative satisfaction can impact directly on the profitability of services and loyalty, rather than transaction-specific satisfaction.

2.3 Paratransit Transportation

Paratransit Transportation defines as *alongside transit* (Lave and Mathias, 2000); it is considering as public transportation, with the owner can be both by the public and private companies, which consists of conventional modes, private motorized and non-motorized vehicles. Historically, the terminology for Paratransit Transportation was born in North America in the 1960s, while mass transportation neglected the residents in the newer suburban areas, and demand for mobility services in those neighborhoods, especially for the young generation who unable to purchase private vehicles, arose (Orski, 1975). Later, some private operators were collectively provided movement for a small group of residents; to connect them with mass transportation and city center. Since the improvement of mass transportation in developed countries was able to satisfy its inhabitants, Paratransit Transportation changed its function to become a feeder for certain communities, senior citizen, disabled people, with demand-responsive systems, for instance, shared-taxi and subscription Buses (Shimazaki and Rahman, 1996).

However, in Global South, the emergence of Paratransit Transportation has entirely different reasons. Since the economic sector is growing gradually in developing countries, this factor affects to low investment in high-capacity mass transportation systems, and one of its impacts is inadequate accessibility service provision. Mostly, residents of these countries, especially the poor, could not afford private vehicles, and it later leads to the establishment of collective transportations, on filling the gap (Phun and Tetsuo, 2016). Paratransit Transportation comes up as the affordable movement providers, and many people still rely on it nowadays.

Cervero (2000) classified performance traits of Paratransit Transportation in four criteria, which are consist of:

Entrepreneurism

Many developing cities were struggling with the low fiscal condition and lack of institutional capacity, which resulted in the inadequate provision of formal public transportation and failed to meet the user's demand. To fill these gaps, numerous private vehicles operators take part into the market. Most of the operators privately owned and operated their vehicles (Cervero and Golub, 2007). They provide both of flexible-route and fixed-route. While some authorities in developing countries treat Paratransit Services' operation as illegal action, other governments regulated their routes and fares, and establish the specific laws for their operation (Weningtyas, 2013)

Small and Aging Vehicles

According to Cervero (2000), Paratransit Transportation is ranging from 60 persons until one person capacity (see on Classes of Paratransit Transportation for further explanation). Within this industry, the operators commonly are operating the small size of vehicles, to reach users from another area that served by regular public transit, both complimenting the existing services and competing with regular service, or also depends on each cities' culture and conditions (Shimazaki and Rahman, 1995). Because the service fare is relatively cheap and low profit, the owners of the paratransit transportation often have a low budget for maintenance of the vehicles, use the erroneous equipment, and pay a little amount of salary for the drivers (Cervero and Golub, 2007a).

Low-performance Services

Since most of Paratransit Transportation operators, either regulated or unregulated by the local authority, are managing the services by themselves, and there is improper attention to maintain the level of service (for instance lack of driving skills; unlicensed driver and poor condition of vehicles) (Cervero and Golub, 2007). Even if the users were accepted the service, to some extent, they rated it very low, especially in safety, security, and comfort level (Joewono and Kubota, 2007)

Competitive Market.

Huge numbers of Paratransit vehicle are entering the market illegally, which results in high competition within the drivers. Therefore, it leads to delay time in waiting for more passengers; sometimes, changing from the normal routes in another area with higher demand, congestion, and road accident (Weningtyas, Fujiwara, et al., 2013).

2.3.1 Classes of Paratransit Transportation

Paratransit Transportation's variety ranges from the significant capacity to small capacity; from motorized to non-motorized vehicles. Cervero (2000) classifies five categories of Paratransit Transportation, with Class 1 until Class 4 area categorized as motorized

transportation, and Class 5 as non-motorized transportation.

Class 1 Conventional Bus.
Most developing cities use bus service under transportation authority permission as trunk-line or in concession arrangement with governments, but a small number of cities have illegal operations of them. The capacity of bus vehicles is between 25-60 passengers, with fixed-route and fixed-schedule, serving long-haul journey within region and sub-region area.

Class 2 Minibus.
Jakarta's microlets, Manila's Jeepneys, and Kenya's Matatu are the example for this collective intermediate vehicle, with current capacity ranging between 12-20 seats. Operators offer fixed-route but semi fixed-schedule and serve middle-haul journey in sub region area.

Class 3 Microbus.
With the capacity for 4-11 persons, microbus is locally designed to serve less demand area within sub region, with fixed-route and semi fixed-schedule. Sometimes, the drivers suffer from deficit income, and to return the capital costs, they also provide door-to-door service for those who need this.

Class 4 3-Wheelers and Motorcycles.
The fastest growing paratransit vehicles in developing countries are three-wheeler and motorcycle-taxi, and they have advantages by their small size and mostly functioned as a feeder. With a low capacity between 1-4 passengers, both vehicles offer smooth maneuver in facing traffic jam and also enabling passenger with geographical constraints (e.g., narrow roads) to connect to city centers or nearest transit stations.

Class 5 Pedicab/ Horse-Cab.
All of the non-motorized paratransit transportation are included in this category, and provide mobility within neighborhood area, with low capacity 1-6 persons.

2.3.2 User Satisfaction on Paratransit Transportation and Intention to Use in the Future

Recently, some researchers have conducted the studies to understand the user perception of Paratransit Transportation, and mainly they were aimed to concentrate mostly in developing countries. In Bandung, Indonesia, study for Paratransit Transportation, which called Angkutan Kota, focusing on the user perception, which considering market segmentation and trip-making behavior with paratransit transportation (Tarigan et al., 2014). The authors figured out that based on calculation, commuters for Paratransit Transportation has six segments, which are divided by their access to private vehicles, their dependency to public transportation, and mode of transit choice. According to the surveys, 40.3% passengers are willing to use Angkutan Kota because they have no private vehicles at home, while affordability level shows 12.8% and accessibility factor 10.7% within the commuters.

Similarly, another research in Bangkok, Thailand, tried to measure the feasibility of fixed-routes and flexible-routes paratransit transportation based on commuter satisfactions, and how it relates to mass transit connectivity (Tangphaisankun, 2009). The attributes are featuring numerous factors, for instance, comfort and convenience, safety and security, and information. The results are showing that flexible-routes, such as motorcycle-taxi, able to satisfy high-income people who prefer faster and responsive services, while it considers as dangerous in safety level. Therefore, fixed-route services bring benefits for low-income and middle-income commuters, as they are safer and less-cost than flexible routes.

In Hong Kong, Loo (2007) noted that local Paratransit Transportation mentioned as resident couch service, can reduce the dependence of private vehicle because it is cheaper than driving and also eliminate high-cost parking fee. Also, a study on Paratransit Transportation in Jakarta mentions the importance of measurement of service quality and perceived value from commuters' point–of view to be able to improve the overall performance of the service and convince more people to use this service in the future (Sumaedi et al. 2012). This study also states that service quality elements, such as safety, level of passengers' crowding, engine maintenance, drivers' attitudes towards travelers, and clean and comfort, determine the satisfaction level of commuters. Moreover, Rahman et al. (2016) research in Dhaka city, Bangladesh reveals that customers in Paratransit Transportation are more influenced by the provision of 'Service Features' rather than just 'Physical Appearance.'. other notable results from this study are reliability of service on Paratransit Transportation (e.g., time of journey during weekdays), Vehicle Fitness, and Travel Expenses, in which also have an impact on customer satisfaction and their intention to continue use Paratransit Transportation (Joewono and Kubota, 2007; Sumaedi, 2012; (Rahman, Das, et al., 2016)).

2.4 Commuter Train Ridership Factors and the Importance of the Non-Motorized and Motorized Public Transportation Connectivity in Rail Services

There are several features that affect the train ridership. Adapting from (Taylor and Fink, 2003)**,** the conditions depend on many factors, including internal factors, which can be controlled by the transit providers; and external factors, which outside the responsibility of transit providers. One of the essential factors is proved to be an accessibility from home to the train station, and train station to the destination (Givoni and Rietveld, 2007) and the explanation will be written down below.

2.4.1 The Effects of External Factors and Internal Factors to Rail Ridership

External Factor

(1) Socio-Economic Factors.

Several kinds of literature mentioned that employment level plays such a significant role in transit ridership, and so does income level. Both of these features also have an active relationship with private vehicle ownership, fuel prices, and also parking costs.

(2) Spatial Factors.

Most researchers tend to focus on the effect of density, mixed-use and compactness development with travel behavior, but there is no bigger effect than the availability of parking space and its price, especially in US cities. Another study reveals the relationship between developments in new residential areas may increase the maximum number of transit ridership. However, it would not happen not because of its level of density, but the accessibility from neighborhood area to mass transit stations.

(3) Public Finance.

To be able to provide stable operations, funding and subsidies from public authorities also affect transit ridership, since it may reduce the actual fare.

Internal Factor

(1) Pricing Factor.

The biggest factors that may influence transit ridership are fare and pricing. Several researchers examine the relationship between pricing factor and services quality as fundamental variables in engaging passenger to use public transport. One of the literature mentioned that level of ridership would increase the level of services are also improve, rather than lowering the fare.

(2) Service Quantity and Service Quality Factors.

Another important feature from service quantity of transit, which will improve transit ridership, are coverage area and frequency of service. As mentioned above, passengers are more satisfied with service improvement than reducing trip fare. Also, some literature also highlights the important factors of service quality that determine transit ridership be the availability of information, safety and security, customer service, and clean fleets.

To support those factors, Keijer and Rietveld (2000) also provided other significant factors which influence commuter to use rail service, such as connectivity to train station, the frequency of trains, and the environment around the station, infrastructure, and bus services.

2.4.2 The importance of Accessibility to the Train Station

Accessibility to the rail station is proved to be one of the most significant elements in rail service in the Netherlands (Keijer and Rietveld, 2000). Specifically, the authors' study describes that commuters tend to walk to/from the stations within <1,5 km. Otherwise, they will choose bicycle or public transportation as their access and egress mode to train stations.

Givoni and Rietveld (2007) measured the user satisfaction of rail commuters in The Netherland, and the results indicate that in general, services quantity and service quality factors play an important role in engaging passengers, for instance, station organization and information, ticket service, safety, security and comfortable vehicles. Other important features to take into consideration are also reliable timetable, access to stations, affordable price, and nice personnel. Moreover, optimization of mass transit ridership may improve by

technical aspects, such as stop spacing and service frequency; and also integration with other transit or paratransit services, for instance, flexible-schedule services. To support these studies, research of User Satisfaction in MRT3 Manila also indicates that there is high demand in increasing ticket booth numbers, developing sufficient pedestrian walkway outside the stations, and establishing other transit and paratransit stops and its linkage to MRT Station (Okada et al., 2003).

Usually, railway stations are placed at a certain distance from each other, so that designing the accessibility to each station is a fundamental aspect to support rail service (Givoni and Rietveld, 2007). It is also important to estimate the overall travel time that uses by commuters from their origin to destination. Otherwise, they will not choose public transportation, if the travel time surpasses certain maximum limit (Krygsman, Dijst, et al., 2004). Also, commuters will accept longer egress time and journey less than access journey.

A study in 'how to improve satisfaction level of commuter in MRT3 Philippines'' reveals that 42% of users reach the station by jeepney (collective taxi) and 25,2% using the bus as their access mode. On the other hand, commuters made up to 50% walking towards their destination in egress mode, while 30% of them use jeepney (Okada, Doi, et al., 2003). It shows that integration between public transportation is one of the most fundamental aspects in increasing ridership of commuter rail.

2.4.3 Relationship between Public Transportation's User Satisfaction and Intention to Use with Commuter Rail Ridership

The importance of feeder service to support commuter train service is assessed in numerous studies. Mostly, recent studies are focusing on commuter satisfaction in rail services rather than on its feeder systems, although feeder services between the start point and last destination from the train station are playing a significant role to increase ridership of light rail transit (Kim, Ulfarsson, et al., 2007). Semler and Hale (2010) suggest that providing good public transportations, walking, and bicycling from/to train station positively increase ridership, especially for residents who have no private vehicles or living around walk able area to the stations, rather than build the larger parking sites around the stations,

In Hong Kong, Loo (2007) found out that customer satisfaction of resident couch services could reduce residents' dependence of a private vehicle in accessing nearest rail stations. Similarly, in Bangkok, study also mentioned the importance of increasing ridership of Mass Transit in the future, by improving several elements of service in its feeder, which is Paratransit Transportation called Songtaew, since 52% of respondents utilize this mode as their access mode to Rail stations (Tangphaisankun et al., 2009). Moreover, literature in which addressing passengers' anxiety in Taiwan Railway Administration (TRA) mentioned that improper accessibility to training station (e.g., inadequate feeder support for access and egress mode) could cause anxiety for its daily commuters, since most of the train stations are located in central area in certain part of the cities (Cheng, 2010).

Tangphaisankun (2009) evaluates ridership of BTS and MRT in Bangkok city based on present trip pattern and public transit connectivity in access and egress mode. Even though it is not easy to recognize direct link between rail demand and its accessibility, the investigation in these variables is also relevant, especially for decision-maker, to establish certain policy and investment, critically analyzing broader impacts based on new development, and estimating future demand for rail transportation. In summary, it is important to understand to what extent a complementary function of access mode to train station determines the overall quality of railways journey.

2.5 Conclusion

Many kinds of literature emphasize the importance of user satisfaction as the powerful tools to estimate the intention to continue using some services in the future. One of the widely used postulates, which are Theory of Planned Behavior, has explained the positive relationship of perceived behavior and its influence toward future intention. Zeithaml (1988) and Cronin and Taylor (1992) emphasize the importance of service quality and perceived value as the drivers of satisfaction level of customers, in which influencing the intention to use certain services in the future. Numerous studies were conducted in public transportation customer satisfaction to prove this theory empirically (Lai and Chen, 2010; Sumaedi et al., 2012; de Ona, 2016) by combining service quality and perceived value for their research in public transportation. Additionally, Joewono and Kubota (2007) and Rahman (2016) focus on service quality in assessing user satisfaction for Paratransit Transportation.

Paratransit Transportation, one of the informal public transportation, is known as reliable public transportation in developing countries and provides many benefits, but at the same time, it also creates numerous negative issues (Cervero and Golub, 2007a). Despite those problems, several studies affirm the benefit factors of this service and suggest the decision maker consider Paratransit Transportation in the new development transportation planning, instead of terminating its existence (Fujiwara and Zhang, 2013).

On the other hand, rail-based transportation worldwide has lost its commuters due to the several factors, such as high fare and poor connectivity between its stations to commuters' origin and destination (Okada et al., 2003). Several studies in developing countries mention about the value of Paratransit Transportation as flexible-time and demand responsive vehicle to support ridership of commuter train (Okada et al., 2003; Joewono and Kubota, 2007; Loo, 2007). In summary, user satisfaction and intention to use of Paratransit Transportation can increase the ridership of rail-based transportation.

2.6 Conceptual Framework

This part will describe the correlation regarding user satisfaction and intention to use in Angkutan Kota service with the commuter rail ridership, based on the literature reviews which already explained above. To be able to understand the causality between independent variable (user satisfaction towards Angkutan Kota) with dependent variable (commuter rail

ridership), this study will assesses the perceived value and quality of service as two main elements in which determine the behavior-intention to use angkutan kota in the future, which adapting from several literatures (adapted from Gray, 1992; Joewono and Kubota, 2007; Tangphaisankun, 2009; Sumaedi, 2012). This study will focus on Angkutan Kota, which is included in Paratransit Transportation Class II.

To measure the ridership level, the target group for this study particularly aims the users of a commuter train, and their present trip pattern and connectivity between origin-destination transit modes will be evaluated. A study in Paratransit Transportation as a feeder for Bangkok MRT and BTS figured out the close relationship between connectivity and access time attributes in satisfaction and the intention to use public transit, both commuter train, and paratransit, rather than comfort and convenience attributes (Tangphaisankun, 2009).

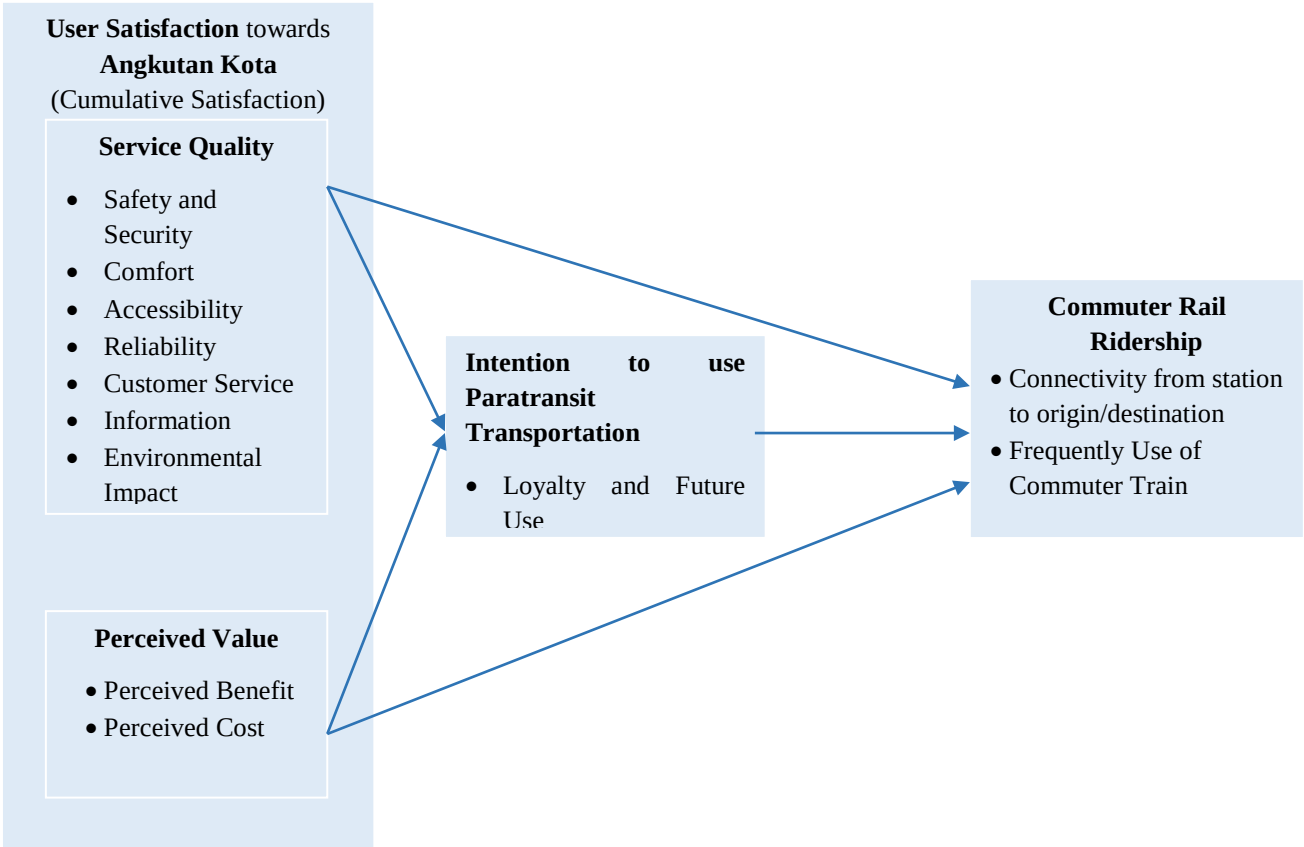

Figure 4 Conceptual Framework

Adapted from Joewono and Kubota, 2007; Tangphaisankun, 2009; Zeithaml,1996; de Ona, 2016; Rahman, 2016

Chapter 3: Research Design and Methods

3.1 Introduction

This chapter explains the operationalization of this research and consists of six sections. In brief, section two describes the theoretical framework and its indicators, then continue to research strategy in section three. Illustration of data collection method and sampling will be presented in section four, and lastly, in section five and six there are justifications in validity, reliability, and data analysis technique.

3.2 Revised Research Question

To what extent does user satisfaction and intention to use of Angkutan Kota influence commuter train ridership in Cimahi City?

Research question:
To what extent does user satisfaction and intention to use of Angkutan Kota influence commuter train ridership in Cimahi City?

Sub-question:
a. How is the current user satisfaction score, in regards to service quality and perceived value, towards Angkutan Kota in Cimahi City?
b. Which factors of user satisfaction, in regards to perceived value and service quality, impact on intention to use of Angkutan Kota?
c. To what extent user satisfaction, in regards to perceived value and service quality, and intention to use of Angkutan Kota, impact on ridership of Commuter Train?
d. Which factors of user satisfaction, in regards to perceived value and service quality, and intention to use of Angkutan Kota, impact on ridership of Commuter Train?

