ANALYSIS ON BARRIERS AND OPPORTUNITIES OF PUBLIC TRANSPORTATION ACCESSIBILITY IN JAKARTA

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Angkutan umum/angkot: a medium capacity shared taxi ride minibus kind of public transportation**.**

Bajaj: Jakarta's version of auto rickshaws. A gas fueled three-wheeled taxi.

Bodetabek: Bogor, Depok, Tangerang, Bekasi. Cities outside Jakarta Province that are part of Jakarta Metropolitan Area. Also called Greater Jakarta.

Gojek: Motorcycle taxi, ride sharing, and taxi online service established in Indonesia. The service also extends to various kinds of service such as food delivery, package delivery, online shopping, cleaning service, and others.

Grab: Motorcycle taxi, ride sharing, and taxi online service from Malaysia. The service also extends to scooter sharing and food delivery.

Jakarta LRT: Light rail metro system in Jakarta.

Metro mini/kopaja: name of *angkot* service.

MRT Jakarta: Heavy rail metro system in Jakarta, still in completion. The first phase of the first line consists half elevated rail on fly over and underground rail.

RPJMD: stands for *Rencana Pembangunan Jangka Menengah Daerah* or Jakarta Regional Mid-term Development Plan. It consists vision, mission, planning, and planning standard for Jakarta. RPJMD is renewed every five years.

Transjakarta: Bus rapid transit metro service in Jakarta which serves inside and around Jakarta. It runs on the roads where the lines go inside its own dedicated lane or in fly over exclusive for the buses.

Uber: Motorcycle taxi, ride sharing, and taxi online service from the US.

Abstract

Jakarta Provincial Government promotes public transportation modes and tries to make people leave their private transportations in order to reduce traffic congestion. However, more people still use their private vehicles every year. While public transportation development in Jakarta has been slow, mass transportation integration and the completion of MRT Jakarta could be the turning point. Accessibility is essential to develop good public transportation. Hence, it is crucial to look into what encourages and discourages people to use public transportation by considering social dimension of accessibility. Factors that affect and relate to accessibility, which influence people's decision to choose public transportation, were analyzed and identified, based on individual and transport components for accessibility. Such thorough analysis answered a primary research question of this paper: 'what are the barriers and the opportunities to increasing public transportation usage in Jakarta?' This research used data collection from questionnaires as well as documents from open resources and articles about public transportation modes in Jakarta. These data were processed to find barriers and opportunities to improving accessibility by using a qualitative descriptive approach. The findings of the study will help create a future planning and policy approach that can encourage increase in usage of public transportation.

Keyword: accessibility, transportation, public transportation, urban planning, social dimension

1. Introduction

As Indonesia's capital city and the most populated one, Jakarta is currently facing a rapid urbanization alongside a growing economy. The Capital City of Indonesia expanded from 180 km2 in the 1960s to a fully metropolis in the 1970s. Now Jakarta has 9.6 million inhabitants in its 696 km2 area. Jakarta also has a high mobility interaction of people commuting from suburbs and neighboring cities, which included a Jakarta Metropolitan area (Bodetabek) into Jakarta (Hasibuan et al., 2014).

Like many megacities of developing countries in Asia, Jakarta is facing issues arising from rapid urban development. One of the most significant problems is car and motorcycle dependency. The high mobility interaction resulting from people commuting from distant suburbs into the city center has created traffic congestion. The problem has occurred for long decades. People who live with this routine have seen this as an everyday look. Congestion in Jakarta has emerged in 1965 (Yuliawati, 2016) and has been getting worse every year. The problem leads to inequality among Jakarta people as the gap between those who have and do not have access to cars, motorcycles, or other private vehicles in terms of opportunities and quality of life is growing (Hidayati et al., 2019).

The government had issued policies and regulations to reduce congestion, but the policies and regulations mostly feed on the car dependencies such as eradicated bicycles and becak. Other than policies and regulations, the government also built overpasses for intercity and inter provinces train railway so the railway would not disturb car traffic. The government also built bridges, underpasses, and highways in many parts of Jakarta since the 1980s (Yuliawati, 2016).

Meanwhile, the development of public transportation in Jakarta is slow as it has always conflicted but inseparable from political dynamics at the time (Hidayati et al., 2019). Since the 1970s, Jakarta had *angkutan umum* or *angkot*, a shared taxi ride minibus kind of public transport, *Metro Mini* and *Kopaja*, a short bus transports, as public transportation modes in Jakarta. Over the years, these modes have become unreliable and overcrowding the already busy roads with uncontrollable numbers due to weak regulation. They are then slowly reduced and replaced with bus rapid transit *Transjakarta*, which

has been on service since 2004 and has increased its reliability with more corridor lines. However, the blueprint of integrated public transportation service in Jakarta wasn't in any form until 2007 (Yuliawati, 2016). In the current Jakarta Regional Mid-term Development Plan (RPJMD), this integration is the government's vision to realize sustainability in the form of the 'Jakarta Smart City' program. One of the goals is to promote smart mobility by integrating routes and services from all public transportation modes in Jakarta.

Furthermore, the plan to create rapid mass transportation in Jakarta started in 1987. After many setbacks, Jakarta finally has its first mass rapid metro line in 2019 after a long development since 2008. Light rail rapid transit in Jakarta, to integrate with bus rapid and mass rapid transit, has also started operating since December 2019, and Greater Jakarta LRT is still in construction and expected to function in 2021 entirely. It takes 50 years for Jakarta to begin developing a well-planned and integrated public transportation. Fifty years of unreliable public transportation has led to path dependency on cars and motorcycles. Public transportation modes are stigmatized by many people not as efficient as private cars or motorcycles for the lack of punctual and safety. It will need much effort to change the mindset.

The public transportations ridership claimed to have been increasing by the operators (Arjanto, 2019; Barokah, 2020). Nonetheless, the traffic congestion level in Jakarta is 53% (TomTom, 2018), reasonably high, although it is slowly decreasing from the previous year. However, the decrease might come from the new road and highway expansion projects alongside the completion of MRT and LRT Jakarta, which done simultaneously. Based on Databoks (2019) survey, the amount of private owned motorcycles and cars still rapidly increased. The condition with public transportation ridership and traffic congestion means, despite the government's program to encourage people to use public transportation, more people still prefer their transportation rather than public ones.

It is crucial to increase the interest of the citizens of Jakarta towards public transportation. It will be hard to change the mindset of car or motorcycle oriented to public transportation oriented. By looking from a sustainability perspective, the idea of sustainable transportation means that the transportation has to allow basic needs and equity. The equity aspects are affordability, accessibility, and efficiency (Litman and Burwell, 2006). Affordability means that people as the users are able and willing to pay for transportation and not pressured their household's income. Efficiency means that transportation can provide economic and social opportunities with the least time and costs (Olofsson et al., 2011).

Accessibility is the critical field in transportation because affordability and efficiency will not work if transportation cannot be reached by all the people to fulfill the daily lives and opportunities equally. However, the social aspect of accessibility in transportation development is often overlooked, especially in Jakarta (Dharmowijoyo et al., 2020). When thinking about accessibility, people usually think about whether people can afford transportation or help them save time and money in daily activities. However, there are some cases that people would be willing to pay for higher living costs if it could give them higher levels of accessibility (Martens, 2012). For example, housing price and other property price increases when they are nearby transit spot. We need to see that transportation is about commuting people from one place to another. However, we also need to understand that transportation development has a social impact on society beyond economical wise. It offers good life quality and opportunity. Excellent transportations service that has all equity aspects would have given a good life quality and equal life opportunity (Jones and Lucas, 2012). Therefore, accessibility is a crucial factor that should be looking into more. It is, after all, the reason why the transportation system exists.

With transportation development going around in Jakarta right now, especially with MRT and the transit-oriented development around the commercial area in Jakarta, it is essential to understand the social equality aspect of transportation to identify the factors that give opportunities to the

community. There are many literatures about transportation development in Jakarta that focus on environment and benefit for mobility and efficiency in terms of spatial analysis. However, rarely do these papers talk about the subjective social factors that lead people to think and decide. The fact is not many researchers mentioned the social aspect of transportation. Usually, when we talk about transportation, we will talk about the externalities such as costs, emissions, and other economic or environmental impacts (Martens, 2012). Economical and environment are important things to consider, but social is equally crucial because transportation is for people. To be used by all people, public transportations must have accessibility for all. If accessibility is not planned and designed for all, then only some people would use it. Some barriers discourage people from using public transportation and opportunities that might have to encourage them instead. Hence, this research tried to find these barriers and opportunities that influenced the social side of what influence people in choosing between private transportation or public transportation. The aim is to understand the better approach to get more people in Jakarta to use public transportation services and hopefully reduce the dependency on cars and motorcycles.

The primary question of this research is, 'What are the barriers and opportunities to increase public transportation usage in Jakarta?'. The secondary questions that support the primary questions are 'What are the factors that affect and influence people in choosing or not choosing public transportation?' and 'What public transportation could do to meet the transportation demand and decrease barriers for people to use public transportation?'.

The findings of this research will benefit the Jakarta Provincial Government and urban planners as feedback on planning sustainable public transportation. Analysis and factors obtained from the research will help develop policy and planning in public transportation to gain positive social outcomes. The positive social outcomes expected are in the form of ethical impacts for the communities that will help them achieve a good quality of life.

2. Literature Study

This chapter will explain social dimension, equity, and how accessibility is an integral part of promoting social equity in transportation. After that, the literature will explore factors that form good and equal accessibility. Accessibility factors would then be identified based on the literature. The last part of this chapter briefly explaining the condition of public transportation services and policy to deal with traffic congestion in Jakarta.