3.3 Definition of Variables and Sub-Variables

For this research, the author adopted several studies regarding satisfaction, service quality, perceived value, behavioral-intention, and ridership in train-services. This following table shows the definitions for each variable and sub-variables, and the sentences of each definition are already paraphrased.

In this study, the definition of each variable and sub-variable are adopted from numerous previous studies as given below:

Table 1 Definition of Variables

Customer Satisfaction	Customer satisfaction is the actual evaluation from the customers' point-of-view, based on their expectation, after using or experiencing certain products and services.	Oliver (1997) in Muhammad and Alhamdani (2011)

	Satisfaction as a 'psychological state' of the customer to judge and evaluate particular services and products quality that already given.	(Mohammad and Alhamadani, 2011).
Service Quality	Service quality defines as the technical assessment in measuring the service delivery; whereas satisfaction obtains from of expected desired level of service versus actual performance.	Transportation Research Board, 1999, in Joewono and Kubota, 2007
	Service quality is a predecessor for customer satisfaction, and it portrays the technical judgment.	Chou, Lu, et al., 2014
	Service quality is explained as "form of attitude, with a long-run evaluation" while satisfaction represents "transaction-specific measure."	Parasuraman, et al., 1988; Cronin Jr and Taylor, 1992
Perceived Value	Perceived value describes as an overall assessment of the utility or service by consumers, in which combining customers' perception on two factors, such as benefits and costs.	Zeithaml, 1988
Intention to Use – Behavioral Intention	Behavioral Intention defines as to what extent a person wants to perform or not perform the certain present behavior in the future.	Warshaw and Davis (1985)
	Behavioral Intention explains as a commitment to repurchase a particular product or certain services in the forthcoming years, or in short called customer loyalty.	Oliver (1997) in Lai and Chen (2010)
Train Service Ridership	The passengers who use a public transportation systems, e.g., buses or trains, or the number of passengers.	Dictionary.com

3.4 Operationalization of Variables and Indicators

Operationalization explains as the transformation of theoretical concepts into the empirical situation, by changing the theory into certain objects that can be evaluated and observed (Van Thiel, 2014). As explained in Chapter 2 Literature Review, this study focuses on the relationship between user satisfaction in Paratransit Transportation and commuter train ridership. In this section, operationalization table is developed by translating theoretical framework into measurable entities. For this intention, several previous studies are assessed in able to develop strong linkage between each variable and indicators and answer the research questions. The theories, variables, and indicators are described in the Table 2 Operationalization Table as follows:

Table 2 Operationalization Table

Theory	Variables	Sub Variables	Indicator		Source
Theory of Planned Behavior	**User Satisfaction**	Perceived Value	Perceived Cost	• Price of the ticket • General costs including money and time.	De Ona et al. (2016)
			Perceived Benefit	• the relationship between quality and price	
Theory of Planned Behavior	**User Satisfaction**	Service Quality	Accessibility	• Accessibility to the car	Joewono and Kubota (2007)
			Safety and Security of the journey	• Overall security • Availability of police • Overall safety from road accident	Joewono and Kubota (2007)
			Comfort	• Cleanliness inside the car • Comfort during trip from start until stop	Joewono and Kubota (2007)
			Reliability	• Length of access and egress journey	Joewono and Kubota (2007)
			Information	• Availability of route direction information • Availability of information in emergency situation	Joewono and Kubota (2007)
			Customer Service	• Crew's skill and ability • Crew's attitude and help to serving the customer	Joewono and Kubota (2007)
			Environmental impact	• Effect of congestion • Effect of this mode operation on the economic life • Effect of this mode operation on the social, cultural, political	Joewono and Kubota (2007)
Theory of Planned Behavior	**Intention to Use** - Behavioural Intention		Loyalty	• Say positive things about these modes • Recommend this mode to someone who seeks your advice. • Frequent/Infrequent User	Zeithaml (1996); Tangphaisankun (2009)
			Switch	• Ride this mode less in the next few years • Change into another modes that offers better prices	
			Pay More	• Continue to use this modes if its prices increase.	

	Ridership of Commuter Train	Present Trip Pattern	Origin-Destination Access	• Details of access trip and egress trip - number of modes used • walking time, waiting time, in-vehicle time	Tangphaisankun (2009)
			Frequent User/Non Frequent User	• Time using commuter train in a week	

3.5 Research Strategy

The objective of this research is to explain the influence of user satisfaction and intention to use Paratransit Transportation, specifically Angkutan Kota, as a supporting system to enhance the ridership of commuter train. The research question has two variables, which consist of the independent variable (user satisfaction and intention to use Paratransit Transportation), and then the dependent variable is ridership of commuter train. Consequently, to be able to evaluate user satisfaction within a large number of populations, surveys strategy will be applied. Surveys is an adequate strategy for large-scale research with a significant number of indicators, mostly driven by theory-test research or deductive research, aims to obtain external validity or generalization, contains "describe and test" objectives and empirical data sources, and has huge numbers of units to measure (Van Thiel, 2014).

3.6 Data Collection Method and Sampling

3.6.1 Sampling Techniques and Sample Size Selection

Population study

Due to the specific study among commuter-train and paratransit transportation users, this study will use non-probability sampling technique, specifically purposive type sampling, and aiming the commuters who are using both of commuter train and paratransit transportation for their daily commuting. At this moment, the population number for this particular kind of passenger is still unknown. However, the data for each station is currently unavailable.

However, based on the data of Station Cimindi passengers, the average number of travelers in 2017 is 31.000

Cochran's formula (Barlett, Kotrlik, et al., 2001) is adopted To calculate the sample size, as follows:

$$n = \frac{t^2 pq}{e^2}$$

With *n* is the *sample size*; *t* is *value for the selected alpha level for confidence level of 95% (1,96)*; *p* is *estimated percent in the population*; *q* is *100 – p*, and *e* is *acceptable sample error*. This study will employ a margin of *error level* in 5%, and since the *estimated target population number* is unknown, it will sets at 50% or 0,5 (Barlett, Kotrlik, et al., 2001).

$$n = \frac{(1{,}65)^2(0{,}5)(0{,}5)}{(0{,}05)^2}$$

As a result, the adequate number of minimum respondents (*n*) is 272. The measurement of *t-value* is reffering to Barlett and Kotrlik (2001), who formulated a table about sampling size, and classified the standard *t-value* for categorical data in three categories, which are *1,65*, *1,96*, and *2,58*. This paper deployed 1,65 for the selected alpha value. Based on this calculation, the data collection is obtained within 25 days of fieldwork period. However, due to the limited number of surveyor within the fieldwork period, the number of respondents were reduced into 223.

Purposive sampling provides several advantages; it is efficient in regards to cost and time and also resulting in a robust outcome (Tongco, 2007). However, there are also things to be noted, since the purposive sample bias to particular characteristics, the results later could not be generalized, and not sufficient enough to fulfill external validity.

Area of Study

In brief, the data sample will draw in two train stations in Cimahi city, Bandung Metropolitan Area, West Java, Indonesia. Historically, the development of train line in Bandung was initially completed by the Indie-Dutch government on occupation period in 20th centuries, for the intention to connect Batavia (nowadays it is called Jakarta) and Bandung City, and transporting people and goods (Dienaputra, 2011). Ideally, to get an overview of trip characteristics for each, the sampling process should be obtained in all of the commuter train stations. Due to the time limitation, the author will narrow down the number of stations within two locations.

These two stations have 38 schedules of commuter trains per day, starting from 04.30 a.m. until 11 p.m., and connecting people to west and east part of Bandung Metropolitan Area and vice versa. The location of both stations is given in Figure 2 below.

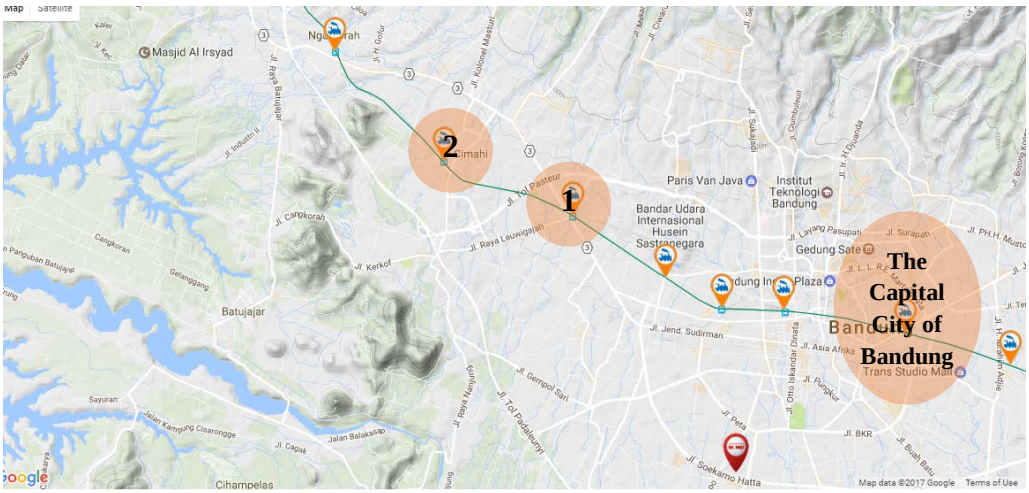

Figure 5 The Location of Commuter Train Stations

Figure 6 Map of Cimahi City

3.6.2 Data Collection Method and Instrument

While deploying surveys as the main strategy, the researchers usually work with quantitative data to obtain numerical data needed and generate it through questionnaires. By applying quantitative data, researchers can easily create the logical relationship between numerous variables and indicators in statistical analysis. Quantitative research could be a reliable method for measuring the average score in the large-scale area, for instance, the users of mass transit. The main data source will be from the empirical condition, and in numerical form, in social science, it is called primary quantitative data collection. Nevertheless, this study shall not neglect qualitative data source; if the following result specific findings might occur, the qualitative information can be useful to diagnose the possibility of the most influenced factors for specific behavior, in this context, user satisfaction.

Main data collection instrument is a questionnaire, which contains four parts of questions, such as following indicators: socio-demographic and economic background, then continue to the second part of the ridership information on a commuter train, such as access and egress mode, and frequently use the commuter train. On the third part, the opinion regarding perceived value, service quality, and behavioral-intention will take place.

3.7 Validity and Reliability

In social science, researchers need to consider the validity and reliability of their work. Internal validity is how the factors of the independent variable have a direct result in determining dependent variable's condition, not other variables (Gay, Mills, et al., 2011). Moreover, external validity defines as how far the generalization of outcomes of the study can be applied to study's population, time, and condition (Johnson and Christensen, 2000). Moreover, reliability is to what extent the evaluation tools present consistent results (Phelan and Wren, 2006). To fulfill the validity and reliability requirement, researchers should assess

the previous studies, so that they could avoid the failure in including fundamental elements, developing adequate tools and instruments, and successfully bringing out the significant outcomes of the study (Gideon, 2012).

As this study will deploy non-probability sampling, with purposive sampling technique, we could not reach the external validity, since the result cannot be generalized (Hibberts, Johnson, et al., 2012). The ideal situation of purposive sampling may be suitable to analyze and identify the individual characteristic of the target population and used to obtain representative outcomes (Schreuder, Gregoire, et al., 2001).

The questionnaires will be utilized as the main method for acquiring the quantitative data. To ensure this study validly and reliable, the questions will cover the most significant factors in numerous past studies, which stated by the authors that the indicators of independent variable has direct results for the dependent variable, and conclude the irrelevant aspects from their studies.

3.8 Data Analysis Technique

This study will apply two different techniques. Firstly, Ordinal Regression Model shall run to investigate which factors from Perceived Value and Service Quality affect the Intention to Use of Angkutan Kota. Secondly, Path Analysis will be employed to analyze the effect of user satisfaction and intention to use to commuter train ridership. Both models are an adequate technique for measuring the relationship between a set of independent variables, with a dependent variable. The analysis of primary quantitative data collection employed computer statistical software, which is Statistical Package for the Social Sciences (SPSS).

Chapter 4: Research Findings

4.1 Introduction

This chapter presents the significant findings and data analysis from field work primary data collection. This paper intends to examine the relationship between user satisfaction and intention to use of Paratransit Transportation and how it impacts on ridership of Commuter Rail in Bandung Metropolitan Area and its surroundings. The data is obtained in Cimahi city, as one of the most important parts in BMA, which mostly consists of residential, service, and industrial area.

4.1.1 Problem Statement

Mobility still becomes the most fundamental issue in Cimahi city, with limited options of public transport for its residents and visitors, such as small-scale transportations/Paratransit Transportation and inadequate number and service of mass rapid transportation. As expected, because of rapid urbanization and improvement in economic sectors, the number of private vehicles is increased, and without major extension of road systems, congestion tends to happen every day (Titania, 2008). One of Paratransit Transportations called Angkutan Kota is accused of causing congestion in several nodes around BMA, and Cimahi city as well, and dangerous drivers' behavior (Weningtyas, Fujiwara, et al., 2013). Even Angkutan Kota has 91% of loyal users (Tarigan, Susilo, et al., 2014) and fits well with Bandung's geographical landscape, 56% of respondents from online survey wants to terminate its service. On the other hand, a commuter train is getting more popular in the past two years, after the reformation of its service by PT KAI. Customer satisfaction, around 68% train passengers in Bandung city use Angkutan Kota to access its main station (Rohjan, Surdia, et al., 2012). It implies that Angkutan Kota as a relatively small public transportation plays a valuable role to relate a passenger from their origins and destination to the train stations, and can increase ridership of commuter trains.

4.1.2 The Characteristics of Study Location

The survey was conducted in two stations in Cimahi City; each station has a different class and land use pattern. The first station, Station Cimahi, is located in Central Cimahi and categorized as Station Class 2. The station is surrounded by residential area and military-base buildings. There are several available options for public transportation for commuter service's passenger to access this station, such as Angkutan Kota, Ojek (*motorcycle taxi*), and private vehicles. This station is serving 36 schedules of commuter line service direction Padalarang – Cicalengka, four schedules of fast and limited commuter train Padalarang - Cicalengka, six schedules of commuter line service of Cibatu – Purwakarta, and around three schedules of intercity trains. In regards of Paratransit Transportation, eight routes are passing by this station and giving residents from North Cimahi, Central Cimahi, and South Cimahi the access to the station.

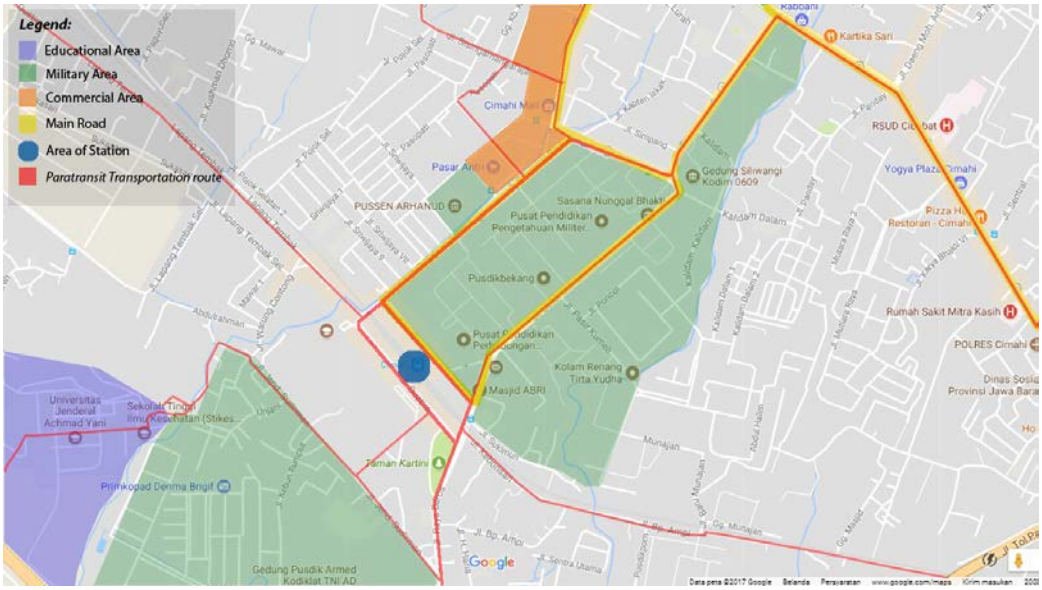

Figure 7 Cimahi Station study area map and access roads

Figure 8 Station Cimahi entrance and drop-off condition
Source: Personal documentation

Station Cimindi is administratively located in borderline of Cimahi city and Bandung city. The differences of surrounding area of the station, in particular, are distinctive. Station Cimahi is situated right in front of the road, easily recognized by its signage, and has a proper drop off and amenities such as mini market and adequate parking lot. On the other hand, Station Cimindi has only building which placed in the middle of Cimindi open market, no visible entrance from the main road, poor quality of road access, and has limited space for parking.

Station Cimindi serves 32 schedules of commuter line service direction Padalarang – Cicalengka, and six schedules of commuter line service direction Cibatu – Purwakarta. Based on the observation, commuter rail passengers who visit Station Cimindi come from several areas of West Bandung and six routes of Paratransit Transportation from Cimahi city and one route of Paratransit Transportation from Bandung city (Sederhana – Cimindi).

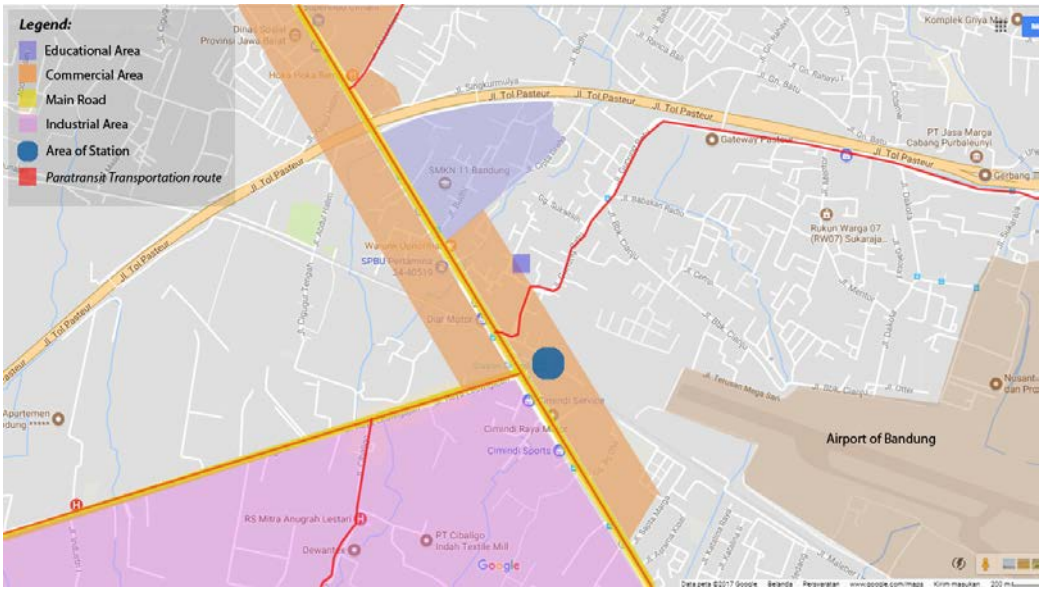

Figure 9 Cimindi Station study area map and access roads

Figure 10 Station Cimindi entrance and drop-off condition, in the middle of open market
Source: Personal documentation

4.1.3 Data Collection

The data collection was generated in approximately 12 days, from 6th of July 2017 until 21st of July 2017 in weekdays. During the fieldwork period, 245 questionnaires were distributed, and a total number of the filled questionnaire is 223, which generated 190 responses by asking the specific type of respondent in two train stations in Cimahi city, and 33 responses are obtained from the online survey. The questionnaire contains four parts in 6 pages printed paper. The first and second parts cover the opinions regarding indicators of Perceived Value and Service Quality of Angkutan Kota, in 19 questions with Likert-Scale, from 1 (one) "Strongly Agree" until 5 (five) "Strongly Disagree." For the sake of SPSS analysis, the

author recodes the scale from 1 (one) “Strongly disagree” until 5 (five) “Strongly agree,” due to the misunderstanding when creating the questionnaires and avoid the confusion in data presentation.

The third part is questioning about the respondent’s opinion in their opinion of the future use of Angkutan Kota, based on their future intention to use this service in general and if the cost increases, together with the recommendation for their relatives to ride with Angkutan Kota. The given rating is 7-scale Likert, ranging from “Extremely unlikely” to “Extremely Likely.” Lastly, the socio-demographic background of the respondents is assessed on the fourth part. Bahasa Indonesia is a main language for the questionnaires, and the respondents in the station were given a pen as rewards.

Figure 11 Respondents were answering the questionnaires
Source: Personal documentation

4.2 Descriptive statistics of General Characteristics of Respondents

4.2.1 Introduction

This section purposes of bringing an overview of general characteristics of respondents. The first part explains the respondents' characteristics by their socio-demographic background; continued with the second part about commuter train passengers' preferences access and egress mode of to the station. The third part presents the frequency of use of both Angkutan Kota and Commuter Train, and the fourth part assesses the access and egress time of the respondents. The relationship between the access and egress time with a percentage of access and egress mode are also attached.

4.2.2 Respondents' Characteristics

In able to understand the overview the background of the commuters, several control variables were asked to the respondents, which consist of a socio-demographic background, such as gender, age, last education, current job, income level, and area of living. The control variable is intended to help researchers in identifying the relationship between dependent and independent variables, and also recognize the other form of influence during the analysis, and it has potential to create reasonable explanation about the results (Carlson and Wu, 2012). As a result by gender, 66,8% of the respondent is female, while 33,2% is male. Moreover, most of the interviewees are a young adult, with 47,1% is categorized between the age of 16 and 25 years old, with the most common last education is High School Graduate with 45,9%.

Table 3 Respondent characteristics by gender, age, and last education

No	Control Variables	Options	Number of respondent	Precentage
1	**Gender**	Male	74	33,2%
		Female	149	66,8%
2	**Age**	< 15	8	3,6%
		16-25	105	47,1%
		26-35	33	14,8%
		36-55	56	25,1%
		< 55	20	9,0%
3	**Education Level**	Less than high school	36	16,4%
		High school graduate	101	45,9%
		Diploma	30	13,6%
		Bachelor degree	45	20,5%
		Master degree	7	3,2%
		Doctoral degree	1	0,5%
		Not responded	3	1,3%

In general, the occupation of commuter train passenger is varied, from full-time employee to housewives. Based on the Table 4, full-time employee and student become the most frequent occupation within the respondent respectively achieve 38,1% and 27,4% among the respondents. It also reported that the most of the respondents earn below Rp2.400.000 (equal €153) with 52,0%. This results indicate that price is related to the occupation, and people considering to ride with the commuter train because it is cheap and easier for them to access their working place or universities by walking from near train station.

Table 4 Respondent Characteristics' by Occupation and Income Level

No	Control Variables	Options	Number of respondent	Percentage
1	**Occupation**	Full time employee	85	38,1%
		Part time employee	15	6,7%
		Unemployed and looking for a job	13	5,8%
		Unemployed and not looking for job	9	4,0%
		Retired	5	2,2%
		Student	61	27,4%
		Other	34	15,2%
		Not responded	1	0,4%
2	**Income Level**	< 2.400.000	116	52,0%
		2.400.000-3.900.000	56	25,1%
		4.000.000-5.900.000	18	8,1%
		> 5.900.000	16	7,2%
		Not responded	17	7,6%

Area of living, which illustrates in Table 5, is the last control variable applied in the questionnaire, to get an insight into the common area of where the passengers of the commuter train are settling. Apparently, only 40.3% of the respondent is living in Cimahi city, while the number of respondents from the City of Bandung, District of Bandung, and District of West Bandung also prefer to access Cimahi city's train station due to the ease mobility. Administratively, Cimahi city is a small town surrounded by residential, industries, and other public facilities. With many options of Paratransit Transportation crossing the city to connect numerous sub-districts of Bandung city, District of West Bandung, and District of Bandung, and obviously, both of the stations in Cimahi city are located in convenience area.

Table 5 Respondents' Characteristic by Area of Living

No	Control Variables	Options	Number of respondents	Percentage
1	**Area of Living**	North Cimahi	18	8,1%
		Central Cimahi	32	14,3%
		South Cimahi	40	17,9%
		District of West Bandung	33	14,8%
		City of Bandung	42	18,8%
		District of Bandung	35	15,7%
		Other area	23	10,3%

4.2.3 Respondents' Trip Characteristics

4.2.3.1 Respondents' Access Characteristics

Chart 1 shows that overall; the most favored travel options to access the station are Angkutan Kota, private vehicle, and online taxi. Respectively, 57,4% of respondents use Angkutan Kota as their main access mode, while 17% prefer to use private vehicles and 12,6% ride with the online taxi (Uber/Gojek). In regards of Angkutan Kota as the main access mode to approach the station, Station Cimindi has the most frequent respondent and almost 70% of passengers ride with Angkutan Kota, while Station Cimahi has the similar results with 59,8% respondents. However, 42,4% respondents from online survey prefer to ride with Online motorcycle taxi to approach the stations, while 27,3% other travel with Angkutan Kota, and 21,2% with private vehicle. According to Table 7, walking is only popular among respondents from Central Cimahi and City of Bandung, with 21,9% and 11,9% chose it as their preferred access mode.

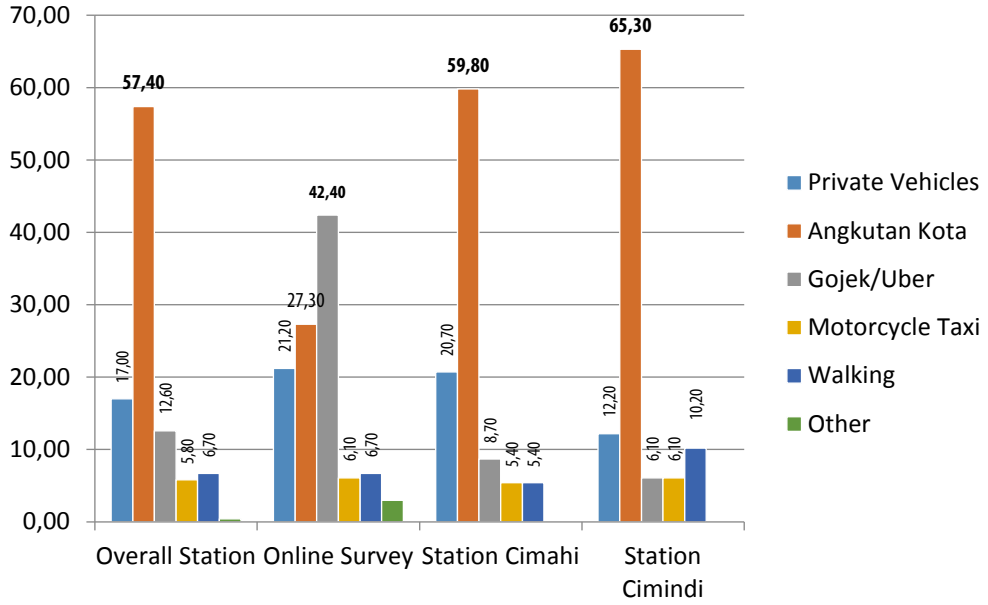

Chart 1 Most Frequent Access Mode of Respondent by Station

The observation of the most frequent access mode by area of living aims to classified the users based on their preference of mode for accessing the station from their initial area. Most of Angkutan Kota users mostly come from South Cimahi, District of Bandung, and North Cimahi, with 68% - 72% of respondents ride Angkutan Kota as their main access, compared with 37,5% and 45% respondents from Central Cimahi and City of Bandung, respectively.

Table 6 Percentage of Access Modes by Area of Living

Area of Living	Private Vehicle	Angkutan Kota	Gojek/ Uber	Motorcycle Taxi	Walking	Other
North Cimahi	16,7%	66,7%	16,7%	0,0%	0,0%	0,0%
Central Cimahi	28,1%	37,5%	3,1%	9,4%	21,9%	0,0%
South Cimahi	10,0%	72,5%	7,5%	5,0%	5,0%	0,0%
District of West Bandung	21,2%	51,5%	15,2%	12,1%	0,0%	0,0%
City of Bandung	7,1%	45,2%	28,6%	7,1%	11,9%	0,0%
District of Bandung	22,9%	68,6%	5,7%	2,9%	0,0%	0,0%
Other area	17,4%	65,2%	8,7%	0,0%	4,3%	4,3%

Table 7 classified the respondents in four different classes related to monthly income, by area of living. This classification aims to investigate the choice of access and egress mode of respondents based on their revenue. From the table 6 and 7, we may conclude that the biggest users of Angkutan Kota are low-income people (< Rp2.400.000), and mostly residing inside District of West Bandung and South Cimahi. In comparison, respondents from Central Cimahi and City of Bandung have the lowest percentage of Angkutan Kota users below 50%, which is linear to the sum of middle and upper middle-income residents (Rp.2.400.000 – 5Rp.5.900.000) sharing 46,6% and 42,1% respectively. However, among the resident from the City of Bandung, Gojek is the second most popular access mode, while the private vehicle is preferred private vehicle. Therefore, middle and upper middle income tend to choose faster and more comfortable mode to access the station.

Table 7 Classification of Area of Living by Monthly Income

Area of Living	< Rp2.400.000 (Low Income)	Rp2.400.000 – Rp3.900.000 (Middle Income)	Rp.4.000.000 – Rp5.900.000 (Upper Middle Income)	<Rp5.900.000 (High Income)
North Cimahi	47,1%	17,6%	23,5%	11,8%
Central Cimahi	46,7%	43,3%	3,3%	6,7%
South Cimahi	63,9%	27,8%	8,3%	0,0%
District of West Bandung	64,5%	25,8%	9,7%	0,0%
City of Bandung	44,7%	34,2%	7,9%	13,2%
District of Bandung	65,6%	21,9%	3,1%	9,4%
Other area	59,1%	9,1%	13,6%	18,2%

Respondents' Access Time

Chart 2 illustrates about the overall access time, and the result is 46,2% of commuters need more than 10 minutes to go to the station, and it applies to whole stations. Angkutan Kota still becomes a favorable access mode, since it is widely available to connect resident to the station, as seen in Table 8. Alternatively, 14,3% commuters preferred Gojek (online motorcycle taxi) to reach the station less than 5 minutes and 25,7% between 5 – 7 minutes, while walking and private vehicles are seen as another frequent access mode for 7-10 minutes journey time.

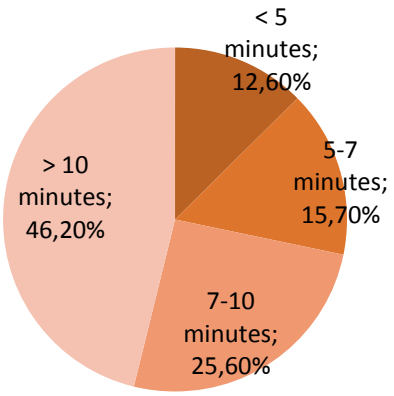

Chart 2 Overall Respondents' Access Time

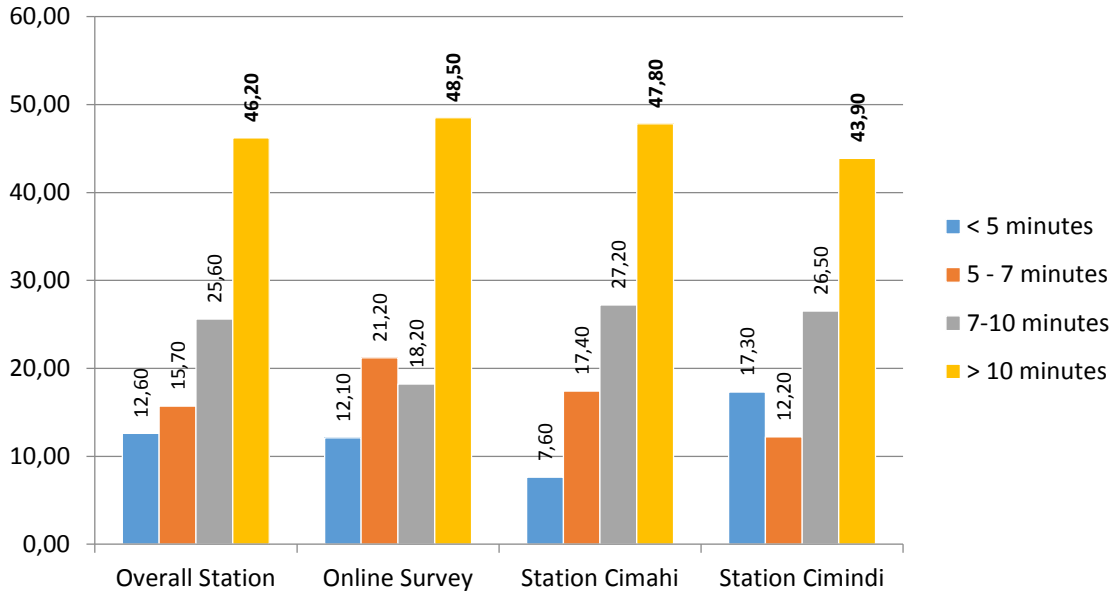

Chart 3 Respondents' Access Time by Station

Table 8 Access Journey Time by Preference Access Modes

Access Journey Time	Private Vehicle	Angkutan Kota	Gojek/ Uber	Motorcycle Taxi	Walking	Other
< 5 minutes	10,7%	67,9%	14,3%	0,0%	7,1%	0,0%
5 - 7 minutes	20,0%	48,6%	25,7%	5,7%	0,0%	0,0%
7- 10 minutes	21,1%	45,6%	10,5%	12,3%	10,5%	0,0%
> 10 minutes	15,5%	64,1%	8,7%	3,9%	6,8%	1,0%

Table 9 shows the overall frequencies of access journey time divided by the each surveyed stations. In Station Cimahi, among 47.8% of respondents' share spend more than 10 minutes, 9.8% living in the City of Bandung, while other 8,7% responses come from District of Bandung. Continue with Station Cimindi, 11.2% of respondents are living in Central Cimahi, and 9.2% other is residing in District of Bandung. Apparently, in the overall area of the station, the highest share of respondents are spending more than 10 minutes for access journey time, particularly 16.2% originate from Cimahi city. Nevertheless, City of Bandung and District of Bandung also share the considerable percentage, with 10.3% and 9.4%, respectively.

Table 9 Access Journey Time by Area of Living

Area of Station	Access Journey Time	North Cimahi	Central Cimahi	South Cimahi	District of West Bandung	City of Bandung	District of Bandung	Other
Station Cimahi (among 92 respondents)	< 5 minutes	1,1%	1,1%	2,2%	3,3%	0,0%	0,0%	0,0%
	5 - 7 minutes	3,3%	0,0%	3,3%	5,4%	1,1%	2,2%	2,2%
	7- 10 minutes	2,2%	9,8%	3,3%	4,3%	4,3%	1,1%	2,2%
	> 10 minutes	4,3%	6,5%	7,6%	5,4%	9,8%	8,7%	5,4%
Station Cimindi (among 98 respondents)	< 5 minutes	1,0%	4,1%	3,1%	6,1%	2,0%	0,0%	1,0%
	5 - 7 minutes	0,0%	1,0%	3,1%	1,0%	3,1%	3,1%	1,0%
	7- 10 minutes	4,1%	5,1%	8,2%	2,0%	2,0%	4,1%	1,0%
	> 10 minutes	2,0%	6,1%	11,2%	5,1%	6,1%	9,2%	4,1%
Online Survey (among 33 respondents)	< 5 minutes	3,0%	0,0%	0,0%	3,0%	3,0%	3,0%	0,0%
	5 - 7 minutes	0,0%	0,0%	0,0%	0,0%	12,1%	0,0%	9,1%
	7- 10 minutes	0,0%	0,0%	0,0%	0,0%	6,1%	9,1%	3,0%
	> 10 minutes	0,0%	0,0%	0,0%	3,0%	24,2%	12,1%	9,1%
All Area (among 223 respondents)	< 5 minutes	1,3%	2,2%	2,2%	4,5%	1,3%	0,4%	0,4%
	5 - 7 minutes	1,3%	0,4%	2,7%	2,7%	3,6%	2,2%	2,7%
	7- 10 minutes	2,7%	6,3%	4,9%	2,7%	3,6%	3,6%	1,8%
	> 10 minutes	2,7%	5,4%	8,1%	4,9%	10,3%	9,4%	5,4%

4.2.3.2 Respondents' Egress Characteristics

Egress mode defines as how people depart from the station to their destination. Accordingly, Chart 2 presents the most popular egress modes are Angkutan Kota, online motorcycle taxi and walking. The result describes that 49,8% of respondents ride with Angkutan Kota when 18,4% prefer walking, and 15,2% choose online motorcycle taxi (Uber/Gojek). These results could be explained by the demographic situation in Table 4 when the most common occupations are a full-time employee, students, and other (regarding the responses of the questionnaire: mostly housewives) whose destinations are walkable from the train station.

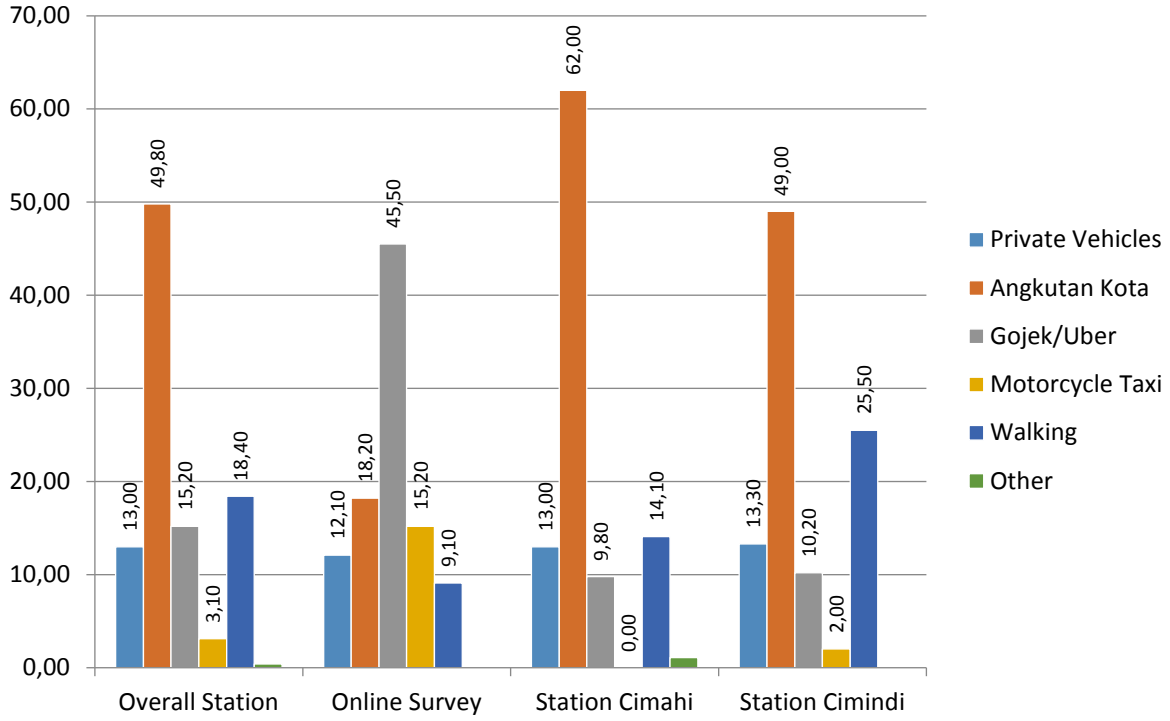

Chart 4 Most Frequent Egress Mode of Respondent by Station

Table 10 illustrates the preferences of egress mode by current occupation. It indicates that Angkutan Kota is the most popular choice among retired, unemployed, and students, with more than 60% share within the preference modes. On the other hand, full-time employee and part time employee have more options to choose the preferable mode, with Angkutan Kota and walking are became their first choice of egress mode. Even if there is no formal question asked to the respondents to clarify about this circumstance, several respondents from these categories confirmed that their destinations, which mean their offices, are close to the train station. For the explanation about egress journey time, see Table 11 on the next part.