2.1 Social equity and accessibility

Social equity and accessibility are inseparable. Many works of literature have linked the importance of social equity of accessibility. Jones and Lucas (2012) stated that accessibility is 'the most documented forms of social outcome from the transportation system.' It provides a measure of how people reach goods and services that are necessary for them. Dempsey et al. (2009) stressed that accessibility is a fundamental measure in measuring social equity. Services and facilities, public transportation routes, and roads impact accessibility as they define aspects of everyday life and social standard in the neighborhood. Positive social outcomes, such as job opportunities, health care, and social activities determined by the existence and accessibility of these public services (Lucas, 2011).

Specifically, equity in public transportation service refers to the idea that sustainable transportation should be affordable, accessible, and efficient for everyone (Litman & Burwell, 2006) as well as the distribution of rights such as equal treatment and benefits (Boschmann & Kwan, 2008). However, Van

Wee & Geurs (2011) saw that there is moral judgment in defining the equity of access to destination beyond distributions.

Analyzing equity in public transportation could be difficult as equity can split up into different subtypes. Litman (2020) categorized these types of equity into horizontal equity, vertical equity concerning income and social class, and vertical equity concerning mobility need and ability. Horizontal equity or fairness and egalitarianism is concerned about the distribution of impact between individuals and groups, in which everyone should be able to receive the same benefits and costs. Vertical equity in income and social class or social inclusion is concerned about the distribution of impacts by income and social class. Vertical equity in mobility needs and ability is concerned about whether the transportation service could accommodate all users, including those with special needs. These types of equity conflicted against each other as horizontal equity concerns about the costs of transportation facilities and services, while vertical equity concerns about subsidies for disadvantaged people. Social equity itself is a more social-focused of looking at policy that give equal benefits to different layers of society, which is a type of vertical equity.

Transportation system and connection to economic and social activities are essential for socio-economic wellbeing as an understanding of economic and social activities have gained importance in recent times (Dodson et al., 2006). One example is the growing metropolitan urban structure. This phenomenon results in social inequity and exclusion, which lead to the growth of disadvantaged groups of society. Dodson et al. (2006) also noticed that studies related to transportation exclusion developed from social exclusion theories. Social exclusion or social inequity comes from the differentiation of social status across urban space. The distinction drives spatial shift into 'divided city,' high spatial differentiation between socio-economic groups in the form of spatial housing and labor market (Fainstein et al., 1992). To overcome the distinction, the government should carefully perceive the links between individual and household economic status with transportation needs and opportunities within spatial and structural change context.

Transportation is not just about commuting people from one place to another and that it touches all aspects of life in the city. The primary reason politicians and policymakers would spend so much money on developing transportation systems is because good transportation increases economic development. Good transportation could also bring equality in life and opportunity; both are the social aspect of the community (Tumlin, 2012). However, the struggle is that between environment, economic dimension, and social dimension, as mentioned in the sustainability concept (Brundtland, 1987), the social dimension is the hardest to measure. It has broad and subjective characteristics and also challenging to define (Shen et al., 2011). Nevertheless, the social dimension is indispensable in understanding and developing transportation planning and policy as each society defines its people and the kinds of social interaction, integration, and experience. The uniqueness of each urban community as part of the social aspect makes social dimensions essential to understand as one policy for a society probably would not work for another.

Affordability refers to the capability of users as able and willing to pay for transportation service. Ideally, transportation service should be calculated as possible so that people from all kinds of social backgrounds can afford it while also maintaining supply and demand based on location (Talen, 2010). Meanwhile, efficiency is even more of an economic dimension in which transport infrastructure should run smoothly with less cost (Olofsson et al., 2011), which can also lead to people's decision in the kind of transportation mode they will choose. Efficiency looks into the economic dimension of sustainable transportation development, specifically at the cost-effectiveness of users and infrastructure (Karjalainen & Juhola, 2019). Tumlin (2012) stated that the customers or public transportation users prefer public transportation as a rational and conscious decision to spend less on every trip. However, the users can also use their social and conditional factors. These factors can be one of the reasons why many people in Jakarta still prefer their private transportation. There is even

a preference based on feelings that commuting public transportation is not as dignified as having private cars or motorcycles. If an individual has a bike in the garage, it gives their status to the community as someone who has a decent job and life (Kharizsa et al., 2015).

While affordability and efficiency aspects relate to both economic and social dimensions, accessibility is a significant element in the social dimension (Karjalainen & Juhola, 2019). Concerning equity, accessibility consists of factors related to the improvement of opportunities and quality of life, such as health care, employment, services, commercial, and education. All of these elements are what social equity must achieve a positive outcome. These elements will affect the opportunities and life based on the land-use and transportation planning and could influence rational decisions for the users. Even though the conditional factors would still present, thanks to familiarity and path-dependency, that has formed a culture in society (Hidayati et al., 2019; Sorensen, 2013), people under better conditions of social equity to supports rational decisions would prefer public transportation over their private ones.

2.2 Define accessibility measures

Accessibility defined in several ways with different meanings based on focus from various issues and spatial scales related to transportation planning or urban planning. Most of the research related to accessibility uses geographical approach and statistics as a measure (Huerta Munoz & Källestål, 2012; Cervero, 2005). Much of the study also focuses on accessibility for people with disabilities (Putranto & Putri, 2018). However, since this research understands social equity, the accessibility perspective focuses on accessibility for all and not exclusively for people with disabilities and will lean more on the social aspect. Therefore, indicators for measures chosen are comparable for all transportation users in Jakarta with different social factors.

Geurs & van Wee (2004) evaluated accessibility indicators through literature related to transportation. Looking into land-use impact, transportation developments, and policy plans on functioning a society, they argued that good accessibility reflects the needs based on life background, physical condition, available travel modes, and budgets. Accessibility measures potential opportunities or interactions, while equity analyzes its disparities (Boschmann & Kwan, 2008). Typically, it comprises two primary components, the time and costs to travel and the quality of needs and opportunities (Paez et al., 2012). Karou and Hull (2012) saw these two components as the correlation between changes in the transportation system and journey length and ease of reaching for numbers of daily activities at different locations. Geurs & van Wee (2004) identified this as factors that respectively influence individual components, including conditions that help to reach opportunities and transportation components, including infrastructure conditions to support individual needs. In short, accessibility has something to do with how transportation as a means to move to a desired location fits what the individual needs to go to that desired location.

Four types of components for accessibility are identified (Geurs & van Wee 2004). The first one is the land-use component. It consists of spatial distribution opportunities supplied at each destination, the demand for these opportunities around the area, and supply and demand for opportunities. The second is the transportation component, which expressed the importance of distance and destination using specific transportation modes. The third is the temporal component, which reflects temporal constraints such as available time of the day or certain individual activities. The fourth component is the individual component. This component reflects the needs, abilities, and opportunities of individuals. These are what influence an individual to want to have access to transportation modes. The components are indicators or measures to evaluate the level of access equity. Van Wee & Geurs (2011) suggested that these components strongly related to the social dimension inaccessibility.

Toward finding the social dimension in barriers and opportunities of public transportation, this research focused on transportation components and individual components (Figure. 1). These two components are accordingly in location-based measure of accessibility, which is analyzing accessibility on the spatial distribution of activities. By focusing on individual components, we can see deeper into the social dimension side of public transportation. Albacete et al. (2015) stated that location-based-measure in identifying individual components could help see accessibility measures on opportunities from travel, time, distance, or cost accessibility measure.

Accessibility measures that mentioned are such as scaled by functional limitation, accessibility measure based on spatial interaction, and measures based on space-time measure related to individual condition at a particular time in a specific space. These type of accessibility measures shows how accessibility on the individual level is related to the limitation on an individual's freedom of action in the environment, such as duration of activities, the time for activities, and speed that is provided by the transportation system. Usually, the measure is by looking at the individual distance to place of opportunities, the number of the individual, and their welfare.

Individuals will need a specific transportation mode which suitable for particular needs to reach opportunities. Individuals will choose based on the amount of time (travel, waiting, and parking), costs, and effort (reliability, level of comfort, risks). In conclusion, individual component in transportation accessibility is a conceptualization that transportation is a personal tool to have freedom, movement, and choice (Martens, 2012). Each transportation would have different characteristics, which would serve as options for individuals as a way to fulfill their needs for daily life and opportunity.

Transportation components came from on infrastructure supply, demand for passenger and freight transport, and characteristics (Albacete et al., 2015; Geurs & van Wee, 2004). Transportation would be able to serve its purpose if there is demand from individuals with needs and opportunities to fulfill. If the supply and demand are suitable, transportation services should have proper characteristics ideal for the demand to move individuals from the location to the destination. These characteristics are such as capacity, route, system, and headway. Transportation supply should also always meet the demand of individual needs and opportunities, meaning that it should always be available when needed in functional capacity (Figure 1).
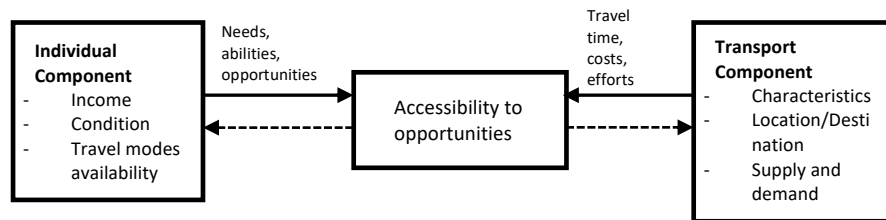

Figure 1. Relationships between component of accessibility (Geurs & van Wee, 2004)

Individual component, as previously mentioned, reflects on individual needs, abilities, and opportunities. In figure. 1, based on adaptation from Geurs & van Wee (2004) analysis on accessibility measures, individual needs and abilities come from modes of availability by income and the right condition. Van Wee & Geurs (2011) mentioned how individual component reflects how individual needs, abilities, and opportunities can influence a person's level of access to transportation modes. When the component factors fulfilled, an individual can have opportunities that would require accessibility. However, these factors are contextual (Brussel et al., 2019). The factors based on local standards and government policy. Income level standard in Jakarta, for example, is different than

other cities in Indonesia. Social and economic level in Jakarta also different. Travel modes availability in Jakarta is even more diverse (Hidayati et al., 2019).