Table 10 Preferences of egress mode by current occupation

Occupation	Private Vehicle	Angkutan Kota	Gojek/ Uber	Motorcycle Taxi	Walking	Other
Full Time Employee	11,8%	38,8%	23,5%	4,7%	21,2%	0,0%
Part Time Employee	13,3%	53,3%	6,7%	0,0%	26,7%	0,0%
Unemployed, Looking for a job	30,8%	61,5%	0,0%	0,0%	7,7%	0,0%

Occupation	Private Vehicle	Angkutan Kota	Gojek/ Uber	Motorcycle Taxi	Walking	Other
Unemployed, not looking for a job	33,3%	33,3%	0,0%	11,1%	22,2%	0,0%
Retired	0,0%	100,0%	0,0%	0,0%	0,0%	0,0%
Student	11,5%	60,7%	18,0%	1,6%	8,2%	0,0%
Other	8,8%	50,0%	2,9%	2,9%	32,4%	2,9%

Respondents' Egress Time

Chart 5 illustrates that 46.4% of respondents spend more than 10 minutes after departing from the stations to reach their destination. Referring to the most preferred mode for egress journey on Table 11, Angkutan Kota still the most favorable modes for every category, while walking is preferable for 5 – 7 minutes and 7 – 10 minutes travel time, with 19.3% and 23.1% shares, respectively. Lastly, Gojek shares the considerable percentage for the journey with travel time less than 5 minutes with 24%.

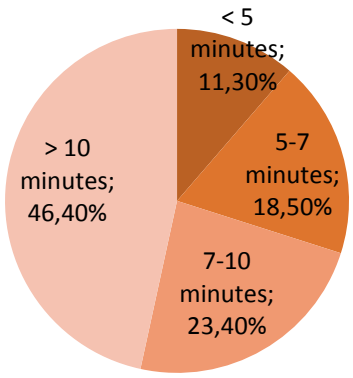

Chart 5 Overall Respondents' Egress Time

Table 11 Egress Journey Time by Egress Mode

Egress Journey Time	Private Vehicle	Angkutan Kota	Gojek/ Uber	Motorcycle Taxi	Walking	Other
< 5 minutes	12,0%	44,0%	24,0%	4,0%	16,0%	0,0%
5 - 7 minutes	7,3%	53,7%	17,1%	2,4%	19,5%	0,0%
7- 10 minutes	7,7%	48,1%	17,3%	1,9%	23,1%	1,9%
> 10 minutes	18,4%	49,5%	11,7%	3,9%	16,5%	0,0%

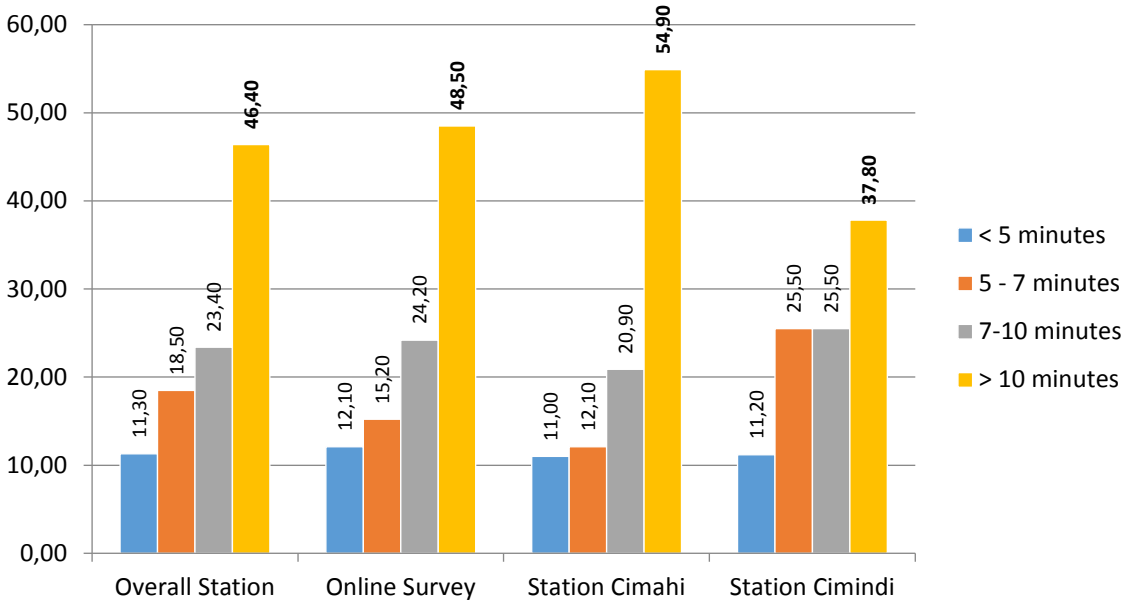

Chart 6 Respondent's Egress time by Station

As seen in Chart 6, on average, most of the respondents spend more than 10 minutes on their egress time travel, both from the filled questionnaire from Station Cimahi and Station Cimindi and also from an online survey. Table 12 presents the information about the relationship between current job and their travel time. In overall, no indication of the impact occupation on egress time, since almost every category shows the similar results.

Table 12 Egress Travel Time by Occupation

Occupation	< 5 minutes	5-7 minutes	7-10 minutes	> 10 minutes
Full Time Employee	8,2%	12,9%	24,7%	52,9%
Part Time Employee	13,3%	26,7%	13,3%	46,7%
Unemployed, Looking for a job	7,7%	23,1%	23,1%	46,2%
Unemployed, not looking for a job	22,2%	11,1%	11,1%	55,6%
Retired	20,0%	0,0%	20,0%	60,0%
Student	13,3%	25,0%	20,0%	41,7%
Other	8,8%	20,6%	35,3%	35,3%

4.2.3.3 Frequency of Travel for Angkutan Kota and Commuter Train

This part purposes to present the overall frequency of Angkutan Kota and Commuter Train rides, to be able to recognize the percentage of frequent and non-frequent users. According to Chart 7, 38.1% of the respondent ride with Angkutan Kota infrequently/ once a week, with approximately 21.1% of the entire area are daily users. Despite the irregular of use of Angkutan Kota in overall results, the respondents from Station Cimindi regularly travel with Angkutan Kota for their daily commute, with the total share of 'daily use' and '4 – 6 times a week' categories are reaching up to 62,3%, as seen from Chart 8. The similar result also

occurs from the responses of Station Cimahi, with 40,8% total share of 'daily use' and '4 – 6 times a week' categories. Non-frequent users of Angkutan Kota in Station Cimahi is considered as small, while in Station Cimindi appears only 2%.

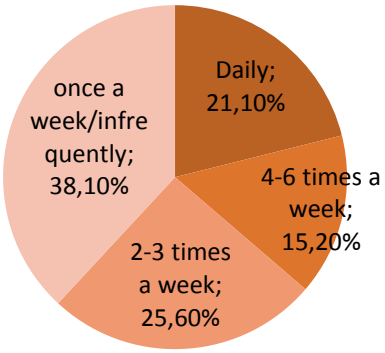

Chart 7 Overall Percentage of Angkutan Kota user

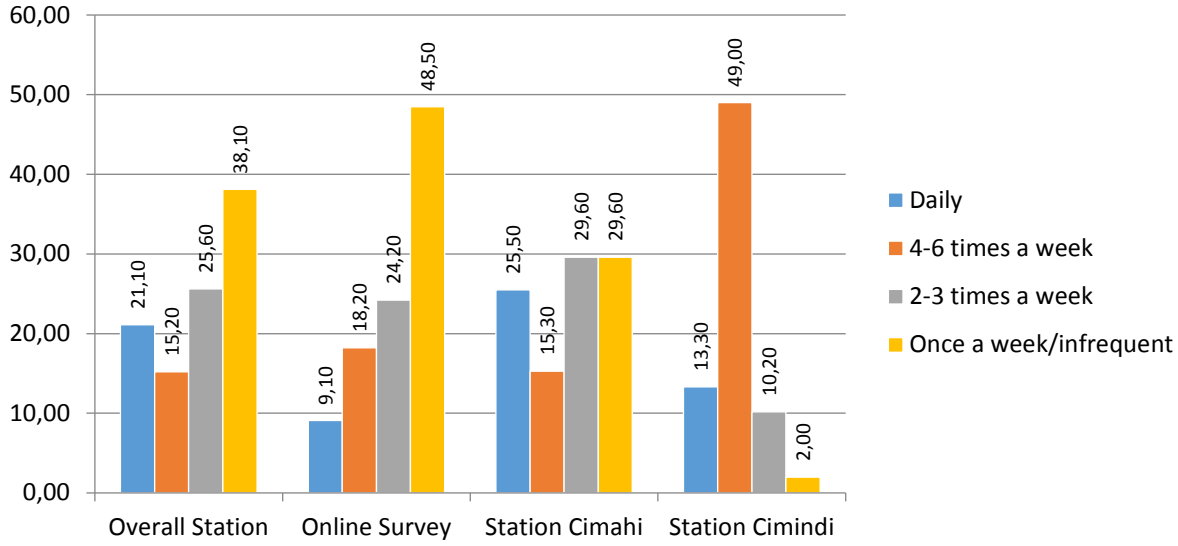

Chart 8 Percentage of Angkutan Kota User by Area of Station

Surprisingly, Chart 9 illustrates that 61,5% of respondents are the infrequent rider of the commuter train; with the total percentage of daily use and 4 – 6 times a week only achieve 31,1%. This situation may occur because of the newly established services, as presented in Chapter 1 Problem Statement, PT. KAI as the train service providers keep changing the local line schedules and services. However, since the external issues on commuter train ridership are not investigated and considered beforehand, it will state as the limitation of this study.

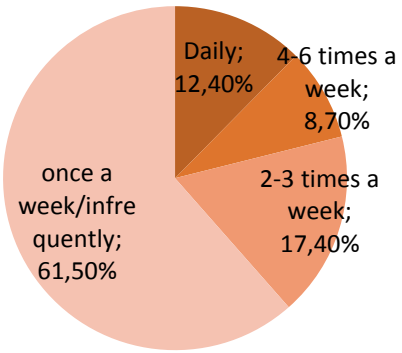

Chart 9 Overall Percentage of Commuter Train rider

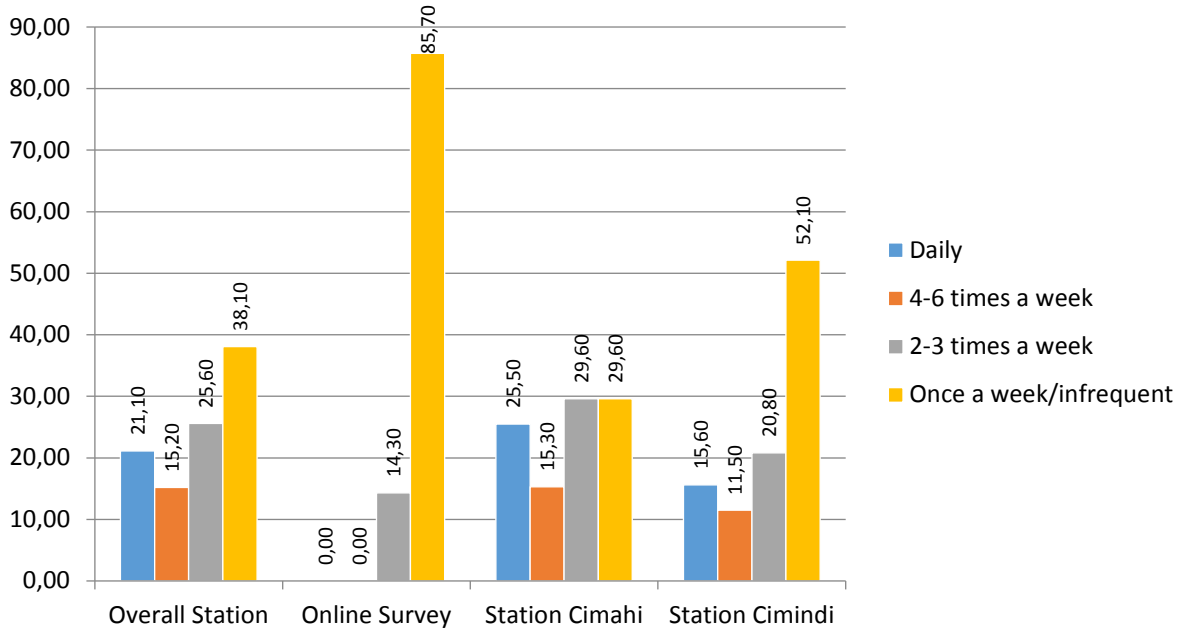

Chart 10 Overall Frequency Commuter Train rider by Station

4.3 Commuters' perception of Perceived Value and Service Quality

4.3.1 Introduction

This part presents the current score of User Satisfaction and Intention to use of Angkutan Kota. As explained on Chapter 3 Operationalization, User Satisfaction of Angkutan Kota has two sub-variables, which are Perceived Value and Service Quality. During fieldwork period, 19 close-ended opinions regarding commuters' perceived value and service quality were given in satisfaction level, from 1 (one) "Strongly disagree" until 5 (five) "Strongly agree." Separately, variables in Intention to use were measured differently, with from 1 (one) "Extremely disagree" until 7 (seven) "Extremely agree." The final results are described in the next part.

4.3.2 The Present User Satisfaction of Angkutan Kota

4.3.2.1 Perceived Value Present Scores

Based on the indicator of Perceived Value on Table 13, 70.4 % of respondents agree that Angkutan Kota's cost worth in regards to distance, 48.5% of its service, and 45.3% of its travel time. For the overall perceived benefit, 50.2% of respondents accept the cost of Angkutan Kota. On average, the results show that most of the respondents perceive the overall value of Angkutan Kota, with 3,35 out of 5 mean scores, supported by mode score 4 out of 5.

Table 13 Perceived Value Present Score

Perceived Value Indicators	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean Score	Mode Score
Perceived Cost							
Perceived Cost by Distance	7,2%	63,2 %	18,8%	9%	1,8%	3,65	4
Perceived Cost by Service	4,5%	43,2 %	30,2%	21,2%	0,9%	3,29	4
Perceived Cost by Journey Time	5,4%	40,1 %	25,2%	27%	2,3%	3,19	4
Perceived benefit	5%	45,5 %	25,2%	23,0%	1,4%	3,3	4
Overall Perceived Value Score						**3,35**	**4**

4.3.2.2 Service Quality Present Scores

Based on the opinion about service quality on Table 14, the respondents share their positive opinions about Angkutan Kota, such as easy accessibility with 70.4%, impact on economic development with 75.8%; impact on social development with 74%; and surprisingly, route information with 56% share. Even there's no official publication about the routes (e.g., online real time information, proper Angkutan Kota's stops), most of the respondents stated that

they could easily find the information from the driver or their relatives about Angkutan Kota's route.

According to the respondents' opinion about security and emergency, several negative problems occurred. Around 59,7% disagree that Angkutan Kota is secure enough for them, and 57,6% answered there's no emergency information inside the vehicles, such as a first-aid box or glass-breaker. Moreover, the opinion also supports the problem of congestion caused by Angkutan Kota with 51,1%. On average, the present mean score for service quality of Angkutan Kota is 3.22, which means commuters were accepted the service, and this result is supported by the mode score 4 out of 5. Despite these positive facts, the operators of Angkutan Kota need to fix several things to improve the satisfaction level of Angkutan Kota, especially in safety and security part.

Table 14 Service Quality present score

Service Quality Indicators	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean Score	Mode Score
Accessibility to the car	9,9%	60,5%	21,1%	8,1%	0,4%	3,7	4
Safety and Security of the journey							
Overall Safety	2,3%	32%	31,1%	34,2%	0,5%	3,01	2
Overall security (monitoring by officer)	5%	16,7%	28,4%	48,6%	1,4%	2,75	2
Safety on the road	0,9%	43%	24,9%	30,3%	0,9%	3,13	4
Comfort							
Overall Comfort	2,7%	40,7%	41,2%	15,4%	0%	3,3	3
Cleanliness	2,3%	28,8%	32,4%	34,2%	2,3%	2,95	2
Reliability in time	9,0%	36,5%	27,0%	26,6%	0,9%	3,26	4
Information							
Route Information	3,2%	53,4%	29,4%	11,8%	2,3%	3,43	4
Emergency Information	2,3%	53,6%	33,3%	9,5%	1,4%	2,54	2
Customer Service							
Customer service's skill	1,8%	28,8%	36,5%	32,0%	0,9%	2,99	3
Customer service's attitude	4,5%	29,6%	43,9%	21,1%	0,9%	3,16	3
Environmental Impact							
Effect on Economy	7,3%	69,5%	14,5%	8,2%	0,5%	3,75	4
Effect on Social	11,3%	63,1%	15,3%	10,4%	0%	3,75	4
Effect on Congestion	13,9%	37,2%	25,1%	22,4%	1,3%	3,4	4
Overall Service Quality Mean Score						**3,22**	**4**

4.3.2.3 Intention to Use Present Score

According to Table 15, 53.4% among the respondents show their possibility of using Angkutan Kota in the future, and 41,7% recommend its service to their relatives. Moreover, 35% of the respondents also consider to travel with Angkutan Kota in the future, even if the cost increase. However, 57,9% from the responses reported that commuters prefer to ride

with other mode with better cost, while more than 60% also convinced to change to another mode with better service. In conclusion, the current score for intention to use is 4,55 out of 7. This score demonstrates about uncertainty about their ridership with Angkutan Kota in the future because most of the respondents keep being neutral in expressing their opinion about this.

Table 15 Intention to Use Present Score

Intention to Use Indicators	Extremely Unlikely	Strongly Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Strongly Likely	Extremely Likely	Mean Score	Mode Score
Loyalty									
Future Use	5%	0%	9,9%	31,5%	31,1%	13,5%	9,0%	4,65	4
Recommendation	2,7%	6,3%	14,8%	34,5%	26,0%	10,3%	5,4%	4,27	4
Loyalty if cost increase	9,0%	8,1%	18,8%	29,1%	20,6%	9,9%	4,5%	3,92	4
Switch									
Better Price	2,7%	2,7%	15,8%	20,8%	23,1%	19%	15,8%	4,79	5
Better Service	0,9%	4,5%	11,7%	18,0%	16,2%	25,2%	23,4%	5,14	6
Overall Intention to Use Mean Score								**4,554**	**4**

4.4 The Relationship between Perceived Value, Service Quality, and Intention to Use of Angkutan Kota

4.4.1 Introduction

This section aims to investigate the factors that influence the intention to use of Angkutan Kota and to what extent the satisfaction level of Angkutan Kota determine the ridership of Angkutan Kota. For these intentions, Regression Models were developed to measure the probability of the future use of Angkutan Kota and which factors from user satisfaction are giving the significant impact upon future utilization and ridership of Angkutan Kota. In conclusion, the outcomes could provide an insight into the fundamental attributes regarding ridership of Angkutan Kota and its future use.

4.4.2 Reliability Test and Inferential Test

Recent studies in social science emphasize the importance of assuring internal consistency for each attribute within the variable. A useful test that widely applied is reliability test, which could precisely estimate the *internal consistency*, and provides the information about which indicators work well with the data analysis (Cortina, 1993). This study suggests that the consistency of the indicators is accepted if the Cronbach's alpha has a value greater than 0,7. However, another study allows Cronbach's alpha has value no less than 0.6, despite the fact that validity of data set is considered as doubtful (Garson, 2012).

Table 16 Reliability Test

Variables	Sub Variables	Indicator	Sub-Indicator	Number of sub-indicator	Cronbach Alpha
User Satisfaction	Perceived Value	1. Perceived Cost	• Perceived cost, • perceived service, • perceived travel time	4	0,734
		2. Perceived Benefit	Overall perceived benefit		
	Service Quality	1. Accessibility	Accessibility to the car	14	0,631
		2. Safety and Security	• Overall safety • Overall security • Safety on the road		
		3. Comfort	• Overall comfort • Cleanliness		
		4. Reliability	Reliability in time		
		5. Information	• Route of information • Emergency Information		
		6. Customer Service	• Crew's Skill • Crew's attitude		
		7. Environmental impact	• Economy effect • Social Effect • Congestion effect		
	Behavioral - Intention to Use	1. Loyalty	• Future use • Recommend this mode • Frequent/Infrequent User of Angkot*	4	0,620
		2. Switch* (deleted)	(e.g.) Change into another mode that offers better prices		
		3. Pay More	Future Use if price increases		
Ridership of Commuter Train	Present Trip Pattern	Origin-Destination Access	• details of access trip and egress trip time journey • number of modes used	2	*(no reliability test applied)*
		Frequent time of using Commuter Train	Time using commuter train in a week	1	*(no reliability test applied)*
Control Variables	Demographic Background of Respondents	• Age • Gender • Education Background	To explain the socioeconomic background of the respondents, and how	6	*(no reliability test applied)*

		• Income • Area of Living • Occupation	these indicators can influence their preferences to ride with Angkutan Kota and Commuter Train.		