Transportation components should try to fulfill the growing needs and abilities of individuals by serving transportation mode that would provide good travel time, costs, and less effort. The supply and demand are tailored based on individual components, which then would define the transportation infrastructure location and characteristics such as travel speed, number of lanes, timetables, and costs. Ideally, the more people gained opportunities (job or occupation), the more transportation grow to supply the needs to commute for their opportunities. This condition is a feedback loop between individual components and transportation components, a wheel of accessibility, and opportunities that support each other. Opportunities would grow as more individuals with the right component and accessibility would help the individual as long as transportation service has all the right components to realize accessibility.

Table. 1 presents component factors from individual and transportation, as well as each identification factors. Individual component is the stratification of the population, influenced by the individual's income, condition, and travel modes availability. Income is an individual's earnings based on their occupation, significantly affecting accessibility—condition-based from the solid background (age, gender) and educational level. An Individual's travel modes availability is from private vehicle ownership as well as proximity to public transportation. Transportation component is time and costs between location in everyday activities, influenced by transportation's characteristics, location of the transit area, and supply and demand. Characteristics identified by transportation infrastructure (gates, capacity, effectiveness, and reliability. The proximity can see location or destination to the city center, business center, and residential area. The availability of transportation can identify supply and demand can meet people's demand and needs to pursue the opportunity.

Component	Component factors	Identification
Individual Component	Income	Wage per individual
	Condition	Individual background that defines he/she condition (age, gender, educational level)
	Travel modes availability	If an individual has a private vehicle (car, motorcycle) and/or in proximity to public transportation
Transportation Component	Characteristics	Transportation infrastructure (gates, capacity, speed, effectiveness and reliability)
	Location/Destination	Transportation location (proximity to city center or business center, proximity to residential area)
	Supply and demand	Transportation availability

Table 1. Identification of component factors

2.3 Transportation in Jakarta

Public transportation has existed in different forms, such as commuter trains, buses, and minibusses. However, in Jakarta, there is a lack of integration between these modes. The government understood this problem and had planned integrated public transportation modes since 2007 (Yuliawati, 2006; RPJMD 2007-2013). It is not until the current Regional Mid-term Development Plan Year 2017-2022 that development for the walkable city, pedestrian-friendly area, and integrated transportation planned for Jakarta's future. However, private transportation is still more preferred rather than the public. It indicates that access to public transportation have not reach satisfaction (Khafian, 2014).

Developing accessibility in Jakarta is challenging with urban sprawling and automobile-dependency. Therefore, to lure more people into preferring public transportation as a dally transportation mode, the Provincial Government Is collaborating with *Transjakarta*, MRT Jakarta, and LRT Jakarta to developed an integrated transportation system.

The way transportation and planning developed in Jakarta for decades created automobile-dependency for the government and society. For the government, building roads in hindsight is the most natural solution and increase the economy fast. This automobile-oriented planning just shaped how Jakarta looks like today, making any new intervention to promote accessibility of public transportation harder. Meanwhile, people have made a habit of automobile-dependency due to adapting to the condition of poorly developed public transportation in Jakarta for a long time. This condition is also reflecting to components factor of accessibility. Individual demand must meet the supply of transportation infrastructure. The lack of public transportation that meets their demand had led people to have a car or motorcycle. Kharizsa et al. (2015) saw the dependency problem in Jakarta, like the Cycle of Automobile Dependency (CAD) (Litman, 2007). The Automobile-dependency phase came from the stigmatization of public transportation modes and the increase of vehicles' infrastructure. Dependency influenced by transportation and land-use factors. People use cars because of inconvenience in facilities. People who live far from the workplace and found it hard to access public transportation, would prefer to drive. The act driving with their transportation had become a habit, and stigmatism that compelling on their own could make them done their activities.

Nonetheless, Jakarta Provincial Government made programs and regulations to decrease private transport use and force more people to utilize public transportation. The most notable one is Law No. 5 Year 2014, about traffic restrictions based on an odd number and even number on private vehicles' license plate. The regulations are commonly called Peraturan Ganjil Genap or Odd-Even Regulation. The government hoped that this regulation forces people to use public transportation by limit their ability to commute with private transportations.

3. Methodology

This chapter will talk about the methodology used in this research. The primary goal of this research is to analyze social dimension outcomes of accessibility in transportation in Jakarta. The aim is to find and understand what still hold many Jakarta people from using public transportation so that these underlying factors could be used as tools and evaluation to increase public transportation users. Therefore, the primary question is, 'What are the barriers and opportunities to increase public transportation usage in Jakarta?'. Meanwhile, the secondary questions are 'What are the factors that affect and influence people in choosing or not choosing public transportation?', 'What public transportation could do to meet the transportation demand and decrease barriers for people to use public transportation?'. This chapter consists of several sections about research design, data collection process, and data analysis.

3.1 Research design

As mentioned in chapter 2, individual components and transportation components are the key factors in identifying the social dimension in barriers and opportunities of public transportation. Individual component factors are income, condition, and travel modes availability, which identified from wage, individual background, and individual transportation experience. Meanwhile, transportation component factors are characteristics, location/destination, and supply and demand, which identified from transportation infrastructure, location, and availability.

This research used mixed-method. Qualitative descriptive approach and document analysis are methods chosen in this research. Qualitative approach enables exploration of social dimensions in society, complex interest issues that persist, and factors that are hard to measure quantitatively (Creswell, 2013). It also has basic features that could support interviews (Colorafi & Evans, 2016). The content descriptive approach analyzes many texts into a highly organized and concise summary of the results (Erlingsson & Brysiewicz, 2017). Research design based on Colorafi & Evans (2016, p.18) study design adaptation as a guide on developing the qualitative descriptive research. This approach is suitable for identifying the individual component and their interest and perspective on public transportation. Additionally, the data produced from this approach is compared to transportation components to see if individual interest and perspective on transportation follow the state of transportation component.

As shown in figure 2, the data collection was divided into two approaches: questionnaires and document analysis. Data from these two approaches were analyzed separately. In the analysis process, the data taken from the questionnaire were used mainly to identify individual components. Meanwhile, the data taken from the document analysis primarily were used to identify transportation components.
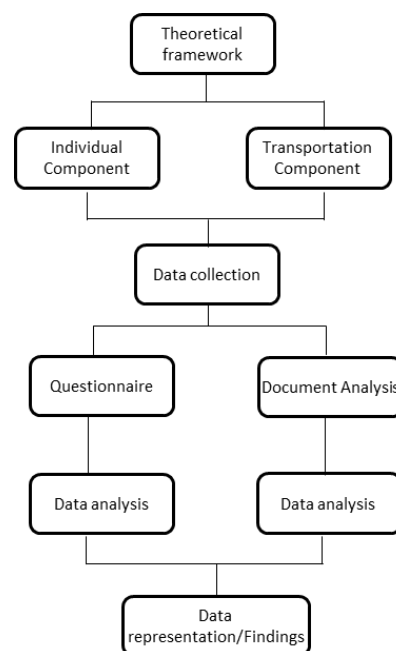

Figure 2. Research strategy

Document analysis used open data to determine the current state of public transportation component in Jakarta. These consist of available data on public transportations transit capacity, the spread of transit locations, and transport capacity in the form of articles, regulations, and open data from the Jakarta Provincial Government and transportation operators. The data produced from this approach is suitable to identify the state of the transportation component of public transportations in Jakarta. The data is compared to the individual component to see how public transportation accommodate accessibility to individual opportunities.

The findings from the comparison between questionnaire data and document analysis presented narratively to identify and explain the social situation in barriers and opportunities of public transportation. It would then use for analyzing barriers and opportunities that encourage and discourage the use of public transportation.

3.2 Theoretical framework

The theory used in this research is accessibility measures and indicators from Geurs & van Wee (2004). Accessibility on the individual level is related to opportunities or interactions defined by the background and a limitation on freedom of action, which are time, duration, and speed for each activity that individual does daily. Meanwhile, the transportation component would have characteristics suited to individuals needs for daily life and opportunity.

The analysis process is by examining both individual components and transport components. Individual component analysis should explain how opportunities, needs, and abilities to use transportation come from their income, condition, and the availability of travel modes. Therefore, analysis must be from questions to individuals who act in need of daily and consistent transportation mode. Transportation component analysis should see the characteristics, location, or destination, as well as supply and demand, to see if these components provide good travel time, costs, and the least effort possible.

From this analysis, we can then differentiate between public transportation users and non-public transportation users. From an individual perspective, we can also understand an opportunity that leads them in need of transportation. For non-public transportation users, we can see what the barriers that prevent them or lead them away from using public transportation are.

3.3 Data collection

Data collection is to understand and discover events or experiences in the case study (Sandelowski, 2000). Data collection is retrieved from respondents' questionnaires to find data by individual components and document analysis from Jakarta public transportation routes, total passengers per year, and regulations to find characteristics following transportation components.

Data analysis in this research is by directed content analysis (Hsieh and Shannon, 2005). Directed content analysis is suitable to analyze data to validate the theoretical framework. In this research, the data gathered from the questionnaire and document analysis.

3.3.1 Questionnaire

The sampling strategy used for the questionnaire process is case purposive sampling. Purposive sampling is a nonprobability sample that can be logically assumed to represent the population (Battaglia, 2011). Respondents should apply to conditions to participate in the survey. This approach is to find a diversity sample to cover all relevant varieties of the phenomenon to make an excellent qualitative analysis (Jansen, 2010). The sample of people who fulfilled the conditions below.

People who live around Jakarta and Greater Jakarta filled an online survey about their background and transportation mode preference. There are conditions applicable to the respondents to fill the survey:
1. The respondents must live in Jakarta or Greater Jakarta (excluding Kepulauan Seribu).
2. The respondents go to work or school or regularly commute inside and to Jakarta (daily destination should not be in Bogor, Depok, Tangerang, and Bekasi).
3. The distance between their home to work or school is more than 1 km or require transportation to reach.

The process of individual components data collection from questionnaires is by spreading online questionnaires from social media such as Instagram and Whatsapp. Selected respondents received a reward for completing the survey by putting their phone number to encourage questionnaire completion. Respondents are also encouraged to spread the questionnaires to others to ensure the randomization of data. The questionnaire was created on Qualtrics to get real-time information on respondents.

The questions presented to the respondents are from information based on theories about accessibility and current policy development in Jakarta regarding roads and public transportation. They are composed to let the respondents informed their information according to component factors from Geurs & van Wee (2004). The first part of the questionnaire was close-ended questions about individual backgrounds or conditions such as income, location, and destination. The second part of the question was respondents' daily experience of commuting from home to their workplace, school, or other daily activities space in Jakarta. After that, respondents must elaborate on the open-ended question of how do they commute daily. In the end, 110 respondents completed the questionnaires and gave sufficient data for the research.

3.3.2 Document analysis

Transportation data collection from document analysis is by searching for Jakarta Provincial Government, *Transjakarta*, and MRT Jakarta open data. The kinds of data collected based on the identification of transportation components, which are characteristics, location/destination, and supply and demand. Data for characteristics developed from documents about capacity, transit size, and headway. Location/destination is from route maps of public transportation in Jakarta from Jakarta Metropolitan Mass Transit Network Map (FDTJ, 2018). Supply and demand data are from open data of the number of public transportation passengers between 2019 to 2020 from Open Data Jakarta.

3.3.3 Data analysis

Questionnaire answers downloaded from Qualtrics into Excel format. The responses were analyzed with qualitative descriptive approach using ATLAS.ti and Excel. Close-ended answers such as income, destination, and location will be used as identification on transportation usage and formulated in Excel. Open-ended answers are coded based on meaning units, which are descriptive interpretation of data (Erlingsson & Brysiewicz, 2017), formulated in ATLAS.ti to ease the coding process. Income is chosen as the main indicator as it results from an individual's occupation that could influence accessibilities. Respondents identified by the order in which questionnaires filled in Qualtrics. The number would then identify and cross-check the respondents' statistical data and open-ended answers to see the individual component that might influence the decision to use public or private transportation.

Respondents statistical data taken from close-ended answers could give general information on each indicator about individual factors that influenced barriers and opportunities inaccessibility. These 110 respondents were identified based on their income level, daily location, and destination to define characteristics that could later explain respondents' barriers and opportunities in transportation accessibility.

Meanwhile, open-ended answers are analyzed to understand what encourages and discourage them from using or not use public transportations as a way to see barriers and opportunities that influence their decisions. The first step was to compile all open-ended answers from Excel to ATLAS.ti. After

that, the answers written in Indonesian for respondents' convenience interpreted in codes meaning units.

The codes were divided into two categories (Table 2). The first category related to public transportation usage activity. It was divided into the use of public transportation and the non-use of public transportation. In this category, the codes identified that other than public transportation or private transportation, respondents also choose motorcycle taxi, taxi, and *angkot*. Respondents who preferred to use public transportation also gravitate toward mixing commuting public transportation with either motorcycle taxi, *angkot*, or private transportation. The second category related to experience the respondents gained in the commuting process, which influenced their transportation preference. In the negative experience category, the respondents experienced discomfort or any short of impracticality in general and in specific during their commuting habits. On the positive experience category, the respondents experienced comfort and practicality in general and specific during their commuting habits.

Codes meaning units	Categories	
	Public transportation usage	Experience
Avoid odd-even regulation		Negative Experiences
Choices of routes		Positive Experiences
Comfort		Positive Experiences
Communication		Positive Experiences
Far from home		Negative Experiences
Mix use public transportation with motorcycle taxi	Use Public Transportation	
Mix use public transportation with private transportation	Use Public Transportation	
Mix use public transportation with share taxi (*angkot*)	Use Public Transportation	
Motorcycle taxi as an alternative	Use Public Transportation	
Not enough seats		Negative Experiences
Practical		Positive Experiences
Proximity		Positive Experiences
Public transportation as an alternative	Use Public Transportation	
Public transportation is cool		Positive Experiences
Public transportation not available	Not Use Public Transportation	Negative Experiences
Rather at home		Negative Experiences
Tired		Negative Experiences
Traffic		Negative Experiences
Trip planning		Positive Experiences
Unpractical		Negative Experiences
Use motorcycle taxi	Not Use Public Transportation	
Use private transportation	Not Use Public Transportation	

Use public transportation	Use Public Transportation
Use share taxi (*angkot*)	Not Use Public Transportation
Use taxi	Not Use Public Transportation

Table 2. Coded meaning units into categories

4. Findings

As mentioned before in the previous chapters, the problem addressed in this research is accessibility inequity, which seems to result in the high number of private transportations in Jakarta. This research will analyze the barriers and opportunities that encourage and discourage public transportation use. The problem and the purpose of the study lead to the primary research question, 'What are the barriers and opportunities to increase public transportation usage in Jakarta?'. The secondary question would be, 'What are the factors that affect and influence people choosing or not choosing public transportation?'. Another secondary question is, 'What public transportation could do to meet the transportation demand and decrease barriers for people to use public transportation?'

The first part of this chapter is about the transportation component of public transportations in Jakarta from document analysis taken from open data and literature. It would give perspective about the current condition of public transportation in Jakarta to understand the public experience with public transportations in Jakarta before connecting it with barriers and opportunities.

The second part is about individual components analysis from closed-ended and open-ended answers from the respondents. It is to identify the condition of the individuals who use public transportation in Jakarta. The analysis is done with a qualitative approach to questionnaires answers, which are then identified from coded meaning units to see what the factors are and how each factor defines an individual's decision to choose transportation modes. The transportation component has related to the analysis. It related infrastructure and service currently provided for users to identify the barriers and the opportunities. The statistical data from the questionnaire's close-ended answer was used to identify respondents' backgrounds based on the individual component framework in order to see which part of demographic has these specific barriers and opportunities.

The last part of this chapter explains the barriers and opportunities that are identified based on individual components. With all the analysis combined, this research reveals the factors influencing the decision to use public transportations, particularly in Jakarta, as well as the barriers and opportunities that lead them to their decisions.

4.1 On transportation component

Based on respondents' statistical data, there are three most preferred mass public transportations in Jakarta. There are *Transjakarta*, MRT Jakarta, and Commuter Line.

1. *Transjakarta* BRT

Transjakarta is 251.2 km long, the longest BRT line in Southeast Asia, with currently 13 routes (corridor) serving and connecting South, East, West, North, and Central Jakarta. This BRT has its

dedicated lane usually located on the right side of the road or in their private flyover road, so they do not intersect traffic. The BRT connected with integrated feeder buses, which carried passengers from smaller stations in narrow roads and stations in Bekasi, South Tangerang, Depok, and Bogor.

Transjakarta (2020) stated that the regular *Transjakarta* BRT operates with over 1347 buses. Based on the data released in 2018 and *Transjakarta*, these buses include 660 single buses and 140 articulated buses. Single buses can carry around 85 or 100 passengers based on the bus type, while articulated buses can carry around 120 passengers. They served over 13.9 million people daily from all routes by January 2020 (Jakarta Open Data, 2020).

Based on the minimum standards set by Jakarta Government Regulation No. 33 Year 2017, *Transjakarta* BRT should have 7 minutes headway during peak and 15 minutes headway during off-peak with 60 seconds stop per station. However, the report from observation by Siahaan & Alvinsyah (2018) on route 6H stated the average headway is 9 minutes, not following the established standard.

 2. MRT Jakarta

MRT Jakarta is the latest public transportation in Jakarta, opened in March 2019, with the next phase is still in construction by 2020. It is a metro line using an electric train. The first line, North-South Line, serves from business and residential areas in Lebak Bulus (South Jakarta) to Bunderan HI (Central Jakarta), of which there are 13 stations. From 13 stations, 7 of them are elevated stations, and 6 of them are underground stations.

Daily passengers estimated at 93.000 in December 2019 (Afifa, 2020) with maximum daily capacity per train is around 174.000 passengers (MRT Jakarta, 2018). Based on general publication from MRT Jakarta, the train headway is 5 minutes headway during peak, 10 minutes headway during off-peak, and 20 minutes headway during the weekend.

3. Commuter Line

Commuter Line is the oldest remaining public transportation in Jakarta, built during the Colonial era in 1930. It is a high-frequency electric rail service connecting all the neighboring cities in the metropolitan area to business and commercial areas in Jakarta, especially in South Jakarta, East Jakarta, and Central Jakarta. In 2011, Commuter Line modernized to improve its comfort and safety, and the line is improved. Currently, 11 lines are serving. Generally, Commuter Line trains are of 8, 10, or 12 cars with 80 to 110 passengers per car.

The average number of passengers per day estimated at around 1 million people (Databoks, 2019), with annual ridership estimated at 320 million people (Databoks, 2018). Databoks (2018) also calculated that the Depok-Bogor line, which connects the city of Depok to Central Jakarta and Central Jakarta to Bogor, served 69.95% of annual passengers. Commuter line headway is 5 minutes on peak hour for their full lines, Bogor/Depok - Jakarta Kota and Bogor/Depok - Jatinegara. In comparison, other lines that are not as crowded are 10 to 15 minutes and 30 to 38 minutes (KRL, 2019).

The commuter line is well-known due to jostling, which happens every day due to the high intensity of passengers and train capacity that could not accommodate all passengers (Detiknews, 2013). This situation is not comfortable although many people still want to go through this and hope that one-day commuter line can be more comfortable.

Besides mass public transportation mode, small capacity services such as motorcycle taxis, shared taxi or *angkot*, and taxi are favorite commuting choice in Jakarta. Out of these three, the motorcycle taxi is the most preferred for its simplicity and practicality in the hailing process with online application. With the development of ride-hailing technology, motorcycle taxi has become a favorite choice to commute practically and cheap. Other than motorcycle taxis, *angkot* is a long-serving public transportation in Jakarta since the 70s and still preferable in some areas around Jakarta.