*Note: *additional indicator adapted during fieldwork period, not included in Reliability Test*

As seen in Table 16, the examination of reliability test indicates that the attributes of the independent variable are suitable and consistent enough to apply in Regression Model. However, *Switch* indicator, which is a part of the intention to use, is eliminated due to the low result of Cronbach's alpha (below 0,6). Otherwise, the outcomes from the regression and analysis shall not be valid. Additionally, the frequency of use of Angkutan Kota is assigned as a supporting attribute in measuring intention to use Angkutan Kota.

4.4.3 The Factors impact on Intention to Use of Angkutan Kota by Perceived Value and Service Quality

4.4.3.1 Methodology

This section will assess the significant factors from user perception that might influence intention to use (loyalty) of Angkutan Kota, by developing ordinal logit regression model. This regression model is employed if the independent variable has ordinal/categorical value, and consists of a set (two or more) Independent variables, associated with dichotomous or polychotomous (more than two categories) dependent variable (Thomson, Furness, et al., 1998). Particularly, an adequate number of sample sizes are required. Before we execute the regression models, we shall conduct several tests for both the Independent Variables and Dependent Variable. Otherwise, the error on results will happen if violated. Table 17 shows the ability to apply Ordinal Regression Model since the outcomes indicate that the independent and dependent variables have a linear relationship, homogeneity of its variance, no multicollinearity occurred, and each variable's error is independent (Thomson, Furness, et al., 1998).

Table 17 Inferential Test for Regression

No	Inferential Test	Results	Threshold
1	Linearity Test	P-value = 0,684	Deviation from Linearity: *P-value* > 0,05
2	Homogeneity of Variance (homoscedasticity)	•Perceived Value *P-value* < 0,339 •Service Quality *P-value* < 0,840 •Intention to Use *P-value* < 0,783	Levene's test (*P-value*) α > 0,05 (Park, 2009)
3	Multi-collinearity	• Perceived Value VIF = 1,184 •Service Quality VIF = 1,124 •Intention to Use VIF = 1,114	Variance Inflation Factors (VIF) value between 1 until 10 (Dormann, Elith, et al., 2013)
4	Independence Test	Durbin Watson's value = 2,011	Durbin-Watson's value between 1,4 < value < 2,6 (Nau, 2017)

4.4.3.2 Ordinal Logit Regression

Ordinal Logit Regression (OLR) has a slightly different model with linear model regression. OLR model investigates the cumulative probabilities instead of individual probabilities. The basic formula for Ordinal Logit Regression draws below,

$$ln\left(\frac{\lambda_j}{1-\lambda_j}\right) = \beta_{0i} + \beta_1 x_1 + \beta_2 x_2 + \ldots . \beta_k x_k$$

where x_1 to x_k are the *k* predictor variables, and λ_j is the predicted probability of an results at or less than particular category of *J*. ((Smith and McKenna, 2012). This model assumes that the effect of the predictor by using proportional odds model. Ordinal Logit Regression also useful in managing ordinal data, and helps researchers in measuring categorical dependent variable, both of dichotomous and polychotomous dependent variable (Kennedy, 2003). In analysing the outcomes for dependent variables, both significant variables and non-significant predictors are needed because each predictors may impacted other results by its log (DeMaris, 1995).

4.4.3.3 The Impact of User Satisfaction on Intention to Use of Angkutan Kota

This part presents the data analysis and model interpretation to give a better understanding about which significant factors of User Satisfaction are influencing Intention to Use Angkutan Kota. As explained in Chapter 3, user satisfaction has two sub-variables, which are perceived value and service quality. The data on two sub-variables were categorized in five opinions about commuters' perceived satisfaction level, from "Strongly Disagree" to "Strongly Agree."

For this objective, five models were developed. The first model and second model are separately analyzing two sub-variables of user satisfaction as a predictor of intention to use of Angkutan Kota. Accordingly, both of the outcomes later might justify the result from the third model, which included both of the sub-variables as the predictors. The "Loyalty" indicator is chosen to become a dependent variable for these models because the indicator is represented commuters' opinion about their future use of Angkutan Kota. Differently, the fourth model was measured by employing overall user satisfaction attributes as predictors over Angkutan Kota Ridership. Lastly, the fifth model intends to analyze the odd ratio of ridership of Angkutan Kota which determined by loyalty indicator. As a conclusion, the most frequent factors in determining intention to use could be evaluated.

Therefore, only the significant attributes are presented in this part. In SPSS, no indicators are deleted despite its low significance, with the purpose to keep the model parallel and help the calculation for the overall regression. Wald statistic, referred as *z-statistic,* is also included here. It helps the analysis process by dividing regression coefficient with its associated standard error (Field, 2013). Additionally, Field (2003) also suggests assigning the analysis of *exp (B),* namely odds ratio, to compare the effects of each indicator of location over the threshold.

First Model: Perceived Value as Predictor and Loyalty as Dependent Variable

Final -2 Log Likelihood (-2LL) of this model reveals that unexplained variances are slightly decreasing, from 465,197 to 407,805, and this result indicates that the model has a good fit, supported by significant *p-value*. Furthermore, parallel test produces a large *p-value > 1,000*, so it fails to reject the null hypothesis. Consequently, proportional odds for this model is accepted (Norusis, 2006 in Joewono and Kubota, 2007). However, the goodness-of-fit table suggests that the model does not fit the data very well, with Pearson's *P-value* has rejected the null hypothesis, and signifies that the predicted values differ from the observed values.

Table 18 Parameter Estimates of Perceived Value *(significant at p <0.05)*

	Estimate	Std. Error	Wald	df	Exp(B)	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold							
[Loyalty= 2]	-5,014	,810	38,296	1	0.0067	-6,602	-3,426
[Loyalty= 3]	-3,659	,760	23,173	1	0,0260	-5,149	-2,169
[Loyalty= 4]	-1,743	,731	5,686	1	0,1750	-3,176	-,310
Location							
[PV_Service=1]	-4,044	1,717	5,548	1	,01750	-7,409	-,679
[PV_Time=1]	-2,223	1,058	4,415	1	0,108	-4,297	-,149

Note. R^2 = .23 (Cox & Snell), .24 (Nagelkerke). Model $X^2(16)$ = 57,391, significant at p <.05

As seen in Table 18, perceived service and perceived journey time have a significant impact on loyalty. The estimate of perceived service and perceived time come up with negative values, showing that the attributes predicted the opposite outcomes from the dependent variable. Referring to the exp(B) values, we can conclude that the respondents who assign a higher score on perceived service 5,7 times (1/0,1750) will use Angkutan Kota in the future, compare to less satisfied customers. Similarly, people who satisfied in their perceived time journey more likely to ride with Angkutan Kota 9,2 times (1/0,108) higher than the less satisfied passengers.

Second Model: Service Quality as Predictor and Loyalty as Dependent Variable

Similar to the previous model, Final -2 Log Likelihood (-2LL) from this model shows that unexplained variances are slightly decreasing, from 690.423 to 532.476, and it reveals that the model has a good fit and significant *p-value*. However, the goodness-of-fit table suggests that the model does not fit the data very well, with Pearson's *P-value* has rejected the null hypothesis, and points out that the predicted values differ from the observed values. *P-value* on parallel test shows large significance value (1,000) with *p-value > 0.05* so that it fails to reject the null hypothesis. Based on these results, proportional odds for this model is accepted.

Table 19 Parameter Estimates of Service Quality *(significant at p <0.05)*

	Estimate	Std. Error	Wald	df	Exp(B)	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold							
[Loyalty= 3]	9,150	3,064	8,917	1	9414,44	3,144	15,156
[Loyalty= 4]	11,606	3,099	14,028	1	109754,4	5,532	17,679
[Loyalty= 5]	13,682	3,134	19,059	1	875018,2	7,540	19,825
[Loyalty= 6]	15,461	3,167	23,826	1	5183546	9,253	21,668
Location							
[Servqual_Accessibility=3]	-1,564	,658	5,644	1	,209	-2,854	-,274
[Servqual_Accessibility=4]*	-,542	,604	,803	1	,58	-1,726	,643
[Servqual_Safety=1]	9,245	3,554	6,765	1	10352,67	2,278	16,211
[Servqual_Security=1]	-4,985	1,811	7,580	1	0,0068	-8,534	-1,436
[Servqual_Comfort=2]	-5,427	2,176	6,222	1	,0044	-9,692	-1,163
[Servqual_Comfort=4]	-5,980	2,248	7,076	1	,0025	-10,385	-1,574
[Servqual_Cleanliness=2]	8,708	3,385	6,619	1	6051,128	2,074	15,342
[Servqual_Cleanliness=4]	9,635	3,407	7,995	1	15290,7	2,956	16,313
[Servqual_CongestionEffect=1]	-5,439	1,705	10,182	1	,004344	-8,780	-2,098
[Servqual_CongestionEffect=4]	-1,641	,507	10,465	1	,19377	-2,635	-,647
[Servqual_Reliability=2]	-1,428	,673	4,505	1	,2398	-2,747	-,109
[Servqual_Reliability=4]	-1,676	,609	7,578	1	,187	-2,870	-,483
[Servqual_DriverSkill=2]	5,018	1,823	7,579	1	151,1088	1,446	8,591
[Servqual_DriverSkill=4]	5,669	1,819	9,710	1	289,7446	2,103	9,235
[Servqual_DriverAttitude=2]	4,391	1,021	18,512	1	80,72	2,391	6,391
[Servqual_DriverAttitude=4]	4,907	,958	26,246	1	135,23	3,030	6,784
[Servqual_EmergencyInfo=1]	7,500	1,871	16,061	1	1808,042	3,832	11,168

Note. R^2 = .52 (Cox & Snell), .54 (Nagelkerke). Model $X^2(51)$ = 157,947, significant at p <.05
**not significant at p < 0.05, only use for comparison*

Table 19 indicates that service quality plays a major role in determining loyalty. The cleanliness, drivers' skill, and attitude estimate values illustrate that respondents who assign a higher score in satisfaction score more likely to ride with Angkutan Kota in the future, compared to the lower level of satisfaction. Differently, passengers who perceived Angkutan Kota as the main source of congestion are less likely to travel with Angkutan Kota, as explained with the negative value from the estimate table. Furthermore, people who assign a higher score for reliability in time five times (1/0.187) more convinced to use Angkutan Kota for future access, compared to other categories.

Previously stated as the firm attribute of Angkutan Kota in the literature review, accessibility also becomes the significant predictor for loyalty. Based on estimated value, a respondent who satisfied with the accessibility of Angkutan Kota 4,7 times more likely to use Angkutan Kota, compared to the dissatisfied customer in this factor. In brief, these findings illustrate

that accessibility, cleanliness of vehicles, reliability in journey time, and drivers' attitude are the biggest determinant to encourage the passengers traveling with Angkutan Kota.

Third Model: Service Quality and Perceived Value as Predictors and Loyalty as Dependent Variable

Model fit information for the third model reveals that the model has a good prediction, since the Final -2LL shows the huge different unexplained variances from 690.423 to 501.934, with significant p-value < 0.05. Likewise, goodness-of-fit outcomes have a similarity with the previous two models, since the Pearson's *P-value* has rejected the null hypothesis, despite the considerable significance value of Deviance (p > .05). However, Test of parallel line supports the parallelism of this model with p-value > 0.05. In conclusion, proportional odds for this model is accepted. Additionally, Pseudo R-Square values are adapted to measure the effect of the independent variables (predictors) on the dependent variable. According to Cox and Snell's value of 0.58, this logistic model could explain 58,2% the variation of the dependent variable. Moreover, Nagelkerke's value of 0.61 explains that the predictors have a slightly strong relationship by 60,7% with the dependent variable.

Table 20 Parameter Estimates Ordinal Regression Model by Loyalty *(significant at p <0.05)*

	Estimate	Std. Error	Wald	df	Exp(B)	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold							
[Loyalty= 5]	8,524	4,044	4,443	1	5034,15	,598	16,450
[Loyalty= 6]	10,450	4,062	6,617	1	34544,37	2,488	18,412
Location							
[PV_Service=1]	-6,422	2,198	8,536	1	0,0016	-10,730	-2,114
[PV_Service=4]	-2,604	1,122	5,390	1	0,074	-4,803	-,406
[Servqual_Accessibility=3]	-1,534	,751	4,171	1	0,216	-3,006	-,062
[Servqual_Accessibility=4]*	-,310	,690	,202	1	0,733	-1,662	1,041
[Servqual_RoadSafety=2]	4,036	1,892	4,549	1	56,6	,327	7,745
[Servqual_SocialDevelopment=4]	1,282	,639	4,022	1	3,603	,029	2,535
[Servqual_CongestionEffect=4]	-1,651	,544	9,210	1	0,192	-2,717	-,585
[Servqual_Reliability=3]	-1,570	,669	5,511	1	0,208	-2,882	-,259
[Servqual_Reliability=4]	-1,492	,669	4,971	1	0,225	-2,804	-,180
[Servqual_DriverAttitude=2]	3,779	1,112	11,553	1	42,77	1,600	5,959
[Servqual_DriverAttitude=4]	4,567	1,036	19,434	1	96,254	2,536	6,597
[Servqual_EmergencyInfo=1]	6,795	1,848	13,516	1	893,37	3,173	10,418

Note. R^2 = .58 (Cox & Snell), .61 (Nagelkerke). Model $X^2(66)$ = 188,489, significant at p <.05
**not significant at p < 0.05, only use for comparison*

Table 20 illustrates that perceived service has a significant influence on the loyalty of Angkutan Kota. According to its predicted estimate values and exp (B), respondents who assign a higher score in perceived service more likely to assign a higher score on loyalty.

This result enhances the product from the first model that perceived value regarding service has become a fundamental aspect of public transportation. Correspondingly, people who select low score in reliability in time estimate values less encouraged to use Angkutan Kota, 4,8 times higher than people who assign a high score on it. Moreover, positive coefficients in drivers' attitude also reveal that people tend to ride with Angkutan Kota 9,6 times if its drivers offer the excellent services while running this service.

Accessibility is also considered as a valuable factor to courage people in using Angkutan Kota, as people who assign higher satisfaction score more likely loyal to Angkutan Kota. The similar result also revealed in the second model, in which ease accessibility could strongly motivate commuter to travel with Angkutan Kota. Apparently, the outcomes from emergency info and effect on social development have no further information about its importance upon loyalty, even both of them are statistically significant, due to the uncertainty in the estimated values.

Fourth Model: Service Quality as Predictor and Frequency of Use Angkutan Kota as Dependent Variable

According to OLR outcomes for the fourth model, the unexplained variances reduce from 577,854 to 412,158 after the establishment of this model. Consequently, this model has a good fit, which also supported by significant *p-value*. Hence, based on the goodness-of-fit Pearson's *P-value* has rejected the null hypothesis, showing that this model does not fit the data well. However, *P-value* on parallel test supports the parallelism from this model, with significance value above *0.05*. In conclusion, proportional odds for this model is accepted.

Table 21 Parameter Estimates for User Satisfaction on Angkutan Kota Ridership *(significant at p < .05)*

	Estimate	Std. Error	Wald	df	Exp(B)	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold							
[AngkotUse = 1]	18,213	1467,470	,000	1	81246638	-2857,975	2894,401
[AngkotUse = 2]	19,600	1467,470	,000	1	3,25E+08	-2856,588	2895,788
[AngkotUse = 3]	20,621	1467,470	,000	1	9,03E+08	-2855,567	2896,808
Location							
[PV_Distance=1]	-3,558	1,966	3,275	1	0,028496	-,295	7,412
[PV_Distance=4]*	,325	,889	,134	1	1,384031	-2,067	1,417
[PV_Service=2]*	1,999	1,284	2,424	1	7,381671	-4,515	,517
[PV_Service=3]	2,490	1,259	3,910	1	12,06128	-4,958	-,022
[PV_Service=4]*	1,755	1,229	2,039	1	5,783448	-4,164	,654
[Servqual_Cleanliness=2]	38,746	,492	6210,72	1	6,72E+16	-39,710	-37,783
[Servqual_Cleanliness=3]	38,657	,455	7207,95	1	6,14E+16	-39,550	-37,765
[Servqual_Reliability=2]*	-,597	,729	,671	1	0,550461	-,832	2,026
[Servqual_Reliability=3]	-1,351	,678	3,976	1	0,258981	,023	2,680

Note. R^2 = .53 (Cox & Snell), .57 (Nagelkerke). Model $X^2(66)$ = 165,696, significant at p <.05

**not significant at p < 0.05, only use for comparison*

According to Table 21, perceived service and perceived distance have a significant effect on ridership of Angkutan Kota. A commuter who assign high satisfaction score regarding perceived distance more likely to use Angkutan Kota, 35 times than respondents with the lower scores. However, respondents who assign a higher score in perceived service less likely to ride with Angkutan Kota. A similar conclusion is also applied in cleanliness and reliability in time attributes, which indicates that the person who dissatisfied with these factors have the higher probabilities to ride with Angkutan Kota in the future.

Fifth Model: Intention to Use as Predictor and Frequency of Use Angkutan Kota as Dependent Variable

Unfortunately, the fifth model does not accept the model fit, since the with p–value fails to reject the null hypothesis with $p > 0.05$ and value of X^2 (5) = 9,497. Despite this information, goodness-of-fit shows that the model fits the data very well, with Pearson's *P-value* has retained the null hypothesis. Parallelism from the model is also approved with *P-value* bigger than 0.05, However, since the model fit from this model not statistically significant, the relationship between loyalty and frequency of use Angkotan Kota could not be investigated. However, the parameter estimate table is present below.

Table 22 Parameter Estimate Loyalty on frequency of use of Angkutan Kota

	Estimate	Std. Error	Wald	df	Exp(B)	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold							
[AngkotUse = 1]	-,061	,419	,021	1	,884	-,882	,760
[AngkotUse = 2]	1,027	,425	5,838	1	,016	,194	1,860
[AngkotUse = 3]	1,812	,437	17,164	1	,000	,955	2,669
Location							
[Loyalty=2]	,434	,687	,400	1	,527	-,912	1,781
[Loyalty=3]	-,147	,579	,064	1	,800	-1,282	,989
[Loyalty=4]	,156	,471	,110	1	,740	-,766	1,079
[Loyalty=5]	,798	,471	2,876	1	,090	-,124	1,720
[Loyalty=6]	,885	,531	2,774	1	,096	-,157	1,927

Note. R^2 *= .0.042 (Cox & Snell), .045 (Nagelkerke). Model* $X^2(5) = 9,497$

4.5 The Relationship between User Satisfaction and Intention to Use of Angkutan Kota on Commuter Train

4.5.1 Introduction

This section aims to examine the key aspects of user satisfaction and intention to use of Angkutan Kota that influencing commuter train ridership, and to what extent these independent variables determine the ridership of commuter train services. Consequently, Simple Path Diagram is employed to assess the direct and indirect effects of user satisfaction and intention to use Angkutan Kota toward passenger train ridership. Furthermore, Ordinal

Logit Regression (OLR) models were developed to measure the impacts and probability from each attribute of perceived value and service quality upon ridership of commuter train. Briefly, the outcomes from the data analysis will justify the capability of Angkutan Kota as a feeder based on commuters' point of view and compare it with previous studies.

In able to run Path Analysis and regression, the reliability test and inferential test are necessarily needed. This preliminary tests already conducted in the previous part, which has a similar independent and dependent variables. According to Table 16 and Table 17 (see 4.4.2 Reliability and Inferential Test), the dataset has adequate assumptions and internal consistency.

4.5.2 The Factors impact on Commuter Train Ridership by Intention to Use and User Satisfaction of Angkutan Kota

4.5.2.1 Methodology

The first model applied is Path analysis, which defines as a technical method to analyze the causal effect of independent variables and the dependent variable, and able to estimate not only direct effect but also indirect effect (Lee, 2012). This model was adapted to measure the unobserved variable that may occur within dependent and independent variables. The simple model of Path Analysis is drawn below.

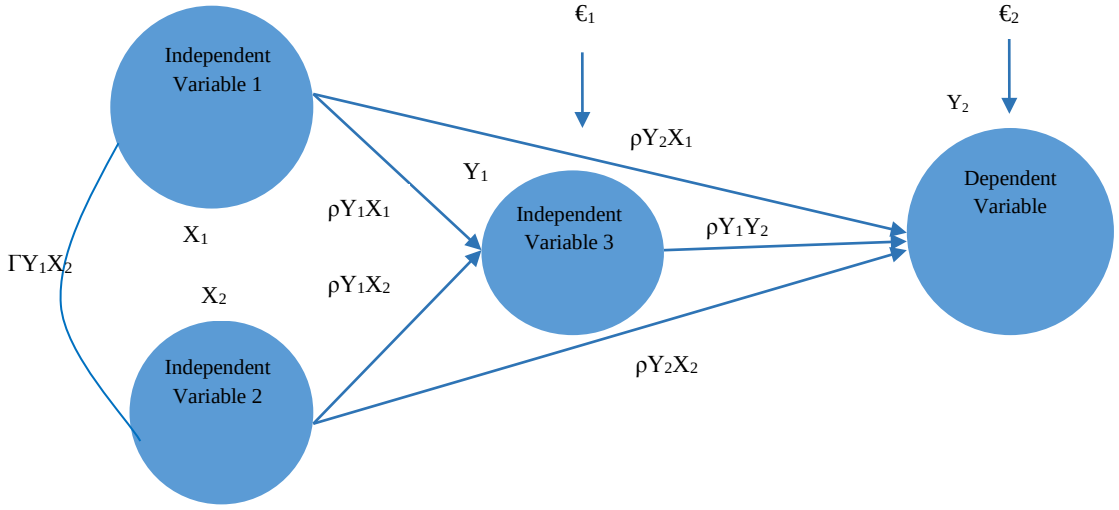

Figure 12 Simple Path Diagram
Source: Pedhazur (1997)

In Path Analysis, the variables that explain in the model called endogenous variable, while another variable without explanation in the model called exogenous variable (e.g., Perceived value and service quality). The advantage in applying this model is the capability to estimate the intervening variable, which defines as the unintended effect that caused by exogenous variable over its effect on another variable for certain endogenous variable. As seen in Figure 12, direct effects are illustrated by ρY_1X_1, ρY_1X_2, ρY_2X_2, and ρY_1Y_2, while $€_1$ and $€_2$ are errors in this model.

Ordinal Logit Regression is employed in two models of analysis. The first model investigates the odds ratio of commuter train ridership by user satisfaction and overall intention to use attributes. Moreover, the second model examines the possibility of passenger train ridership which determined by user satisfaction, intention to use, and also, a present journey of Angkutan Kota. Later on, the comparison of the models could give an insight into which are the most significant aspects from Angkutan Kota's services influencing the ridership of mass transit.

4.5.2.2 The Factors impact on Intention to Use of Angkutan Kota by Perceived Value and Service Quality

4.5.2.2.1 Path Analysis

Simple Path Diagram method is a part of causal modeling, as a tool for researchers to examine the interrelationship within a set of independent and dependent variables that have been ordered logically ((Lee, 2012). The process starts with the establishment of arrow diagram, which shows the cause-and-effect relationship, as drawn below in Figure 13.

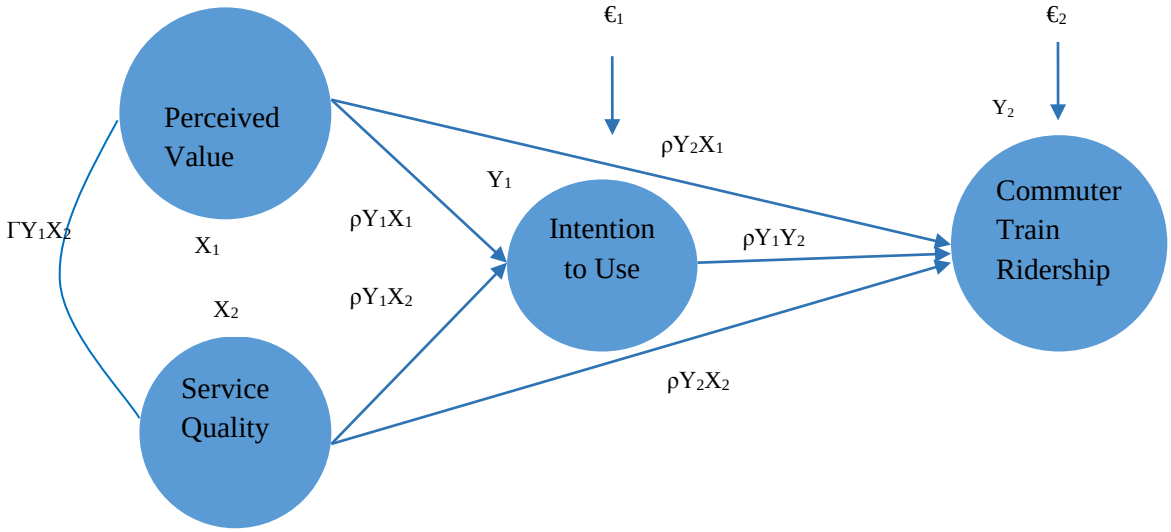

Figure 13 Path Diagram of User Satisfaction, Future Use of Angkutan Kota on Commuter Train Ridership

In this model, endogenous variable is represented by Commuter Train ridership and intention to use, while the exogenous variable is performed by Perceived value and service quality. As explained before, Intention to use is the part of the independent variable. However, since the perceived value and service quality have a significant impact on intention to use, it classified as endogenous variable. After the structure between variables is connected in the diagram, later on, the equation of the diagram is divided into two sub-structures, and each formula shall contain one endogenous variable on it. The first and the second sub-structures from this model formulated as follows,

$$Y_1 = \rho Y_1 X_1 + \rho Y_2 X_2 + €_1, \quad \text{(equation 1)}$$

$$Y_2 = \rho Y_2 X_1 + \rho Y_2 X_2 + \rho Y_2 Y_1 + €_2, \quad \text{(equation 2)}$$

where X_1 is an overall mean score of perceived value, X_2 is an overall average score of service quality, Y_1 is an overall average rating of intention to use, Y_2 *is the frequency of Commuter Train Use*, $€_1$ and $€_2$ are error values.

a. Sub-Structure 1:

Table 23 and Table 24 present the outcomes from SPSS to support the equation for Sub-Structure 1. Standardized coefficient beta on Table 23 indicates that perceived value has a significant effect on intention to use by 0,217 or 21,7%, while service quality has a weak impact on intention to use, due to the insignificance Alpha of Overall Service Quality (p-value > 0,05). However, in this equation, the variable is still employed to get an overview of the impact of both sub-variables.

Table 23 Coefficient Table Sub-structure 1

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1,817	,634		2,868	,005
Overall Perceived Value	,417	,104	,271	3,991	,000
Overall Service Quality	,330	,199	,113*	1,660	,098

**not significant in p < 0.05*

Table 24 presents the correlation between X_1 and X_2 and this data shall be applied to measure the indirect effect on sub-structure one formulation, drawn as $\Gamma Y_1 X_2$. The correlation value shows that the relationship between both attributes is significant, with Pearson's 0.301 and *p-value* < 0,05. The calculation of sub-structure one shall present in Table 26.

Table 24 Correlation Table of User Satisfaction

		Perceived Value	Service Quality
Perceived Value	Pearson Correlation	1	,301**
	Sig. (2-tailed)		,000
	N	222	217
Service Quality	Pearson Correlation	,301**	1
	Sig. (2-tailed)	,000	
	N	217	217

***. Correlation is significant at the 0.01 level (2-tailed).*

b. Sub-structure 2:

Table 25 presents the outcomes from SPSS to support the equation for Sub-Structure 2. Standardized coefficient beta on Table 25 indicates that perceived value has a significant effect on commuter train ridership by 0,190 or 19%, while service quality and intention to use have a weak relationship with commuter train ridership, referring to the insignificant alpha of Overall Service Quality (p-value > 0,05). Despite the statistical issues, both of these variables are still included.

Table 25 Coefficient Table of Sub-Structure 2

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2,331	,676		3,447	,001
Overall Perceived Value	,293	,114	,190	2,567	,011
Overall Service Quality*	-,085	,211	-,029	-,404	,686
Overall Intention to Use*	,062	,072	,062	,866	,388

**not significant in p < 0.05*

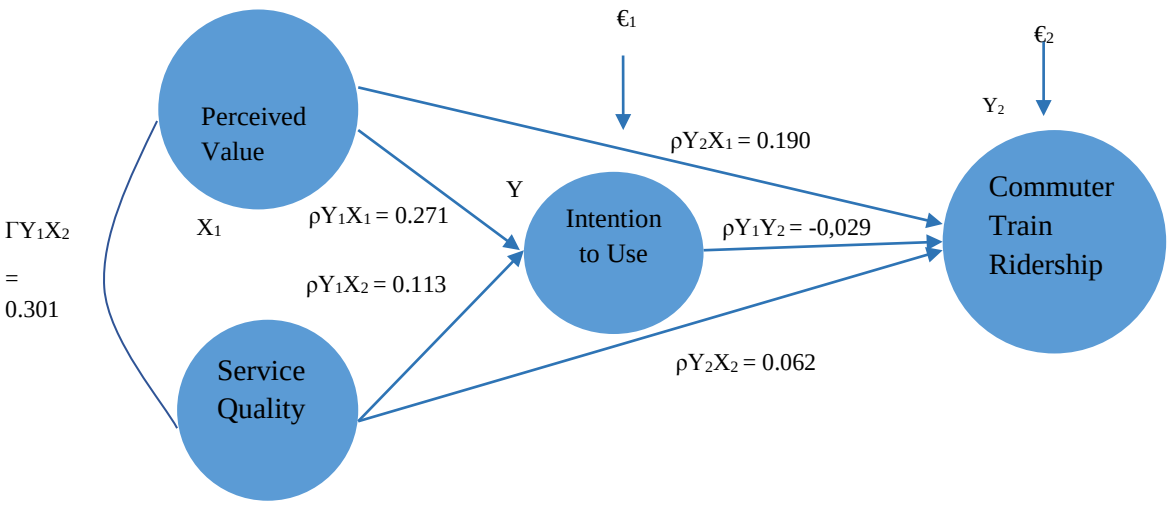

Figure 14 Final Results of Path Diagram

According to the calculation in Table 26, in overall, both perceived value and service quality have a minimal effect on commuter train ridership with total effect only 2.83% and 0.0574%, respectively. From this analysis, perceived value reveals as the most important variable in determining commuter train ridership with 2,83%, compared to service quality with only 0,0574%. These findings are supporting the previous study from Joewono and Kubota (2007) and de Ona (2016) which report that fare as the key aspect in determining commuters' preference in using paratransit transportation. In conclusion, Perceived Value and Service Quality have 11% influence in Intention to Use of Angkutan Kota. On the other hand, user satisfaction and intention to use of Angkutan Kota only have a small impact with 3%.

Table 26 Calculation results from Path Diagram

Path Analysis Variables	Effects	Standard Coefficient Beta	Value
Perceived Value → Intention to Use **(ρY_1X_1)**	Direct Effect	(0.271) x (0.271) = 0.0734	7,.34%
	Indirect Effect	(0,271)x(0.301)x(0.113)= 0.0092	0.92%
	Total Effect	0.0826	8.26%
Service Quality → Intention To Use **(ρY_1X_2)**	Direct Effect	(0.113) x (0.113) = 0.0128	1.28%
	Indirect Effect	(0,271)x(0.301)x(0.113)= 0.0092	0.92%
	Total Effect	0.022	2.2%
Perceived Value → Commuter Train Ridership **(ρY_2X_1)**	Direct Effect	(0.190) x (0.190) = 0.0361	3.61%
	Indirect Effect	(0.271 x (-0.029) = -0.0078	-0.78%
	Total Effect	0.0283	2.83%
Service Quality → Commuter Train Ridership **(ρY_2X_2)**	Direct Effect	(0.062) x (0.062) = 0.003844	0.384%
	Indirect Effect	(0.113 x (-0.029) = -0.00327	-0.327%
	Total Effect	0.000574	0.0574%
Intention to Use → Commuter Train Ridership **($\rho Y_1 Y_2$)**	Direct Effect	(-0.029) x (-0.029) = 0.00084	0.084%
	Indirect Effect	0	0
	Total Effect	0.00084	0.084%
Other factors outside variables ($€_1$)		1 – (0.0826+ 0.022) = 0.89	89%
Other factors outside variables ($€_2$)		1 – (0.0283+0.000574+0.00084) = 0.97	97%

4.5.2.2.2 Ordinal Logit Regression

As explained in the Introduction part, Ordinal Logit Regression is employed to measure the influence of each attribute of perceived value and service quality towards ridership of commuter train. The development of two models aims to find out the influences from the satisfaction level of commuters, with and without their present journey information. Regarding this purpose, ridership of Angkutan Kota is engaged as the representative for commuters' present journey and shall be included in the second model regression.

First Model: User Satisfaction and Intention to Use as Predictors and Frequency of Use Angkutan Kota as Dependent Variable

The first model indicates the model fit is accepted, with the unexplained variances decrease from 444,943 to 270,807 and conclude that this model has a good fit, which also supported by significant *p-value*. However, the goodness-of-fit table suggests that the model does not fit the data well, with the important outcomes of Pearson, which means rejected the null hypothesis about model fit. Test of the parallel line this model has a set of parallel line. In conclusion, proportional odds for this model is accepted.

Table 27 shows the statistics based on each item of predictors from Perceived Value, Service Quality, and Intention to Use as the predictors, with Commuter Train Ridership as the dependent variable. 'Loyalty' and 'loyalty if the cost increase' indicators show the positive correlation between ridership of commuter train and future use of Angkutan Kota. However, people who recommend Angkutan Kota service to their colleagues not often travel by

commuter train. On the opposite way, respondents who assign low scores in the perceived distance and perceived benefit more frequently to ride a commuter train. This result might be related to how far respondents' initial location and their destination from the train station, since people who live nearby could easily walk toward the train station and having less advantage in riding with Angkutan Kota.

Table 27 Ordinal Regression Model for User Satisfaction and Commuter Train Ridership

	Estimate	Std. Error	Wald	df	Exp(B).	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold							
[Recode_KRDUse = 1]	34,023	2357,894	,000	1	5,97037E+14	-4587,365	4655,412
[Recode_KRDUse = 2]	35,915	2357,895	,000	1	3,95992E+15	-4585,474	4657,303
[Recode_KRDUse = 3]	37,095	2357,895	,000	1	1,28871E+16	-4584,294	4658,483
Location							
[Loyalty=3]*	,828	2,044	,164	1	2,288736686	-4,834	3,179
[Loyalty=6]	3,800	1,926	3,895	1	44,70118449	-7,574	-,026
[Recommendation=2]	7,591	3,538	4,604	1	1980,292817	-14,526	-,657
[Loyalty_IncreaseCost=1]	6,525	2,376	7,542	1	681,9797737	1,868	11,182
[Loyalty_IncreaseCost=6]	8,842	2,705	10,682	1	6918,816445	3,539	14,144
[PV_Distance=2]	5,283	2,145	6,063	1	196,9598695	-9,488	-1,078
[PV_Distance=4]	4,013	1,680	5,707	1	55,31255958	-7,305	-,721
[PV_Benefit=3]*	-2,458	1,606	2,342	1	0,0856	-5,606	,690
[PV_Benefit=4]	-4,281	1,768	5,865	1	0,013828826	,816	7,746
[Servqual_Cleanliness=2]	12,617	1,018	153,540	1	301643,1575	-14,612	-10,621
[Servqual_Cleanliness=3]	10,883	,880	153,111	1	53263,14992	-12,607	-9,160
[Servqual_CongestionEffect=1]	-11,589	5,039	5,289	1	9,26747E-06	1,712	21,465
[Servqual_CongestionEffect=4]*	-,293	,979	,089	1	0,746022141	-1,627	2,212
[Servqual_RouteInfo=2]	-5,198	1,959	7,043	1	0,005527609	1,359	9,037
[Servqual_RouteInfo=3]	-4,061	1,851	4,811	1	0,017231779	,432	7,690
[Servqual_DriverSkill=3]	12,359	5,645	4,794	1	233048,0653	-23,423	-1,296
[Servqual_DriverSkill=4]	12,782	5,682	5,060	1	355755,8642	-23,918	-1,645
[Servqual_DriverAttitude=2]	-4,276	1,993	4,603	1	0,013898144	,370	8,181
[Servqual_DriverAttitude=4]	-5,152	1,919	7,208	1	0,005787818	1,391	8,914
[Servqual_EmergencyInfo=2]	-2,670	1,035	6,655	1	0,069252225	,642	4,699
[Servqual_EmergencyInfo=3]*	-1,762	1,076	2,679	1	0,171701118	-,348	3,871

*Note. R^2 = .56 (Cox & Snell), .64 (Nagelkerke). Model $X^2(83)$ = 174.137, *significant at p <.05*
**not significant at p < 0.05, only use for comparison*

The estimated coefficients from drivers' skill, route information, and emergency information of Angkutan Kota provides the positive relationship with commuter train ridership. Respondents who appoint higher scores on these three attributes more frequently travel by commuter train. Conversely, the estimated coefficients between two categories of congestion effect show the large differences; respondent who perceived Angkutan Kota as the main

reason for a traffic congestion more likely ride with Commuter Train 100.000 times than other categories. This situation can be explained logically because the frequent users from the commuter train are likely traveling with it to avoid a traffic jam. In conclusion, the loyalty of Angkutan Kota users show the positive impacts on commuter train ridership, while perceived value indicates the opposite results. Moreover, the technical aspects of service quality such as drivers' skill and route information should be taken into account to enhance the capability of Angkutan Kota as a feeder for mass transit services.

Second Model: User Satisfaction, Intention to Use, and Ridership of Angkutan Kota as Predictors and Frequency of Use Commuter Train as Dependent Variable

The second model has a similar structure with the first model, with additional predictors of respondents' present journey, which is the frequency of use of Angkutan Kota. As a result, model fit is accepted with the unexplained variances decrease from 444,943 to 213,731, supported by significant *p-value.* Furthermore, the goodness-of-fit table suggests that the model fit the data well, with the considerably high significant values of Deviance. Lastly, a parallel line from this model also accepted.

Table 28 illustrates the numerous similar findings with the previous model. Firstly, the 'loyalty' and 'loyalty if the cost increase' indicators also present the positive relationship between future use of Angkutan Kota and ridership of commuter train. Secondly, the respondents who assign lower scores in perceived benefit and perceived distance have higher probabilities to travel frequently with a commuter train. Based on these results and interpretations, it seems that loyalty and future use of Angkutan Kota contribute to the frequent use of train services. Oppositely, results from perceived value indicators suggest that it have indirect impacts on ridership of commuter train. It because its indicators illustrate a negative relationship with the frequent use of train, despite its positive correlation on intention to use of Angkutan Kota in the previous part.