In Jakarta, a motorcycle taxi has become a reliable transportation mode. Applications provided by third-party sources, such as *Gojek*, *Grab*, and *Uber*, help find motorcycle taxis. It has become a practical solution to arrive on time during rush hour and congestion. To some extent, these applications also allow its users to call for ride-sharing or ride-hailing taxi. While these improve mobility, these are not sustainable in the long term, especially that congestion and vehicles on the street of Jakarta keep increasing every year (Suatmadi et al., 2019).

There is also a problem with the status quo of motorcycle taxi online services. As motorcycle taxi become more reliable in the community, so does the demand from motorcycle taxi riders and services for rights to get equal pay as any other transportation services (Budiansyah, 2020). However, this remains uncertain as based on the Ministry of Transportation Law No. 22 Year 2009, online or non-online motorcycle taxis are not part of regulated public transportation services. Ministry of Transportation Law No. 12 Year 2019 regulates the standard operational service and fare for all motorcycle taxis. However, even that still does not acknowledge the legality of motorcycle taxis as public transportation. The status quo remains, and the government deemed inconsistent and non-strict in dealing with this situation.

Angkutan umum or *angkot* is a shared taxi service with a pre-determined route but without a dedicated stop. Passengers who want to use this service would have to wait in the road where the *angkot* line is and hail it when visible, while passengers who want to get off would only need to signal the driver. The nature of this service results in them being one of the causes of traffic congestion in Jakarta.

Compare the three preferred mass public transportations and small capacity transportation services; some factors make small capacity service more reliable. From characteristic component factors, small capacity services are valid and reliable as transit stations or fixed routes do not determine these services. They are also reachable everywhere as users can hail them from the side of the road or by mobile application and have enough fleet to meet the users' demand. Meanwhile, mass public transportations in Jakarta do not cover every place in Jakarta, only the important ones. *Transjakarta* BRT has a smaller fleet to connect smaller stations, but highly demanded service such as Commuter Line only connecting Bogor or Depok (and Bekasi in between) with a rather long headway. At the same time, MRT Jakarta currently only serves around the center of Jakarta.

4.2 On individual component

Individual component factors consist of income, condition, and travel modes availability. These factors are what influence an individual in deciding on choosing transportation. The first part explains statistical data taken from respondents' close-ended answers that are projected to the income level to identify individual conditions from different income. The second part explains experience as described by the respondents in open-ended answers.

4.2.1 Respondents' statistical data

Based on close-ended answers, most respondents who filled the questionnaires live outside Jakarta in the neighboring cities (Table. 3). From respondents who live in Jakarta Province combined, the percentage between respondents who live inside Jakarta and respondents who live outside in the Metropolitan area is 47% to 46%. On the other hand, based on the destination, most respondents' daily destinations are located in South Jakarta, and most of these respondents are from > Rp 20.000.000 income level group.

There are more 18-35 age demographic on < Rp 3.500.000, Rp 3.500.000 - Rp 4.999.999, and Rp 5.000.000 - Rp 9.999.999 income while there are more above 50 age demographics on Rp 10.000.000 - Rp 20.000.000 and > Rp 20.000.000. The number of male and female respondents are almost equal (54% and 46%, respectively). Most of the respondents' educational level are Bachelor degrees. Bachelor demographic dominated Rp 5.000.000 - Rp 9.999.999, Rp 10.000.000 - Rp 20.000.000, and > Rp 20.000.000 while PhD demographic only occurred so little in > Rp 20.000.000 demographic. 54% of the respondents are male, and 46% of the respondents are female.

Individual Component	Income				
	< Rp 3.500.000	Rp 3.500.000 - Rp 4.999.999	Rp 5.000.000 - Rp 9.999.999	Rp 10.000.000 - Rp 20.000.000	> Rp 20.000.000
Percentage	16%	15%	24%	21%	24%
Location					
South Jakarta (27%)	6	1	7	7	9
East Jakarta (12%)	3	1	4	4	1
West Jakarta (6%)	0	2	0	3	2
North Jakarta (2%)	0	0	0	0	2
Central Jakarta (6%)	2	2	0	1	2
Non-Jakarta (Bekasi, Bogor, Tangerang, Depok) (46%)	9	10	15	7	10
Destination					
South Jakarta (55%)	12	7	10	12	19
East Jakarta (15%)	4	2	6	4	0
West Jakarta (10%)	2	1	2	3	3
North Jakarta (4%)	0	2	1	0	1
Central Jakarta (17%)	2	4	7	3	3
Age					
18-35 (41%)	9	12	17	7	0
36-50 (19%)	3	1	5	4	8
>50 (40%)	8	3	4	11	18
Gender					
Male (54%)	11	8	12	14	14
Female (46%)	9	8	14	8	12
Education					
High School (14%)	8	5	2	0	0
Bachelor (67%)	9	9	22	16	18
Master (16%)	3	2	2	6	5

PhD (3%)	0	0	0	0	3

Table 3. Respondents statistics

Based on this statistical data from the close-ended answer from respondents, we could see the individual component from each income level. The statistical data would help identify what kind of people would be affected by barriers and opportunities. < Rp 3.500.000 income level represented the people with low income who are students or people who work in informal sectors such as cadgers, street vendors, helpers. In table 3, we can see that this income level has half of the respondents live outside in the Metropolitan area of Jakarta. In contrast, the other half live in South Jakarta, East Jakarta, and West Jakarta. Rp 3.500.000 - Rp 4.999.999 income level represented people with lower-middle-income who mostly are students. Rp 5.000.000 - Rp 9.999.999 income level represented people with middle income who are students and fresh graduates who just started their careers, informal sector workers, or homemakers. Rp 10.000.000 - Rp 20.000.000 income level represented people with middle or upper-middle income who are people with stable jobs or homemakers. At last, > Rp 20.000.000 income level represented people with upper-middle or high income who are people with good stable jobs.

In table 4, we could see the correlation between each income level with open-ended answers. < Rp 3.500.000 income level are mainly the respondents who mix-use public transportation with a motorcycle taxi. Some of them use public transportation, but only two respondents from this income level use private transportation. Some of them stated a positive experience group, meaning that the respondents enjoy what they have, although some also experience tiredness and traffic, which are not avoidable. This income level may not afford private transportation, so public transportations are their reasonable choice. Some of them mix-commute with other transportations, but as have been mentioned previously, the mix-commute is to help them reach public transportation. Meanwhile, experience categories such as positive and negative experiences, as seen in table 4, reflect each income level's experience when they use their preferred transportation mode.

Respondents classified in Rp 3.500.000 - Rp 4.999.999 income level has more equal reactions in use public transportation group. Like < Rp 3.500.000 income level, respondents in this income level also mix-commute with other transportations to reach public transportation, although some also able to just use public transportation. However, more respondents use private transportation. The reason could be because there are more young people at this income level. It is typical for younger people to have their families picked them up from their daily destination, back at home. Respondents from this income level also have positive experiences with their preferred transportations. One of them expressed how to be able to use public transportation is a refreshing experience. However, the negative experiences related to tiredness and traffic also exists in this income level. One of the respondents here was the one who stated that there is no available public transportation nearby. The respondent is Respondent 8, who lives in Depok. She stated that there is no comfortable and practical public transportation near her house, so she chose a motorcycle taxi to commute daily. The respondent's statement reflects on identified barriers and opportunities that people do not prefer public transportation because it is unpractical, ineffective, and tiresome.

Respondents in Rp 5.000.000 - Rp 9.999.999 income level have more people not using public transportation. There are 16 responses of 'use private transportation' and six responses of 'use motorcycle taxi.' Even 5 of the respondents who use public transportation, responded with 'Mix use public transportation with motorcycle taxi.' People in this income level start to afford private transportation or hail motorcycle taxi service daily. Looking at the respondents' age and education level, many of these people are fresh graduates or just start their careers. Punctuality is essential for

newcomer workers. Their salary can facilitate a transportation mode that would bring them to their work faster and more efficiently as public transports could not provide efficiency yet. However, some of them who prefer public transportation have public transportation comfortable and within walking distance for them.

In Rp 10.000.000 - Rp 20.000.000 income level, more respondents use private transportation than public transportation, although some use public transportation. People with middle or upper-middle income could afford for private transportation and would leave public transportation. Some exceptions could apply to those who live and work in South Jakarta as there is more variation of public transportation service and within walking distance.

Respondents in > Rp 20.000.000 income level also have more of them prefer to use private transportation, and some of them still use public transportation. Respondents who are in this income level are mostly people from age above 50. At this point, they have stable and well-paid jobs with their proper education. They can afford to have private transportation and choose not to have to use private transportation. Therefore, not many of them prefer public transportation. The respondents from this income level also stated the positive experience in which they feel like they could control the routes and time of their daily trip. This statement mentioned more on this income level respondents than any other income level before.