Table 28 Ordinal Regression Model for User Satisfaction, Intention to Use, and Angkutan Kota ridership to Commuter Train Ridership *(significant at p < .05)*

	Estimate	Std. Error	Wald	df	Exp(B)	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold							
[KRDUse = 1]	27,489	107,645	,065	1	8,68E+11	-183,491	238,469
[KRDUse = 2]	29,999	107,650	,078	1	1,07E+13	-180,990	240,988
[KRDUse = 3]	31,555	107,653	,086	1	5,06E+13	-179,441	242,552
Location							
[Loyalty=2]	-11,225	4,093	7,521	1	1,33366E-05	-19,247	-3,203
[Loyalty=4]*	-3,109	1,986	2,450	1	0,04464	-7,002	,784
[Recommendation=2]	32,104	5,797	8,849	1	8,761E+13	-28,606	-5,882
[Recommendation=5]	12,705	4,595	7,645	1	3293,7451	3,699	21,711
[Loyalty_IncreaseCost=2]	6,255	3,059	4,181	1	520,60937	,259	12,251
[Loyalty_IncreaseCost=6]	13,821	4,426	9,752	1	1005504,537	5,146	22,495

	Estimate	Std. Error	Wald	df	Exp(B)	95% Confidence Interval	
						Lower Bound	Upper Bound
[PV_Distance=3]	7,022	2,537	7,658	1	1121,026	2,048	11,995
[PV_Distance=4]*	2,728	2,159	1,597	1	15,302251	-1,503	6,959
[PV_Benefit=2]	5,339	2,649	4,063	1	208,304	,148	10,530
[PV_Benefit=4]*	-1,637	2,112	,601	1	0,19456	-5,776	2,502
[Servqual_EconomyDevelopment=2]	9,164	2,884	10,100	1	9547,169	3,513	14,816
[Servqual_EconomyDevelopment=4]	4,481	2,102	4,547	1	88,322951	,362	8,600
[Servqual_SocialDevelopment=2]	-5,289	2,672	3,917	1	0,0050468	-10,527	-.051
[Servqual_CongestionEffect=2]	5,919	1,987	8,872	1	372,03948	2,024	9,814
[Servqual_CongestionEffect=3]	4,500	1,426	9,959	1	90,01713	1,705	7,296
[Servqual_Reliability=1]	12,826	4,971	6,658	1	371758,60	3,083	22,569
[Servqual_Reliability=4]*	2,465	1,336	3,407	1	11,6734	-,152	5,083
[Servqual_RouteInfo=2]	-12,298	3,640	11,416	1	4,560E-06	-19,431	-5,164
[Servqual_RouteInfo=4]	-9,011	3,241	7,728	1	0,000122	-15,363	-2,658
[Servqual_DriverAtittude=2]	-11,070	3,211	11,884	1	1,557E-05	-17,364	-4,776
[Servqual_DriverAtittude=4]	-10,105	2,856	12,516	1	4,087E-05	-15,703	-4,507
[Servqual_EmergencyInfo=2]	-6,537	2,031	10,354	1	0,0014488	-10,518	-2,555
[Servqual_EmergencyInfo=3]	-4,982	1,998	6,219	1	0,0068603	-8,897	-1,066
[AngkotUse=1]	-8,915	1,772	25,298	1	0,0001343	-12,389	-5,441
[AngkotUse=2]	-2,264	1,106	4,192	1	0,1039339	-4,432	-,097
[AngkotUse=3]	,852	1,145	,554	1	2,3443308	-1,391	3,095

*Note. R^2 = .67 (Cox & Snell), .76 (Nagelkerke). Model $X^2(86)$ = 231,213, *significant at p <.05*
**not significant at p < 0.05, only use for comparison*

Service quality attributes reveal that the respondents who satisfied with Angkutan Kota, regarding its route information, drivers' attitude, and emergency information, more frequently riding a commuter train. However, reliability in time and congestion effect present the opposite outcomes. It suggests that reliability attribute not necessarily affects the ridership of commuter train, or the respondents have not perceived it as the important things to consider. Likewise, people who perceived the higher advantage of Angkutan Kota regarding economic development less frequently travel by Commuter Train.

Evidently, the odds ratios for frequent use of Angkutan Kota show the positive correlation between its ridership and commuter train ridership. People who regularly travel with Angkutan Kota have a higher chance to ride with commuter train 2,3 times, compare to the infrequent users with only 0,00013. In brief, the intention to use and service quality of Angkutan Kota have a positive contribution on ridership of commuter train. On the other hand, perceived value attributes present the indirect effect on the frequent use of train ridership, despite its results indicate the negative correlation.

Chapter 5: Conclusions and recommendations

5.1 Introduction

This chapter aims to present the conclusion about paratransit as a feeder for rail-based transportation, particularly Angkutan Kota as one of widely used public transport in BMA. Mobility still becomes the major issues in BMA, with an inadequate number of formal transport to connect people from periphery and sub urban area to the central area. To overcome these problems, small-scale transportations such as Paratransit Transportation tend to fill the gap, and later on growing disorderly. Angkutan Kota is blamed as the main source of traffic congestion (Weningtyas, Fujiwara, et al., 2013), pollution, and insecure. On the other hands, many residents, especially low-income people, rely on Angkutan Kota's service (Tarigan, Susilo, et al., 2014), and have no other options of mobility modes to access their desired place.

Commuter train services, which provided by PT KAI as the state-owned company, is one of the available mass transit to link people across BMA, with some improvements over the past three years. According to a study about customer satisfaction of commuter train, 68% respondents ride with Angkutan Kota to access the station in the City of Bandung, the capital city of BMA. It was the indication that Angkutan Kota could become one of the most reliable public transport as a feeder to helps commuter train increase their ridership, and solve the connectivity problems in BMA.

5.2 Main Objective

Research objective in this paper is to explain the capability of Angkutan Kota as a feeder to support connectivity for existing Bandung Metropolitan Area's commuter train services. This article investigates the current score of user satisfaction and intention to use of Angkutan Kota, and how these variables influence commuter train ridership.

5.3 Methodology of Research

This research is conducted in Cimahi city, as one of the densest city within BMA. In able to get an insight of commuters' perception, this research employs quantitative data analysis, with the survey as the main research strategy. An adequate number of samples was obtained by spreading filled questionnaires in two main stations in Cimahi city and supported by an online survey. The purposive sampling type was applied since this study requires the commuters who already experienced both of Angkutan Kota and commuter train. The respondents were asked about their opinion regarding their satisfaction and future use in using Angkutan Kota as public transport, and their present journey, including frequency of commuter train use, present travel time, and favorable access and egress modes. Lastly, the dataset is being analyzed using Statistical Package for the Social Sciences.

5.4 Conclusion and Recommendation

5.4.1 Respondents' Characteristics and their Present Trip

In overall, 66% of respondents consists of female, while the most common age occurred located between 16 – 25 years old. High school graduate has become the common last education, and most of the commuter riders are also a full-time employee, retired elder, high school and university students. Among the respondents, 52% is earning lower than Rp2.400.000 (approximately 155 Euro) monthly, and classified as low-income respondents, while 25% are considered as middle-income respondents, with higher monthly income. Unsurprisingly, only 40.3% of the respondents are residents of Cimahi city, considering the facts that both of the stations could be reached from surrounding area, such as District of Bandung, District of West Bandung, and City of Bandung by several options of public transport mode.

Expectedly, more than a half of respondents prefer to travel with Angkutan Kota to the station, as explained before that the desired respondents are the people who experienced to ride with Angkutan Kota. However, only 21% of respondents are a daily user of Angkutan Kota, and surprisingly 61% is an infrequent user of commuter trains. The results indicate that commuter train still becomes an optional mode of public transport, while Angkutan Kota with the capability to reach a suburban area with a narrow road has a wider number of the users.

5.4.2 The impact of User Satisfaction to Intention to Use of Angkutan Kota

The present scores of user satisfaction of Angkutan Kota reveal about respondents' acceptance over the perceived cost and benefit that offered by Angkutan Kota and also its service quality. The highest scores were obtained by perceived distance and perceived benefit indicators, while the highest score in Service Quality was reached by the effect on economic and social development, accessibility to the vehicle, and route information indicators. These results are also supported by previous research from Sumaedi et al. (2012) and de Ona (2016). However, these attributes are not necessarily determining the future use of Angkutan Kota since the respondents expressed their uncertainty about their future use of Angkutan Kota with the average 'neutral' score.

In this intention, Ordinal Logistic Regression (OLR) model is employed to measure the probabilities from each indicator from perceived value and service quality on intention to use. The analysis and interpretation of the data set demonstrate to what extent the predictors have a significant influence on the dependent variable. Five models were developed, but only four models fit with the data. The analysis and interpretations from the model present that the cost regarding service, journey time and distance significantly determine respondents to ride with Angkutan Kota as their main access mode. These similar results can be found in Joewono and Kubota (2007), Sumaedi (2012), and de Ona (2016) who confirmed that costs as the major aspects of the future use of public transportation.

Regarding service quality, reliability in time, accessibility of vehicle, and drivers' skill and attitude have the positive correlations towards future use of Angkutan Kota. Apparently,

cleanliness appears as the complimentary aspects that impact on intention to use, as confirmed by Tangphaisankun (2009). On the other hand, safety and security predictors have no significant impacts on intention to use of Angkutan Kota, except for emergency information inside the vehicle.

5.4.3 The impact of User Satisfaction to Intention to Use of Angkutan Kota on Commuter Train RIdership

This part will analyze the impact of user satisfaction and intention to use to commuter train ridership, with the establishment of Path Analysis model and two Ordinal Logit Regression models. The results indicate a considerable amount of influence on perceived value and service quality on intention to use, with 8,26% and 2,2%, respectively. On the other hand, user satisfaction and intention to use only affect the dependent variable in such a small percentage, with only 3% in total direct and indirect effect.

To support the previous findings from Path Analysis, Ordinal Logistic Regression is also employed to examine the particular significance variables. In general, the results give evidence that intention to use of Angkutan Kota has a positive influence toward commuter train ridership. In the same manner, the ridership of Angkutan Kota simultaneously has a positive correlation with train ridership, supported by indicators from service quality, such as route information, drivers' skill and attitude, and emergency information.

Conversely, perceived benefit and perceived cost regarding Angkutan Kota distance, together with congestion effect, have opposite effects from the previously mentioned attributes. It is understandable as this results might happen for the resident who is living near the train station and can easily walk towards the station; or respondents experienced longer journey time and inadequate service for Angkutan Kota while accessing the station and in daily commuting (Tangphainsankun, 2009).

5.4.4 Conclusion

This research intends to examine the capability of Angkutan Kota as a feeder for commuter train ridership, from the user satisfaction and future use of Angkutan Kota. Several previous studies emphasize the importance of user satisfaction to measure the performance of public transportation (Cronin and Taylor, 1992), and how present perceived behavior could impact the future intention (Zeithaml, 1986). Correspondingly, the results from data analysis and interpretation reveal several significant findings regarding the future use of Angkutan Kota and how it might impact ridership of commuter train in BMA. Firstly, the perceived value Angkutan Kota seen as the key aspect to determine the future use of Angkutan Kota, especially in developing countries (Joewono and Kubota, 2007; Tangphaisankun, 2009). It relates on affordability trait of Angkutan Kota, since the 52% of them are considered as the low-income people.

Likewise, several attributes from service quality, such as cleanliness, reliability in time, accessibility of the vehicle, emergency information and drivers' skill and attitude perceive as

important aspects to motivate people to keep travel with Angkutan Kota in the several years ahead. This result also confirmed by the previous studies about the paratransit transportation as a feeder, which concludes the ease accessibility and service from the driver of transportation have a positive impact on satisfaction level and willingness to ride mass transit.

In regards to mass transit connectivity, loyalty to Angkutan Kota are proven to have a significant influence on commuter train ridership. However, even if the perceived value and service quality have a relatively small influence on commuter train ridership, its indirect impacts on train services should take into consideration. It was confirmed that information concerning on routes and emergency, together with reliability in time, is also convincing people to ride a commuter train. In conclusion, it is important to measure the desired performance of public transport. Specifically, Paratransit Transportation can successfully compete with the private vehicle and create the proper connectivity for residents (Joewono and Kubota, 2007).

Furthermore, even safety and security have no significant impacts based on data analysis and interpretations in Chapter 4, the operators and regulators should improve safety and security aspects of the Angkutan Kota since both of these indicators achieved the low scores in satisfaction level. This findings are also stated in Joewono and Kubota (2005) about the level of perceived safety and security in Paratransit Transportation. Also, the respondents' interest in services and comfort offered by public transportation and comfort are growing in the past decade (Tangphainsankun, 2009), so these attributes should take into account for the further improvement.

5.4.6 Recommendation

This paper proves the capability of Paratransit Transportation as a feeder, by measuring the satisfaction level from the respondents. However, the recent findings illustrate that both of these public transportations are still competing with each other. To tackle this condition, the related stakeholders, such as transit operators and policy makers, should manage the plans and strategies for both modes in an urban context, for instance, integrating them with another transportations plan. This suggestion might be able to increase the attractiveness in using public transportation, and reduce the dependency of a private vehicle, and improve the quality of life for the residents and their surroundings (de Ona, 2016).

Hence, data analysis and findings in this paper have several limitations. Firstly, the area of study is considered as a small city with a dense population, and the results cannot be generalized across the entire area of Bandung Metropolitan Area. Secondly, the sample size was only obtained in one period, so different results might occur in the other time period. Last, the suitable number of respondents might able to enhance the validity of the analysis. Correspondingly, based on the several findings and limitations from this paper, the author proposes to the future researchers to examine the other area with the wider respondents characteristics, and within several periods of time.

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Annex 1 Research Instrument and Questionnaires

Variable	Indicators	Questions	Response Scale	Literature	Number in questionnaire
User Satisfaction – Perceived Value	Perceived Cost	• Price of the ticket • the general costs including money and time.	1= strongly disagree 5=strongly agree	De Ona et al (2016)	Q1, Q2, Q3, Q4
	Perceived Benefit	• relationship between quality and price	1= strongly disagree 5=strongly agree		
User Satisfaction – Service Quality	Accessibility	• Quality of stop* • Accesibility to the car	1= strongly disagree 5=strongly agree	Joewono and Kubota (2007)	Q7, Q8
	Safety and Security of the journey	• Overall security daytime and at night • Availability of police* • Prevention from offensive action* • Overall safety from road accident	1= strongly disagree 5=strongly agree	Joewono and Kubota (2007)	Q9, Q10, Q11
	Comfort	• Air quality and temperature* • Cleanliness inside the car* • Design and arrangement of stop* • Comfort during trip from start until stop	1= strongly disagree 5=strongly agree	Joewono and Kubota (2007)	Q12, Q13, Q14
	Reliability	• Length of waiting time at the first stop • Punctuality • Length of staying on board • Length of transfer time*	1= strongly disagree 5=strongly agree	Joewono and Kubota (2007)	Q15, Q16
	Information	• Availability of information regarding the service* • Quality of information* • Availability of information regarding route direction. • Availability of information in emergency situation	1= strongly disagree 5=strongly agree	Joewono and Kubota (2007)	Q17, Q18, Q19
	Customer Service	• Crew's skill and ability • Crew's attitude to serving the customer	1= strongly disagree 5=strongly agree	Joewono and Kubota (2007)	Q20, Q21, Q22

		• Crew's help provided to the passenger • The ease of payment*			
	Environmental impact	• Level of emission, noise pollution, and sight pollution* • Level of resources consumption* • Level of congestion impact or disruption caused by this mode • Effect of this mode operation on the economic life • Effect of this mode operation on the social, cultural, political	1= strongly disagree 5=strongly agree	Joewono and Kubota (2007)	Q23, Q24, Q25
Intention to use - **Behavioral - Intention**	Loyalty	• Say positive things about this modes to other people. • Recommend this mode to someone who seeks your advice. • Encourage friends and relatives to use this modes*	1= strongly disagree 5=strongly agree	Zeithaml (1996)	Q27, Q28, Q29
	Switch	• Ride this mode less in the next few years * • Change into another modes that offers better prices	1= strongly disagree 5=strongly agree		Q30
	Pay More	• Continue to use this modes if its prices increase somewhat. • Pay a higher price than competitors charge for the benefits you currently receive from this modes*	1= strongly disagree 5=strongly agree		Q31
Ridership	Origin-Destination Access	• details of access trip and egress trip – number of modes used • walking time, waiting time, in-vehicle	1=private vehicle (e.g car, motorcycle) 2=Angkutan Kota 3=Ojek 4=Becak 5=Walking	Tangphaisankun (2009)	Q33, Q34, Q35, Q36
	FrequentUser/ Non Frequent User	• Time using commuter train in a week	1=<2 2=2-3		Q37

			3=4-6 4=>6		
Socio-Domgraphic Background	Age Level	• Under 18 (1) • 18 – 24 (2) • 25 – 34 (3) • 35 – 44 (4) • 45 – 54 (5) • 55 – 64 (6) • 65 – 74 (7) • 75 – 84 (8) • 85 or older (9)	1=<15 2=15-19 3=20-29 4=30-39 5=40-49 6=>49		Q40
	Gender		Male and Female		Q39
	Income Level		Less than 2.400 to more than Rp10.400.000 (6)		Q41
	Occupation		Student, full-time workers, etc		Q42
	Previous Education		From elementary school to university level		Q43
	Area of Living	Where do you live?	1=North Cimahi 2=Central Cimahi 3=South Cimahi 4=Kota Bandung 5=Kabupaten Bandung Barat 6=Kabupaten Bandung		Q44

			7=Kota Sumedang 8=Lainnya		

* Deleted indicators from the source

Questionnaire - Paratransit Transportation as a feeder

Paratransit Transportation as a feeder

Thank you for your time and participation in this survey!

My name is Bramanti Kusuma Nagari, a master student of Urban Management and Development in Institute of Housing and Urban Development Studies, Erasmus University Rotterdam. I would like to observe the capability of Paratransit Transportation, specifically Angkutan Kota, as a feeder for Commuter Train (Kereta Rel Diesel) Padalarang - Cicalengka.

This questionnaire consists of four parts. On the first part, the respondent will ask to fill the socio-demographic and economic background, and second. On the second and third part, questions will adressing personal perceived value and level of service of the Angkutan Kota. On the fourth part, the questions will be addressing ridership information on a commuter train, such as access and egress mode, and frequently use the commuter train.

This questionnaire needs approximately 5 minutes to complete.

The questions below addressing your socio-demographic background

1 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

2 How old are you?

- ❍ Under 18 (1)
- ❍ 18 - 24 (2)
- ❍ 25 - 34 (3)
- ❍ 35 - 44 (4)
- ❍ 45 - 54 (5)
- ❍ 55 - 64 (6)
- ❍ 65 - 74 (7)
- ❍ 75 - 84 (8)
- ❍ 85 or older (9)

3 Please indicate your present income level

- ❍ Less than 2.400.000 (1)
- ❍ Rp2.400.000 - Rp4.400.000 (2)
- ❍ Rp4.500.000 - Rp6.400.000 (3)
- ❍ Rp6.500.000 - Rp8.400.000 (4)
- ❍ Rp8.500.000 - Rp10.400.000 (5)
- ❍ > Rp10.400.000 (6)

4 Please indicate your occupation

- ❍ Employed full time (1)
- ❍ Employed part time (2)
- ❍ Unemployed looking for work (3)
- ❍ Unemployed not looking for work (4)
- ❍ Retired (5)
- ❍ Student (6)
- ❍ Disabled (7)

5 Please indicate your last education

- ❍ Less than high school (1)
- ❍ High school graduate (2)
- ❍ D3 (3)
- ❍ Bachelor Degree (4)
- ❍ Master Degree (5)
- ❍ Doctorate (6)
- ❍ Higher than Doctorate (7)

6 Where do you live?

- ❍ Cimahi Utara (1)
- ❍ Cimahi Tengah (2)
- ❍ Cimahi Selatan (3)
- ❍ Kabupaten Bandung Barat (4)
- ❍ Kota Bandung (5)
- ❍ Kabupaten Bandung (6)
- ❍ Kota Soreang (7)
- ❍ Lainnya (8)

The questions below addressing your opinion regarding Perceived Value of Angkutan Kota

7 I think that the cost of Angkutan Kota is worth regarding its journey distance

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

8 I think that the cost of Angkutan Kota is worth regarding its service

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

9 I think that the cost of Angkutan Kota is worth regarding its journey time

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

10 I think the overall cost of Angkutan Kota is worth to pay

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

The questions below addressing your opinion regarding Service Quality of Angkutan Kota

11 I think I can easily depart and embark from Angkutan Kota vehicles

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

16 I feel secure when riding Angkutan Kota

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

13 I think that Angkutan Kota is properly-monitored by Officer

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

14 I think the Angkutan Kota is free from traffic incident

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

15 I feel comfortable when riding Angkutan Kota

- ❍ Extremely comfortable (1)
- ❍ Somewhat comfortable (2)
- ❍ Neither comfortable nor uncomfortable (3)
- ❍ Somewhat uncomfortable (4)
- ❍ Extremely uncomfortable (5)

16 I think the vehicle of Angkutan Kota is fairly clean

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

17 I think the schedule of Angkutan Kota is on time

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

18 I think waiting time of Angkutan Kota is too long

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

19 I think the route information of Angkutan Kota is adequate

- ❍ Extremely adequate (1)
- ❍ Somewhat adequate (2)
- ❍ Neither adequate nor inadequate (3)
- ❍ Somewhat inadequate (4)
- ❍ Extremely inadequate (5)

20 I think the driver of Angkutan Kota is knowledgeable and professional.

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

21 I think the driver of Angkutan Kota is helpful and well-mannered

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

22 I think Angkutan Kota provides adequate information in case of emergency

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

23 I think Angkutan Kota has a significant contribution to traffic jam

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

24 I think Angkutan Kota has a significant contribution to economic development

- ❍ Strongly agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

25 I think Angkutan Kota has a significant contribution to social and culture aspects

- ❍ Strongly Agree (1)
- ❍ Somewhat agree (2)
- ❍ Neither agree nor disagree (3)
- ❍ Somewhat disagree (4)
- ❍ Strongly disagree (5)