	Income				
Codes	< Rp 3.500.000	Rp 3.500.000 - Rp 4.999.999	Rp 5.000.000 - Rp 9.999.999	Rp 10.000.000 - Rp 20.000.000	> Rp 20.000.000
Category: Public transportation usage					
Use public transportation (51%)					
Mix use public transportation with motorcycle taxi (17%)	9	4	5	3	2
Mix use public transportation with private transportation (4%)	1	3	0	1	1
Mix use public transportation with share taxi (*angkot*) (4%)	4	1	1	0	0
Motorcycle taxi as alternative (1%)	0	0	0	0	1
Public transportation as alternative (11%)	3	5	1	2	4
Use public transportation (14%)	5	4	2	4	4
Not use public transportation (49%)					
Use motorcycle taxi (9%)	0	3	6	1	2
Use private transportation (38%)	2	5	16	12	18
Use share taxi (*angkot*) (1%)	0	0	0	1	0
Use taxi (1%)	0	0	0	0	1

Public transportation not available (1%)	0	1	0	0	0
Category: Emotion					
Positive emotions (60%)					
Choices of routes (1%)	1	0	0	0	0
Comfort (3%)	1	0	0	1	1
Communication (1%)	0	1	0	0	0
Practical (35%)	7	8	9	7	6
Proximity (13%)	7	1	3	3	0
Public transportation is cool (1%)	0	1	0	0	0
Trip planning (7%)	0	1	0	0	6
Negative emotions (40%)					
Avoid odd-even regulation (4%)	1	0	0	1	2
Far from home (2%)	1	1	0	0	0
Not enough seats (2%)	1	0	0	1	0
Unpractical (9%)	3	3	3	0	1
Public transportation not available (1%)	0	1	0	0	0
Rather at home (1%)	0	0	0	0	1
Tired (7%)	3	2	1	1	0
Traffic (15%)	3	1	3	3	6

Table 4. Coded meaning units sorted by income levels

There is a pattern from these income levels. For instance, more respondents age 18-35 belong to lower to middle-income levels while respondents age > 50 belong to the middle to upper-middle income level. Lower to middle-income levels are likely to use public transportation more than middle to upper-middle income levels. Based on this observation, people who are older, more educated, and have stable jobs are less likely to use public transportation. This because they could afford to have private transportation. However, this experience is exceptional for respondents who has excellent public transportation service in walking distance.

4.2.2 Respondents' experience

In table 2, all coded meaning units are from open-ended answers. The first category is about transportation usage, and the second category is about experiences related to experience in commuting. Each category has two groups. Public transportation usage category contains 'use public transportation' group and 'not use public transportation group.' Meanwhile, experience categories contain 'negative experiences' and 'positive experiences. In tables 3 and 4, refer to income level, each identity sorted by income level and their response in each category.

From open-ended answers, there are different kinds of experience in the public transportation usage category. Codes that are part of 'use public transportation' groups are not solely using public transportation as their mode for daily commute. However, based on respondents' answers, many public transportation users mixed commute with other transportation modes such as motorcycle taxis, share taxis (*angkot*), or private transportation. Some respondents explained how they chose

public transportation as an alternative. It means that they mainly commute with either private vehicle, motorcycle taxi, share a taxi, or other transportation modes while occasionally using public transportation. However, there are also respondents' who answered that they use public transportation daily without mixing it with other modes.

Respondents' who mix-use their transportation mode gave answers about how they needed low capacity transportation, in this case, either motorcycle taxi, share taxi (*angkot*), or private transport to get to public transportation. These display the situation where their place to live or place to work is not on walking distance.

'I walk from the alleyway for 5 minutes to busway (*Transjakarta*) stop. On the way home, I ride *gojek* first (motorcycle taxi service) to reach busway stop' (Respondent 4).

'I ride from home with (my) motorcycle to train station. Then I ride the train (to station near workplace), continue the journey with another public transport' (Respondent 65).

'From home, I walk a little to share taxi or bajaj (auto-rickshaw) to the destination. It is also the same for the return trip' (Respondent 28).

These statements from open-ended answers, which grouped into 'use public transportation,' show that there is interest in utilizing public transportation despite the lack of accessibility to reach the service. The barrier appears to be the proximity of public transportations to the residential and business area of these respondents. Despite the interest in using public transportation daily, they obstructed by the distance between their location or destination to the nearest public transportation.

Answers grouped as using public transportation as an alternative revealed how the respondents who gave such an answer came from a few different reasons. For example, respondent 84 wrote how he rides his car on odd dates and mix-ride motorcycle taxis with public transportation or motorcycle taxi altogether on even dates. There is also a similar response from respondent 75. She usually uses her car, but on odd dates, she uses MRT or *Transjakarta*. These responses show how they deal with Odd-Even regulation, which is in every major arterial road in Jakarta. Both respondents are forced to leave their car, depend on the end number of their car's license plate, and use the nearest public transportation. However, this also shows how Odd-Even regulation cannot guarantee everyone to use public transportation immediately. Although Respondent 75 uses or *Transjakarta* on odd dates, Respondent 84 still mix-commute public transportation with motorcycle taxi and sometimes even use motorcycle taxi altogether. With Odd-Even regulation, people have to try to find different alternatives to go to their daily destinations.

Nevertheless, not all of the people affected by the regulation choose public transportation. This regulation is unsuitable and unfit. It does not address the barrier that has existed, the lack of public transportation that is reachable by walking distance for potential users.

Another example from 'public transportation as an alternative' answer is from respondent 90 showed that respondents who use public transportation as an alternative do not always use small capacity transportation service. The respondent goes to work, usually with private transportation. However, the respondent also stated that he usually goes to work and back in his car, but if there is a meeting outside the office during working hours, he will go with public transportation. Assumed that his workplace nearby public transportation, the respondent has an interest in using public transportation but probably faces the same barrier as others when trying to use it more frequently as part of the daily commute from home to work.

Experience category divided two groups, negative and positive. Negative experiences group consists of adverse responses in respondents' daily trips, while positive experiences group consists of positive responses in respondents' daily trips. Generally, negative experiences expressed in respondents' answers about the impracticality of their transportation mode, and the other codes consist of all experiences that lead to unpracticality. These responses appear in both public transportation users and non-public transportation users, so this is not only tied to one group.

One of code meaning unit that is referred to before is regarding Odd-Even regulation. The regulation made respondent 75 use public transportation when the date does not match her license plate number. However, there are also different ways to overcome this regulation. Respondent 44 has vehicles with both odd and even number at the end of the license plate. The respondents' actions happen because the regulation does not affect the respondent. After all, he can use his vehicle with an odd license plate number on odd dates and vehicles with even license plate on even dates. The respondents' statement, once again, shows that the regulation is ineffective in reducing the number of private vehicles and congestions. It only increases more vehicles bought as some people would have multiple cars or motorcycles with odd and even numbers. People would also prefer a motorcycle taxi or taxi to reach their destination instead of public transportation. Many still see this as a more practical way to be on time.

Other negative experiences identified from open-ended answers are about how public transportation is far from home. Respondent 10, as quoted above, mentioned this as a barrier in choosing public transportation as daily transportation modes. If the respondent uses public transportation, she has to ride a motorcycle taxi or car to reach the nearest station. The situation has become a consideration that makes her choose to use cars more often.

Another negative experience showed in open-ended answers is 'tired.' Respondent 85 mix-commutes share taxis with *Transjakarta* daily but feel tired and uncomfortable with the experience. The respondent also stated that she wished there is more fleet available because she cannot get a seat while the trip is far. The barrier that identified from this statement is the lack of comfort provided by public transportation. Public transportation is usually crowded with passengers. Indeed, it is what lack of public transportation compared to private transportation where the seat is spacious, and people crammed with other people. This experience also happen Respondent 60, who stated that he prefers to use his car if there is an important meeting: it is comfortable and fast. At the same time, public transportation will make him wait and always crowded with people. Tired is also associated with traffic. Traffic conditions happen for people who use private transportation as this experience will not happen with public transportation. Few respondents mentioned having to face the traffic congestion and feel tired about the experience.

'Traffic and tired' (Respondent 61).

'Every Monday to Friday, (I) go to work in the morning. At 6, I am already on my way with a motorcycle. When I arrive at the office, I was already tired because (I go through) traffic congestion in a few spots on the way. Even if I go to work much later, traffic congestion would still be the same' (Respondent 99).

'I use a motorcycle; it is hard because (I) pass through the heart of Jakarta, which is Sudirman (road). As a result, the trip became longer and wasted the gas fuel. Whereas on the weekend, the same trip can be reached with a shorter time and more fuel saved' (Respondent 35).

These responses show how traffic caused tiredness and a high-stress level. Traffic congestion caused more time spent during the trip, which caused stress and energy drained. Despite the experience, other respondents try to overcome this barrier by going to work and back home when the rush hour

is or almost over to avoid traffic congestion. Respondent 36 goes to work at dusk and goes back home at around 8 PM to avoid traffic congestion during rush hour while Respondent 38 goes to work much later at 10 AM when traffic congestion is over and goes back home early at 5 PM when the congestion formed on the opposite direction. Looking at how these people try to avoid traffic congestion and sacrifice punctuality show how much people do not want to deal with traffic congestion.

Respondents who use entirely public transportation daily and not mix-commute with other transportations seem to have no such barrier. Respondent 57 wrote that he walks from his home to MRT station then to his office and vice versa. The respondent is interested in using public transportation and made simple proximity between public transportation to his home and workplace.

Not use public transportation category consists of answers related to respondents' transportation preferences, which are not public transportation. Some prefer to use their private transportation, but some prefer to use a motorcycle taxi, share a taxi, or a conventional taxi. Private transportation is the most preferred among respondents in this group, although a motorcycle taxi is the second preferred. Many respondents also stated how they altered or mix between using their private transportation with motorcycle taxi, such as some respondents quoted below:

'…I find it very easy to use *Gojek* (application to hail motorcycle taxi). However, with MRT, commuter line or *Transjakarta*, (they are) far, it's a bit hard. I have to ride *Gojek* or car at first to the nearest station. (…) Most of the time (I) use a car for a round-trip from home straight to the office and vice versa. If there is no car, I use *Gojek*' (Respondent 10).

'From home, ride a motorcycle or motorcycle taxi to office, and vice versa' (Respondent 2).

Nevertheless, some respondents only prefer motorcycle taxis.
Respondent 13 stated that the motorcycle taxi is faster and more practical. There is also superiority from motorcycle taxi services that come from mobile applications. The application can give the users the estimated time until the motorcycle taxi come. It could also be that the respondent saw that public transportation is not punctual and not informative for its users. There is also one response that uses a motorcycle as an alternative for public transportation. Respondent 48 preferred to use *Transjakarta* but will also choose motorcycle taxi depend on time and situation. Assumedly, the respondent will use *Transjakarta* if the traffic congestion is terrible, and *Transjakarta*'s headway is short and not too crowded. However, if the condition is not sufficient, the respondent will use a motorcycle taxi.

Other than these two transportation modes, there is only one response for each share taxi (*angkot*) and conventional taxi. Respondent 77, who use share taxis, only gave a short answer with 'take *angkutan umum* (*angkot*).' Meanwhile, respondent 32, who use a taxi, said that he found it easier to use a taxi because he only needs to call the taxi to come while if he wants to use MRT or *Transjakarta*. He would have to use an application to plan what he would ride.

On the other hand, the positive experience expressed in respondents' answers about their preferred transportation mode's practicality. These responses also appear in both public transportation users and non-public transportation users with different reasoning. Respondents who use public transportation daily find the practicality in simple steps in their daily trip. For instance, Respondent 86 wrote that he usually would sleep on the bus until the destination. In the meantime, Respondent 101 simply wrote that he only calls a motorcycle taxi and expressed how easy the process is. Both sides of perspectives about practical show that the concept is based on how the people, as transportation users, see between public transportations and private transportation.

Two different perspectives are in respondents' answers that coded into 'comfort.' Respondent 60, who only picked public transportation as an alternative, stated that private transportation is

comfortable and faster while public transportation makes people wait and always crowded. On the other hand, Respondent 62, who commutes with only public transportations, stated that her trip is 'cheap, comfortable with air conditioner, and fast.'

Two different perspectives between public transportation users and non-public transportation users can be reasoned by how the trip is planned based on each individual's location and condition. After all, the primary purpose is to reach the destination as close or as fast as possible, as Respondent 67 stated.

4.3 Identification of barriers and opportunities

Analysis from respondents' answers component factors show the barriers and the opportunities in the current state of public transportation accessibility in Jakarta. The barriers and the opportunities came from the interaction between individual component factors with transportation component factors. The barriers are what hold more people from using public transportation while the opportunities could be improved from the existing potential to lure more people into using public transportation.

From analysis based on public transportation usage and experience category, we can see two perspectives of negative and positive experiences in public transportation users and private transportation users. In the end, everyone wants to have the least traffic congestion on their trip. People also want to be able to reach their destination as fast as possible. These reasons are why people would pick their transportations.

4.3.1 Barriers

Barriers identified from the public transportation usage category are the area between public transportation to areas frequented by people. Another barrier identified is unpunctual and uninformative public transportation rather than its rival like motorcycle taxi services, and public transportation is not as comfortable as private transportation. Barriers identified from the experience category are unpractical public transportation, inappropriate regulations from the government to address traffic congestion problems, and public transportations that are not within walking distance from significant locations.

Looking back into the individual component, 'use public transportation' respondents' groups are mainly in low-income levels. 46% percent of them live outside Jakarta while the rest live in Jakarta, mostly live in South Jakarta (Table. 3). It also explains the motive behind their transportation choice. Those who choose to use public transportation daily is because their income condition allows them to use public transportation. Many of them probably do not have private transportation at their home, so even when they need to reach public transportation by vehicle, low capacity transportation service seems to be a perfect combination. It clarifies how the barrier for individuals mentioned above is the lack of proper infrastructure to access public transportation. The location and sometimes the destination is unreachable that they have to pick another transportation as connecting transportation mode.

Many also still discourage using public transportation as they are unreliable and sometimes unpunctual. Simultaneously, with motorcycle taxis, people can reach the destination in time as motorcycles will not get hold up in traffic congestion. In other words, alternatives outside public transportations are still could be more reliable than public transportations.

Meanwhile, the government's regulation, such as Odd-Even regulation or regulations that support motorcycle taxis or taxis online services, is a short-term solution for traffic congestion. It would still only feed on more independency towards cars or motorcycles. It is the external barrier that influenced the state of the transportation component. Incompatible regulation reduced the importance of public transportation for any potential users.

4.3.2 Opportunities

Opportunities identified from the public transportation usage category are the public interest with public transportation so to avoid traffic congestion and the interest in efficient and comfortable transportation mode. There is also interest in public transportation if the condition makes public transportation simple and easy to use, such as public transportation with good infrastructure, strategic location, high capacity, and short headway. Based on open-ended answers, there is also a mindset that public transportation is cool and the desire to reach the destination as fast as possible.

The respondents who show their positive experience in their commuting preferences give opportunities to develop public transportation services. From table 4, people with middle-income level to upper-income level tend not to mix commute with small capacity transportation. Many of them prefer to use their private transportation. However, those who use public transportation are the reflection of positive outcomes in public transportation. Their living and working environment likely has an excellent transportation infrastructure and location. The result of this experience is someone like Respondent 57 who enjoy walking to MRT station to go to his or her office and return in the same way. It confirms that when the transportation component is sufficient, the individual component will give positive feedback to the transportation component in the form of more people use public transportation.

5. Conclusions

Public transportation is an excellent solution for traffic congestion that accumulates in Jakarta for long. However, public transportation development in Jakarta is slow. It would not be easy to encourage people to use it as people already dependent on private transportation or low-capacity transportations that have filled the streets for decades. With the development of integrated public transportation as well as the recently opened MRT Jakarta, this could be a turning point to develop public transportation services and encourage more people to use public transportations. Many factors influence the decision-making of potential users who use public transportations, such as costs, emissions, economic, and environmental impact (Martens, 2012).

Nevertheless, social dimensions that could influence the decision are rarely discussed while it is equally as important to other factors. They are equally important because people use transportations, and accessibility allows them to be used by all. If accessibility is insufficient, then only some or no people would want to use it. Therefore, this research analyzed factors that affect and influence people choosing public transportations to find barriers and opportunities to increase public transportation usage in Jakarta.

The theory used in this research is Geurs & van Wee (2004) about accessibility indicators. Two indicators are the focus in this study, individual component and transportation component Van Wee & Geurs (2011) mentioned how individual components reflect on individual needs, abilities, and opportunities that need to be met by the transportation component (Albacete et al., 2015). Meanwhile, the transportation component reflects on the ability of transportation to provide the growing needs abilities of individuals with good travel time, costs, and less effort. This research

analyzed the components factors in their impact on social equity in transportation accessibility by questionnaire and document analysis. The questionnaires were divided into close-ended questions and open-ended questions to analyze with a descriptive content analysis method. Close-ended questions were to gather data to define respondents based on individual components, while open-ended questions were for the qualitative descriptive process. The process is to understand each respondent's experience and coded these experiences into meaning units to identify barriers and opportunities of transportations accessibility.

Analysis of transportation components of these mass public transportations shows problems that become a barrier from being preferred by users and equally accessible. *Transjakarta* BRT serves and connects inner Jakarta but also connected to outer Metropolitan Jakarta by its feeder services. The service has high demand, so they compensate it by having over 800 buses to supply the demand. However, *Transjakarta* has a problem with headway as, despite the standard operating regulation from the Provincial Government, it could not fulfill its standard headway and thus not always reliable. It might happen because of the dedicated road lane that *Transjakarta* has to coincide a lot with regular lane, which is usually congested. MRT Jakarta is Jakarta metro line with only one operating route as this transportation service is brand new and under construction. It has a good headway and very reliable. However, this service only has one line available, for now, located in the residential and business areas in South Jakarta to Central Jakarta. Therefore, it is not reliable for people who do not live and work there. Commuter Line is a high-frequency electric rail service that connected the Jakarta metropolitan area to business and commercial areas in Jakarta. This service serves 1 million people daily in 11 lines with 5 minutes headway but only on their full lines.

Meanwhile, other lines that are not as crowded have 10 to 15 minutes headway and 30 to 38 minutes headway during peak hour. Although not very crowded lines, these headways are not suitable for this high-frequency transportation, which has a very high demand daily. Many passengers and not enough trains resulted in usual jostling inside the train.

On the other hand, there are motorcycle taxi, taxi, and *angkot*, which, despite their low capacity, are still some of the most preferred transportations. These services are not sustainable and only worsened car dependency and traffic congestion in the long term. With these small capacity transportations, especially motorcycle taxis or car taxi, people could get the seats for themselves faster by calling it to their location. In contrast, on public transportation, people would have to jostle with other people throughout the way after spending time walking to the nearest station. The situation found in the transportation component of public transportations in Jakarta reflects on the current state of public transportation services in Jakarta. They are not comfortably reachable within walking distance and could not supply the demand from public transportations users. It becomes one of the barriers that discourage people from using public transportations. Other problems such as relaxation or incompatible regulation such as Odd-Even regulation or relaxed regulations for motorcycle taxis also serve as another barrier as these regulations do not solve the actual problem. The problem is the lack of proper transportation components on public transportation services in Jakarta.

In truth, people would choose public transportations if they are affordable and easy to reach. However, based on respondents' data, many of them who are in high-income levels prefer to use private transportations. It could be because public transportations are not practical, reliable, and comfortable enough while private transportation is better and more reliable. It shows public transportations' conditions as barriers that discourage people from choosing it. The unpractical condition and experience of public transportations also show for public transportations users who mix commute with motorcycle taxi or *angkot*. When looking into their answers, we can conclude that this is their way of reaching their destination fast and efficiently. If they only rely on public transportations, they would need more time to just walk into the nearest public transportation.

What are the barriers and opportunities to increase public transportation usage in Jakarta? Overall, the barriers to public transportation usage are the condition of public transportations services and the government's regulation and role. The current regulations still lean on feeding cars and motorcycles dependency rather than prioritizing public transportations development. Public transportation integration and MRT Jakarta, which is known to be reliable and comfortable, is a good start, but all mass capacity public transportations should follow. The government's role is crucial to ensure and nurture public transportation development to a more positive future where public transportations could be more reliable, comfortable, and reach every corner of the Jakarta and Metropolitan area of Jakarta.