The questions below addressing your opinion regarding future intention to use Angkutan Kota

26 On a scale from 0-7, how likely are you to use Angkutan Kota in the future?

- ❍ 0 (0)
- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7 (7)

27 On a scale from 0-7, how likely are you to recommend Angkutan Kota to a friend or colleague?

- ❍ 0 (0)
- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7 (7)

28 I would like to change to another mode of service who offers better price

- ❍ 0 (0)
- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7 (7)

29 I would like to change to another mode of service who offers better service

- ❍ 0 (0)
- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7 (7)

30 I would like to use Angkutan Kota even if its price increasing

- ❍ 0 (0)
- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7 (7)

The questions below addressing your present journey with Commuter Rail

31 Please indicate which modes that you usually use from your origin to train station

- ❍ Private Vehicles (motorcycle or car) (1)
- ❍ Angkutan Kota (2)
- ❍ Online motorcycle taxi (3)
- ❍ Becak (4)
- ❍ Ojek (5)
- ❍ Walking (6)

32 Please indicate which modes that you usually use to reach your destination from train station

- ❍ Private Vehicles (motorcycle or car) (1)
- ❍ Angkutan Kota (2)
- ❍ Online motorcycle taxi (3)
- ❍ Becak (4)
- ❍ Ojek (5)
- ❍ Walking (6)

33 Please indicate your overall waiting time and walking time from your destination until you reach the train station

- ❍ < 5 minutes (1)
- ❍ 5 - 7 minutes (2)
- ❍ 7 - 10 minutes (3)
- ❍ > 10 minutes (4)

34 Please indicate your overall waiting time and walking time from train station until you reach your destination

- ❍ < 5 minutes (1)
- ❍ 5 - 7 minutes (2)
- ❍ 7 - 10 minutes (3)
- ❍ > 10 minutes (4)

35 Please indicate how often you ride Commuter Train (KRD) in a week

- ❍ Daily (1)
- ❍ 4-6 times a week (2)
- ❍ 2-3 times a week (3)
- ❍ Once a week (4)
- ❍ Never (5)

Annex 2 Ordinal Logit Regression Output

Ordinal Logit Regression (Predictor: Perceived Value; Observe Variable: Loyalty)

First Model: Model Information for Perceived Value on Loyalty

Ordinal Logit Regression outcomes					
	-2 Log Likelihood	**Chi-Square**	**df**	**Sig.**	**Value (R^2)**
Model Fitting Information					
Intercept Only	465,197				
Final	407,805	57,391	16	0,000	
Goodness-of-Fit					
Pearson		544,248	369	0,000	
Deviance		319,129	369	0,971	
Test of Parallel Line					
Null Hypothesis	407,805				
General	315,095[b]	92,710[c]	64	0,11	

Parameter Estimates (significant at P < 0.05)

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Loyalty= 2]	-5,014	,810	38,296	1	,000	-6,602	-3,426
	[Loyalty= 3]	-3,659	,760	23,173	1	,000	-5,149	-2,169
	[Loyalty= 4]	-1,743	,731	5,686	1	,017	-3,176	-,310
	[Loyalty= 5]	-,111	,720	,024	1	,877	-1,522	1,299
	[Loyalty= 6]	1,083	,731	2,192	1	,139	-,351	2,516
Location	[PV_Service=1]	-4,044	1,717	5,548	1	,018	-7,409	-,679
	[PV_Time=1]	-2,223	1,058	4,415	1	,036	-4,297	-,149

Ordinal Logit Regression (Predictor: Service Quality; Observe Variable: Loyalty)

Second Model: Model Information for Service Quality on Loyalty

Ordinal Logit Regression outcomes					
	-2 Log Likelihood	**Chi-Square**	**df**	**Sig.**	**Value (R^2)**
Model Fitting Information					
Intercept Only	690,423				
Final	532,476	157,947	51	0,000	
Goodness-of-Fit					
Pearson		1577,096	899	0,000	
Deviance		532,476	899	1,000	
Test of Parallel Line					
Null Hypothesis	501,934				
General	415,611[b]	86,324[c]	264	1,000	

Parameter Estimates (significant at P < 0.05)

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Loyalty= 2]	7,386	3,051	5,859	1	,015	1,405	13,367
	[Loyalty= 3]	9,150	3,064	8,917	1	,003	3,144	15,156
	[Loyalty= 4]	11,606	3,099	14,028	1	,000	5,532	17,679
	[Loyalty= 5]	13,682	3,134	19,059	1	,000	7,540	19,825
	[Loyalty= 6]	15,461	3,167	23,826	1	,000	9,253	21,668
Location	[Servqual_Accessibility=3]	-1,564	,658	5,644	1	,018	-2,854	-,274
	[Servqual_Safety=1]	9,245	3,554	6,765	1	,009	2,278	16,211
	[Servqual_Security=1]	-4,985	1,811	7,580	1	,006	-8,534	-1,436
	[Servqual_Comfort=2]	-5,427	2,176	6,222	1	,013	-9,692	-1,163

[Servqual_Comfort=3]	-5,803	2,222	6,822	1	,009	-10,158	-1,448
[Servqual_Comfort=4]	-5,980	2,248	7,076	1	,008	-10,385	-1,574
[Servqual_Cleanliness=1]	7,985	3,864	4,270	1	,039	,411	15,559
[Servqual_Cleanliness=2]	8,708	3,385	6,619	1	,010	2,074	15,342
[Servqual_Cleanliness=3]	8,845	3,395	6,787	1	,009	2,190	15,500
[Servqual_Cleanliness=4]	9,635	3,407	7,995	1	,005	2,956	16,313
[Servqual_CongestionEffect=1]	-5,439	1,705	10,182	1	,001	-8,780	-2,098
[Servqual_CongestionEffect=4]	-1,641	,507	10,465	1	,001	-2,635	-,647
[Servqual_Reliability=2]	-1,428	,673	4,505	1	,034	-2,747	-,109
[Servqual_Reliability=3]	-1,478	,616	5,753	1	,016	-2,686	-,270
[Servqual_Reliability=4]	-1,676	,609	7,578	1	,006	-2,870	-,483
[Servqual_DriverSkill=2]	5,018	1,823	7,579	1	,006	1,446	8,591
[Servqual_DriverSkill=3]	5,247	1,817	8,336	1	,004	1,685	8,809
[Servqual_DriverSkill=4]	5,669	1,819	9,710	1	,002	2,103	9,235
[Servqual_DriverAttitude=2]	4,391	1,021	18,512	1	,000	2,391	6,391
[Servqual_DriverAttitude=3]	4,103	,981	17,481	1	,000	2,180	6,027
[Servqual_DriverAttitude=4]	4,907	,958	26,246	1	,000	3,030	6,784
[Servqual_EmergencyInfo=1]	7,500	1,871	16,061	1	,000	3,832	11,168

Ordinal Logit Regression (Predictor: Overall User Satisfaction; Observe Variable: Loyalty)

Third Model: Model Information for Service Quality and Perceived Value on Loyalty

Ordinal Logit Regression outcomes					
	-2 Log Likelihood	**Chi-Square**	**df**	**Sig.**	**Value (R^2)**
Model Fitting Information					
Intercept Only	690,423				
Final	501,934	188,489	66	0,000	
Goodness-of-Fit					
Pearson		1615,918	884	0,000	
Deviance		501,934	884	1,000	
Pseudo R-Square					
Cox and Snell					0,582
Nagelkerke					0,607
McFadden					0,273
Test of Parallel Line					
Null Hypothesis	501,934				
General	415,611[b]	86,324[c]	264	1,000	

Parameter Estimates (significant at P < 0.05)

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Loyalty= 2]	1,672	4,007	,174	1	,677	-6,183	9,526
	[Loyalty= 3]	3,529	4,007	,775	1	,379	-4,326	11,383
	[Loyalty= 4]	6,215	4,027	2,382	1	,123	-1,678	14,108
	[Loyalty= 5]	8,524	4,044	4,443	1	,035	,598	16,450
	[Loyalty= 6]	10,450	4,062	6,617	1	,010	2,488	18,412
Location	[PV_Service=1]	-6,422	2,198	8,536	1	,003	-10,730	-2,114

[PV_Service=4]	-2,604	1,122	5,390	1	,020	-4,803	-,406
[Servqual_Accessibility=3]	-1,534	,751	4,171	1	,041	-3,006	-,062
[Servqual_RoadSafety=2]	4,036	1,892	4,549	1	,033	,327	7,745
[Servqual_SocialDevelopment=4]	1,282	,639	4,022	1	,045	,029	2,535
[Servqual_CongestionEffect=4]	-1,651	,544	9,210	1	,002	-2,717	-,585
[Servqual_Reliability=3]	-1,570	,669	5,511	1	,019	-2,882	-,259
[Servqual_Reliability=4]	-1,492	,669	4,971	1	,026	-2,804	-,180
[Servqual_DriverAttitude=2]	3,779	1,112	11,553	1	,001	1,600	5,959
[Servqual_DriverAttitude=3]	3,644	1,090	11,172	1	,001	1,507	5,781
[Servqual_DriverAttitude=4]	4,567	1,036	19,434	1	,000	2,536	6,597
[Servqual_DriverAttitude=5]	0[a]	.	.	0	.	.	.
[Servqual_EmergencyInfo=1]	6,795	1,848	13,516	1	,000	3,173	10,418

Ordinal Logit Regression (Predictor: Overall User Satisfaction; Observe Variable: Ridership of Angkutan Kota)

Fourth Model: Model Information for Service Quality and Perceived Value on Ridership of Angkutan Kota

Ordinal Logit Regression outcomes					
	-2 Log Likelihood	**Chi-Square**	**df**	**Sig.**	**Value (R^2)**
Model Fitting Information					
Intercept Only	577,854				
Final	485,631	92,223	66	,018	
Goodness-of-Fit					
Pearson		729,879	507	,000	
Deviance		485,631	507	,745	
Pseudo R-Square					
Cox and Snell					,346
Nagelkerke					,372
McFadden					,160
Test of Parallel Line					
Null Hypothesis	485,631				
General	326,814[b]	158,818[c]	132	,056	

Parameter Estimates (significant at P < 0.05)

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[AngkotUse = 1]	-21,121	1884,267	,000	1	,991	-3714,216	3671,975
	[AngkotUse = 2]	-20,100	1884,267	,000	1	,991	-3713,196	3672,995
	[AngkotUse = 3]	-18,713	1884,267	,000	1	,992	-3711,808	3674,383
Location	[PV_Service=3]	-2,490	1,259	3,910	1	,048	-4,958	-,022
	[Servqual_Cleanliness=1]	-39,770	1,829	473,043	1	,000	-43,354	-36,186
	[Servqual_Cleanliness=2]	-38,746	,492	6210,716	1	,000	-39,710	-37,783
	[Servqual_Cleanliness=3]	-38,657	,455	7207,948	1	,000	-39,550	-37,765

[Servqual_Reliability=3]	1,351	,678	3,976	1	,046	,023	2,680

Ordinal Logit Regression (Predictor: Intention to Use; Observe Variable: Ridership of Angkutan Kota)

Fifth Model: Model Information for Intention to Use on Ridership of Angkutan Kota

Ordinal Logit Regression outcomes					
	-2 Log Likelihood	**Chi-Square**	**df**	**Sig.**	**Value (R^2)**
Model Fitting Information					
Intercept Only	77,923				
Final	68,426	9,497	5	,091	
Goodness-of-Fit					
Pearson		9,400	10	,495	
Deviance		11,587	10	,314	
Pseudo R-Square					
Cox and Snell					,042
Nagelkerke					,045
McFadden					,016
Test of Parallel Line					
Null Hypothesis	68,426				
General	56,850[b]	11,576[c]	10	,314	

Parameter Estimates (significant at P < 0.05)

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[AngkotUse = 1]	-1,812	,437	17,164	1	,000	-2,669	-,955
	[AngkotUse = 2]	-1,027	,425	5,838	1	,016	-1,860	-,194
	[AngkotUse = 3]	,061	,419	,021	1	,884	-,760	,882
Location	[Loyalty=2]	-,434	,687	,400	1	,527	-1,781	,912
	[Loyalty=3]	,147	,579	,064	1	,800	-,989	1,282

[Loyalty=4]	-,156	,471	,110	1	,740	-1,079	,766
[Loyalty=5]	-,798	,471	2,876	1	,090	-1,720	,124
[Loyalty=6]	-,885	,531	2,774	1	,096	-1,927	,157
[Loyalty=7]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Ordinal Logit Regression (Predictor: Overall User Satisfaction and Intention to Use; Observed Variable: Frequent Use of Commuter Train)

Model Information for User Satisfaction and Intention to Use on Ridership of Commuter Train

Ordinal Logit Regression Results					
	-2 Log Likelihood	**Chi-Square**	**df**	**Sig.**	**Value (R^2)**
Model Fitting Information					
Intercept Only	444,943				
Final	270,807	174,137	83	0,000	
Goodness-of-Fit					
Pearson		1088,750	478	0,000	
Deviance		270,807	478	1,000	
Pseudo R-Square					
Cox and Snell					0,562
Nagelkerke					0,640
McFadden					0,391
Test of Parallel Line					
Null Hypothesis	270,807				
General	165,549[b]	105,257[c]	166	1,000	

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KRDUse = 1]	34,023	2357,894	,000	1	,988	-4587,365	4655,412
	[KRDUse = 2]	35,915	2357,895	,000	1	,988	-4585,474	4657,303
	[KRDUse = 3]	37,095	2357,895	,000	1	,987	-4584,294	4658,483
Location	[Loyalty=6]	3,800	1,926	3,895	1	,048	,026	7,574
	[Recommendation=2]	7,591	3,538	4,604	1	,032	,657	14,526
	[Loyalty_IncreaseCost=1]	6,525	2,376	7,542	1	,006	1,868	11,182
	[Loyalty_IncreaseCost=2]	4,407	2,274	3,758	1	,053	-,049	8,864
	[Loyalty_IncreaseCost=3]	7,428	2,615	8,066	1	,005	2,302	12,554
	[Loyalty_IncreaseCost=4]	8,330	2,736	9,271	1	,002	2,968	13,692
	[Loyalty_IncreaseCost=5]	8,932	2,696	10,978	1	,001	3,648	14,215
	[Loyalty_IncreaseCost=6]	8,842	2,705	10,682	1	,001	3,539	14,144
	[PV_Distance=3]	6,439	1,904	11,434	1	,001	2,707	10,171
	[PV_Distance=4]	4,013	1,680	5,707	1	,017	,721	7,305
	[PV_Benefit=4]	-4,281	1,768	5,865	1	,015	-7,746	-,816
	[Servqual_Cleanliness=1]	18,272	3,544	26,577	1	,000	11,325	25,219
	[Servqual_Cleanliness=2]	12,617	1,018	153,540	1	,000	10,621	14,612
	[Servqual_Cleanliness=3]	10,883	,880	153,111	1	,000	9,160	12,607
	[Servqual_CongestionEffect=1]	-11,589	5,039	5,289	1	,021	-21,465	-1,712
	[Servqual_RouteInfo=2]	-5,198	1,959	7,043	1	,008	-9,037	-1,359
	[Servqual_RouteInfo=3]	-4,061	1,851	4,811	1	,028	-7,690	-,432
	[Servqual_RouteInfo=4]	-3,555	1,861	3,651	1	,056	-7,202	,092
	[Servqual_RouteInfo=5]	0[a]	.	.	0	.	.	.

[Servqual_DriveSkill=1]	0[a]	.	.	0	.	.	.
[Servqual_DriveSkill=2]	9,493	5,422	3,065	1	,080	-1,135	20,120
[Servqual_DriveSkill=3]	12,359	5,645	4,794	1	,029	1,296	23,423
[Servqual_DriveSkill=4]	12,782	5,682	5,060	1	,024	1,645	23,918
[Servqual_DriverAtittude=2]	-4,276	1,993	4,603	1	,032	-8,181	-,370
[Servqual_DriverAtittude=3]	-5,108	1,942	6,917	1	,009	-8,914	-1,301
[Servqual_DriverAtittude=4]	-5,152	1,919	7,208	1	,007	-8,914	-1,391
[Servqual_EmergencyInfo=3]	-1,762	1,076	2,679	1	,102	-3,871	,348

Ordinal Logit Regression (Predictor: Overall User Satisfaction, Intention to Use, and Frequent Use of Angkutan Kota; Observed Variable: Frequent Use of Commuter Train)

Model Information for User Satisfaction, Intention to Use, and Ridership of Angkutan Kota on Ridership of Commuter Train

Ordinal Logit Regression Results					
	-2 Log Likelihood	**Chi-Square**	**df**	**Sig.**	**Value (R^2)**
Model Fitting Information					
Intercept Only	444,943				
Final	219,064	225,879	86	,000	
Goodness-of-Fit					
Pearson		1436,178	475	,000	
Deviance		213,731	475	1,000	
Pseudo R-Square					
Cox and Snell					,657
Nagelkerke					,748
McFadden					,508
Test of Parallel Line					
Null Hypothesis	219,064				
General	92,463[b]	126,601[c]	172	,996	

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KRDUse = 1]	27,489	107,645	,065	1	,798	-183,491	238,469
	[KRDUse = 2]	29,999	107,650	,078	1	,780	-180,990	240,988
	[KRDUse = 3]	31,555	107,653	,086	1	,769	-179,441	242,552
Location	[Loyalty=2]	-11,225	4,093	7,521	1	,006	-19,247	-3,203
	[Recommendation=1]	19,932	6,676	8,914	1	,003	6,847	33,016
	[Recommendation=2]	32,104	8,101	15,705	1	,000	16,226	47,982
	[Recommendation=3]	13,397	4,910	7,445	1	,006	3,774	23,020
	[Recommendation=4]	11,793	4,488	6,905	1	,009	2,997	20,590
	[Recommendation=5]	12,705	4,595	7,645	1	,006	3,699	21,711
	[Recommendation=6]	9,513	4,559	4,355	1	,037	,578	18,449
	[Loyalty_IncreaseCost=1]	10,198	3,017	11,424	1	,001	4,284	16,111
	[Loyalty_IncreaseCost=2]	6,255	3,059	4,181	1	,041	,259	12,251
	[Loyalty_IncreaseCost=3]	10,455	3,873	7,285	1	,007	2,863	18,046
	[Loyalty_IncreaseCost=4]	11,593	4,009	8,362	1	,004	3,735	19,450
	[Loyalty_IncreaseCost=5]	11,582	3,980	8,470	1	,004	3,782	19,382
	[Loyalty_IncreaseCost=6]	13,821	4,426	9,752	1	,002	5,146	22,495
	[AngkotUse=1]	-8,915	1,772	25,298	1	,000	-12,389	-5,441
	[AngkotUse=2]	-2,264	1,106	4,192	1	,041	-4,432	-,097
	[PV_Distance=3]	7,022	2,537	7,658	1	,006	2,048	11,995
	[Servqual_EconomyDevelopment=2]	9,164	2,884	10,100	1	,001	3,513	14,816
	[Servqual_EconomyDevelopment=3]	8,439	3,446	5,997	1	,014	1,685	15,193

[Servqual_EconomyDevelopment=4]	4,481	2,102	4,547	1	,033	,362	8,600
[Servqual_CongestionEffect=2]	5,919	1,987	8,872	1	,003	2,024	9,814
[Servqual_CongestionEffect=3]	4,500	1,426	9,959	1	,002	1,705	7,296
[Servqual_Reliability=1]	12,826	4,971	6,658	1	,010	3,083	22,569
[Servqual_RouteInfo=1]	-10,081	4,472	5,081	1	,024	-18,847	-1,315
[Servqual_RouteInfo=2]	-12,298	3,640	11,416	1	,001	-19,431	-5,164
[Servqual_RouteInfo=3]	-10,075	3,404	8,761	1	,003	-16,746	-3,403
[Servqual_RouteInfo=4]	-9,011	3,241	7,728	1	,005	-15,363	-2,658
[Servqual_DriverAtittude=2]	-11,070	3,211	11,884	1	,001	-17,364	-4,776
[Servqual_DriverAtittude=3]	-11,937	3,313	12,985	1	,000	-18,430	-5,445
[Servqual_DriverAtittude=4]	-10,105	2,856	12,516	1	,000	-15,703	-4,507
[Servqual_EmergencyInfo=2]	-6,537	2,031	10,354	1	,001	-10,518	-2,555
[Servqual_EmergencyInfo=3]	-4,982	1,998	6,219	1	,013	-8,897	-1,066

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