Meanwhile, opportunities for public transportation usage in Jakarta come from people's interest. Many respondents use public transportations despite the shortcomings. There are millions of public transportation users per day despite low reliability and comfort and how much effort it is to reach the stations. If public transportations could improve their service, then more people would use them. Eventually, public transportation could exceed private transportation when we can overcome the barriers that have and utilize the opportunities well.

What are the factors that affect influence people in choosing or not choosing public transportation? The first factor is the government's regulation and policy. Right now, the regulations still feed on cars and motorcycles dependency. People have not trust public transportations as reliable transportation, so they search for other options to commute. Motorcycle taxi has also become a very dependable transportation service despite its low capacity. The government's regulation should not feed into this dependency and should have focused on developing a comfortable and integrated public transportation that reaches all corners of Jakarta. The second factor is transportations reliability. Public transportations must be more reliable than its counterparts and rivals. In order to do that, public transportations must be able to meet the demand of public transportation users. It is only then people would be encouraged to use public transportation. The third factor is proximity. Proximity is an integral part in forming a practical public transportation. Motorcycle taxi, taxi, or shared taxi still have leverage over public transportations because they are easy to call anywhere.

In contrast, with public transportations, people have to walk to reach the stations. Public transportations has to be reached by walking distance to encourage to use public transportations. The fourth factor is comfort. It is unavoidable that public transportations will always be full of people. After all, public transportations are purposed to carry many people at the same time. However, public transportations could give passengers a comfortable experience by having more seats available and less waiting time. In other words, public transportation should have enough fleet to supply the demand of the passengers. *Transjakarta* BRT and Commuter Line are the most crowded transportation services. Both serve millions of passengers every day, but they have only hundreds of buses and cars. Other than that, the headway is too long and inconsistent because there are not enough fleet to make shorter headway and to capacitate all the passengers.

What could public transportation do to meet the transportation demand and decrease barriers for people to use public transportation? Public transportation service in Jakarta must increase its fleet to accommodate millions of passengers and to grow. The integration of public transportation service is not enough as they have to be reachable by everyone from and to everywhere in Jakarta. Despite the planning on the future development of Jakarta (Yuliawati, 2006; RPJMD 2007-2013), the findings show that individual component has not met the transportation component. It means that the transportation component on public transportation, especially mass public transportation provided by the government, has not fulfilled all Jakarta people's requirements. To conclude, if only public transportation in Jakarta is better and more reliable in terms of capacity, walkability, and headway, more people would be very welcome and glad to use public transportation. It is better rather than making policies to prohibit people from using private transportation or limit access for private

transportation because, in the end, people would always want to reach their opportunities based on their component.

The government role is crucial in improving public transportation accessibility. Regulation like Odd-Even regulation is helpful to enforce and introduce people to the experience of using public transportation. However, the regulation should follow by the proper development of public transportation service. As the decision-makers, the government should enforce public transportation that reaches the business and commercial district and all the corners of the residential area. Subsidizing more busses or train cars is also needed to ensure transportation capacity and availability to supply the increasing demand for public transportation. Integrating public transportation in Jakarta's future development is an excellent start to improving transportation components such as characteristics and locations. It is because right now, there are different kinds of public transportation services in Jakarta, yet they are either unattached or overlapping. MRT is developing into Jakarta's metro line, but *Transjakarta* BRT also serves around similar areas where MRT Jakarta goes. Commuter Line has connected Jakarta's metropolitan area longer than any other public transportation service in Jakarta. However, there are still *Transjakarta* feeder services that serve around the area where Commuter Line goes. Integration should mean more than just connecting between two transportation modes in one area. However, it should also improve the accessibility for all kinds of users by improving the infrastructure and put more stations where more people, even in the corners of Jakarta, could use public transportation. The relationship between the transportation component and individual component is a continuity that should always balance from both sides (Geurs & van Wee, 2004; Van Wee & Geurs, 2011).

Analysis of barriers and opportunities for public transportation in Jakarta shows the significance of urban planning's social dimension. Often planning consists of calculations, measurement, policies, and management. However, planning is an intervention of social structure in the community. Social shifts could create high spatial differentiation (Fainstein et al., 1992). Before asking people to use public transportation, public transportation should improve first so it could positively impact the community by allowing them an opportunity to reach their goals.

6. Reflection

This research is written for Jakarta and Jakarta Provincial Government by someone who lives in Jakarta for almost her entire life; thus, this research could have been subjective. I am not a frequent public transportation user, but I have used public transportations at times and also know people who use those as part of their daily activity. In other words, I use private transportation, which is my car to go anywhere. Consequently, Jakarta's traffic congestion is very well known to me for all its experience and conditions. For this reason, I need to be as objective as possible during the process of developing a problem statement and analyzing the questionnaires, which is why I asked the respondents not to use their names. Instead, I identified all respondents by numbers.

During writing this master's thesis research, I learn many things about the importance of accessibility measures. From the beginning, I always want to focus my research on the social side in developing sustainable transportation. First, because I somehow always find my elf searching about social impact in everything since my bachelor days of learning architecture. I am aware that developing infrastructure should take into account spatial movement and quality because whatever the infrastructure is, it will always be going to be built for humans. The process of qualitative analysis also fascinates me because you learn something new about people. There should be more literature that talks about the social aspect of spatial science.

Accessibility components that I found from Geurs & van Wee (2004) paper confirmed my initial prejudice about accessibility. There are many ways to look into accessibility on public transportation, but in the end, we will always be going to talk about time, demand, spatial distribution, and individual background. I also learned that accessibility is different for many people. It depends on the background as in where they live and how privilege they are. It also brought me to realize that there is more than just not wanting to use public transportations and more cars and motorcycles bought. The problem lies in how the government treats public transportation, which is not surprising considering that more roads and fly overbuilt than new lines or corridors for public transportations. It shows the importance of governance in planning and regulating integrated transportation service that works for all people, not just those who work in the city center.

The hardest part for me is finding theories about accessibility but focus on the social dimensions. When I search for literature about accessibility in public transportations, most of the articles will refer to geographical, statistical analysis, or accessibility for disabled. My supervisor helped me a lot in directing me to find the literature that I looked for. This also went for finding the right qualitative approach to gather and analyze the data.

If I could have done something differently, I would have tried to find more respondents so my data could represent people of Jakarta better. Nonetheless, using the qualitative approach already helped me find the identity and representation of Jakarta. At least, by my subjective view, the qualitatively analyzed data has represented well the current condition of all transportation users in Jakarta.

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Questionnaire questions

Q1 Berapakah usia anda?

○ <18 (1)

○ 18-35 (2)

○ 36-50 (3)

○ >50 (4)

Q2 Apa jenis kelamin anda?

○ Laki-laki (1)

○ Perempuan (2)

Q3 Apakah tingkat pendidikan terakhir anda?

○ SMP (1)

○ SMA (2)

○ S1 (3)

○ S2 (4)

○ S3 (5)

Q4.2 Berapakah kisaran pendapatan anda tiap bulan?

○ < Rp 3.500.000 (1)

○ Rp 3.500.000 - Rp 4.999.999 (2)

○ Rp 5.000.000 - Rp 9.999.999 (3)

○ Rp 10.000.000 - Rp 20.000.000 (4)

○ > Rp 20.000.000 (5)

Q5 Di manakah anda tinggal?

○ Jakarta (1)

○ Bogor (2)

○ Depok (3)

○ Tangerang (4)

○ Bekasi (5)

○ Yang lainnya: (6) _____

Q5.2 Pilih lokasi tempat tinggal anda
Kota Administrasi (1)
Kecamatan (2)
Kelurahan (3)

Q6.2 Di manakah lokasi tempat kerja/sekolah/tujuan harian anda?
Kota Administrasi (1)
Kecamatan (2)
Kelurahan (3)

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Q7 Transportasi apakah yang anda miliki di rumah? (Silahkan centang mobil dan motor apabila anda memiliki kedua-duanya)

- [ ] Mobil (1)

- [ ] Motor (2)

- [ ] Bukan keduanya (3)

- [ ] Tidak punya (4)

Q7.2 Apakah kendaraan lainnya yang anda miliki?

_____

Q8 Seberapa sering anda menggunakan kendaraan anda?

○ 1 kali dalam seminggu (1)

○ 2-4 kali seminggu (2)

○ 5 kali seminggu atau lebih (3)

Q9 Apakah anda biasa menggunakan transportasi umum?

○ Iya (1)

○ Tidak (2)

Q12 Mengapa anda tidak menggunakan transportasi umum? (Boleh lebih pilih dari 1)

☐ Sulit dijangkau (1)

☐ Jauh dari rumah atau tempat kerja (2)

☐ Tidak aman (3)

☐ Mahal (4)

☐ Sering telat (5)

☐ Yang lainnya: (6) _____

Q10 Apakah transportasi umum yang biasa anda gunakan?

☐ Transjakarta (1)

☐ MRT (2)

☐ Commuter Line (3)

☐ Yang lainnya: (4) _____

Q11 Mengapa anda memilih jenis transportasi tersebut? (Boleh pilih lebih dari 1)

☐ Nyaman (1)

☐ Dekat dari rumah atau tempat kerja (2)

☐ Murah (3)

☐ Efektif (4)

☐ Tidak kena macet (5)

☐ Yang lainnya: (6) _____

Q12 Seberapa mudah dijangkaunya transportasi umum bagi anda (tidak termasuk gojek, grab, atau taksi online lainnya)? (😄 apabila sangat mudah, 😠 apabila sangat susah)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Q13 Tentu saja Jakarta identik dengan kemacetan bukan? Karena anda lebih memilih transportasi pribadi, seberapa parah tingkat kemacetan yang anda alami setiap harinya? (😄 apabila sangat baik, 😠 apabila sangat parah)

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)

Q14 Pertanyaan terakhir. Bisakah anda menjelaskan secara singkat bagaimana cara anda melakukan perjalanan menuju tempat perjalanan anda (berangkat dan pulang) setiap harinya?

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